Entry Thresholds and Competitive Behavior among Nonprofit Firms

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PRELIMINARY–COMMENTS WELCOME

Abstract

This paper attempts to describe the competitive behavior of charitable nonprofit firms when prices and output are difficult to observe. The paper exploits cross-sectional variation in market size to estimate the number of nonprofits that can be supported within a market. We find that our sample markets generally reach competitive levels once three or more firms are observed. The results also demonstrate that entry thresholds have declined over time. The paper offers several possible interpretations of these findings and future directions for our research.

1 Introduction

A common observation from nonprofit executive directors, board-members, and staff is that the intensity of competition for donations, grants, and skilled labor has grown over time. Practitioners often complain that there are simply too many nonprofits or that existing nonprofits are inefficiently small. In contrast, critics of the sector will argue that market discipline is muted within the nonprofit sector. Because nonprofit receive various tax subsidies and are typically funded by third parties, the natural competitive forces which promote efficiency are rendered ineffective in the sector.

The degree to which competition influences nonprofit behavior is not obvious. In for-profit industries it is often possible to infer competitive behavior from changes in market prices. However, in the nonprofit sector, there are often no discernible prices, since the goods and services trade in subsidized markets or given away for free. Similarly, without residual claimants, the incentive to engage in overtly competitive (or collusive) activities is diminished. Perhaps as a consequence, exit rates among nonprofit firms are astonishingly low (Harrison and Laincz, 2008). Moreover, the normative implications of nonprofit competition are not clear (Thornton, 2006). It has been demonstrated that increased rivalry, through fundraising, can either increase or decrease overall charitable activity (Rose-Ackerman, 1982). This paper will provide an initial framework to detect the relative competitiveness of nonprofit sector firms, both across nonprofit industries and over time.

Because prices and output are difficult to observe, our analysis relies on indirect measures of market competition originally developed by Bresnahan and Reiss (1990, 1991). In this approach, we estimate entry thresholds, which exploit the relationship between market

population and firm entry. From this we draw inferences about relative market power. Our study examines five distinct nonprofit industries over twenty-five years.

2 Background

Economists who examine the nonprofit sector tend to carve the economy into three broad parts; the government sector, the for-profit sector, and the nonprofit sector. While an oversimplification, it recognizes that each of these classes of agents operate according to different objectives and respond to distinct incentives. This paper will focus on competition amongst nonprofits, with a particular emphasis on the human service and arts sectors. It is these types of organizations -in contrast to healthcare or education nonprofits - which are most typically considered "charities". The economics literature examining competition among charitable nonprofits remains underdeveloped.

A significant literature has developed on the topic of competition between for-profit and nonprofit firms in "mixed" markets. The literature has explored multiple mixed industries such as hospitals, nursing homes, and day cares where nonprofit and for-profit firm coexist. Mixed markets have attracted interest of economists because they clearly trace the economic consequences of the nonprofit organizational form.

In the analysis of mixed markets, Besley and Ghatak (2005) as well as Lakdawalla and Philipson (2006) emphasize the profit deviating preferences of the nonprofit entrepreneur. In these papers NP entrepreneurs are motivated by some combination of altruism and a desire for perquisite compensation. These preferences, combined with favorable tax incentives, convince their model entrepreneurs to enter a market as nonprofits. Because of this the en-

trepreneur suffers the non-distribution constraint, whereby there can be no residual claimant. These entrepreneurs will tolerate lower rates of return than their for-profit counterparts, leading them to enter the market. A natural scarcity of entrepreneurs with profit-deviating preferences results in mixed markets, where the marginal firm is profit-maximizing.

An alternative approach is to view the nonprofit organizational form is a credible signal of quality when information asymmetries are acute (Glaeser and Shleifer, 2001). In this case, the nonprofit organizational form serves as a credible signal of quality, for which consumers are willing to pay a premium. Lower cost - lower quality versions of the product are filled by for-profit firms. For a robust review of various models of mixed markets, see Brown (2010).

The intersection between government and the nonprofit sector has also been deeply explored. In the most well developed theories, nonprofit - government relations has been described as a "niche" model. Nonprofits fill the gap between services provided by the government and for profit sectors Rathgeb and Gronbjerg (2006). It is well known that private for-profit firms will not generally provide public goods because of free-riding behaviors (Samuelson, 1954). Furthermore, for-profit firms will have difficulty providing goods where quality is difficult to observe ex-ante (Hansmann, 1980). This type of market failure is typically offset by a government provision of public goods. However, government will typically have insufficient feedback mechanisms to provide the precise type, level, or quality of collective goods demanded by particular populations (Weisbrod, 1977). Furthermore, government may be legally prevented from providing particular types of public goods, such as religious services. Put simply, the nonprofit sector fills this gap. Comprehensive reviews of this relationship can be found in Steinberg (2006) and Young (2006).

This analysis will focus on the competition amongst charitable nonprofits. The nonprofit

universe, characterized as those organizations operating under section 501(c)(3) of the tax code, includes a broad array of organizations. Our interest is restricted to donative nonprofits which are financed primarily - thought not exclusively - through charitable donations. This particular class of firms is economically interesting because they primarily exist to provide public goods. These organizations play an important role in the US economy by engaging private donor markets to provide goods and services that are often substitutes for government provision. Competition amongst nonprofit firms is not well understood by economists, largely because of the variation in objective functions by nonprofit managers.

The most widely adopted model of competition among charitable nonprofits was originally developed by Rose-Ackerman (1982). In her model, nonprofit managers maximize net-revenues by choosing their fundraising expenditures. Her paper explores the relationship between fundraising strategies and overall production of the public good, conditional upon varying perceptions by donors about the use of their charitable gift. Her theoretical models suggest that fundraising can become excessive due to competition. Excessive competition - in contrast to for profit markets - may reduce social welfare, even if donors care about how much of their donation will be allocated to fundraising.

Rose-Ackerman's work is supported by later theoretical and empirical analysis. Bilodeau and Slivinski (1997) develop models of nonprofit competition suggesting competitive markets will results in - potentially excessive - nonprofit specialization. Excessive specialization is characterized by declining total output. The authors suggest cartel behavior - such as the United Way - or donor restricted gifts may increase total welfare in the market.

Unlike for-profit markets, these papers suggest that the influence of competition on nonprofit market outcomes may not be strictly positive. Because of the public good nature of

nonprofit output, it is possible to characterize circumstances where too much competition reduces total welfare in the market. Consequently, this paper seeks to develop an empirical framework for examining the "toughness" of market competition amongst rival nonprofits.

3 Empirical Model

We envision a market m with a total of N potential nonprofit participants. Each potential entrant i must decide whether to enter. Nonprofits evaluate the overall value of entering the industry. Not only do NPs consider the net income or financial viability of entering the industry, but we allow the NP to value other not-for-profit motivations in their objective function. We follow Lakdawalla and Philipson (2006) and assume that nonprofits may also put weight on the quantity of consumers served. The nonprofit payoff function is therefore:

$$V_{im} = X_m\beta + h(N)\alpha + \epsilon_{im} + \gamma q_{im} \quad (1)$$

Consistent with previous entry model specifications, X captures demand and supply side characteristics influencing the decision to enter the market. We discuss the particular variables in the Data section. After controlling for these differences across markets, our main area of interest is how nonprofits consider other donation-driven competitors when deciding to enter the market. Thus, the number of existing nonprofits in the market enters the payoff function separately through h(N) in order to capture own competitive effects from entry.

