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Abstract

We study the entry and exit dynamics of nonprofit public charities using 1989-2003 tax return data. The observed patterns can be understood using a dynamic industry model based on Jovanovic (1982) that incorporates profit-deviation and a non-redistribution constraint. Both features generate a high exit threshold which implies high net entry rates and low exit rates. The data reveal that nonprofit gross entry rates are lower than those of for-profits in services, while extremely low exit rates (across both sectors and time) result in net entry rates nearly 3 times larger than that of for-profit firms. We find that the behavior of new public charities is remarkably similar to that found in studies of private firms (e.g. new firms begin smaller than the industry mean, but grow faster). However, exit patterns diverge sharply. Besides relatively low exit rates, the survival rate of new nonprofit firms greatly exceeds those found in studies on services and manufacturing. In addition we find that the hazard rate of exit declines with age and size, and with size conditional on age.

KEYWORDS: Nonprofits, Entry, Exit, Dynamics

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1 Introduction

This paper analyzes nonprofit (NP) entry and exit patterns and shows they can be understood through the lens of a modified version of Jovanovic's (1982) model of industry dynamics. We incorporate into the original model two key characteristics of NPs, based on the insights of Lakdawalla and Philipson (2006): (i) the non-redistribution constraint (retained earnings may not be distributed to managers or trustees) imposed by law; and (ii) profit-deviating behavior. Both features lead to lower exit rates by changing the point at which shut down becomes optimal. We then test the model against the data by constructing a panel of incumbents, births, and deaths by sector for approximately 290,000 public charities using annual U.S. tax return data from 1989-2003.[1] Our data allow us to examine the assets, ages, and other characteristics of these firms such that we can identify what types of NPs enter and exit.

We find that NP entry behavior resembles that of for-profits but greatly differs on the exit side. New public charities begin smaller than incumbents. The survivors grow much faster than incumbents while the variance in their growth rates declines with age. The hazard rate of exit for new nonprofits is extremely low, while the hazard rate of exit is negatively related to size and age.

The focus of this paper is on nonprofit behavior, rather than comparisons with for-profits, for several reasons. First, the patterns we describe apply across all types of nonprofits suggesting that the differences we find are not driven by industry specific effects such as the degree of competition with for-profits. That is, the patterns appear to stem from the nonprofit form of organization. One of our contributions is demonstrating that the model, designed with for-profits in mind, applies to nonprofits. Second, despite the growing size of nonprofits in the economy, they are relatively little understood. Reports have noted a large increase in the number of nonprofits, but the characterization of a surge in the formation of new NPs, as we show below, is less than half the picture. The real story is the extremely low exit rates for NPs, particularly among new firms. Third, while we are able to make some comparisons with the aggregate entry and exit patterns among for-profits through use of Census Bureau data, we do not have annual firm level data on for-profits comparable to the rich data set on nonprofits used here. However, our results do suggest some promising avenues for further research at the more detailed sectoral level and we discuss some of these in our concluding remarks.

Furthermore, many studies have examined the entry and exit patterns in manufacturing and, from that literature, a set of "stylized facts" on entry and exit

[1] The panel by year and sector is available at http://faculty.lebow.drexel.edu/HarrisonT.

patterns has emerged (see Geroski, 1995, Sutton, 1997, and Caves, 1998). In contrast, little is known about the service sector, in general, and nonprofits in particular. Only a few studies have examined the service sector. Troske (1996) looks at finance, insurance, and real estate in Wisconsin and Audretsch et al. (2004) examine the Dutch hospitality sector. Some studies look at entry or exit only (e.g. Twombly, 2003; Harrison, 2008), or particular nonprofit sectors, most often hospitals (e.g. Deily, McKay, and Dorner, 2000; Chakravarty et al., 2006). However, the broad and detailed dynamic patterns of nonprofit entry and exit have not been analyzed.

This paper addresses these patterns and is organized as follows: Section 2 briefly presents the broad entry and exit patterns among nonprofits to motivate the theory and empirical tests; Section 3 presents the dynamic industry model and applies it to nonprofits; Section 4 describes the data in detail and the construction of our incumbent, birth, and death counts; Section 5 tests the data against the model; Section 6 summarizes the findings and discusses some important questions that arise.

2 Overview

Recent reports in the Nonprofit Almanac 2007 and from the Federal Reserve Bank of Minneapolis emphasize a rapid expansion in the number of NP entities over the past 20 years (Wirtz, 2006; Urban Institute, 2007). The number of public charities filing with the IRS increased by 45% between 1989 and 2000, while the total number of firms in the economy increased by only 12.6%.[2] Entities that are classified as tax-exempt public charities accounted for over 8% of US wages and salaries as of 2005 (Urban Institute, 2007), while estimates suggest as many as 65 million volunteers participated in charity work (Bureau of Labor Statistics, 2007). NPs now exceed the wholesale and construction sectors in size (Salamon and Sokolowski, 2006).

An initial impression from the increasing size of the sector might be that, for some reason, new NPs are forming at enormous rates. The driving forces could be wealth or substitution effects reflected in greater government or private support or a response to low provision of public goods from the government. At the same time, high rates of entry by tax-exempt entities raise issues regarding efficient use of public tax revenue, potential "unfair" competition with private enterprise, and concern over for-profits in disguise taking advantage of the corporate income tax

[2] Percentage increase for public charities derived from data described in Section 4. Percentage increase for all firms calculated from Small Business Administration (SBA) data available at http://www.sba.gov/advo/research/data.html.

exemption. However, before anyone can begin to assess the welfare and policy implications, it is important to understand just what exactly is driving the expansion in the number of NPs.

Table 1 presents the entry and exit rates by year for public charities in our data set. Nonprofit entry rates remained generally stable over time around 5% across sectors while exit rates remained low, though increasing in the later years.[3] We compare these rates with those for all services including for-profits between 1989-1998.[4] In our data, gross entry rates for NPs are about half the gross entry rates among for-profits in services while the exit rates are only about one-fourth the for-profit rate. In most studies of for-profits, exit rates are very close to entry rates and exhibit positive correlation across industries (See Geroski, 1995, and Caves, 1998). Typical exit rates are within about two percentage points of the entry rates, yielding net entry rates of around 1-2% or less. Our data show that between 1989 and 2000 nonprofits (NPs) had an average annual net entry rate of 3.4%, compared with 1.9% for services in Table 1, and *nearly 3 times* the US national average of 1.2% for all types of firms. The exit rates are sharply lower for NPs and the end result is substantially higher net entry rates among NPs.[5]

One explanation for low exit rates among nonprofits may be that there exists a cooperative element in their behavior. New nonprofit entrepreneurs may be more likely to internalize their impact on existing nonprofits when making entry or location decisions. Thus, exit rates would fall because NP entrepreneurs "care" about their counterparts as partners rather than rivals and behave less competitively. If so, we would expect low exit rates among sectors dominated by NPs, but not necessarily in mixed markets where for-profit competition is often substantial. Table 2 shows mean annual gross entry and exit rates and the net entry rate across nonprofit sectors from 1989-2000. The rates vary by sector, with Public Safety and Environment showing the highest gross and net entry rates, while Diseases

[3]For reasons discussed in Section 4, our exit rate measure for NPs, if anything, is an *overestimate*. Moreover, measurement issues arising from right-censoring of the data at least partially explain the observed increase in exit rates over time.

[4]Services data from SBA dynamic data using SIC 70-89 for services. SBA data are for establishments while nonprofit data are for firms. From the US Census the average establishment-firm ratio in services is 1.11 across years with the maximum being 1.15 across years. We adjusted the establishment counts in all years downwards by 1.15 for our firm estimates to illustrate that the entry-exit difference with NPs does not hinge on the distinction between establishments and firms. 1999-2000 data for both types show similar patterns, but the categories for all services change due to the conversion to NAIC codes making comparability an issue.

[5]In Table 1, the rates for all firms includes NPs in the SBA data. The rates for NPs use only NP counts from our data. If we were able to separate the SBA data into nonprofits and for-profits, the differences would be even larger than in Table 1 since the "all firms" measure is a weighted average of the two.

Table 1
Services Entry and Exit Rates, 1990-98

	Gross Entry Rate			Gross Exit Rate			Net Entry Rate		
	All Establishments	All Firms (Estimate)	Nonprofits	All Establishments	All Firms (Estimate)	Nonprofits	All Establishments	All Firms (Estimate)	Nonprofits
1990	11.86%	10.31%	5.70%	9.83%	8.55%	1.28%	2.03%	1.77%	4.43%
1991	11.75%	10.22%	5.54%	9.96%	8.66%	1.31%	1.79%	1.56%	4.24%
1992	13.38%	11.63%	5.96%	10.06%	8.75%	1.34%	3.31%	2.88%	4.62%
1993	11.02%	9.58%	5.91%	9.28%	8.07%	1.63%	1.74%	1.51%	4.29%
1994	11.06%	9.62%	5.79%	9.39%	8.17%	1.82%	1.67%	1.45%	3.97%
1995	11.42%	9.93%	5.84%	9.25%	8.04%	2.01%	2.16%	1.88%	3.83%
1996	11.71%	10.18%	5.49%	9.43%	8.20%	2.74%	2.28%	1.99%	2.76%
1997	14.07%	12.23%	5.08%	10.41%	9.05%	2.54%	3.65%	3.18%	2.54%
1998	11.64%	10.12%	5.06%	9.95%	8.65%	2.96%	1.69%	1.47%	2.11%

Data Sources: Establishment level birth and death rate's for Services sector from SBA.
Establishments per Firm ratio ranges from 1.11 to 1.15 over this period. Firm Estimate column divides establishment count by 1.15.
NP Rates are the Nonprofit gross entry, exit, and net entry rates calculated from the NCCS Core files.

Table 2
Mean Entry and Exit Rates Across Industries, 1989-2000

NTEE	Description	Gross Entry Rate	Exit Rate	Net Entry Rate
A	Arts, Culture, and Humanities	5.40%	2.29%	3.11%
B	Education	4.98%	1.91%	3.07%
C	Environmental Quality, Protection, and Beautification	8.74%	2.30%	6.44%
D	Animal-Related	6.87%	1.45%	5.42%
E	Health	4.17%	2.21%	1.96%
F	Mental Health, Crisis Intervention	4.52%	2.34%	2.17%
G	Diseases, Disorders, Medical Disciplines	3.73%	2.44%	1.29%
H	Medical Research	6.79%	2.92%	3.87%
I	Crime, Legal Related	6.59%	2.38%	4.21%
J	Employment, Job Related	4.39%	2.22%	2.16%
K	Food, Agriculture, and Nutrition	4.51%	1.82%	2.69%
L	Housing, Shelter	6.57%	1.38%	5.19%
M	Public Safety	9.07%	1.73%	7.34%
N	Recreation	6.42%	2.33%	4.09%
O	Youth Development	5.60%	2.09%	3.50%
P	Human Services-Multipurpose and Other	5.47%	1.95%	3.52%
Q	International, Foreign Affairs, and National Security	7.76%	3.44%	4.32%
R	Civil Rights, Social Action, Advocacy	7.09%	2.66%	4.43%
S	Community Improvement, Capacity Building	7.44%	2.90%	4.54%
U	Science and Technology Research Institutes, Services	4.88%	3.13%	1.75%
V	Social Science Research Institutes, Services	4.97%	2.78%	2.20%
W	Public, Society Benefit- Multipurpose and Other	6.35%	3.23%	3.12%
TOTAL		5.56%	2.14%	3.43%

has the lowest. The gross entry rate across all sectors is 5.6% and the exit rate is only 2.1%. Table 2 demonstrates that the pattern of low exit rates and high net entry rates applies across all types of nonprofit sectors where for-profit competition varies greatly. None of the sectors has an exit rate higher than 3.5%. The highest exit rate comes from International which also has a gross entry rate of 7.8%, well above average.

In studies conducted using data on manufacturing and services, most new firms exit within a short period of time. For example, Dunne, Roberts, and Samuelson (1988) find that in manufacturing about 60% of new firms die within five years and nearly 80% in ten years. As we show in Section 5, only about 12% of new nonprofits exit within five years and 17% after ten years. The low exit rate among all NPs and the high survival rate for new NPs explains the large expansion in NPs relative to the rest of the economy, not the gross entry rate.

