

Nontraditional Crowding Out: Spending and Endowment Decisions By Nonprofit Managers

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Abstract

Nearly all studies of the interaction between private charitable poverty relief and government welfare programs focus on the crowding out of private donations. A reduction in donations does not necessarily imply a reduction in relief spending, as charity managers may choose to spend a portion of their endowment to aid the poor. I measure the change in donations, charitable spending, and the size of the charity's endowment when there is a change in government spending. In order to clearly identify the effects of government spending, I construct an annual panel data set of every private charity and government agency in Massachusetts between 1922 and 1932. Massachusetts law forbade local and state governmental agencies from providing direct funding to charities. And since federal poverty relief was non-existent there are no concerns when analyzing the data with double counting government transfers. I use an instrumental variable estimation technique with charity fixed effects to show that a dollar increase in per capita government relief spending decreased an individual charity's spending by 16 cents. The 16 cent decrease cannot be fully explained by declining donations as donations to charity fell by less than 5 cents for every dollar spent by the government. Endowments also did not benefit from government spending as total property held by the charity decreased by 8 cents for every dollar spent by the government.

Keywords: Crowding Out, Nonprofit Sector, Great Depression

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1 Introduction

Crowding out estimates are an important consideration for policy makers when deciding on the size of the government's poverty relief efforts. Poverty reduction efforts will fall short of their goals if government decision makers do not accurately measure how private donors and charities respond to expansions in government spending. The empirical literature on crowding out has focused on measuring charitable donations instead of charitable spending.¹ A rich theoretical literature supports the empirical side by modeling donors as agents contributing to a public good. In all of these models donations go directly to those in need. Yet this approach does not capture an important institutional feature that most private donations flow through charities before reaching the poor.

A smaller strand of the literature examines the impact of government spending increases on spending by charities (Robert 1984; Hungerman 2005; and Gruber and Hungerman, 2007). These studies however are unable to identify whether crowding out is fully driven by declines in donations to the charities or independent decisions by charity managers. In this paper I use a rich new data panel data set to examine how changes in government spending influenced donations to the charities, spending by the charities, and the savings they accumulated in endowments.

Poverty relief charities have played a major role in society, particularly in the early 1900s, by collecting charitable donations, identifying people in need, and distributing the money to those people. Narratives throughout the 20th century suggest that managers of poverty relief charities generally have sought to raise the level of living of their recipients to some target minimum. During good times, charities often accumulated savings in endowments enabling them to expand expenditures during hard times when donations slowed and poverty increased. Thus, there is no guarantee that changes in donations to the charities and spending by the charities are mechanically tied together. My data supports this decoupling of donations and expenditures. Of the 4,818 observations in my sample, changes in donations and changes in spending moved in opposite directions 48 percent of the time.

To provide a framework for analysis, I develop a model for charity managers from historical narratives. Charity managers are utility maximizing agents who seek to reduce the "poverty gap" between a target minimum livable income and the actual incomes of people below that target. To the extent that government transfer payments and spending by other charities fill that gap, the charity might reduce its own distributions to the poor. The inclusion of the poverty gap in the manager's utility offers advantages as the model shows how manager's decisions are influenced by government spending, spending by other charities, and changes in economic conditions over the business cycle.

To examine how government spending affects manager decisions, I have compiled a new panel data set with annual information on donations to and spending by all income maintenance charities and all government agencies in Massachusetts between 1922 and 1932. Since

¹Reece (1979); Abrams and Schmitz (1984); Kingma (1989); Lindsey and Steinberg (1990); Khanna et al. (1995); Payne (1998); Okten and Weisbrod (2000); Khanna and Sandler (2000); Andreoni and Payne (2003); Manzoor and Straub, (2005); Borgonovi (2006) Andreoni and Payne (2010);

the period precedes the New Deal, the federal government was not involved in providing financing for relief. Study of the Massachusetts data also offers a clean way to identify the separate impact of government spending on donations and expenditures because Massachusetts law forbade governmental agencies from providing funding to charities. Therefore, I avoid the double-counting and identification problems described by Gruber and Hungerman (2007) when governments provide transfers to the poor by passing them through charitable agencies.