In the results that follow, we assume that $\epsilon_{im} = \epsilon_{jm} = \epsilon_m$. Thus, the model assumes homogeneity across all nonprofit firms. That is, the identity of the competitors is not a consideration when deciding whether to enter a market. While this is clearly an abstraction, this assumption simplifies estimation and allows us to focus on how the number of other

nonprofits affects entry. We also note that any estimation with the number of nonprofits as a regressor also makes similar assumptions; the advantage of our framework is that the assumption is more explicit and we can therefore, in extensions, consider how the assumption impacts the results.

We now determine the conditions under which we assume a nonprofit would enter a market. Common to the IO literature, we assume that NPs enter up to the point where the expected value of entry is positive and will not enter under negative value. We note here that due to the nonprofit motive, this does not necessarily imply that economic profits must be positive. The NP does need to be economically viable but the weight on serving the community (q) implies that the nonprofit could enter when a for-profit would not. Holding the demand and cost characteristics of the market constant, we follow Bresnahan and Reiss (1990, 1991) where the Nash equilibrium is unique in the total number of firms in the market. The conditions for a Nash are then:

$$V(N) \geq 0 \tag{2}$$

$$V(N+1) < 0 \tag{3}$$

Given our assumptions, we can estimate this model as an ordered probit with the total number of firms as the dependent variable. A likelihood function is therefore formed based on the probability of observing N number of NPs in a market.

An additional advantage of this framework, for our purposes, is that we can then estimate the threshold profitability/value needed in order to enter a particular market. The model relies on a revealed preference assumption that, if in a particular market, we observe N nonprofits, N must be viable and N+1 is not. Although we likely expect fluctuations in any

given market at a point in time, this assumption is reasonable given that we are finding these thresholds, averaged over all of our markets (and controlling for other market characteristics).

We can now re-write the objective function; taking into account the size of the market and subsuming $\gamma * q$ into the X vector:

$$V_{im} = X_m * S_m\beta + h(N)\alpha + \epsilon_{im} \tag{4}$$

where S measures the population in market m. X is the interpreted as per-capita demand; while S is the size of the market measured. Averaged over all markets, epsilon is zero and thus, the threshold S required to just be indifferent between entering and not entering the market (i.e., V=0) is:

$$X_m * S_m\beta + h(N)\alpha = 0 \tag{5}$$

$$S_m(N) = -h(N)\alpha / X_m * \beta \tag{6}$$

For example, the break even population required to induce entry of a monopolist and duopolist respectively is:

$$S_1 = -\alpha_1 / X_m * \beta \tag{7}$$

and

$$S_2 = -(\alpha_1 + \alpha_2) / X_m * \beta \tag{8}$$

where X_m is the average of the per-capita demand variables for markets with 1 and 2 firms respectively. S_n therefore provides the *total* population needed to support n firms. The per-firm population is given by

$$s_n \equiv S_n / n.$$

Following Bresnahan and Reiss (1990, 1991), we also calculate the ratio of s_{n+1}/s_n to infer how the relative change in entry thresholds changes the competitive nature of the firms.

As an example, suppose we know that it takes 10,000 people to support 1 firm in a market. If the existing market is already perfectly competitive - and costs are identical - each additional firm should require an additional 10,000 people to enter. If we, however, observe a significant increase in population required to support an additional firm, then we can infer that price-cost margins have fallen. In this case, the incumbent firm was somehow able to delay entry of the second firm. It is the magnitude of this increase in population required to support an additional firm that reveals the movement toward a competitive equilibrium. This process should continue until entry thresholds stabilize. [1]

Figure 1 provides a graphical illustration of the intuition behind the model. In panel (1), price is higher than marginal costs and the nonprofit is not at the minimum of the average cost curve. Note that the output necessary to support the firm is less that the other panels. Panel (2) depicts how increasing the size of the market will flatten the residual demand curve, implying the tangency for zero profit moves down and to the right on the AC curve. Importantly, this increases the amount of output necessary to support the representative firm. By panel (3), the market has sufficiently expanded such that the residual demand curve is perfectly elastic. Consequently, prices have converged to the competitive equilibrium and output per firm is at its minimum efficient scale. As the market expands further, we should not observe additional increases in per-firm output.

As the market converges to a competitive equilibrium, we would therefore anticipate that

[1] It is also possible to interpret constant entry thresholds as collusive behavior. If firms were able to form a cartel, the entry threshold would also be stable. However, given an initial increase in the entry threshold, we find this interpretation implausible.

s_{n+1}/s_n would also converge to one. This insight allows us to use the variation in number of firms and market size across markets to infer the number of firms needed to approach a competitive environment. We can then also analyze how this competitive N has changed across time.

It is also possible that the fixed costs of production will rise for the marginal firm. This may occur due to some external barrier to entry such as increased costs for land. In this case, even if variable profits are constant, a firm just earning V=0 would now earn V$<$ 0. We are currently exploring empirical options to mitigate this possibility. Currently, we cannot empirically distinguish between a decline in variable profits from an increase fixed costs . Under either scenario, the number of people required to support additional firms will increase in order to break even. Thus, we could imagine that a population of 30,000 is required for 2 nonprofits, implying that $s_2/s_1 = 15,000/10,000 = 1.5$.

4 Data

A challenge in any study of this type is determining the relevant economic market for the firms in the study. Furthermore, we are primarily interested in the relevant market for donations (an input) rather than the market for output. The output of most nonprofit firms is typically offered below the cost of production, or for free. Typically, there is excess demand for nonprofit output. Consequently, the binding constraints on the activities of most nonprofit firms are their inputs, particularly donations. We make the conjecture that the Metropolitan Statistical Area (MSA) represents a reasonable approximation for the donor to choose among competing nonprofits, given the selection of nonprofit industries described

next.

The paper constructs a panel of nonprofit markets for five distinct nonprofit industries. The range of the panel covers twenty-five years, in five year increments. We infer the existence of a nonprofit from their Form 990 tax filing for a particular year. Tax file data is aggregated and maintained by the National center for Charitable Statistics (NCCS). We rely on NCCS Core Files for the years: 1990, 1995, 2000, and 2005. With some exceptions, all nonprofits are required to file a Form 990 annually.[2]

The particular nonprofit industries were constructed using the National Taxonomy of Exempt Entities (NTEE). The NTEE classifies all nonprofit organization according to a detailed taxonomy, similar to NAICS codes. We use the National Taxonomy of Exempt Entities (NTEE) to identify nonprofit firms with similar types of output. Note that our study focuses on competition for donations, so we wish to identify particular NTEE sub sectors that compete in relatively distinct economic markets. We do this by selecting nonprofit sub sectors (at the 2 digit level) using the following criteria:

1. The nonprofit firms are headquartered within an MSA.
2. Their inputs (donations and labor) are derived locally and outputs are consumed locally.
3. The nonprofit firms contained within the two-digit sub sector are reasonably homogeneous in their outputs. Consequently, donors would likely perceive them as substitutes.
4. The nonprofit firms contained within the subsector produce output that is not substitutable with for-profit output.
5. The nonprofit firms contained within the subsector receive a non-trivial fraction of their revenues as private donations.

[2] For the time range of the sample all nonprofit organizations organized under section 501(c)(3) of the US tax code were required to file a Form 990. Exceptions include those organizations earning less than 25,000 USD in revenue and religious organizations (including churches).