Low exit rates raise additional policy concerns. Because, by law, NPs cannot distribute retained earnings, the alternative use of assets held by NPs will be undervalued by internal managers and trustees relative to a for-profit firm. Indeed, recent acquisitions of nonprofit hospitals by for-profits were complicated by the legal requirement to place the asset value of the former NP hospital into a foundation for further charitable purposes (Isaacs, Beatrice, and Carr, 1997). Moreover, there is potentially a significant loss of property tax revenue, if NPs delay exit due to the undervaluation of assets.

These statistics paint a surprising picture of the "growing" nonprofit sector. That is, the growth in numbers is primarily fueled by low exit rates. The comparison from Tables 1 and 2 also suggests that the high rates of net entry are not the result of industry life cycle patterns (See, for example, Klepper, 1996). While some of the highest net entry rates appear among NP sectors arguably in formative stages (e.g. Environment), mature industries such as Arts and Housing also grew substantially and had high net entry rates primarily associated with low exit rates.

These aggregate statistics, however, obfuscate the dynamics within sectors. In order to examine the industry level patterns, we need a framework and turn to the dynamic industry model of Jovanovic (1982). After laying out the model in the following section we then explore the data in light of the model's implications for nonprofit behavior.

3 Nonprofit Industry Dynamics

3.1 Base Model

The Jovanovic (1982) model has been widely applied in empirical studies of entry and exit. The model highlights an evolutionary process of entry, growth, decline, and failure among firms within a single industry. It predicts that the hazard rate of exit should be negatively related to both age and size, new firms should start smaller than incumbents, new firms that survive should grow faster than incumbents but the mean and variance in the growth rates should diminish with age. Dunne, Roberts, and Samuelson (1989), Mata and Portugal (1994), and Troske (1996), among others, provide empirical support for these predictions.

Here we sketch out the basic Jovanovic (1982) model, before applying it to NPs. Within the industry, firms produce a homogenous product (or service) and the only source of heterogeneity is in efficiency, specifically in the production costs. When firms enter, they begin with identical perceptions of their true costs. Upon receiving signals of low costs, they expand production and grow. When firms receive bad signals, implying high costs, they contract. Firms that receive a sufficient number of bad signals reach a point where their expected costs drive the continuation value below an exit threshold determined by an outside option.

Let $c(y)$ be a strictly convex cost function where y is the output. Costs are subject to random shocks in each period of production. Total costs are $c(y_t)x_t$ where x_t represents a random variable independent across firms. Each firm has a type θ which reflects its true production efficiency, but is unknown to the firm. The types are distributed normally, $N(\overline{\theta}, \sigma_\theta^2)$, and firms know the distribution. Over time, firms infer θ through a process of Bayesian updating. The influence of θ on x_t is as follows. Let $x_t = \xi(\eta_t)$ where the function $\xi(\cdot)$ is strictly increasing, positive, and continuous with finite upper and lower bounds. $\eta_t = \theta + \epsilon_t$, where ϵ_t is a shock with $\epsilon_t \sim N(0, \sigma^2)$ which is independent over time and across firms. Under the assumptions of the model, x follows a Martingale process such that $E(x_{t+1}) = x_t$.

The industry consists of an infinite number of firms and each firm is measure zero. Firms are thus too small to affect price, and the price sequence over time $\{p_t\}_0^\infty$ is given. Firms choose y_t to maximize expected profits:

$$\Pi = max_{y_t}\left[p_t y_t - c(y_t)x_t^*\right] \tag{1}$$

where x_t^* is the expected value of x_t conditional on information available prior to time t. The first-order condition yields the standard results that price equals expected marginal cost and output is decreasing in costs.

Let the entry cost be k and let W represent the liquidation value. Both k and W are assumed identical across firms and independent of all other variables. Firms have a constant discount rate of β and an infinite horizon. The value function is then:

$$V(x,n,t;p) = \Pi(p_t,x) + \beta \int max\left[W, V(z,n+1,t+1;p)\right] P(dz|x,n) \quad (2)$$

where the state variables are the expected value of x, the number of periods the firm has been in existence, the time period, and the exogenously given price vector. $\Pi(p_t, x)$ is the expected one-period return with respect to y when $x^* = x$. $P(dz|x, n)$ represents the probability that $x^*_{t+1} = z$ given that $x^*_t = x$ and the age of the firm is n.

Firms with higher expected costs have a lower continuation value. Let $\gamma(x, n, t; p)$ be the level of x^*_t (expected costs) at which the continuation value equals the liquidation value, making the firm indifferent between staying in the industry and exiting. Then $\gamma(\cdot)$ solves $V(x, n, t; p) = W$. $V(x, n, t; p)$ is strictly decreasing in x making $\gamma(x, n, t; p)$ uniquely defined and the cost threshold is decreasing in the liquidation value.

3.2 Profit-Deviation and the Non-Redistribution Constraint

In adapting the Jovanovic (1982) model to nonprofits we draw on the insights of Lakdawalla and Philipson (2006). They observe that when nonprofits have output-related objectives (altruism or profit-deviation, in their terminology), we can treat nonprofits as for-profit firms with differing cost functions. Specifically, when a nonprofit values output (e.g. hospitals with a mission to serve low income families) in addition to formal profits, the firm's effective costs are lower than a standard for-profit. They show that in mixed markets for-profit firms are the marginal firms. Therefore, demand shocks or policy changes regarding nonprofits will affect for-profits who react by entering and exiting more quickly than nonprofits. Because their focus is on long-run equilibrium, that model is largely silent on the dynamic behavior of nonprofits. However, when we introduce profit-deviation and the non-redistribution constraint into the model of Jovanovic (1982), it predicts, *ceteris paribus*, that net entry rates should be higher among nonprofits than for-profit firms in the same market.

To explain this result, it is important to make clear that NP status entails two separate features: 1) profit-deviating behavior (PD) which means that the objective function includes goals in addition to profit-maximization; and 2) the non-redistribution constraint (NRC) which forbids the firm from awarding investors with financial rewards (i.e. all net revenue must be re-invested in the firm). NP status is not necessary for profit-deviating behavior.[6] However, it is reasonable to think of NPs as being more likely to pursue non-pecuniary goals. The NRC, in contrast, is a consequence of nonprofit status. Nonprofits are legally not permitted to distribute retained earnings or assets; all funds must be reinvested in the firm. This constraint applies at exit as well, including mergers.

In what follows, our focus is on the entry and exit patterns of nonprofits and not on the choice between entering as a for-profit or nonprofit. Therefore we assume all firms that enter as a for-profit are not profit-deviators while all nonprofits are profit-deviators and subject to the non-redistribution constraint. We employ a linear representation of PD behavior as in Lakdawalla and Philipson (1998).[7] The one-period return is a linear combination of output and profits:

$$v = \alpha_y y + \alpha_\Pi \Pi, \qquad \alpha_y + \alpha_\Pi = 1. \tag{3}$$

α_y represents the subjective weight placed on goals related to output (service provision) other than the profit motive. A profit-deviating firm with $\alpha_y > 0$ places more weight on output (service provision) than a pure profit-maximizer. Profit-deviators could also have $\alpha_y < 0$ which suggests they produce below profit maximizing levels, perhaps due to a focus on high quality or prestige.

Since Π in (3) is (1), the objective function becomes:

$$v = max_{y_t} \left[\alpha_y y_t + \alpha_\Pi (p_t y_t - c(y_t)) x_t^* \right]. \tag{4}$$

The first-order condition can be expressed as:

$$p_t = c'(y_t) x_t^* - \frac{\alpha_y}{\alpha_\Pi}. \tag{5}$$

The term $\frac{\alpha_y}{\alpha_\Pi}$ shows that the deviator sets quantities as if it had lower costs. The entire right-hand side is the *effective* marginal costs for the deviator. Application of the implicit function theorem to the first-order condition shows that output is decreasing in x_t^* and increasing in α_y, ($\frac{dy}{dx^*} < 0$ and $\frac{dy}{d\alpha_y^*} > 0$). Higher costs lower output, as before, while a higher degree of profit-deviation leads to larger output for the same level of costs. The deviation (or altruism) parameter, α_y acts like a subsidy on output. The operator of the firm willingly forgoes some profits to increase output.

If two firms have identical expected true costs, but one firm has $\alpha_y = 0$ and the other has $\alpha_y > 0$, the deviator will produce more and appear to be inefficient

[6]Scott Morton and Podolny (2002) provide evidence for profit-deviation in the California wine industry and the effects on price and competition where some owners value quality.

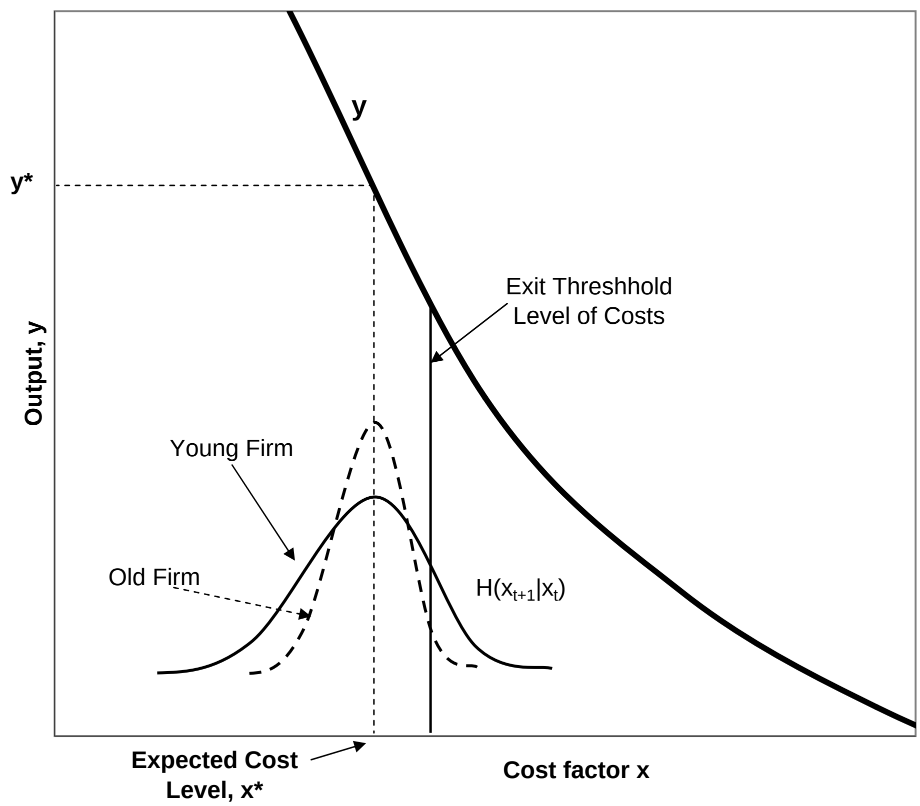
[7]This linear representation of a nonprofit objective function was also employed by Steinberg (1986).

based on its cost function alone, but not in terms of its objectives. Suppose we observe the same two firms producing the same level of y. In that case, the pure for-profit firm must have lower marginal costs than the deviator. Since α_y, $\alpha_\Pi > 0$ and $c'(y) > 0$ then the total cost function for the deviator must be higher than the non-deviator.

3.3 Exit

Consider, first, an industry composed exclusively of for-profits as in Jovanovic (1982). Figure 1 displays the relationship between expected costs (on the x-axis) and output (y-axis). As expected costs, x^*, increase, output, y, decreases. For a firm of a given age and expected cost level, there is a distribution around the expected cost level for the firm's true costs $H(x_{t+1}|x_t)$. If realized costs are sufficiently large to imply that future expected costs exceed γ (the solid vertical line) then the firm exits.

Figure 1: Output, Costs, and the Exit Threshhold



Since firms produce based on expected costs, the distribution $H(x_{t+1}|x_t)$ for a low cost firm, would lie to the left along the x-axis and such a firm would be larger in output size. Holding age constant, it means that larger firms will have a smaller portion of the distribution to the right of the exit threshold. Thus, smaller firms will be more likely to exit than larger firms.

Given two firms with the same expected costs, but differing ages, the variance of the distribution of $H(x_{t+1}|x_t)$ is smaller for the older firm because that firm has more signals upon which it forms its posterior distribution. Thus, younger firms with fewer signals (less experience) have a larger portion of their distribution exceeding the cost threshold and are more likely to exit.