I analyze the data using charity and year fixed effects and instrumental variable analysis with corrections for serial correlation and heteroskedasticity. The results show that a dollar increase of government spending decreased spending by each private charity by approximately 16 cents and donations to the charity by less than 5 cents. Savings in the form of the endowment decreased by 8 cents when government relief spending increased by a dollar. The results for charitable spending was statistically significant at the 5 percent level, while the endowment measurement was statistically significant at the 10% level. The estimate of donations were not statistically significant at the 10% level. The results suggest that government spending decreased charity spending on the poor by a significant amount, but the decline came from charity managers reallocating resources rather than being forced to from lower donations. Also managers reduced the amount of assets they held when government spending rose.

2 Literature Review

Most theories on the interaction between public and nonprofit relief spending focus on the actions of donors. ‘Crowding out’ or ‘traditional crowding out’ is defined as the decrease of voluntary contributions from donors from an increase of forced contributions (taxes). Warr (1982), Roberts (1984), and Bergstrom, Blume, and Varian (1986) formally model this interaction. Their models predicted that government spending increases eventually would eliminate all funding for charities.

A long list of empirical papers measured the crowding out of donations from either government grants or government spending. Kingma (1989), Khanna et al. (1995), Payne (1998), Okten and Weisbrod (2000), Khanna and Sandler (2000), and Straub (2004) all measured the impact of government direct grants to charities on donations. Reece (1979), Abrams and Schmitz (1984), and Lindsey and Steinberg (1990) measured the impact of government spending on donations to the charity. Most of these studies found that donors are not very responsive to government spending.

To explain why the empirical research found donors unresponsive to government spending, Andreoni (1990) proposed an update to the standard altruistic model. In the standard altruistic model individuals receive utility from the total size of the public good only. Andreoni (1990) observed that the act of giving provided its own utility. This is known as the warm glow effect and helps explain why donations are still substantial in the modern era, despite large amounts of government spending.

Recently researchers have focused on charity managers as an important source of crowding out. Andreoni and Payne (2003, 2010) measured the impact of government grants on

reducing the incentive for charity managers to fund raise. The reduction in fund raising effort causes donations from the private sector to fall. Although crowding out on fund raising effort would be an important consideration for many modern data sets, due to the law passed in Massachusetts, my data set does not contain direct government grants to private charities.

This lack of government and charity interactions was a feature of Gruber and Hungerman's (2007) analysis, which measured the impact of New Deal spending on church benevolent spending. New Deal funds were not distributed to private sources, which eliminated a major identification problem. The identification problem is a result of the joint determination of government grants and private donations. Nonprofits that are better at lobbying private donors would also be better at lobbying politicians and bureaucrats. Charities with an unobservable talent for lobbying would have increases in both government funds and private funds at their location. This would bias crowding out estimates as donations and spending would increase simultaneously.

In their study, Gruber and Hungerman, used data from six Protestant denominations aggregated at the state level. They found that religious denominations decreased benevolence spending by 5.7 cents for every dollar spent from the federal government. However, the protestant denominations only covered 50% of the population of church going citizens. The final adjusted crowding out of religious benevolent spending from federal spending was 2.9 cents. The data available to Gruber and Hungerman (2007) did not allow them to examine the mechanisms by which crowding out occurred. They suggest that more "information is also needed to see whether crowd-out is driven by changes in donations or in spending allocation." My data set contains revenue sources of charities allowing me to explore why and how charity managers were reacting to government spending.

3 The Behavior of Charity Managers

To investigate the motivation of nonprofit managers I develop a model of a utility maximizing charity manager. The manager is working for a nonprofit in the income maintenance sector as depicted in Figure 1 located in Appendix A.. The sector's goal is to reduce the "poverty gap," the difference between a target income level and the actual income for people who fall below a target income. The lower right-hand box for recipients in Figure 1 shows the size of the poverty gap. Both nonprofits and the government seek to fill the poverty gap through aid spending. Each organization decides on the amount of spending on aid compared to alternative uses for funds.