From these criteria, five representative nonprofit industries were selected. These industries contain nonprofit organizations that are likely to compete for donations with each other in geographically distinct areas. [3] Markets are geographically identified using Metropolitan Statistical Areas (MSA).The Office of Management and Budget defines Metropolitan Statistical Areas as having at least one urbanized population of 50,000 or greater. Each of the 343 MSAs contain five nonprofit industries, for a total of 1,815 potential markets.[4] Using the Form 990 data it is possible to know how many nonprofits existed with in each of those markets for a particular year.

Table 1 offers summary statistics for each nonprofit industry. Note that Museums are the largest nonprofit industry in the sample, with 1,639 total firms in 2005. This industry averaged 7.2 firms per MSA, while the median number of firms was only 3 per MSA. For every sector, there was a least one MSA with no firms in the market. The Hot Line and Crisis Prevention industry had the smallest average number of firms per market.

Figure 2 offers another way of viewing the variation in market structure across markets. The figure shows a histogram of the frequencies of markets by the number of firms they contain. Note that roughly half of all markets contain either a monopoly or no firms. Note that the histogram is top-coded at 10 for visual convenience.

Each of these markets were linked with basic demographic data derived from the Bureau

[3] Some MSAs contain a very large number of firms for any particular nonprofit industry. This creates a long right tail in the distribution of the number of firms per market that could skew our results. To mitigate this problem we trim the largest 20 MSAs from the sample. Note also that this includes Washington DC, which - for obvious reasons - contains a disproportionate number of nonprofits relative to its population size.See Figure 2 for a description of the distribution of firms across markets.

[4] OMB actually lists 366 MSAs. However, only 363 could me be matched to NCCS data. This is likely because of recent changes to the OMB coding which had not been applied to the NCCS data. The three MSAs not included were: Crestview-Fort Walton Beach-Destin, FL; Sarasota, FL; & Steubenville-Weirton, OH-WV. The number of MSAs was reduced to 343 when the twenty largest MSAs were trimmed from the sample.

of Economic Analysis (BEA) Regional Economic Accounts. Table 2 offers basic summary statistics for these covariates. The average population of an MSA within the sample is 677,240. The average per-capita income was 31,934 USD. Transfer payments to individuals include: retirement and disability insurance benefits, medical payments (mainly Medicare and Medicaid), income maintenance benefits, unemployment insurance benefits, veterans benefits, and Federal grants and loans to students. MSAs, on average received 3,353,405 USD in personal transfer payments. MSAs also earned, on average, 19,900,000 USD in total earnings, which includes: personal income-wage and salary disbursements, supplements to wages and salaries, and proprietors' income.[5]

Our findings are derived by regressing the number of NPs observed in a market against proxies for firm demand (per-capita income, transfer payments, and total earnings) multiplied by MSA population. An ordered probit regression model allows us to generate estimates for α and β in equation (4). From this, we generate predicted values for $S_m(\mathrm{N})$ in equation (6). The predicted values can be interpreted as the minimum population necessary to support entry of N firms. These results are discussed in the next section.

5 Results

Table 3 presents the ordered probit estimates of the X covariates for our five selected sectors. The top pane of the table depicts the model coefficients for 2005. For that year, we find that higher per-capita incomes increase the likelihood of entry into the market, holding the size of the market constant. The amount of public transfers to an area seems to only affect entry for

[5] http://www.bea.gov/regional/definitions/

food banks, a sector where we might expect more complementarity between nonprofit and public services. Our measure of labor costs in the area also suggests, as we would expect, that higher labor costs decrease the number of nonprofits in the market.

Even though we control for per-capita income, it is possible that the measure may be identifying additional variation across markets that is related to the overall need for social services. The wage variable may pick up the lower tail of the income distribution better than the income variable. These relationships are generally consistent across time which suggests large shifts in equilibrium behavior have not occurred. This lends more credence to one of our modeling assumptions–that the market demand is generally stable over time. Thus, assessing the competitive framework at a given point in time and then comparing across time is a reasonable strategy.

We use these results to estimate the average market size required to induce N to enter the market. It is crucial to note that the estimates are for the population necessary to support N firms at zero economic profit. The estimates are presented in Table 4. For example, in 2005, a monopolist Abuse Prevention Center required approximately 58,000 people in a market in order to enter the market and break even. A monopolist Homeless Shelter required about 68,000 people. The negative S_1 for Food Banks and Museums suggests that in markets with the average level of income, transfers and total earnings, we always will have at least 1 nonprofit in the market. This is does not contradict Table 1 which shows that some markets have no Museums or Food banks. For example, markets that have lower than average income levels might not be able to support a Museum, even with a larger population.

In contrast, Crisis Prevention organizations require large markets, with at least half a million people in order to support one nonprofit. The large difference in entry thresholds

across industries is striking. However, the difference across estimates likely suggests that either Museums enjoy higher per-person demand in the average market relative to Crisis Prevention Centers or that Crisis Prevention Centers have higher fixed costs. Relatively little information can be gained from comparing entry thresholds across industries. The more relevant comparison is to examine variation across market size for the same industry.

Entry of the second firm provides more information on the competitive structure of the market. For example, the typical Abuse Prevention Center market will require an estimated 467,000 people to support two nonprofits. This translates into a per-firm population requirement (s_n) of 233,500. The increase in per-firm population requirements (s_n) is most likely the result of a fall in price-cost margins. Large increases in the per-firm entry threshold for the second firm indicates that either the monopolist firm was successful at deterring entry, or that operating costs decline with scale. Under either scenario, the finding suggest that the first Abuse Prevention Center in a market maintains some market power. Given the current data and empirical approach, it is not yet possible to distinguish between declines in price-cost margins and rising fixed costs. [6]

The threshold ratios provide a similar interpretation, but allow us to more easily compare across industries. The ratios show that, in 2005, the second Abuse Prevention Center needs about four times the per-firm population in order to enter the market. For contrast, Homeless Shelters require slightly more than twice as many people to support the duopoly relative to the incumbent monopoly. The ratio $\frac{s_2}{s_1}$ is more difficult to interpret for Museums and Food

[6] The price-cost interpretation requires that the fixed costs of entry remain constant as N increases. Bresnahan and Reiss (1991) implicitly make this assumption for their particular industries of study. It is less clear that this is a correct assumption for the nonprofit sector. It is possible that the fixed costs of entry will rise with N, possibly due to higher entry requirements for fundraising. The consequence of relaxing this assumption would be that increasing per-firm entry threshold (s_n) could be an indication of rising entry costs (possibly due to anti-competitive behavior) rather than lower price-cost margins.

Pantries due to the negative population estimate for S_1. The ratio $\frac{s_3}{s_2}$ however shows a similar pattern of larger per-firm thresholds needed (i.e., ratio>1) in order to induce entry of the third firm. The degree to which these ratios are declining as more nonprofits enter, as discussed in the Methodology section, is one of our primary interests in this paper and we therefore turn to that analysis.

The first striking feature to note about the trend in the threshold ratios is that, across all sectors and years, we converge to an entry threshold ratio of 1 in around 3 to 4 firms. This finding is very similar to results found in for-profit industries in Bresnahan and Reiss (1991). Stated clearly, these nonprofit sectors do not require a large number of firms to achieve a competitive equilibrium. By this measure, nonprofit organizations appear as competitive as a comparable for-profit market. Given the nature of nonprofits, one might wonder whether the ratio of 1 suggests a collusive, instead of a competitive, equilibrium. The fact that we observe ratios significantly above 1 when the market has fewer firms, however, is more consistent with a story of increasing competition rather than increasing collaborative or cooperative behavior.