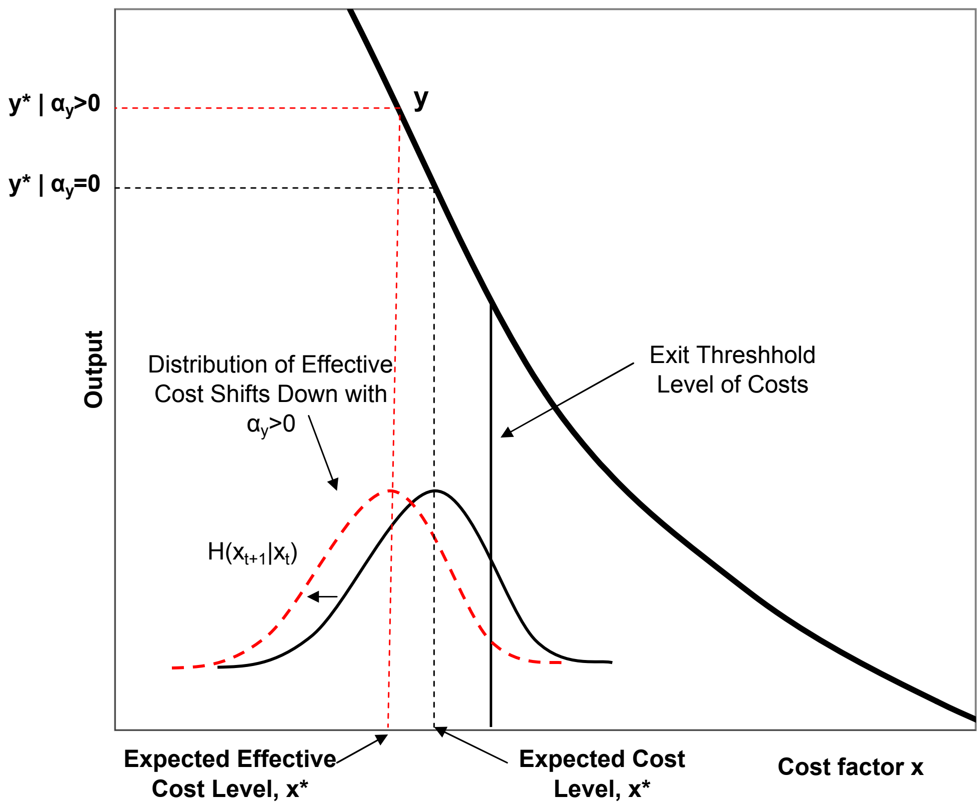
When new firms enter with the expected mean of the θ distribution, they will begin smaller than incumbents. Since incumbents that realized high costs have already exited, the size distribution of incumbents is truncated at the small end. Relative to the incumbents, the surviving firms in an entering cohort will exhibit faster growth because the variance in their cost distribution is larger. New information causes larger adjustments to the level of expected costs for young firms. As new firms gain experience, the variance of their distribution around θ shrinks, their growth rates decline and the variance of the growth rate distribution for a cohort declines.

With nonprofits also in the market, i.e. a mixed market, we continue to assume that all firms, for-profit and nonprofit, enter the market drawing from the same θ distribution. Both profit-deviation and the non-redistribution constraint affect the exit behavior of nonprofits. Let $y^*(x, \alpha_y)$ be the solution to the first-order condition. Using y^* to form the indirect utility function and applying the envelope theorem, it is straightforward to show that $\frac{dv^*}{d\alpha_y} = y^*(x, \alpha_y) > 0$. Thus, for any given level of expected costs, x^*, the one period value is higher for the profit-deviator. Moreover, since x^* is a Martingale, future values respond in the same way and the overall value function is increasing in α_y. Since $V(\cdot)$ is increasing in α_y it follows that $\gamma(x, n, t; p)$ is also increasing in α_y. That is, the exit threshold cost level increases with profit-deviation. That result holds provided W does not also rise with profit-deviation (and we return to this issue below).

The key implication of the model is that within the same industry, *nonprofit net entry rates will be higher than for-profit net entry rates*. Figure 2 shows the impact of profit-deviation on the dynamics. Due to the shift in $\gamma(x, n, t; p)$, a profit-deviator with expected costs, x^*, behaves like a pure for-profit firm with lower expected costs, because the effective costs are lower (See equation (5)). A smaller portion of the distribution lies to the right of the exit threshold for deviators making them less likely to exit for the same expected true costs. With both types of firms drawing from the same θ distribution, nonprofits will be less likely to exit. Since there are an infinite set of incumbents at all points in time, net entry in the model is given as the difference between entry and exit. That is, net entry is equivalent to the probability of survival conditional upon entry.

Firms will still exhibit a decreasing hazard rate of exit with age and size, but exit rates for nonprofits will be lower for two reasons stemming directly from profit-deviation. First, because the exit threshold for x_t^* covers a smaller portion of the exit range, fewer firms will hit that threshold and exit. Second, it will take firms longer (more draws from the distribution) to reach the point where the expected costs are large enough to push the firm past the exit threshold.

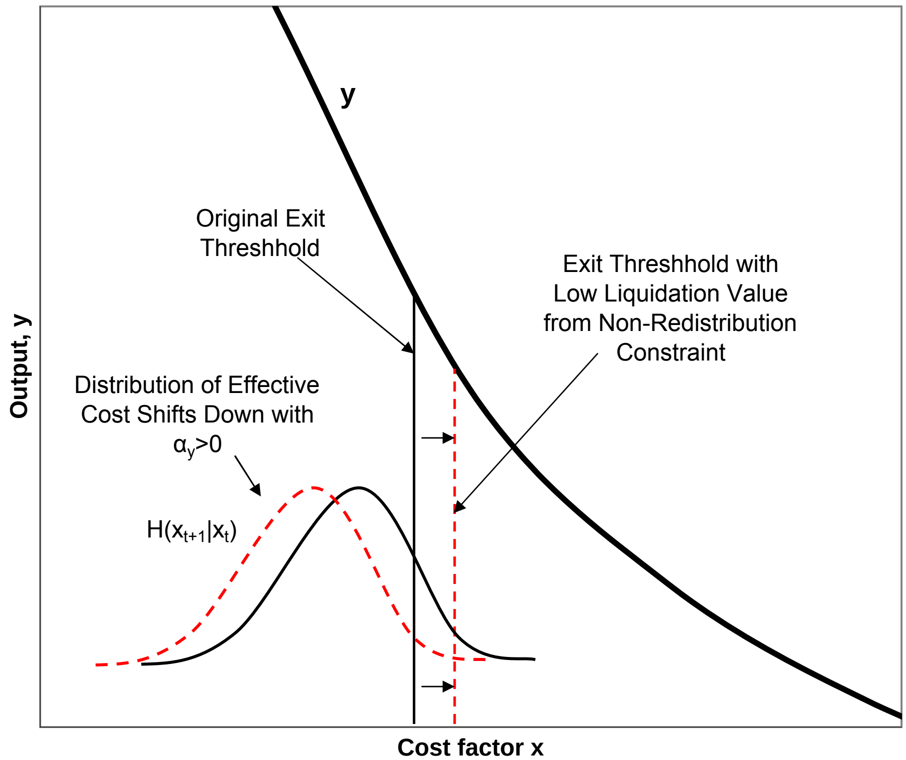
Figure 2: Output, Costs, and Profit Deviation



The results above apply provided the outside opportunity cost, W, does not increase with α_y. In the basic model, W is assumed invariant to all parameters, including costs, and over time. However, entry as a nonprofit means that, by law, upon shut down all remaining assets must be donated to charitable purposes.[8] No

[8]From IRS form 1023, Application for Tax Exempt Status, "...upon dissolution of your organization, your remaining assets must be used exclusively for exempt purposes...".

Figure 3: Output, Costs, and the NRC



distribution from the sales of assets to individuals is permitted for the same reason that flow profits may not be distributed or equity issued.[9] Thus, for nonprofits we denote the liquidation value as $W_{NP} < W$. At its extreme, one could think of $W_{NP} \leq 0$ whereby the decision-makers receive zero value (or less) from the shut down decision. That does not preclude exit since x can always be sufficiently large to drive the one-period returns below zero. The owner of a for-profit firm looks at W as the alternative use of assets in earning a return. The assets can be sold or deployed elsewhere where the profit prospects are better. Those options are *not* available to NPs, and hence, the liquidation value is lower.

[9]If profit-deviators have a preference for the output specific to that industry, output preference would imply an even lower opportunity cost for such deviators. In addition, legal barriers to changing mission while retaining nonprofit status would also reduce the liquidation value relative to a for-profit which faces no such restrictions. Furthermore, Hansmann (1986) suggests that some of NPs' capital is reflected in status or reputation. Hansmann (1990) makes a specific case for universities. Much of the "value" of a university is reputational capital which is not recoverable upon exit suggesting high sunk costs.

For an industry where nonprofit firms have a low W_{NP} the implications are straightforward. Such firms have a higher cost threshold of exit than for-profits in the same market. Thus, the NRC implies that nonprofits should be slower to exit and not exit until a higher cost threshold has been reached. Unlike profit-deviation, the NRC has no effect on the production decision in each period.[10]

The NRC reinforces the effect of profit-deviation. Taken together, the model predicts nonprofits will exhibit higher net entry than for-profits within the same market. Figure 3 illustrates the effect of the NRC. The liquidation value for a NP firm is lower and therefore shifts to the right requiring a higher cost level to drive the continuation value down sufficiently far for exit. Firms with identical expected costs, but differing liquidation values will have different probabilities of exit. The lower the liquidation value, the lower the hazard rate of exit.

3.4 Entry and Equilibrium

To characterize the equilibrium of the model, define the following:

$$\text{Let } \Psi\left(x|t,\tau;p,I\right) = \Pr\left[\begin{array}{c} x_s^* < \gamma\left(s-\tau,s;p,I\right),\ s=\tau+1,...,t-1 \\ \text{and } x_t^* < \min\left[x,\gamma\left(t-\tau,s;p,I\right)\right] \\ \text{given } x_\tau^* = x_0 \text{ and given that} \\ \text{entry occurred at } \tau\ \left(\tau < t\right) \end{array}\right]. \tag{6}$$

Ψ represents the probability that a firm which entered in some previous period τ with mean expected cost parameter of x_0 did not exit in any period prior to the current period, t, and that its current expected costs are below the threshold costs $\gamma\left(\cdot\right)$ and less than some value of x. $I \in [FP, NP]$ is an indicator variable for whether the firm is for-profit or nonprofit and thus captures the level of α_y. We assume that the level of α_y is a common constant across nonprofits and invariant with time. Then we can write the expected output level of the firm as:

$$\phi\left(t,\tau;p,I\right) \equiv \int y\left(p_t/x;I\right)\Psi\left(dx|t,\tau;p,I\right). \tag{7}$$

where output y is a function of price over cost, the type of firm, weighted by the probability of the firm remaining in existence and having expected costs x.

Denote the entry measure for for-profit firms as e_τ^{FP} and for nonprofit firms as e_τ^{NP} where e_τ represents combined entry. Then the output of a cohort of firms

[10] The absence of an effect of the NRC on production decisions follows from the fact that production is based on variable costs, while there is no capital accumulation in the model. If NPs accumulate capital and the NRC discourages investment, lower output might be expected among NPs because they would grow slower than for-profit counterparts.

entering at time τ is $\sum_I e_\tau^I \phi(t,\tau;p,I)$ and the combined entry sequence is $e \equiv \{e_\tau\}_0^\infty$. Thus, industry output is:

$$Q_t = \sum_{\tau=0}^{t} e_\tau^{FP} \phi(t,\tau;p,FP) + \sum_{\tau=0}^{t} e_\tau^{NP} \phi(t,\tau;p,NP) \equiv Q_t(p,e), \qquad (8)$$

which is merely the sum of output across entering cohorts. The demand function is deterministic, represented by $D[Q_t, t]$, and at all points in time t the function is strictly decreasing in Q_t.