Donors in the lower left-hand box of Figure 1 decide the size of their voluntarily contribution to nonprofits in the form of voluntary donations after the government has made them involuntarily contribute in the form of taxes. Although donors are important source of funding for nonprofit they were not the only source. In the upper box in Figure 1, the circle on the left shows that nonprofits often had a business that provided net revenue as well. Many poverty relief charities ran thrift stores that sold donated clothing and other in-kind goods to obtain revenue. Also, poverty relief charities often charged a fee that was associated with receiving the charities services. For example, assisted living homes would charge a small fee to reserve a bed in the establishment. Nonprofits also gained revenue from

income generated from the endowment in the middle circle of the upper box in Figure 1. The endowment usually is invested in bonds, stocks, or bank accounts that generate investment income. The income stream allows the nonprofit to allocate resources either towards filling the poverty gap, saving for future activity, spending to raise donations or improving the quality of care provided.

3.1 Information Used By Charity Managers

There is plenty of narrative evidence that charities focused on closing the poverty gap. First, there existed a target income that both public and private organizations in the sector used and agreed upon. Documentation from the early 1900s shows that both public and private charities measured and generally agreed upon a target income. The adoption of general standards was relatively new for the era. Government institutions in Massachusetts first set standards in 1914. After the adoption of standards, the state and private charities continued to adjust the minimum living income target based on changing prices.

In 1913 family budget standards as applied to public relief were practically unknown. The first attempt of public relieving officers to measure scientifically the weekly needs of a given family in terms of rent, fuel, food and clothing, was made by the State Board of Charity in 1914. After consultation and correspondence with many public and private relief agencies all over the country a standard budget guide . . . was adopted. It has been revised several times in the past ten years and it is still in use. . . (Massachusetts Department of Welfare 1923, pp 11)

The target budget was not just updated yearly. During the war years monthly bulletins were issued updating those in the poverty relief community to the rapid increases in the cost of living so targets could be adjusted accordingly.

During the War, when food and fuel conservation became a national necessity, both the Federal Government and the State of Massachusetts made exhaustive studies of food and fuel values, of clothing costs, rent and sundries. They issued monthly bulletins dealing with the cost of living which were of immense value and which stirred a nation-wide interest in the subject of family living costs. (Massachusetts Department of Welfare 1923, pp. 11)

Private charities were also measuring and developing a target income.

In an attempt to compare the men's rate of wages with their actual needs, a scale of expenditures was made up. . . The final estimate was supposed to represent approximately the minimum upon which a family could exist and keep healthy during the period. . . In nearly every doubtful question the committee felt that it was better to err on the side of too small rather than too large an estimate. Having compiled this scale, the committee then took each family and estimated its expenses strictly by applying the scale, thus hoping to get the minimum upon which each family should be able to live entirely apart from its actual expenditures. (Associated Charities of Boston, 1917, pp.21)

In addition to shared information about minimum living income, charities and the government also had information about the level of income of the poor. Both public and private organizations obtained this information through investigating the claims of the poor. This was mostly done with household visits. On these visits investigators asked questions about income, size, and age composition of the household. They also were interested if the household was being helped by other organizations. As an example, the Massachusetts Department of Public Welfare advised:

In order to determine what is a sufficient amount of aid for a given family, a thorough investigation of its circumstances is necessary. Much depends upon the thoroughness of this inquiry. The resources of the family, including help which may be secured from relatives and interested societies, must be discovered, as well as the needs of the family in terms of food, clothing, rent, fuel, etc. (Massachusetts Department of Welfare 1924, pp. 8)

The private sector's source of information about the poor came from Charity Organization Societies. The goal of these charities was focused on reducing waste in relief spending. They believed that the poor would become dependent on hand outs. To keep the poor from receiving too much aid, they investigated the poor and kept information on all sources of income.