We do however observe differences between sectors in the number of firms needed to approach competitive levels. Using 2005 for our initial analysis, we see that abuse centers, crisis intervention centers, and homeless shelters stabilize at a similar per-firm population threshold when three firms have entered the market. Art museums and food banks reach a ratio of 1 when four firms are present. The difference does not necessarily reflect that the former are more competitive than the latter. Larger fixed costs associated with art museums and food banks would also explain the variation. Without further direct information on fixed costs, we cannot distinguish between the two.

Over time though and within a sector, we find that we reach competitive equilibrium faster in all of the sectors in the earlier periods of the data. Consider Figure 3D as an example. Food pantries reached an entry threshold ratio of 1 around the second firm in 1990. By 2005, it took four firms to approach similar per-firm population thresholds. We find a similar pattern for the other sectors as well. We take this to imply that these sectors were more competitive in the 1990s in the sense that it took fewer firms competing to approach the competitive equilibrium.

In 1990 and 1995, abuse prevention centers (Figure 3B), crisis intervention organizations (Figure 3C), and homeless shelters (Figure 3E), we find that the difference in the per-firm population needed to encourage entry of the monopolist and the duopolist are very similar. That is, the ratio of the thresholds is very close to 1 even when only 2 firms are in the market. Counter to our earlier discussion, it is more difficult to infer whether the market was initially competitive or collusive. Full collaboration between the organizations would imply that total profits are split between the existing firms, even as entry occurs, and thus the ratio would also be equal to 1. Thus, one interpretation is that these sectors engaged in a more collaborative environment in the 1990s and have subsequently become more competitive over time.

A final empirical pattern to emerge is that entry thresholds have generally declined over time. For example, Figure 3A demonstrates that entry thresholds were uniformly highest for Museums in 1990, regardless of the number of firms. Entry thresholds fell for all Museum markets in 2000. The pattern continues for 2000 and 2005. With the exception of crisis prevention centers (Figure 3C), all of the other industries studied followed a similar pattern. This result has a number of possible interpretations. The most plausible is that firms have increased their operating over time, requiring lower number of people to support a particular

number of firms. Alternatively, entry costs could have fallen via new technologies, again implying that a greater number of firms can be supported for a given population size. It is also possible, but less likely, that competitive pressures have increased over time, generally reducing price-cost margins, thereby increasing the number of firms. At this stage in our analysis, we cannot distinguish between these outcomes.

6 Discussion and Next Steps

In this paper, we estimate a model that allows us to infer the competitive nature of nonprofit, donative organizations without observing changes in prices or quantities of people served by the nonprofit. We are able to make this inference by systematically comparing the differences in the number of nonprofits within an industry across markets. These differences are then used to estimate break even thresholds, that is, the average population needed to just support a given number of firms. We find that for all of the subsectors examined, markets reach competitive levels once three or more nonprofits have entered the industry. This result in some sense is surprising but also very similar to results found for for-profit industries (Bresnahan and Reiss, 1991). The results therefore suggest that a relatively small number of firms are needed to observe competition between nonprofits.

Our paper also provides more insight into the question of whether nonprofit competition has increased over time. On one hand, we find that competitive behavior was more prominent with the first few entrants in earlier years of our dataset. This would tend to favor the argument that donative markets are less competitive now. Several caveats should follow this finding though. First, the increase in competitive thresholds over time is slight. The results

that few nonprofits are needed to reach competitive levels still applies strongly.

Second, the number of observed firms in all of these subsectors is rising at the same time that the breakeven threshold ratios are staying relatively constant over time. Therefore, one could interpret additional entry after reaching the competitive levels as excess entry and indeed increasing competition for donations over time. This argument is consistent with previous findings of excessive fundraising for nonprofits (Thornton, 2006, Rose-Ackerman, 1982). This is of particular concern for the nonprofit sector, where excessive competition may reduce the private provision of collective goods. Isolating the influence of competition over time is a crucial next stage to our analysis.

Finally, we need to consider to what extent increased reliance on program service revenues or other revenue streams would affect our results. For example, as donative markets become more competitive, nonprofits may move toward fee-for-service revenues to compensate. In doing so, the break even threshold levels (i.e., population required to breakeven) could change at a rate that would imply lower levels of competition. Future versions of the paper need to incorporate reliance on program service revenues to be able to speak more directly to this point.

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Table 1

Summary Statistics for the number of firms by Nonprofit Industry for 2005

Industry Description	NTEE Classification Codes	Total Number of Firms	Averange number of Firms per MSA	Min number of firms per MSA	Median number of firms per MSA	Max number of firms per MSA	Number of MSAs
Museums	A50 - A57	1,639	7.2	0	3	180	363
Abuse Prevention	I70 - I73	601	2.6	0	1	52	363
Hot Lines & Crisis Prevention	F40, F42	231	0.9	0	0	14	363
Food Pantries and Programs	K30, K31, K34- K36	955	4.2	0	2	85	363
Homeless Shelters	L40 - L41, P85	845	4.3	0	1	124	363

Source: National Center for Charitable Statistics Core Files and the National Taxonomy of Exempt Entities

Table 2

Summary Demographic Statistcs for Sample MSAs in 2005

	Mean	SD	Min	Max
Population	677,240	1,548,368	55,731	18,800,000
Per Capita Income	$ 31,934	$ 5,798	$ 17,533	$ 68,543
Tansfer Payments to Individuals	$ 3,353,405	$ 8,472,610	$ 255,553	$ 122,000,000
Total Earnings	$ 19,900,000	$ 53,700,000	$ 752,298	$ 685,000,000

Source: BEA Regional Economic Accounts

Table 3

Probit regression results where N (Number of Firms in the market) is regressed on the interaction of Population and the covariates listed in Table 2. Markets are represented by a MSA and nonprofit industry pair.