In defining the equilibrium entry conditions, the first difference between NPs and FPs to note is the degree of "sunkeness" in the entry cost. For FPs at least some portion of the start-up costs are sunk and unrecoverable through exit. However, for NPs essentially *all* of the start-up costs are unrecoverable. Since the NRC applies, all start-up funds, provided through what must be contributions (cash, assets), can never be recovered by "investor-donors" for the same reason that the liquidation value is lower.

Therefore we distinguish between the sunk costs associated with a firm of any type entering the industry, k, and the additional sunk costs associated with choosing to enter as a nonprofit, k_{NP}. Those sunk costs change the outside opportunity cost, W, *upon entry* as a nonprofit which means that the value of W differs for an investor-donor pre- and post-entry. Prior to entry, committing resources to a charitable enterprise is still a choice. Alternatively, those resources could still be used for pure profit-making opportunities elsewhere. Post-entry they cannot. Therefore, we also distinguish between the outside opportunity cost faced by a potential nonprofit entrant W which we assume equal to the opportunity cost of a for-profit entrepreneur, and the opportunity cost (liquidation value) available to an incumbent nonprofit, W_{NP}, discussed in the preceding subsection.[11] The value function for nonprofits, denoted V^{NP}, also differs from for-profits due to profit-deviation and the lower liquidation value post-entry.

The equilibrium here is one of perfect foresight. Firms' beliefs about the price sequence, which are shared by all firms, ensure that the expected price sequence is the price sequence observed in equilibrium.

Definition of Equilibrium: *Equilibrium is a pair of functions $y(\cdot)$ and $\Psi(\cdot)$ that characterize optimal output and exit behavior of firms, and a triplet of non-*

[11]One could argue that nonprofit entrepreneurs face a lower pre-entry opportunity cost than for-profit entrepreneurs since the output of other options may be weighted less or not at all in profit-deviators' objective functions. Lowering the opportunity cost for profit-deviators pre-entry would not change the basic results. It would suggest a relative increase in gross entry by NPs, but would not affect relative net entry rates.

negative sequences $\left(p, e^{FP}, e^{NP}\right)$ *s.t.* $\forall\ t = 0, 1, ...,$

$$\begin{aligned} E1 &: p_t = D_t \left\{Q_t\left(p, e\right), t\right\} \\ E2 &: V\left(x_0, 0, t; p\right) - k = W \text{ if } e_t^{FP} > 0 \\ E3 &: V\left(x_0, 0, t; p\right) - k \leq W \text{ if } e_t^{FP} = 0. \\ E2' &: V^{NP}\left(x_0, 0, t; p\right) - k - k_{NP} = W \text{ if } e_t^{NP} > 0 \\ E3' &: V^{NP}\left(x_0, 0, t; p\right) - k - k_{NP} \leq W \text{ if } e_t^{NP} = 0 \end{aligned}$$

The equilibrium definition above allows for industries to consist of for-profits only or nonprofits only as special cases. First, if E2 and E3′ always hold such that $e_t = e_t^{FP}\ \forall t$ then the equilibrium is the same as the original Jovanovic (1982) model. Condition E1 states that the expected price path is the actual price path. The conditions under E2 and E3 are the equilibrium entry conditions for for-profits. E2 states that if a positive amount of entry occurs, it will do so up until the point where the value of entry minus the sunk entry costs equals the opportunity cost. E3 states that if no entry occurs in period t then the value minus entry costs must be equal to or less than the opportunity cost. On the other hand, if E3 and E2′ always hold such that $e_t = e_t^{NP}\ \forall t$ then we have an industry comprised of all nonprofit firms.

In a mixed market, $E2$ and $E2'$ hold allowing simultaneous entry by both types of firms in the perfect foresight equilibrium. Note that we assume there exists sufficient supply of both types of potential entrants to ensure both conditions hold.[12] With simultaneous positive entry of both types we have that $V^{NP} = V + k_{NP}$, requiring that $V^{NP} > V$. Without profit-deviation raising V^{NP}, there is no incentive to enter as a nonprofit since the NRC raises costs yet generates no additional gains. Larger values for profit-deviation, α_y, would induce more entry by nonprofits relative to for-profits in a mixed market while higher values of k_{NP} would reduce entry of nonprofits relative to for-profits. The model therefore does not make a clear prediction as to whether gross entry should be higher for for-profits or nonprofits within the same market, but does allow for variation in their relative gross entry rates. Empirically, from Table 1, we see low gross entry rates among nonprofits relative to for-profits in the service sector in general. In sum, profit-deviation is necessary to induce nonprofit entry in our model, while the NRC explains low gross entry rates.[13]

[12] In Lakdawalla and Philipson (2006), they assume a fixed supply of altruists in order to sustain an equilibrium with both types of firms. If we also assume a limited supply of altruists, then E2′ need not hold with equality, but E2 will hold in a mixed market and a for-profit firm will be the marginal entrant.

[13] Ben-Ner (1986) argues there are tighter financial constraints on NPs, particularly for start-ups

Changes in the gross entry rate of nonprofits imply changes in the gross entry rate among for-profits and the total gross entry rate. Since nonprofits have a preference for output they produce more than for-profits with the same expected costs, therefore in expectation $\phi(t, \tau; p, FP) < \phi(t, \tau; p, NP)$. In addition, a greater fraction of nonprofits survives which increases the expected output of any nonprofit cohort. Equation (8) then implies that within the same market the larger the gross entry of nonprofits, e^{NP}, the lower the gross entry rate of for-profits, e^{FP}. Moreover, as e^{NP} increases, the lower must be the total gross entry rate, e. The model implies that total gross entry rates will be highest in pure for-profit industries and lowest in pure non-profit industries, *ceteris paribus*.[14]

Within the same industry, we are assuming that the draw from the θ distribution is independent of firm type, for-profit or nonprofit. Thus, in equilibrium the distribution of the true costs (θ) would be mixed between for-profit and nonprofit entities up to the highest cost threshold level that applies to for-profits. The highest cost firms beyond that threshold, however, would be all nonprofit because their exit cost threshold is higher. That is, the model predicts that nonprofits should dominate the right tail of the cost distribution.[15] Note that profit-deviation implies that this observation will not necessarily hold based on size measures. High cost nonprofits with preference for output may produce as much as the smallest for-profits, because their *effective* costs are lower.

Our model explains the low gross exit rates and high net entry rates among NPs relative to for-profits. Specifically, it predicts that net entry rates among nonprofits will be higher than among for-profits in the same industry; exit by nonprofits will take longer on average than among for-profits; gross entry rates may vary between nonprofit and for-profit firms; and the highest cost firms will be nonprofit. The standard predictions of the Jovanovic (1982) model still hold when including PD and the NRC. To summarize, on the entry side, the model predicts that new firms will start smaller than incumbents, surviving firms will grow faster than incumbents, but their growth rates and variance of growth rates

which could also explain low entry rates and a small entering size. However, credit constraints would also tend to raise exit if NPs are paying higher costs on debt or find financing more difficult. Thus, borrowing constraints alone would suggest lower net entry rates for NPs.

[14]In the static model of Scott Morton and Podolny (2002), owners value quality (as opposed to output). Thus, in their framework the entry relations are reversed such that a market with a larger fraction of profit-deviators would induce a higher overall gross entry rates, because owners restrict output to focus on quality. Our model would generate similar results in the case where $\alpha_y < 0$.

[15]We do not have the data to test this implication directly. However, it strongly suggests a bounds approach in conjunction with the cost frontier analysis as employed in Deily, McKay, and Dorner (2000). Our model implies that the overall level of inefficiency when comparing for-profits and nonprofits may not be readily indistinguishable. However, if one looks at the distribution of cost inefficiencies, the most inefficient firms should all be nonprofit.

will decline over time. On the exit side, the model predicts that the hazard rate of exit is decreasing in size and age, decreasing in size conditional on age, and decreasing in age conditional on size. In Section 5, we examine whether the data exhibit these patterns and explore the low exit rate in more detail.

4 Data Description

4.1 Data Coverage

The data for nonprofit firms is obtained from the National Center on Charitable Statistics (NCCS) at The Urban Institute. Although most nonprofits are exempt from federal income taxation, the IRS requires they file a 990 tax return annually if their gross receipts are greater than $25,000. Our data contain all 501(c)3 public organizations who filed a tax return between 1989 and 2003. The National Taxonomy of Exempt Entities (NTEE) classifies NPs based on their primary mission. The 1st digit of the 4 digit code divides nonprofits into 26 lettered categories from Arts to Health Care to International. This level of disaggregation is comparable to a 3- or 4-digit NAICS code. Our focus in this paper is on firms physically directly providing services. Therefore, as further detailed in the Data Appendix, we omit firms classified as private foundations and organizations belonging to 1-digit sectors T (Philanthropy, Volunteerism, and Grantmaking), X (Religious-related), Y (Mutual Benefit), and Z (Unknown).

As seen in Table 3, there were about 165,000 public charities filing tax returns in 1989 and by 2000 this number nearly reached 240,000, an increase of 45% through 11 years. The largest sectors, (A) Arts, (B) Education, (E) Health, and (P) Human Services, grew at rates below or near the overall change. Many smaller sectors, e.g. (C) Environment and (M) Public Safety, witnessed greater than average growth. Thus, the increase has not been driven by expansion in the large sectors alone. Research related sectors were among the slowest growing including (G) Diseases, (U) Science and Technology Institutes, and (V) Social Science Research Institutes.

4.2 Comparability with Other Studies

Our data set differs from analogous for-profit entry/exit studies in three crucial ways. First, while we have rich financial data, we do not have employment data. Most studies of entry and exit use employment numbers as a proxy for size and, hence, computing growth rates. We use two measures for size: inflation-adjusted assets and expenses. Assets have been used in other studies (e.g. Hart and Oulton,

Table 3
NTEE Industry Classification and Number of Firms

NTEE	Description	1989 N	1989 Share	2000 N	2000 Share	Percent Change	Average Annual Growth Rate
A	Arts, Culture, and Humanities	20,976	12.7%	29,364	12.3%	40.0%	3.11%
B	Education	35,111	21.3%	48,984	20.5%	39.5%	3.07%
C	Environmental Quality, Protection, and Beautification	2,985	1.8%	5,920	2.5%	98.3%	6.42%
D	Animal-Related	2,428	1.5%	4,338	1.8%	78.7%	5.42%
E	Health	17,561	10.6%	21,731	9.1%	23.7%	1.96%
F	Mental Health, Crisis Intervention	5,819	3.5%	7,356	3.1%	26.4%	2.15%
G	Diseases, Disorders, Medical Disciplines	4,133	2.5%	4,748	2.0%	14.9%	1.27%
H	Medical Research	1,395	0.8%	2,116	0.9%	51.7%	3.86%
I	Crime, Legal Related	3,017	1.8%	4,743	2.0%	57.2%	4.20%
J	Employment, Job Related	2,917	1.8%	3,689	1.5%	26.5%	2.16%
K	Food, Agriculture, and Nutrition	1,872	1.1%	2,501	1.0%	33.6%	2.67%
L	Housing, Shelter	8,289	5.0%	14,443	6.0%	74.2%	5.18%
M	Public Safety	1,811	1.1%	3,941	1.6%	117.6%	7.32%
N	Recreation	12,001	7.3%	18,626	7.8%	55.2%	4.08%
O	Youth Development	5,131	3.1%	7,493	3.1%	46.0%	3.50%
P	Human Services-Multipurpose and Other	26,366	16.0%	38,568	16.1%	46.3%	3.52%
Q	International, Foreign Affairs, and National Security	1,614	1.0%	2,563	1.1%	58.8%	4.29%
R	Civil Rights, Social Action, Advocacy	1,248	0.8%	2,003	0.8%	60.5%	4.39%
S	Community Improvement, Capacity Building	7,079	4.3%	11,518	4.8%	62.7%	4.52%
U	Science and Technology Research Institutes, Services	1,401	0.8%	1,693	0.7%	20.8%	1.74%
V	Social Science Research Institutes, Services	575	0.3%	728	0.3%	26.6%	2.17%
W	Public, Society Benefit- Multipurpose and Other	1,413	0.9%	1,973	0.8%	39.6%	3.08%
TOTAL		165,142	100%	239,039	100%	44.7%	3.42%

1996), and provide a reasonable measure of the size of the firm. However, some nonprofits have large endowments relative to service provision, and thus expenses would provide a better proxy for the economic impact of the firm. As we show in the next section, both variables tell the same story with regards to entry, growth, survival, and failure of nonprofits.