The Objects of this Society are: To aid the diffusion of knowledge connected with the relief of the poor. To accomplish these objects, it is designed: To provide that the case of every applicant for relief shall be thoroughly investigated; To provide a means of confidential exchange of information between the overseers of the poor, charitable societies and agencies, and benevolent individuals; (Associated Charities 1917 pp.1)

Based on the target income and information from investigations of the poor about the poor's income and other organizational spending, changes in the size of the poverty gap were known to the charity manager during the time period. Charity managers then reacted to the size of the poverty gap by changing spending. The poverty gap changes because of two factors outside of the control of the manager: general economic conditions and other organizational spending. The impact of economic conditions is straightforward. Recessions cause more people to fall below the target income and the gap for each family below the target minimum to widen, while economic expansions helped shrink the gap.

The poverty gap also will shrink to the extent that the charity manager views spending by other organizations as a substitute for his own. Managers would reduce their own spending on the poor in response to relief spending by other organizations. For example, the manager of an assisted living would be unlikely to change spending much in response to a rise in spending on orphanages because he might see little connection between their purposes. On the other hand, charities that both offer firewood to the poor might be highly responsive to each others' spending. Even if the other firewood charity spends more, the manager might not see that spending as a complete substitute because the manager receives a 'warm glow' from his own spending on the poor.

3.2 ‘Warm Glow’ Felt By Charity Managers

There are reasons to suspect that charity managers are not cold calculating accountants running the charity to maximize efficiency. Steinberg (1986); Khanna et al. (1995); Posnett and Sandler.(1989); Okten and Weisbrod (2000); and Brooks (2005) all report varying nonprofit maximizing behavior by managers when making fund raising decisions. Warm glow from charity managers would fit in with literature. Charity managers most likely select into the position. Although all charities are spending to reduce poverty, charities provide a wide range of goods and services. Charities also target specific demographics. For example, there were religious charities that helped poor ministers. This would indicate that charity managers had a vested interest in those they were helping.

There is also a status effect of running a charity. Managers might be attracted to helping others through the positive effect their job description has on others. This would indicate that it was important for the charity manager to supply poverty relief from their organization rather than letting the government take over. I insert warm glow into the objective function of the manager similar to the warm glow model described by Andreoni (1990). Managers care about how much their organization gives in addition to shrinking the overall poverty gap.

3.3 Theoretical Model

The utility maximization problem for the charity manager can be written as:

$$\begin{aligned} \max_{e_{it}, x_i} u(e_{it}, x_i + G + X_{-i} - P, x_i) \quad & st(e_{it} + x_i \leq TR_i + e_{i,t-1}) \\ & st(G + X_{-i} - P \leq 0) \\ & st(e_{it} \geq 0, x_i \geq 0) \end{aligned}$$

Where e_{it} is the *end of the year* endowment that charity i will start with in the next period; x_i is spending on the poor by the charity, G is government poverty relief spending; $X_{-i} = \sum_{i \neq j} x_j$ is relief spending by all other charities; P is the size of the poverty gap before any spending by governments or charities; TR_i is the total revenue for the year; and $e_{i,t-1}$ is the size of the endowment in the *previous period*.

The poverty gap is constructed as the lump sum transfer needed to return all those below the poverty line back to the minimum income. P is constructed as:

$$\sum_{k=1}^N (povertyline - income_k) \cdot 1(income_k < povertyline)$$

where $1(income_k < povertyline)$ is an indicator function that equals one if the income of individual k is below the agreed upon poverty line, *povertyline*. I sum over the total number of citizens in society N .

The manager chooses the level of the endowment at the end of the year e_{it} and the expenditures on the poor x_i in this constrained maximization problem. The first term in the utility function gives the manager the option to save for the future instead of spending money on the poor today. The second term reflects the poverty gap that remains after the spending by the charity x_i , the government G , and other charities X_{-i} . The poverty manager

gains altruistic utility from the final size of the poverty gap after everyone has contributed. The third term is the warm glow utility to the manager providing her goods and services directly to the poor. The model indicates that the source of funding either private or public is not important to the manager.