	1 Museums	2 Abuse Prevention	3 Crisis Prevention	4 Food Pantries	5 Homeless Shelters
Probit Estimates using 2005 Panel					
Per-Capita Income*Population	**1.82E-10** ***	**7.57E-11** ***	**3.36E-11** ***	**1.21E-10** ***	**1.32E-10** ***
z	*9.25*	*6.85*	*2.97*	*9.53*	*10.3*
Transfers*Population	-9.06E-14	-2.08E-14	2.93E-14	**1.54E-13** ***	4.96E-14
z	*-0.55*	*-0.52*	*0.71*	*2.6*	*0.92*
Total Earnings*Population	-3.41E-14	**-1.73E-14** ***	-4.60E-15	**-5.87E-14** ***	**-4.20E-14** ***
z	*-0.96*	*-2.02*	*-0.52*	*-6.62*	*-4.33*
N	*343*	*343*	*343*	*343*	*343*
LR	*353.98*	*143.79*	*76.14*	*262.21*	*304.46*
Pseudo R2	*0.23*	*0.1188*	*0.0999*	*0.1904*	*0.2256*
Probit Estimates using 2000 Panel					
Per-Capita Income*Population	**2.26E-10** ***	**8.41E-11** ***	**4.95E-11** ***	**1.37E-10** ***	**1.50E-10** ***
z	*12.38*	*6.28*	*3.62*	*9.73*	*10.35*
Transfers*Population	2.86E-14	1.68E-14	6.02E-14	**1.68E-13** ***	1.62E-14
z	*0.34*	*0.35*	*1.22*	*3.29*	*0.33*
Total Earnings*Population	**-9.05E-14** ***	**-2.72E-14** ***	**-2.09E-14** ***	**-7.03E-14** ***	**-5.33E-14** ***
z	*-6.77*	*-2.98*	*-2.26*	*-7.56*	*-5.72*
N	*343*	*343*	*343*	*343*	*343*
LR	*339.45*	*117.99*	*51.46*	*214.99*	*233.73*
Pseudo R2	*0.2269*	*0.1112*	*0.0717*	*0.1715*	*0.2132*
Probit Estimates using 1995 Panel					
Per-Capita Income*Population	**2.57E-10** ***	**1.21E-10** ***	**8.31E-11** ***	**1.79E-10** ***	**1.92E-10** ***
z	**11.15**	**6.28**	**4.29**	**9.14**	**9.57**
Transfers*Population	-5.38E-14	-5.18E-14	-3.34E-14	**1.65E-13** ***	4.12E-14
z	-0.47	-0.66	-0.42	**2.07**	0.52
Total Earnings*Population	**-8.93E-14** ***	-2.86E-14	-2.05E-14	**-9.28E-14** ***	**-7.24E-14** ***
z	**-3.63**	-1.60	-1.12	**-5.13**	**-4.00**
N	*343*	*343*	*343*	*343*	*343*
LR	*300.50*	*123.46*	*62.67*	*202.12*	*222.65*
Pseudo R2	*0.22*	*0.1377*	*0.0881*	*0.1669*	*0.2188*
Probit Estimates using 1990 Panel					
Per-Capita Income*Population	**2.17E-10** ***	**9.37E-11** ***	**9.64E-11** ***	**1.58E-10** ***	**1.70E-10** ***
z	10.28	4.72	4.88	8.15	8.37
Transfers*Population	7.06E-14	6.77E-15	3.42E-14	**1.51E-13** **	4.97E-14
z	0.72	0.08	0.43	1.90	0.63
Total Earnings*Population	**-8.82E-14** ***	-1.92E-14	**-4.47E-14** ***	**-8.49E-14** ***	**-7.51E-14** ***
z	-4.52	-1.03	-2.42	-4.7	-4.08
N	*343*	*343*	*343*	*343*	*343*
LR	*266.63*	*108.21*	*57.58*	*162.93*	*157.97*
Pseudo R2	*0.2076*	*0.147*	*0.0865*	*0.1493*	*0.1959*

Table 4

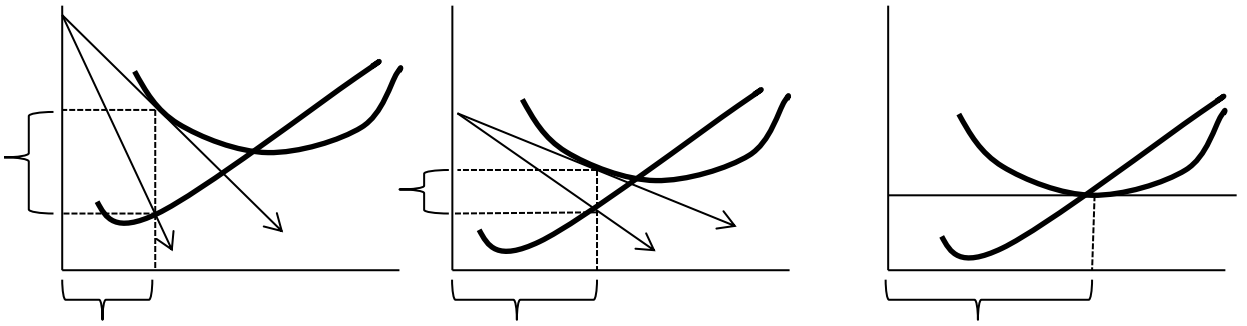
S = Total Population Required to Support Entry of N firms

s = Per-Firm Population Required to Support Entry of N firms

Ratio = s(N+1)/s(N)