There is also reason to believe that employment data would be a misleading measure of "size" for nonprofits. Nonprofits rely heavily on volunteer labor. A report by The Independent Sector (2001) estimated that in 2000 adults volunteered 15.5 billion hours of work, the equivalent of 9 million full-time employees valued at $239 billion. Given that total *paid* employment in nonprofits was only 11.9 million workers, that implies using formal employment figures would understate economic size/contribution by approximately 40%. In addition, relative to Health and Education, other sectors depend disproportionately more on volunteer labor. Thus, use of employment as a threshold would create additional bias across the sectors.

Second, due to the gross receipts threshold of $25,000, this dataset obviously omits small firms. Gross receipts includes any incoming cash flows such as donations, grants, investment income, dues, and sales revenues. Thus, any nonprofit below this threshold is extremely small in terms of its economic activity, and very unlikely to have any formal paid employment. However, the number of nonprofits that appear to fall below this threshold is substantial. The Nonprofit Almanac shows that in 1999 there were 646,000 501(c)3 public charities, but only 246,000 filed the 990 or about 38%, with the others below the gross receipt threshold or simply failing to report (Urban Institute, 2007). For a study of entry and exit the minimum threshold size is important because past work routinely finds that the turbulence and churn among firms (entry and exit) occurs predominantly at the small end of the size distribution (See Geroski, 1995 and Caves, 1998). Thus, omitting the small firms would tend to understate both entry and exit rates.

For-profit studies of industry dynamics, due to a threshold based on employment size, also omit very small firms (Dunne, Roberts, and Samuelson, 1988 and 1989; Audretsch and Mahmood, 1994 and 1995, Mata and Portugal, 1994; and Troske, 1996). Moreover, using Economic Census service sector data which includes firms with at least one paid employee, there were 208,911 and 224,980 tax-exempt establishments for 1992 and 1997, respectively (US Economic Census, 1992 and 1997).[16] Furthermore, when matching tax return data to employment

[16]Most nonprofits are classified as service sector. We define the service sector as those in the following service categories: Professional, Scientific, & Technical Services; Administrative & Support, & Waste Management & Remediation Services; Educational Services; Health Care & Social Assistance; Arts, Entertainment, & Recreation; and Other Services. Those cover the areas in the industry codes where 501(c)3 organizations fall with a few exceptions.

data from the BLS, Salamon and Sokolowski (2005) identify 195,145 nonprofit organizations for 2002. In our tax return data, we have a total of 210,889, 252,405 and 272,700 501(c)3 public charities in 1992, 1997 and 2002 respectively. Thus, we are likely including a *greater* percentage of small firms which would tend to increase the entry and exit rate measures.

Finally, the dataset also omits nonprofits who simply fail to comply with the filing requirements. Because the IRS receives little tax revenue from these entities, they have limited resources to enforce compliance. However, the IRS investigates any nonprofit that fails to file a tax return for three consecutive years. If the nonprofit is found to still be in existence, it may lose its tax-exempt nonprofit status. There is really nothing we can do to address firms that never file during our time period. However, our analysis suggests that the more common problem is firms not filing in consecutive years. This problem is mitigated since our long time span (15 years) increases the likelihood that we observe an organization file for at least a few years. For such nonprofits, we do not observe financial information in these non-filing years but we do assume that the organization exists during the interim years. We can track the nonprofits across time because the tax forms include the unique employer identification number (EIN). This methodology provides the most complete panel possible which is essential for the purposes of this paper.

4.3 Entry and Exit Measures

The data contain the variable RULEDATE which reports the year the IRS granted 501(c)3 status to the nonprofit. We also know the first observed tax-filing year (FIRSTFILE) between 1989 and 2003. We identify the entry year as min (RULEDATE, FIRSTFILE). FIRSTFILE cannot be used on its own because the data are left-censored at 1989. We use the earliest year of the two, rather than simply the RULEDATE, because some NPs file a tax return before receiving exempt status which can apply retroactively. The age of the firm is therefore calculated as the year of the data minus the entry year.[17]

Our determination of an exit entails more caveats. As discussed earlier, annual enforcement of the filing compliance is somewhat limited. However, taking the noncompliance into account, it is possible that the firm might not file in year $t + 1$ but file again in either $t + 2$ or $t + 3$. Thus, we classify a firm as an exiter in year t if a firm filed a tax return in year t but not in any subsequent year. Due to this measurement issue we do not report entry or exit counts for the last three years of our data. Entry and exit counts are constructed for 1989-2000 such that firms that

[17]The year of tax-exempt status (RULEDATE) only dates back to 1900. Thus, the age of very old firms (e.g., Harvard University) will be underestimated.

filed in 2000, but not in the last three years (2001-2003) are counted as exiters. Some of those firms we identify as exiters in the later years may file again in a year beyond our data set.[18] For example, a firm filing in 1998 that files again in 2004 would not reappear in our data and would be counted as an exit. Because we find such low levels of exit, we deliberately chose this measure such that we are most likely presenting an *overestimate* of exit. This upward bias in the exit rate is likely to be more severe in the later years since we have fewer remaining time periods to distinguish between a true exit and filing noncompliance. To the extent that our exit measure is biased, it implies our already high net entry rates are underestimates. If we relax our exit definition to lower the exit count, the results showing low exit rates, low hazard rates of exit, etc. become even stronger.

Similar to Evans (1987) and Dunne, Roberts, and Samuelson (1988), we cannot identify mergers and acquisitions in our data. Thus, exit or growth due to consolidation cannot be distinguished from true shut down or internal growth. For our measures, acquisition of a nonprofit by a for-profit is classified as an exit, since we do not observe the reason for exit from the nonprofit data set. For mergers between nonprofits, unfortunately, without hand inspection of the historical records of the 290,000 firms in our data set, we cannot systematically flag these instances. Thus, in the case of a merger between nonprofits, the entity that stops filing the 990 form is counted as an exit.

To get a sense of how much our exit measure may be biased upwards, we match our identified exits to the registry of all nonprofits maintained by the IRS.[19] This data is irregularly gathered from the IRS by the NCCS and it is unclear how long it takes an exiting firm to be removed from the data. An Internal Revenue Service (1994) study suggests that between 20-30% of all nonprofits listed are actually no longer operating. Thus, exits identified using the BMF file are an underestimate and therefore a lower bound on the exit rate. Of the 49,088 firms we identify as exits, we confirm that 21,862 ($\sim$ 45%) no longer exist in the registry. Using only these firms to calculate exit rates, we find that exit rates between 1989 and 2000 range between 0.5% and 1.3% across nonprofits, approximately half of those reported in Table 1.

[18] Mata and Portugal (1994) take a similar approach regarding potential non-compliance in their study of Portuguese manufacturing.

[19] This data, called the Business Master File (BMF), includes the EIN, of all non-religious organizations granted nonprofit status by the IRS, including those that fall below $25,000 in gross receipts. We use the BMF data that were extracted by NCCS in July 2002 and December 2004.

Table 4: Descriptive Statistics of Public Charitites

Variable	Obs	Mean	S.D.	Min	Max
Age	1,685,191	16.58	14.47468	0	100
Assets-Beginning of Year	1,677,685	5,286,980	7.05E+07	0	1.79E+10
Assets-End of Year	1,685,191	5,812,544	7.89E+07	0	2.29E+10
Expenses	1,685,191	3,539,757	4.06E+07	0	1.31E+10
Gross Receipts	1,680,827	5,147,140	1.62E+08	12253.86	9.46E+10
Total revenue	1,685,191	3,847,667	4.49E+07	0	1.65E+10
Contributions	1,685,191	690,163	7634591	0	1.11E+09
Program service revenues	1,570,438	2,772,602	3.84E+07	0	1.30E+10

Note: Age is in years, all other statistics are in inflation-adjusted dollars with 1996 as the base year.

4.4 Financial Data

The tax returns contain financial information on assets, expenses, contributions, mission-related revenues (called program service revenues), and dues. We use end of the year assets and expenses as our size measures. All financial variables have been inflation-adjusted using the US CPI with a base year of 1996.

Once again, due to reduced IRS monitoring of nonprofit tax returns, the reported financial data can be unreliable. We attempt to mitigate this problem as much as possible through extensive data cleaning. Although measurement error no doubt still exists, comparisons across data sets would create more cause for concern. Moreover, since much of our analysis is based on comparisons within sectors or uses industry dummies, systematic measurement error within an industry should be differenced out and therefore less of an issue. After deletions of firms with implausible financial data (see appendix for further details) we have 264,044 firms and 1,685,191 firm-year observations reporting valid financial information.

Table 4 presents the descriptive statistics for these firms. The mean level of assets was over \$5 million and the change from the beginning of year to end of year, on average, was a substantial \$530,000 or just over 10%. Public charity average expenses were \$3.5 million. Program service revenues accounted for over half of gross receipts while contributions only made up about 13%. Over the 11 year span, the total real value of assets held by public charities increased by 102%. To get a sense of the relative size of these sectors, Table 5 shows the share of end-of-year assets across types, sorted by percent change from 1989 to 2000. The final column includes the percentage change in numbers from Table 3 for comparison. (B) Education and (E) Health possess the lion's share among nonprofits, accounting for about 3/4 of assets. Some of the sectors, such as (R) Civil Rights, are financially tiny compared to Education and Health. While the Education sector expanded the most, the majority of sectors increased in relative size. Only the nonprofit Health sector decreased in relative size by a sizeable margin, most likely due to merger and acquisition by for-profit entities. Thus, many of the smaller nonprofit sectors were growing not just in numbers, but in financial size as well.

5 Empirical Evidence

Our purpose in this section is two-fold. Given the paucity of research on industry dynamics in the nonprofit sector, we document the basic patterns and characteristics of entrants and exiters by sector. Second, we test the model's predictions against the data.

The predictions from the Jovanovic model hold after incorporating PD and the NRC. In particular, we should observe that (i) firms start small relative to incumbents; (ii) surviving new firms grow faster than incumbents; and (iii) the variance of the growth rates of survivors should decline with age. On the exit side, the model predicts that exiting firms should also be small relative to incumbents (though it makes no prediction about the relative size of entrants versus exiters). The model also predicts that the hazard rate of exit declines with age and size and with size conditional on age. Those predictions have been confirmed in a number of studies on manufacturing (See Caves, 1998, for an excellent summary).

Tables 6 and 7 detail the characteristics of entrants and exiters relative to incumbents broken down by NTEE sector. For each financial characteristic, we divide the average value for entrants/exiters by the average for incumbents. Across the sectors, we find that exiters are approximately 25-40% the size of incumbents. This finding is consistent with the model prediction that the smaller/inefficient firms will exit the industry. Similarly, new firms start around 25-30% of the incumbent size for all financial characteristics except contributions. Sector (L) Housing & Shelter is an exception with a starting size much closer to the mean incumbent size. However, the generally small starting size contrasts with Troske's (1996) finding for service firms. He finds that new service firms, by employment, are about 80% of incumbents, while manufacturing firms are approximately 25%. Even when we use expenses, which should be correlated with employment levels, new firms are still much smaller. Since our measure of size is based on financial characteristics, the statistics are obviously not directly comparable. However, given the service nature of nonprofit output, one might expect a closer mapping between the two. Since our data are only for nonprofits, this finding might indicate that the nonprofit sector comprises a disproportionate share of the lower tail of the size distribution in mixed industries. Another explanation can be derived from