The manager's spending in this year is constrained by total revenue TR_i and the endowment at the end of the previous year $e_{i,t-1}$. The charity must also have non-negative amounts in the endowment at the end of the period and have non-negative spending on the poor this period. This model also precludes borrowing from outside sources making the endowment the only way for the firm to spend more than revenue generated in the year. Finally, the charity does not want to spend in ways that lead to the poor having more than the target poverty level because they fear the long-run incentive effects of the poor relying on charitable spending.

The first order conditions of the maximization states that the marginal utility gained from an additional dollar contributed to investment in the charity is equal to the marginal utility gained from an additional dollar contributed to the poor at the optimum. The first order conditions can be used to determine the utility maximizing choice functions for spending and the endowment at the end of the period.

$$x_i^* = x(G, X_{-i}, P, TR_i, e_{i,t-1})$$

$$e_{it}^* = e(G, X_{-i}, P, TR_i, e_{i,t-1})$$

3.4 Comparative Statics

To find the comparative statics, I assume that the reduced form utility function is strictly quasi-concave and has an interior solution. I then assume there is a Nash equilibrium. Each charity manager solves his or her maximization equation taking spending by the government, spending by other charities, and the size of the poverty gap without government and charity spending as given. The derivation of the comparative statics is shown in Appendix C.

I assume that there is diminishing marginal utility in increasing the endowment, closing the poverty gap, and contributions towards the warm glow effect. This implies that u_{11}, u_{22} , and u_{33} are all negative. I then assume that increasing the endowment increases the marginal utility from closing the poverty gap and the warm glow feeling (u_{21} and u_{31}). The final assumption is that reductions in the poverty gap leads to a reduction in the marginal utility from the warm glow (u_{32} is negative).

These assumptions lead to the following comparative statics.

Comparative Statics for the Poverty Gap Model

	Charity Spending	Endowment at the End of the Year
Government Spending	Negative	Positive
Other Charity Spending	Negative	Positive
Size of the Original Poverty Gap	Positive	Negative
Total Revenue	Positive	Positive
Beginning of the Period Endowment	Positive	Positive

The comparative statics tell us that a rise in spending by the government G will lead the charity to decrease spending x_i and increase the size of its endowment at the end of the period e_{it} . Increases in spending by other charities X_{-i} will have similar effects. An increase in the poverty gap P leads the charity to increase spending and reduces the endowment. An increase in funds available through donations, revenues, or a higher prior endowment leads to increases in both investment and expenditures. The rest of the paper will investigate the impact of government spending on charity spending and endowment at the end of the year.

4 Data

To examine the impact of government spending on donations to charities and the ultimate spending decisions, I have compiled an extraordinarily rich data set on every charity organization distributing resources to the poor and every city government in Massachusetts for the years 1922 through 1932. All dollar amounts have been adjusted to 2008 dollars to correct for inflation and deflation during the time frame. The data set was collected and reported annually by the Department of Welfare of Massachusetts. The department was unusual at the time, as it published all of the state's welfare activities including private financial statements. They were able to do this because of the state law requiring charities to report all financial activity in order to remain tax exempt. The department also investigated charities to make sure the institutions were legal and humane.

The reports contain records of over a thousand charities. Hospitals, social clubs, animal humane societies, prohibition advocates, private schools, subsidized loan programs, public policy institutes, foreign aid charities, playground and vacation homes, and local guilds all reported their finances to the state board. The focus of this paper is on human service charities. The majority of human service charities were mainly focused on helping specific groups based on their sex, age, religion and ethnicity. The safety net was quite large with nursing homes, boys and girls clubs, orphanages, subsidized child care centers, religious charities, recent immigrant charities, reduced cost housing associations, and specific trade associations. There was also medical relief for the poor through home visits by nurses and organizations that provided below cost drugs. These support a picture that, at least in major cities, the private charitable safety net was quite comprehensive.

I use a balanced panel of 418 human welfare charities in the study. To eliminate all non human welfare charities from the sample, only charities that described themselves as involved in human welfare activities and that aided a positive number of people were used. Charities in the sample must have survived the entire 1922-1932 period. Charities were continually entering and exiting the market for poverty relief. By removing charities that were starting up or shutting down I am controlling for selection problem with comparing mature charities to startups. If crowding out of government spending has a different impact on newly created charities the results of the paper may not be generalizable to the entire distribution of charities.