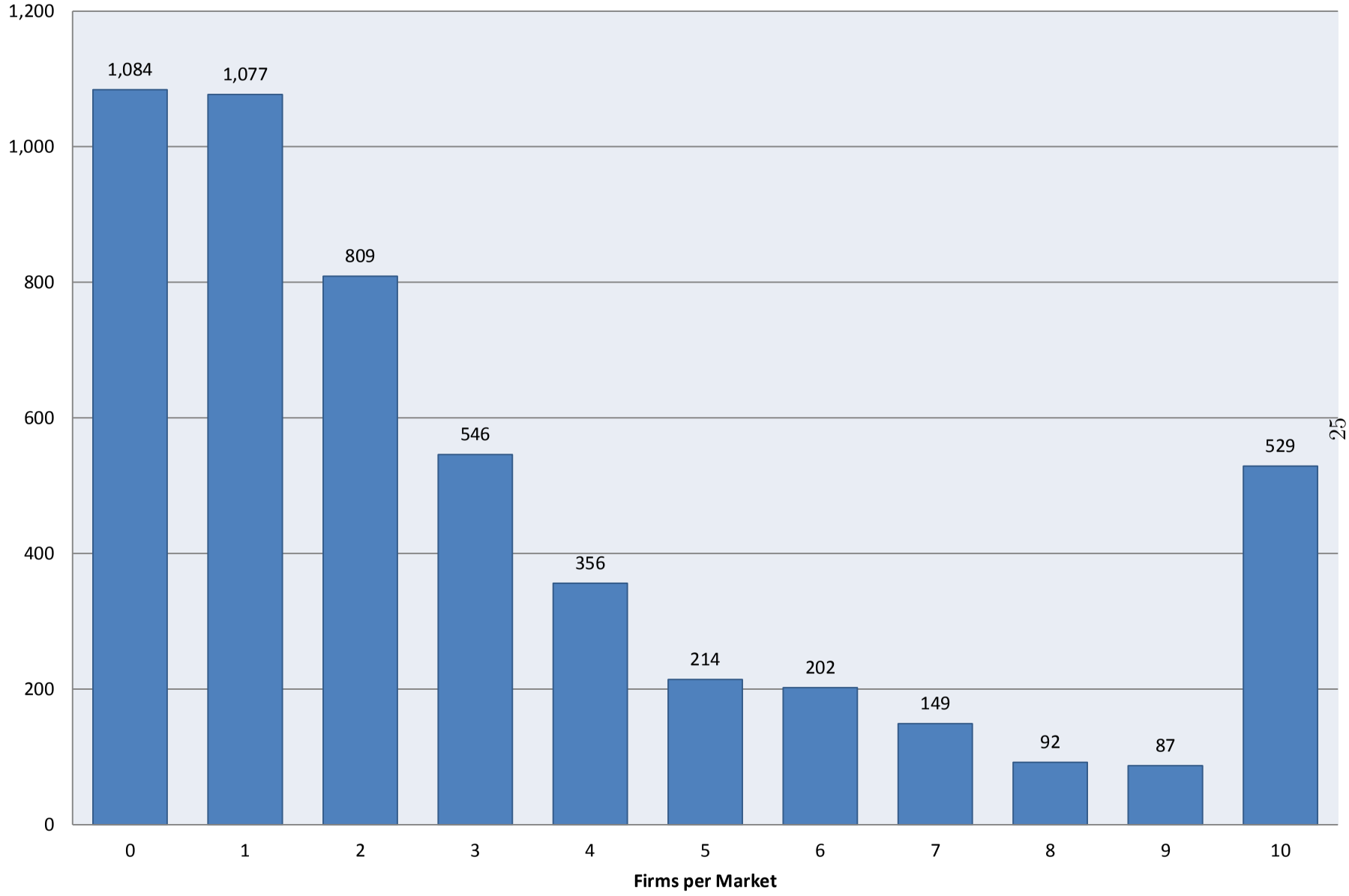
	Museums			Abuse Prevention			Crisis Prevention			Food Pantries			Homeless Shelters		
Entry Thresholds for 2005 Panel															
N	**S**	**s**	***Ratio***	**S**	**s**	***Ratio***	**S**	**s**	***Ratio***	**S**	**s**	***Ratio***	**S**	**s**	***Ratio***
1	(110,917)	(110,917)	*(0.34)*	57,933	57,933	*4.03*	503,820	503,820	*1.41*	(38,265)	(38,265)	*(2.50)*	68,211	68,211	*2.22*
2	76,108	38,054	*1.98*	467,311	233,655	*1.07*	1,423,162	711,581	*1.09*	191,332	95,666	*1.45*	302,694	151,347	*1.06*
3	226,123	75,374	*1.04*	748,826	249,609	*0.99*	2,326,690	775,563	*1.03*	416,963	138,988	*1.12*	483,285	161,095	*0.95*
4	313,352	78,338	*1.05*	987,221	246,805	*0.93*	3,183,405	795,851	*0.99*	620,826	155,206	*0.97*	610,116	152,529	*0.99*
5	410,110	82,022	*0.93*	1,149,040	229,808	*0.97*	3,948,443	789,689		753,399	150,680	*0.97*	753,531	150,706	*0.99*
6	458,537	76,423	*1.07*	1,338,024	223,004	*0.96*				875,741	145,957	*0.94*	894,300	149,050	*1.02*
7	574,470	82,067	*0.99*	1,506,031	215,147	*0.92*				963,803	137,686	*1.06*	1,062,835	151,834	*0.97*
8	652,752	81,594	*0.94*	1,585,306	198,163	*1.00*				1,171,551	146,444	*0.90*	1,182,528	147,816	*0.96*
9	689,111	76,568	*1.03*	1,781,928	197,992	*0.96*				1,189,631	132,181	*0.95*	1,278,039	142,004	*0.93*
10	791,503	79,150		1,902,321	190,232					1,251,508	125,151		1,323,159	132,316	
Entry Thresholds for 2000 Panel															
N	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**
1	(6,700)	(6,700)	-12.29	133,894	133,894	2.29	493,661	493,661	1.38	22,503	22,503	6.4794	223,222	223,222	1.10
2	164,636	82,318	1.12	613,645	306,822	1.02	1,366,650	683,325	0.98	291,618	145,809	1.2721	492,451	246,225	0.87
3	277,125	92,375	1.03	937,769	312,590	0.94	2,018,735	672,912	0.96	556,463	185,488	0.9962	645,405	215,135	0.99
4	381,131	95,283	1.00	1,169,342	292,336	0.93	2,578,290	644,572	0.84	739,133	184,783	1.0021	855,899	213,975	0.89
5	474,555	94,911	0.98	1,360,297	272,059	0.92	2,711,181	542,236		925,895	185,179	0.9905	950,217	190,043	0.98
6	558,232	93,039	0.97	1,506,358	251,060	1.01				1,100,488	183,415	0.9092	1,122,026	187,004	1.04
7	629,608	89,944	0.96	1,771,857	253,123					1,167,261	166,752	0.9482	1,359,337	194,191	0.89
8	691,867	86,483	0.96							1,264,972	158,122	0.9208	1,385,625	173,203	0.91
9	745,814	82,868	0.97							1,310,412	145,601	0.9373	1,414,608	157,179	0.92
10	804,773	80,477								1,364,698	136,470		1,447,086	144,709	
Entry Thresholds for 1995 Panel															
N	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**
1	41,113	41,113	3.17	268,772	268,772	1.45	441,817	441,817	1.27	50,456	50,456	3.23	265,394	265,394	0.98
2	260,259	130,129	1.01	776,974	388,487	0.83	1,126,629	563,314	0.98	325,786	162,893	1.16	517,652	258,826	0.96
3	395,467	131,822	0.91	962,114	320,705	0.97	1,659,988	553,329	0.95	566,953	188,984	1.02	746,067	248,689	0.90
4	481,442	120,361	0.98	1,243,328	310,832	0.95	2,104,040	526,010		774,753	193,688	0.95	899,575	224,894	0.91
5	590,966	118,193	0.97	1,482,578	296,516	0.95				923,311	184,662	0.96	1,024,548	204,910	0.94
6	685,389	114,232	0.94	1,689,387	281,565	1.00				1,065,739	177,623	0.98	1,161,387	193,564	0.91
7	754,090	107,727	0.92	1,968,743	281,249					1,217,950	173,993	0.91	1,232,654	176,093	0.98
8	794,740	99,342	0.97							1,266,715	158,339	0.91	1,380,512	172,564	0.97
9	863,140	95,904	0.97							1,292,302	143,589	0.96	1,504,254	167,139	1.00
10	927,010	92,701								1,383,826	138,383		1,663,824	166,382	
Entry Thresholds for 1990 Panel															
N	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**	**S**	**s**	**Ratio**
1	112,035	112,035	1.51	470,447	470,447	1.10	468,228	468,228	1.16	134,240	134,240	1.68	369,842	369,842	0.98
2	337,906	168,953	1.00	1,035,421	517,710	0.93	1,088,538	544,269	0.96	452,021	226,011	1.08	721,193	360,597	0.86
3	508,040	169,347	0.90	1,448,887	482,962	0.88	1,560,186	520,062	0.99	732,802	244,267	0.98	928,198	309,399	0.91
4	610,798	152,699	0.94	1,702,632	425,658		2,066,127	516,532		960,636	240,159	0.93	1,123,364	280,841	0.88
5	714,813	142,963	0.96							1,111,225	222,245	0.88	1,234,248	246,850	0.96
6	824,705	137,451	0.95							1,176,195	196,033	0.96	1,423,166	237,194	0.94
7	916,150	130,879	0.94							1,315,661	187,952		1,556,431	222,347	
8	980,403	122,550	1.00												
9	1,101,146	122,350	0.93												
10	1,139,052	113,905													