Table 5: Asset Shares by NTEE

NTEE	Description	1989	2000	Change	Number Change
B	**Education**	**32.3%**	**34.2%**	**2.0%**	**39.5%**
S	Community Improvement, Capacity Building	1.0%	1.4%	0.4%	62.7%
L	Housing, Shelter	2.2%	2.6%	0.3%	74.2%
A	Arts, Culture, and Humanities	4.0%	4.3%	0.3%	40.0%
C	Environmental Quality, Protection, and Beautification	0.7%	0.9%	0.2%	98.3%
N	Recreation	0.5%	0.7%	0.1%	55.2%
H	Medical Research	2.0%	2.1%	0.1%	51.7%
W	Public, Society Benefit- Multipurpose and Other	0.3%	0.5%	0.1%	39.6%
D	Animal-Related	0.5%	0.6%	0.1%	78.7%
Q	International, Foreign Affairs, and National Security	0.5%	0.6%	0.1%	58.8%
V	Social Science Research Institutes, Services	0.2%	0.2%	0.0%	26.6%
M	Public Safety	0.1%	0.1%	0.0%	117.6%
R	Civil Rights, Social Action, Advocacy	0.1%	0.1%	0.0%	60.5%
K	Food, Agriculture, and Nutrition	0.1%	0.1%	0.0%	33.6%
I	Crime, Legal Related	0.2%	0.2%	0.0%	57.2%
J	Employment, Job Related	0.4%	0.4%	0.0%	26.5%
O	Youth Development	0.6%	0.6%	0.0%	46.0%
G	Diseases, Disorders, Medical Disciplines	1.0%	0.9%	-0.1%	14.9%
F	Mental Health, Crisis Intervention	0.9%	0.8%	-0.1%	26.4%
U	Science and Technology Research Institutes, Services	1.1%	0.9%	-0.1%	20.8%
P	Human Services-Multipurpose and Other	7.2%	6.8%	-0.4%	46.3%
E	**Health**	**44.0%**	**41.0%**	**-3.0%**	**23.7%**
	All Sectors	**100.00%**	**100.00%**	**0.00%**	**44.7%**

TABLE 6: Entrants Characteristics Relative to Incumbents by NTEE sector

SECTOR		Assets (EOY)	Gross Receipts	Program Service Revenue	Contributions	Expenses
A	Arts, Culture, Humanities	21.9%	31.2%	23.7%	50.4%	23.2%
B	Education	12.0%	11.2%	15.3%	21.3%	14.5%
C	Environment	13.8%	20.5%	19.8%	39.7%	20.3%
D	Animal Related	16.0%	41.2%	23.3%	46.4%	22.3%
E	Health Care	20.6%	20.1%	19.8%	58.6%	20.4%
F	Mental Health & Crisis Intervention	23.4%	26.7%	24.7%	31.8%	23.2%
G	Voluntary Health Associations & Medical Disciplines	19.9%	22.2%	39.7%	21.1%	25.2%
H	Medical Research	11.9%	2.8%	20.6%	40.6%	17.0%
I	Crime & Legal-Related	27.5%	23.8%	21.0%	24.6%	18.3%
J	Employment	27.7%	33.6%	25.3%	51.8%	32.3%
K	Food, Agriculture, & Nutrition	35.2%	24.2%	32.9%	22.6%	21.4%
L	Housing & Shelter	68.2%	90.0%	40.1%	183.7%	45.3%
M	Public Safety, Disaster Preparedness & Relief	60.3%	52.2%	41.3%	72.3%	44.1%
N	Recreation & Sports	24.9%	34.4%	25.1%	60.7%	32.5%
O	Youth Development	10.0%	16.9%	19.1%	29.5%	18.2%
P	Human Services	25.5%	22.9%	20.4%	28.7%	19.6%
Q	International, Foreign Affairs, & National Security	16.3%	22.7%	19.8%	31.9%	25.0%
R	Civil Rights, Social Action, & Advocacy	18.8%	30.5%	31.1%	32.8%	27.9%
S	Community Improvement & Capacity Building	38.0%	34.6%	21.3%	46.8%	25.3%
U	Science & Technology	13.8%	10.6%	11.9%	23.5%	12.0%
V	Social Science	9.9%	15.7%	21.1%	24.1%	15.8%
W	Public & Societal Benefit	37.3%	21.8%	22.9%	53.2%	20.5%

TABLE 7: Exiters Characteristics Relative to Incumbents by NTEE sector

SECTOR		Assets (EOY)	Gross Receipts	Program Service Revenue	Contributions	Expenses
A	Arts, Culture, Humanities	8.9%	15.2%	21.4%	17.3%	19.4%
B	Education	6.3%	7.6%	8.4%	15.3%	11.2%
C	Environment	7.9%	13.5%	20.6%	20.8%	21.2%
D	Animal Related	12.6%	14.7%	13.4%	21.0%	15.3%
E	Health Care	40.7%	48.4%	46.1%	37.8%	46.5%
F	Mental Health & Crisis Intervention	22.5%	30.6%	31.8%	28.6%	31.7%
G	Voluntary Health Associations & Medical Disciplines	18.1%	25.2%	32.2%	28.7%	33.4%
H	Medical Research	14.2%	4.4%	20.7%	26.5%	22.6%
I	Crime & Legal-Related	28.3%	31.1%	21.9%	24.0%	25.2%
J	Employment	19.1%	24.3%	19.0%	32.8%	25.7%
K	Food, Agriculture, & Nutrition	24.8%	32.5%	40.2%	28.9%	33.4%
L	Housing & Shelter	40.0%	55.7%	45.5%	48.3%	48.4%
M	Public Safety, Disaster Preparedness & Relief	29.5%	44.2%	41.0%	57.7%	43.3%
N	Recreation & Sports	18.4%	31.9%	26.7%	44.8%	36.5%
O	Youth Development	22.2%	22.9%	33.7%	28.2%	29.1%
P	Human Services	14.9%	21.0%	24.9%	20.2%	23.4%
Q	International, Foreign Affairs, & National Security	4.9%	6.8%	12.1%	8.4%	9.0%
R	Civil Rights, Social Action, & Advocacy	12.6%	16.3%	14.9%	15.1%	17.6%
S	Community Improvement & Capacity Building	32.3%	50.2%	67.2%	33.9%	48.5%
U	Science & Technology	9.7%	6.1%	2.6%	21.1%	8.8%
V	Social Science	14.0%	6.3%	9.7%	8.2%	8.9%
W	Public & Societal Benefit	31.6%	25.7%	16.3%	37.5%	35.3%

our model. The sunk costs specific to entry as a nonprofit, k_{NP}, would discourage large initial investments. Thus, entering nonprofit firms would likely start smaller.

Relative to other financial measures, new firms rely more heavily on contributions, with the incoming size about 50% of the average contribution for incumbents. Note that in general, the size of contributions for exiters is much smaller. This finding reflects the fact that initial donors, rather than capital markets, fund most new nonprofits. Indeed, recent work suggests that nonprofits may have restricted access to credit markets (Harrison and Laincz, 2007). Comparing across the sectors, we find that most of the sectors with larger initial contributions relative to incumbents may require some degree of capital accumulation in technology (E-Health Care), land (N-Recreation and Sports; L-Housing and Shelter), or other infrastructure (W-Public and Societal Benefit). The sector specific results therefore also suggest that initial contributions are analogous to venture capital for for-profit firms.

Table 8 presents statistics on the relative asset size and expenses conditional on the age of the firm and averaged across all firms. Figure 4 graphs column 5 while Figure 5 illustrates the trends in columns 6 and 7 in Table 8.[20] Survivors grow quite rapidly, starting from a mean relative size of about 25% and reaching two-thirds the mean size of incumbents by their ninth year. Exiters also grow, but quite slowly. In addition, note that the firms that ultimately fail begin substantially smaller than the survivors, and the difference is more pronounced for assets than for expenses.

Growth rates for both surviving firms and failing firms decline as the firms age. In fact, the difference in the growth rates between survivors and exiters is actually larger since we do not include -100% growth rates for firms in their exiting year. Consistent with the model, the standard deviation in the growth rates among new firms begins high and declines with age. The intuition is that the firms have more information and can more accurately predict their effective costs. Thus, as the firm ages, changes in both assets and expenses become smaller over time. Note also that the standard deviation declines with the removal of the exiters who exhibit the lower growth rates.

Our model argues that low exit rates in the nonprofit sector are due to NRC and PD. However, low exit rates could also be attributed to positive market selection bias of entrants (Chakravarty et al., 2006). That is, new firms may enter into high demand and more sustainable markets, decreasing the probability of an exit. Under this scenario, entrants should have lower exit rates than incumbents. Table

[20]Relative size is measured as size for firm i divided by the average size for that industry. Growth rates are calculated as the average annual exponential growth rate between observations to account for cases where financial data is missing. We then average across years and industries for each age category.

Table 8: New Firms Relative Size and Growth Rates in Assets and Expenses

All New Firms

Age	Mean Relative Size (Assets)	Mean Growth Rate of Assets	Standard Deviation	Mean Relative Size (Expenses)	Mean Growth Rate of Expenses	Standard Deviation
0	25.36%	-	-	23.31%	-	-
1	33.86%	35.71%	0.770	33.35%	34.66%	0.609
2	40.71%	28.40%	0.692	39.52%	23.54%	0.510
3	45.23%	23.32%	0.636	42.68%	17.36%	0.456
4	46.70%	19.81%	0.593	48.75%	14.01%	0.420
5	51.04%	17.90%	0.569	47.90%	11.76%	0.392
6	54.26%	16.09%	0.546	51.52%	10.40%	0.379
7	59.30%	14.90%	0.525	55.48%	9.92%	0.373
8	62.96%	13.97%	0.510	60.59%	9.16%	0.363
9	65.62%	13.64%	0.500	62.62%	8.44%	0.348
10+, All Other Incumbents	134.72%	9.92%	0.411	135.97%	6.22%	0.297

Surviving Firms Only

Age	Mean Relative Size (Assets)	Mean Growth Rate of Assets	Standard Deviation	Mean Relative Size (Expenses)	Mean Growth Rate of Expenses	Standard Deviation
0	29.79%	-	-	25.96%	-	-
1	39.69%	37.09%	0.764	36.35%	35.59%	0.604
2	46.20%	29.42%	0.682	41.46%	24.59%	0.504
3	50.18%	24.45%	0.627	44.70%	18.41%	0.448
4	50.97%	20.88%	0.584	51.35%	14.87%	0.414
5	57.26%	18.78%	0.558	50.67%	12.52%	0.386
6	60.22%	16.97%	0.537	55.01%	11.15%	0.373
7	65.79%	15.72%	0.515	59.20%	10.53%	0.370
8	70.34%	14.75%	0.503	65.32%	9.78%	0.358
9	71.34%	14.35%	0.492	67.29%	8.90%	0.343
10+, All Other Incumbents	142.59%	10.34%	0.403	143.02%	6.43%	0.289

Failed Entrants Only

Age	Mean Relative Size (Assets)	Mean Growth Rate of Assets	Standard Deviation	Mean Relative Size (Expenses)	Mean Growth Rate of Expenses	Standard Deviation
0	14.36%	-	-	18.08%	-	-
1	17.54%	27.39%	0.774	26.38%	28.12%	0.618
2	20.39%	20.73%	0.712	30.68%	15.64%	0.512
3	21.29%	14.98%	0.661	34.47%	8.82%	0.457
4	23.92%	12.80%	0.622	36.01%	6.55%	0.429
5	25.04%	10.78%	0.620	37.07%	5.17%	0.398
6	25.82%	8.48%	0.586	35.98%	2.76%	0.381
7	29.44%	7.59%	0.576	40.28%	3.52%	0.382
8	30.45%	7.80%	0.553	42.40%	3.41%	0.384
9	28.47%	6.44%	0.539	36.24%	2.78%	0.370
10+, All Other Incumbents	50.37%	5.15%	0.481	63.05%	1.68%	0.340

Figure 4: Mean Relative Size of New Firms (Expenses)