Figure 1



1 2 3

Figure 2: Frequency of Firms per Market



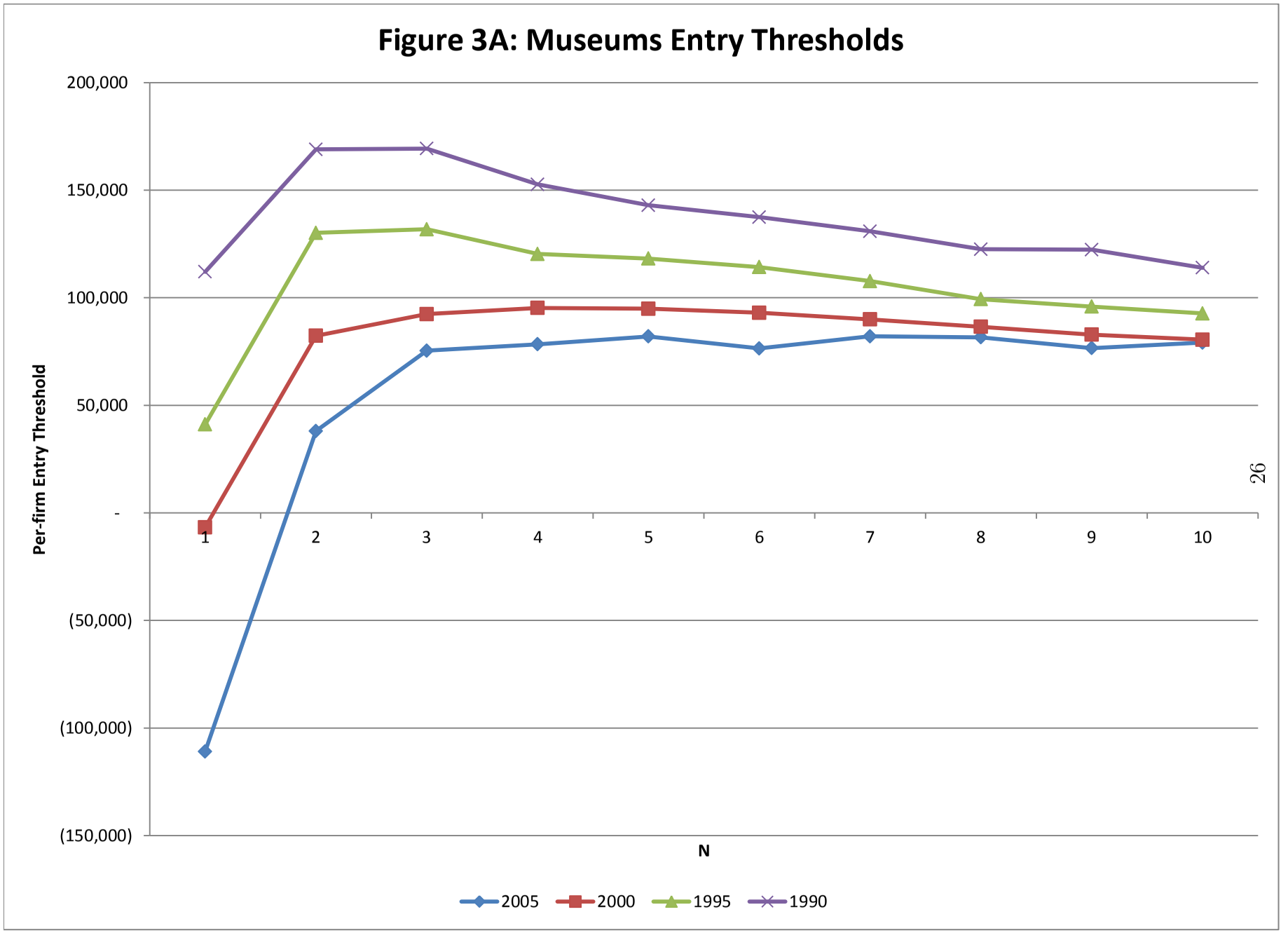


Figure 3A: Museums Entry Thresholds
200,000
150,000
100,000
50,000
-
(50,000)
(100,000)
(150,000)
Per-firm Entry Threshold
1
2
3
4
5
6
7
8
9
10
N
2005
2000
1995
1990