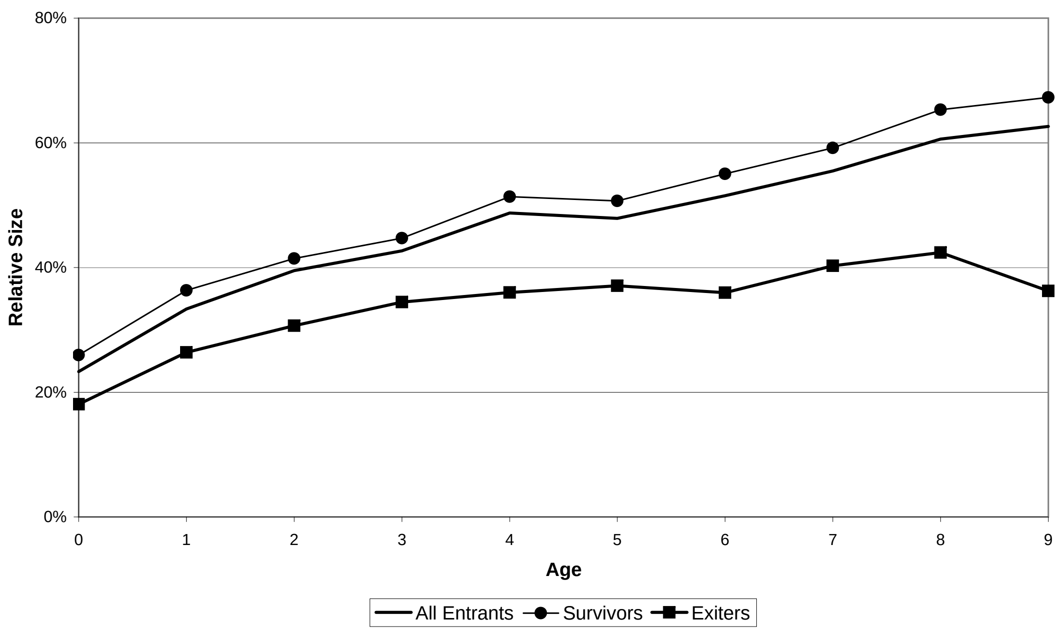


Figure 5: Entrants' Mean Growth Rates and Standard Deviation (Expenses)

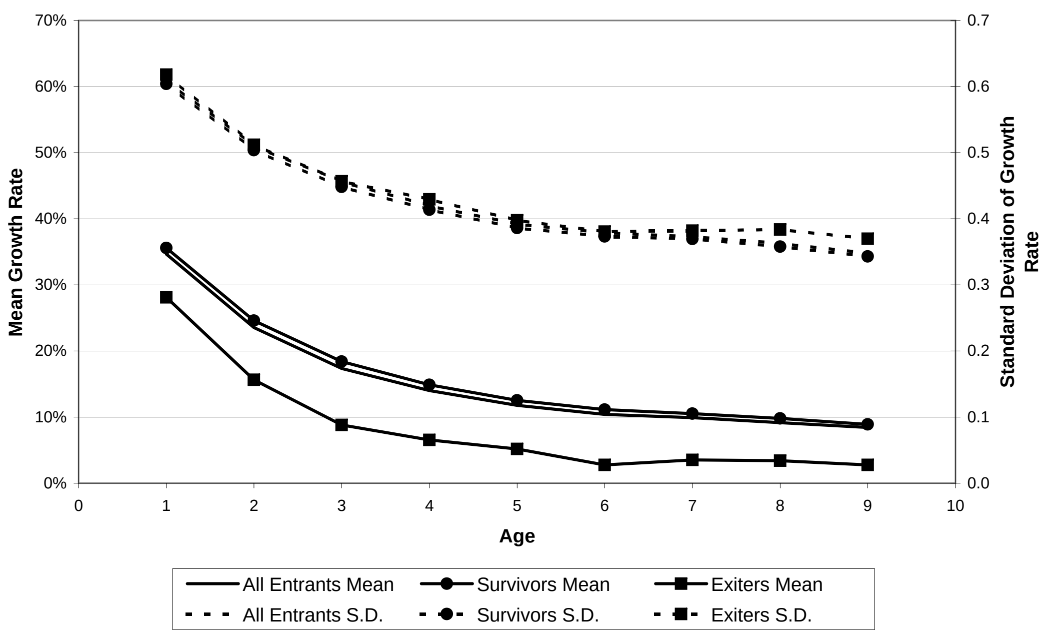


Table 9-Age Distribution of Exiting Firms

Age of Firm	Number	Frequency	Cumulative Frequency
0	4,330	8.82%	8.82%
1	3,822	7.79%	16.61%
2	3,480	7.09%	23.70%
3	3,520	7.17%	30.87%
4	3,002	6.12%	36.98%
5	2,554	5.20%	42.19%
6	2,352	4.79%	46.98%
7	2,013	4.10%	51.08%
8	1,783	3.63%	54.71%
9	1,601	3.26%	57.97%
10	1,499	3.05%	61.03%
11-20	9,870	20.11%	81.13%
21-30	5,125	10.44%	91.57%
31-40	1,855	3.78%	95.35%
41-50	1,331	2.71%	98.06%
>50	951	1.94%	100.00%
Total Exits	49,088	100.00%	

9 therefore presents the exiting age for all 49,088 firms that exit during our study. More than 60% of those firms exiting are 10 years or younger. Given the large number of incumbents relative to the number of entrants in a given year, these results imply vastly larger exit rates for entrants. Thus, although favorable market selection may contribute to the low exit rates, it cannot entirely explain the result.

Although new firms are more likely to exit, their mortality rate is surprisingly low. Table 10 reports that approximately 6% of all firms exit the sector in 5 years. Due to left censoring, this statistic is biased downward; it omits firms that enter and exit before our data begin.[21] We therefore also report the cumulative probability of exit conditional on entry within our study. Our results once again show an extremely low exit rate for entrants–only 12.3% exit in 5 years and 16.6% exit in 10 years. In stark contrast, 60% of new US manufacturing firms exit within 5 years and nearly 80% close down within 10 years (Dunne, Roberts, and Samuelson, 1989). Mata and Portugal (1994) using manufacturing data from Portugal found that 20% of firms died in their first year and only 50% survived 4 years.

Table 11 presents estimates from a discrete hazard logit model with size and age as regressors, clustered by firm. We use assets and expenses separately as our

[21] For example, a firm entering in 1986 but that exits in 1988 would not be counted. However, a firm entering in 1986 and surviving until 1990 is observed in our data.

Table 10: Cumulative Probability of Exit		
Years to Exit	All Firms	1989-2000 Entrants
1	1.50%	3.20%
2	2.83%	5.92%
3	4.04%	8.29%
4	5.26%	10.56%
5	6.30%	12.33%
10	9.88%	16.57%

Table 11: Hazard Rate Estimation

	1		2		3		4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Log(Age)	-0.2257	0.0000	-0.2295	0.000	-0.2910	0.000	-0.3028	0.000
Log (Assets)	-0.2951	0.0000	-0.3118	0.000				
Log (Expenses)					-0.2101	0.000	-0.2201	0.000
Industry Dummies	No		Yes		No		Yes	
Time Dummies	No		Yes		No		Yes	

size measures. Both size and age regressors are logged.[22] Columns (2) and (4) include fixed effects to control for industry and time differences in the average failure rates. Across all specifications, age and size are significant and decrease the probability of an exit. However, the magnitude of the effects, interpreted as elasticities,[23] are relatively low, particularly for our size measures. For both size and age, a 1% increase decreases the failure probability of exit by $0.2-0.3\%$. Thus, although age and size seem to matter overall, their impact is reduced. The negative relation between age and exit is also consistent with Table 9, that is, new firms are more likely to exit.

The industry fixed effects included in Table 11 control for differences in the average failure rates between industries but do not allow for industry-specific coefficients on size and age. If PD and the NRC significantly raise the exit cost threshold such that the shutdown decision within certain industries among NPs is systematically a low probability event, then exogenous unmodeled factors, such as local market conditions, may be more important in determining the exit pattern than age or size. For example, Chakravarty et al. (2006) argue that this occurred

[22]Logging age makes the discrete hazard specification equivalent to a continuous proportional hazard model.

[23]For a logit model, since the overall probability of failure is low, the coefficients are approximately equal to $\frac{dlog(P)}{dlog(x)}$.

for hospitals. They found that the rate of exit for NP hospitals was no different for incumbents and new entrants. They suggested that new NPs were moving into growing regions while incumbents were shutting down in declining regions and that the local nature of the NP activity explained this pattern. If true, one would still expect that the hazard rate of exit would be negatively related to size, since the larger firms are more efficient, but the relationship with age would either vanish or potentially reverse. Sectors tied to the local economy, such as Employment or Crime and Legal Related, would fit this category. Alternatively, a sector may not be in steady-state if it is in the early stages of an industry life cycle. Rapidly growing sectors, perhaps following a large demand shock, such as Environment or Public Safety (See Table 2) may be in a transition. In an early phase of an industry life cycle new firms expand rapidly and grow. This expansion may come at the expense of older existing incumbents negating or inverting the age and size relationships.

We therefore present estimates for each sector separately in Table 12 (all regressions include time dummies). Across all industries, we once again find a negative relation between the probability of exit, size and age. The only exception is that age is insignificant when size is measured using assets for Health (E), similar to Chakravarty et al. (2006). The robustness of the negative relationship between size, age, and the hazard rate of exit and the relatively small range of elasticities on age and size suggest that variations in the life cycle of industries cannot explain the observed low exit rates. Moreover, if local demand shocks were driving the low exit rates, we would not expect to see such a high degree of significance on size and age.

6 Conclusion

The model presented here provides a framework in which to analyze the equilibrium entry and exit behavior of nonprofits in various markets. The modified Jovanovic (1982) model explains the detailed patterns of entry and exit among nonprofits quite well. Once augmented with profit-deviation and the non-redistribution constraint, the theory explains the observed relatively low exit rates and high net entry rates among nonprofits relative to for-profits in the same market.

Consistent with the model we find that new nonprofits begin small in relative size, but survivors grow faster than incumbents while the variance in the growth rate of an entering cohort declines with age. Exiters are also smaller than incumbents, and we find that their hazard rates of exit are negatively related to size and age. The large net entry rates of nonprofits, relative to comparable for-profit firms

Table 12-Hazard Rate Estimation by Industry

Sector	Assets				Expenses			
	Log(Age)	P-value	Log (Assets)	P-value	Log(Age)	P-value	Log (Expenses)	P-value
A	-0.3822	0.0000	-0.3010	0.0000	-0.4579	0.0000	-0.2560	0.0000
B	-0.2031	0.0000	-0.3158	0.0000	-0.2238	0.0000	-0.2466	0.0000
C	-0.3624	0.0000	-0.3338	0.0000	-0.4491	0.0000	-0.2732	0.0000
D	-0.3400	0.0000	-0.2834	0.0000	-0.4344	0.0000	-0.3200	0.0000
E	-0.0219	0.1700	-0.2906	0.0000	-0.1397	0.0000	-0.1473	0.0000
F	-0.1827	0.0000	-0.3433	0.0000	-0.2852	0.0000	-0.2717	0.0000
G	-0.2104	0.0000	-0.3355	0.0000	-0.2718	0.0000	-0.2597	0.0000
H	-0.1504	0.0010	-0.3235	0.0000	-0.1488	0.0000	-0.2721	0.0000
I	-0.2927	0.0000	-0.3383	0.0000	-0.3221	0.0000	-0.2792	0.0000
J	-0.2268	0.0000	-0.3119	0.0000	-0.3275	0.0000	-0.2584	0.0000
K	-0.1751	0.0050	-0.3222	0.0000	-0.3079	0.0000	-0.2379	0.0000
L	-0.3991	0.0000	-0.3165	0.0000	-0.5267	0.0000	-0.1260	0.0000
M	-0.2001	0.0000	-0.4475	0.0000	-0.2450	0.0000	-0.2800	0.0000
N	-0.2142	0.0000	-0.2847	0.0000	-0.2716	0.0000	-0.2226	0.0000
O	-0.2603	0.0000	-0.3124	0.0000	-0.3604	0.0000	-0.2436	0.0000
P	-0.2248	0.0000	-0.3238	0.0000	-0.3133	0.0000	-0.2536	0.0000
Q	-0.2754	0.0000	-0.3195	0.0000	-0.3407	0.0000	-0.3339	0.0000
R	-0.1770	0.0040	-0.3587	0.0000	-0.2106	0.0000	-0.3749	0.0000
S	-0.2426	0.0000	-0.2741	0.0000	-0.2841	0.0000	-0.1943	0.0000
U	-0.2437	0.0000	-0.3825	0.0000	-0.3327	0.0000	-0.3581	0.0000
V	-0.2943	0.0000	-0.4392	0.0000	-0.3464	0.0000	-0.4767	0.0000
W	-0.1392	0.0040	-0.3194	0.0000	-0.1613	0.0000	-0.2355	0.0000

in service industries, are primarily driven by low exit rates. Overall, the most dramatic deviations from for-profit patterns emerge on the exit side, not with growth rates, relative size of entrants, or the effect of size and age on hazard rates.

The results here suggest a number of avenues for further investigation. First, we focused exclusively on the public charities within our data set and across almost all types of charities. Matching our detailed sectoral information with data on competing for-profits should better reveal whether exit threshold differences by type of organization are substantial. It would also allow for assessing how the degree of for-profit competition affects entry and exit. Second, the model also has implications for entry, growth, survival, and exit comparisons across sectors populated by different types of firms (nonprofits only, for-profit only, or mixed markets). Third, the model implies that nonprofits will dominate the high end of the cost distribution in a mixed market because of the higher exit threshold. That can only be observed with an appropriate data set of both types of firms.

Finally, our study has implications for how public funds, given to public charities, might be utilized more efficiently. It is possible that another partial explanation for the low exit rates comes from government grants keeping inefficient charities alive. We cannot say, with our data set alone, to what extent this is true, but it is worthy of further study.

Data Appendix

Below we provide additional details on the data used to study NP entry and exit patterns. The data are obtained from the National Center of Charitable Statistics (NCCS) and contain information for 501(c)3 organizations filing a tax return between 1989 and 2003.

Public Charities Compared to Private Foundations

Within the 501(c)3 subsection, nonprofits are classified as public charities or private foundations. Our data contain only public charities. Public charities are generally more directly involved in service provision, and make up the majority of nonprofits, while private foundations generally distribute funds to other public charities. The major distinguishing feature between foundations and charities rests with the source of funding. Foundations rely on endowments and are required to distribute 5% of their endowment annually. Private foundations also file a different tax form than public charities. To be classified as a public charity, an organization not designated as a church, educational institution, hospital, or government organization must receive at least 33% of its revenue from mission-related activities and no more than 33% from investment or unrelated business income.

Nonprofits that fail this test are classified as "failed public charities" and must file as a private foundation. As a check on our exit measure discussed in Section 4.3, we merged the tax return data set from the NCCS for private foundations with the public charity dataset by matching the EIN codes. Organizations that switch from public charity to private foundation and then back to public charity (approximately 0.2% of our sample) are included in the dataset and considered an incumbent while classified as "failed public charities." We classify a firm as an exit if it becomes a private foundation and never regains public charity status during the time period we observe (the stricter exit rule). We also use the reported financial information in the private foundation dataset to fill in financial information. No doubt some of these organizations may simply fail to meet the public charity filing requirements, but in other instances their mission changed. We calculated our entry and exit rates including those nonprofits that appear in the private foundations data set and found only very small changes to our entry and exit counts. Using the private foundation data, if we consider the firm as an incumbent when it moves from public charity to private foundation, our exit counts decline but negligibly.

Data Cleaning Procedures

Within public charities, sector T (Philanthropy, Volunteerism, and Grantmaking) includes charities that perform much the same role as private foundations. Thus, our sample may not be representative of this sector and we omit it. We also exclude sectors X (Religious-related) and Y (Mutual Benefit). Churches and church-related charities are not required to file, though many do. Because the reporting requirements differ, we omit this sector. Sector Y includes a very small number of public charities, but of those, many are financially large because they include nonprofit retirement funds. The mean asset level in this sector is more than 20 times the next largest sector, Health (E) which includes hospitals. Finally, we also delete firms that have never been classified into an industry which appear in sector Z "Unknown." We computed the aggregate entry and exit rates by year including all of the omitted sectors; none of the patterns shown in Section 2 change. Moreover, the entry and exit patterns for each of these omitted sectors also show a low gross exit rate and a high net entry rate. Panel data for these sectors are included on the website listed in footnote 1.

Given the panel nature of our data, we observe some variation (less than 0.2% of the sample) in the 1-digit NTEE classification for firms across time. For example, we may see one firm designated as sector E (Health) for all years except one where it is designated as (P), Human Services. Most of these are likely data entry errors. We therefore assign firms to the 1-digit NTEE code (excluding Z) which is observed most frequently. In the event of a tie between sectors, we use the most recent classification. As a robustness check, we calculated our entry and exit rates taking the changes in NTEE classification across time at face value. The two approaches produced very similar results. The average difference across sectors in the net entry rates is 0.005 percentage points. In addition, we verified that in the aggregate the total number of firms in each year is identical in both approaches.

For data sets constructed by the NCCS since the mid-1990s, firms were identified as existing if they had filed a tax return within the last 3 fiscal years. When constructing the panel, this implied that some firms might have the identical tax return reported in consecutive years. We eliminate these duplicates, taking the earliest year of data. Thus, consistent with our methodology, this increases the overall exit rate (from 1.8% to 2.1%) and also shifts the identification of the exit year earlier.

We also remove implausible financial data (e.g. negative expenses) although these firms are still counted as existing for that tax year for the purposes of our incumbent count. In addition, there were a few instances, when looking at individual firms in a time series, where it is quite obvious that the data were entered in either thousands or millions of dollars. We identified these instances, inspecting many individually, and treated them as missing. In order to mitigate any sample selection bias in our estimates, we generally treat all financial information from these observations as missing (i.e., make the data square). However, we did not have information on gross receipts or program service revenue for “failed public charities” reclassified as private foundations or for program service revenue for 1990. These missing variables were due to exogenous factors, not because of implausible data. Thus, they are not likely to suffer from sample selection issues. In addition, these variables are not used in the hazard rate estimation. We therefore still use the other valid financial information for these observations.

For-Profit Coverage Comparability

Very small tax-exempt and for-profit entities are not included in the Census and BLS data because the Census and virtually all for-profit studies use a minimum size threshold in terms of employment. These data only include “employer” firms that had some paid employment during the past fiscal year. However, the Census separately counts firms with no paid employment and at least $1,000 in receipts as “non-employers” and these are the vast majority of all firms. For example, in the 1997 Economic Census data, there were 9,531,683 service establishments (employers and non-employers) and, of those, 7,574,574 were nonemployer establishments or 79.5% of the total, a tremendous fraction, leaving just over 20% for inclusion in the Economic Census.[24] In addition, the non-employers account for less than 10% of receipts in the service sector, despite being 80% of the firms. Our data actually do much better since our coverage of 501(c)3 public charities is about 38%. In fact, the average receipts for non-employer establishments in 1997 was $25,606, suggesting that the gross receipts threshold applied to for-profits would include a much larger number of small firms than the employment threshold.[25]

References

Audretsch, D. B. and T. Mahmood, (1994), "The Rate of Hazard Confronting New Firms and Plants in U.S. Manufacturing," *Review of Industrial Organization*, Vol. 9, pp. 41-56.

Audretsch, D. B. and T. Mahmood, (1995), "New Firm Survival: New Results Using a Hazard Function," *Review of Economics and Statistics*, Vol. 77, pp. 97-103.

Audretsch, D. B., L. Klomp, E. Santarelli, A. R. Thurik, (2004), "Gibrat's Law: Are the Services Different?" *Review of Industrial Organization*, Vol. 24, pp. 301-324.

Ben-Ner, A., (1986), "Nonprofit Organizations: Why Do They Exist in Market Economies?" in *The Economics of Nonprofit Institutions: Studies in Structure and Policy*, Susan Rose-Ackerman, ed., Oxford University Press: New York.

Bureau of Labor Statistics, (2007), "Volunteering in the United States, 2006," United States Department of Labor.

Caves, R., (1998), "Industrial Organization and New Findings on the Turnover and Mobility of Firms," *Journal of Economic Literature*, Vol. 36, pp. 1947-1982.

[24] The data on Non-employers are also restricted to firms subject to federal income tax and thus exclude the firms in our data.

[25] Authors' calculation for average gross receipts using services including NAICs codes 54, 56, 61, 62, 71, 72, and 81. Data on Nonemployers from US Census website: http://www.census.gov/epcd/nonemployer/index.html.

Chakravarty, S., M. Gaynor, S. Klepper, and W. Vogt, (2006), "Does the Profit Motive Make Jack Nimble? Ownership Form and the Evolution of the US Hospital Industry," *Health Economics*, Vol. 15, pp. 345-361.

Deily, M. E., N. L. McKay, and F. H. Dorner, (2000), "Exit and Inefficiency: The Effects of Ownership Type," *Journal of Human Resources*, Vol. 35, pp. 734-747.

Dunne, T., M. J. Roberts, and L. Samuelson, (1988), "Patterns of Entry and Exit in U.S. Manufacturing," *RAND Journal of Economics*, Vol. 19, pp. 495-515.

Dunne, T., M. J. Roberts, and L. Samuelson, (1989), "The Growth and Failure of US Manufacturing Plants," *Quarterly Journal of Economics*, Vol. 104, pp. 671-698.

Evans, D., (1987), "Tests of Alternative Theories of Firm Growth,"*Journal of Political Economy*, Vol. 95, pp. 657-674.

Geroski, P.A., (1995), "What Do We Know About Entry?" *International Journal of Industrial Organization*, Vol. 13, pp. 421-440.

Hansmann, H., (1986), "A Theory of Status Organizations," *Journal of Law, Economics, & Organization*, Vol. 2, pp. 119-130.

Hansmann, H., (1990), "Why Do Universities Have Endowments?"*Journal of Legal Studies*, Vol. 19, pp. 3-42.

Harrison, T., (2008), "Taxes and Agglomeration Economies: How are They Related to Nonprofit Firm Location?" *Southern Economic Journal*, *Forthcoming.*

Harrison, T. and C. A. Laincz, (2007), "Nonprofits, Crowd-Out, and Credit Constraints," *Department of Economics Working Paper*, Drexel University.

Hart, P. E. and N. Oulton, (1996), "Growth and Size of Firms," *The Economic Journal*, Vol. 106, pp. 1242-1252.

Independent Sector, (2001), "Giving and Volunteering in the United States," Washington DC.

Internal Revenue Service, (1994), "Exempt Organizations Nonfiler Study," Washington DC.

Isaacs, S.L., D.F. Beatrice, and W. Carr, (1997), "Health Care Conversion Foundations: A Status Report," *Health Affairs*, Vol. 16, pp. 228-236.

Jovanovic, B., (1982), "Selection and the Evolution of Industry," *Econometrica*, Vol. 50, pp. 649-670.

Klepper, S., (1996), "Entry, Exit, Growth, and Innovation over the Product Life Cycle," *American Economic Review*, Vol. 86, pp. 562-583.

Lakdawalla, D. and T. Philipson, (1998), "Nonprofit Production and Competition," *NBER Working Paper* No. 6377.

Lakdawalla, D. and T. Philipson, (2006), "The Nonprofit Sector and Industry Performance," *Journal of Public Economics*, Vol. 90, pp. 1681-1698.

Mata, J. and P. Portugal, (1994),"Life Duration of New Firms," *Journal of Industrial Economics*, Vol. 42, pp. 227-245.

Salamon, L. M. and S. W. Sokolowski, (2005), "Nonprofit Organizations: New Insights from QCEW Data," *Monthly Labor Review* (September), Vol. 128, pp. 19-26.

Salamon, L. M. and S. W. Sokolowski, (2006), "Employment in America's Charities: A Profile," *Nonprofit Employment Bulletin*, December, Johns Hopkins Center for Civil Society Studies, Baltimore.

Scott Morton, F. M. and J. M. Podolny (2002), "Love or Money? The Effects of Owner Motivation in the California Wine Industry," *Journal of Industrial Economics*, Vol. 50, pp. 431-456.

Steinberg, R., (1986) "The Revealed Objection Functions of Nonprofit Firms," *RAND Journal of Economics* , Vol. 17, pp. 508-526.

Sutton, J., (1997), "Gibrat's Legacy," *Journal of Economic Literature*, Vol. 35, pp. 40-59.

Troske, K. R., (1996), "The Dynamic Adjustment Process of Firm Entry and Exit in Manufacturing and Finance, Insurance, and Real Estate," *Journal of Law and Economics*, Vol. 39, pp. 705-735.

Twombly, E., (2003), "What Factors Affect the Entry and Exit of Nonprofit Human Service Organizations in Metropolitan Areas?" *Nonprofit and Voluntary Sector Quarterly*, Vol. 32, pp. 211-235.

Urban Institute, (2007), "The Nonprofit Sector in Brief: Facts and Figures from the Nonprofit Almanac 2007," Washington DC.

Wirtz, R., (2006), "The Economy's Middle Child," Fedgazette (July), Federal Reserve Bank of Minneapolis.