Figure 3B: Abuse Prevention Centers Entry Thresholds

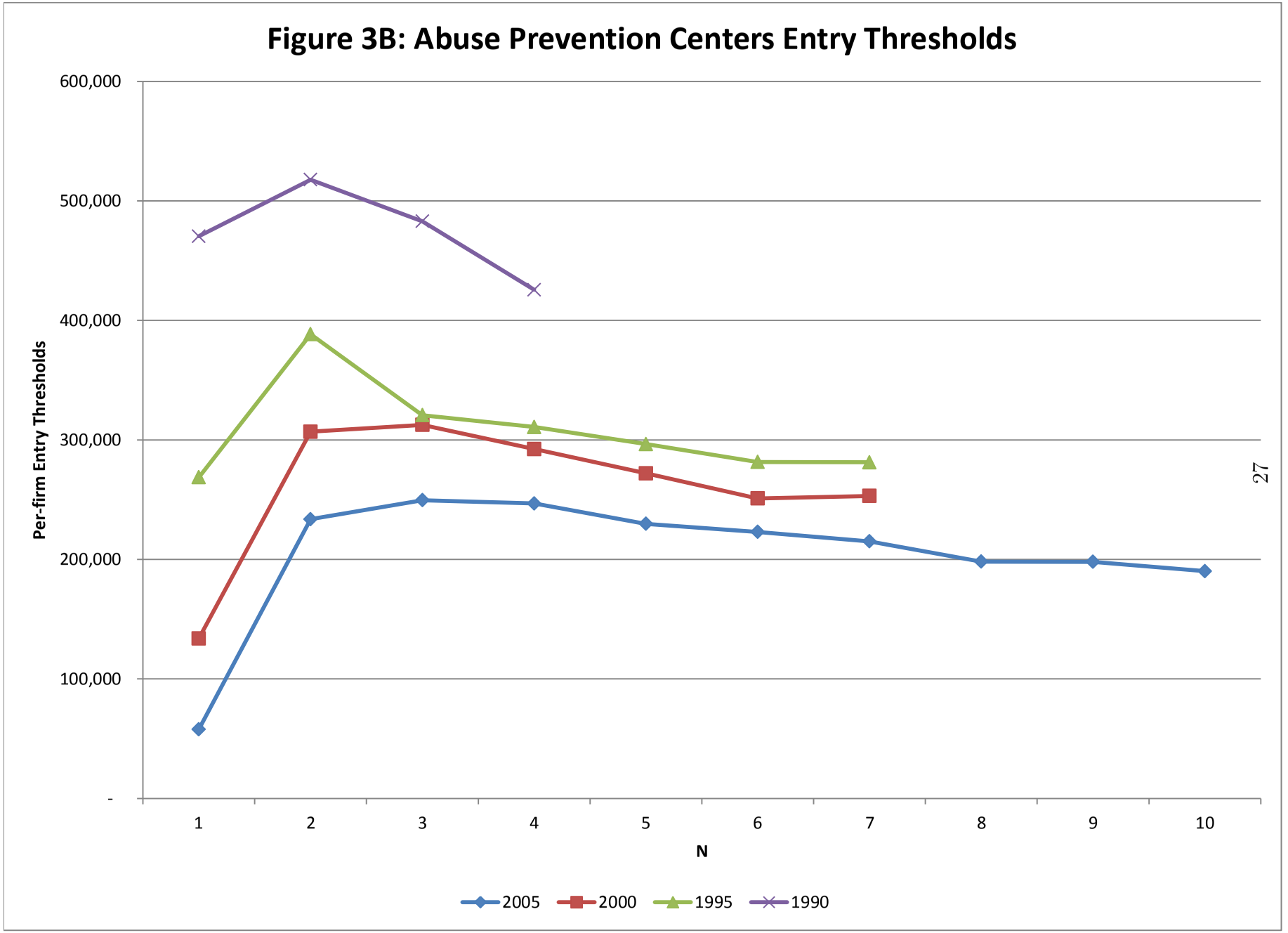


Figure 3C: Crisis Prevention Centers Entry Thresholds

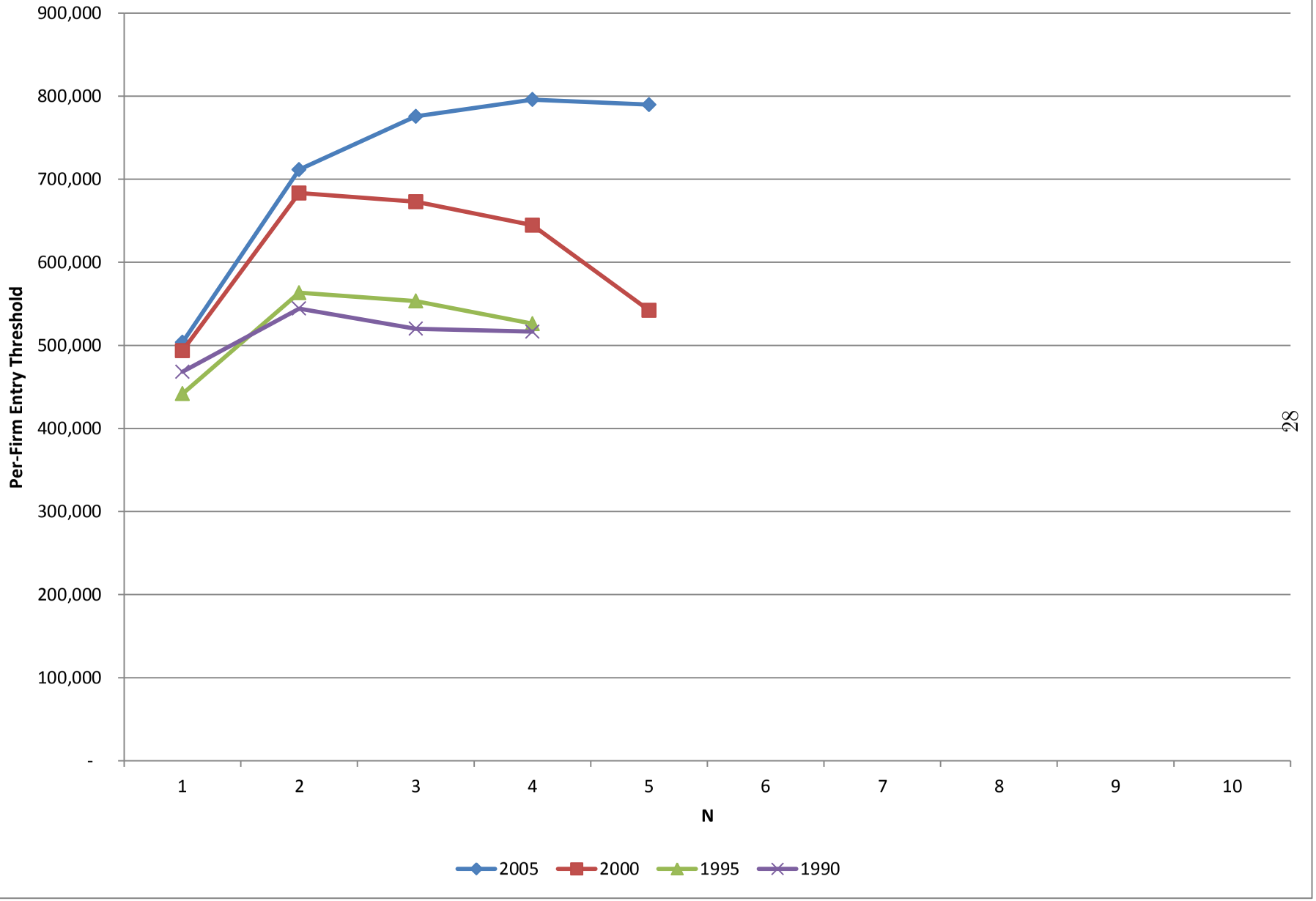


Figure 3D: Food Pantry Entry Thresholds

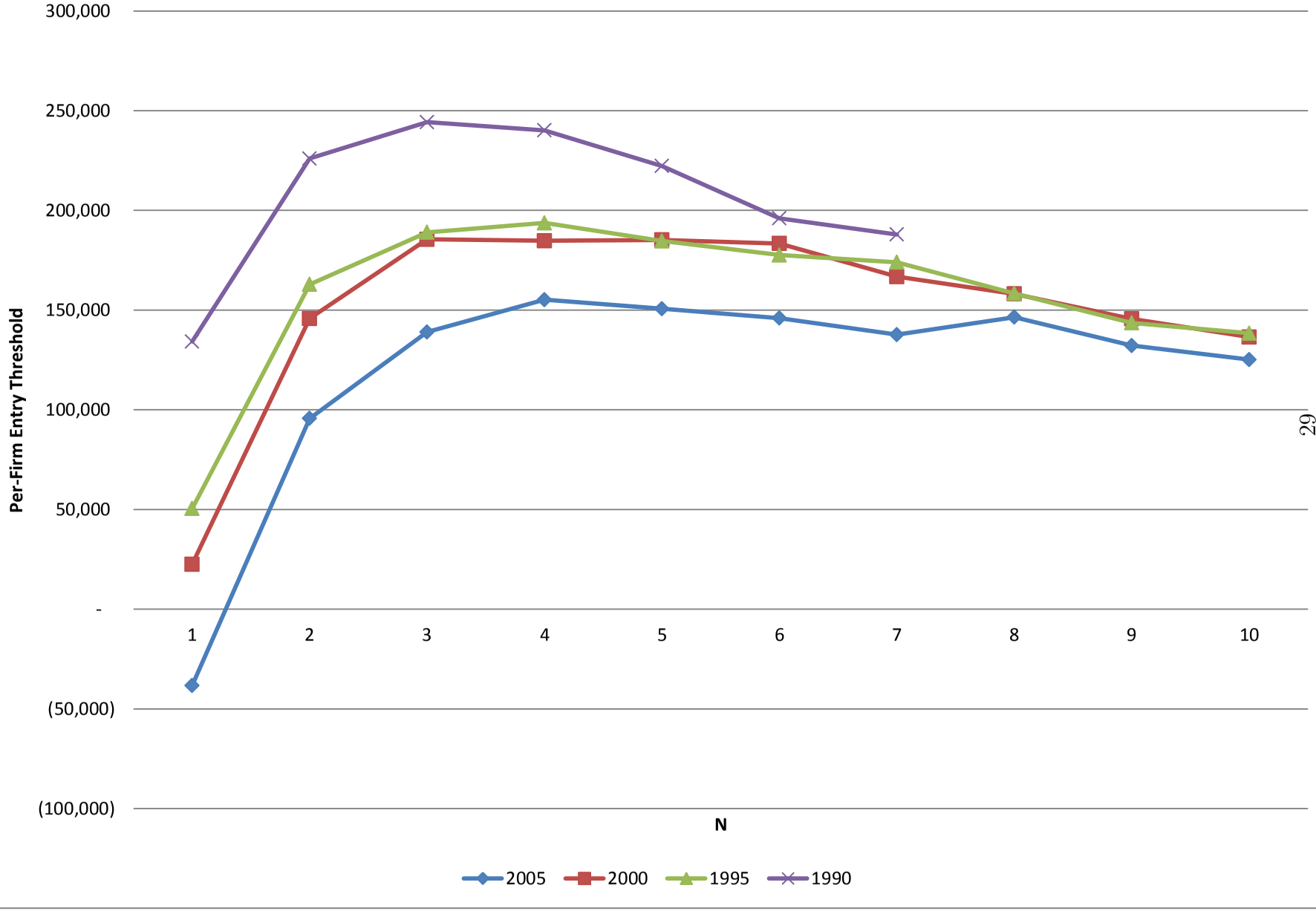


Figure 3E: Homeless Shelter Entry Thresholds