The Department of Welfare also collected data on its own budget including a detailed breakdown of spending at the city level. Government spending was broken into categories based on whether the poor person was in a local government owned building or receiving

relief funds while in their own home. The government usually took on cases where the person was considered permanently poor through a disability. This allowed the private sector to focus more on those in need of temporary help.

The reports by the Department of Welfare include information for each charity on the city of activity, donations, interest income, program revenue, total assets, total spending, salary, number of employees, and the number of recipients the charity helped during the year. The city government spending data shows total amounts of funds directed towards the poor including a breakdown of direct payments versus payments to keep the poor in government run housing. From this data I can trace the impact of government spending on private donations to the charities and on the final expenditures by the charities. I can also examine the extent to which these effects differed. The data set covers a period of boom in the 1920s and the bust in the early phases of the Great Depression. Further, since the data contains the universe of nonprofits, I can also examine how each charity responded to a change in overall spending of the rest of charities in the city.

A key assumption for my analysis is that all levels of government directed their spending only through governmental agencies and not through private charities. In many settings in the early 1900s and today, state and local governments provided funds to private charities to distribute.² Massachusetts was unique in that the government passed a state constitutional amendment in 1917 that prohibited the distribution of funds from state and local governments to welfare charities.³ The law still stands on the books today and there is no evidence that the State Board of Welfare flouted the law.

Although the data set runs through 1939, I focus on the period prior to 1933 for two reasons. First, from 1933 forward there was a rapid expansion of federal welfare spending under the New Deal. Evidence on federal spending in Massachusetts after 1933 is not available below the county level because the data is aggregated by counties rather than separated by townships. This move from 340 townships to 14 counties sharply increases the level of aggregation in the analysis and cuts degrees of freedom. Second, there is evidence that some of the federal money may have flowed through charities illegally during the New Deal, which will negate the clean separation of government spending and private charitable spending.⁴

²In his 1922 book about poor relief in Massachusetts from 1620-1920, Robert Kelso expressed "[T]he State subsidy system of private charities never became for Massachusetts the graceless scramble which besets many of her neighbors."

³Massachusetts State Constitution Article XVIII. Section 2. [N]o grant, appropriation or use of public money or property or loan of public credit shall be made or authorized by the commonwealth or any college, infirmary, hospital, institution, or educational, charitable or religious undertaking which is not publicly owned and under the exclusive control, order and superintendence of public officers or public agents authorized by the commonwealth or federal authority or both...

⁴In August 1933 Congress prohibited FERA funds from being distributed to private agencies. However, private charities were able to circumvent the law by having the state governments take grants from the federal sources and turn around and fund private charities. Wayne McMillen, writing about FERA for The Social Service Review in 1942, took to task a detailed report of private relief expenditure data that claimed the 1933 law had worked. He cites an example in Chicago where a charity was caught with Federal Funds and was forced to give up the funds. Yet government funding "...persisted after federal funds were withdrawn and resulted in the continued subsidizing of this agency from state appropriations." While Massachusetts did not allow state governments to give funds to charities, the Federal government still operated several programs that might have created problems after 1932. Therefore, although the data set stretches to 1939, for purposes of estimation I will only use 1922-1932.

Annual aggregate data from Massachusetts displays three important characteristics of the income maintenance sector depicted in Figure 1. First, donations and spending did not always move in the same direction. Second, total revenue typically did not equal total spending for the year. Third, at the aggregate level government spending on the poor rose a great deal, while private spending generally rose more slowly.

Table 1, located in Appendix B, shows that donations, expressed in real 2008 dollars, compose less than 41 percent of spending by private charities throughout the period. Although donations and spending typically rose in all years, there were periods like 1924 and 1929 when donations fell while spending rose. Donations as a fraction of total spending increase during the 1920s before falling during the first part of the 1930s.

Table 2 shows how savings (total revenue minus total spending) of human service nonprofits changed from 1922-1932. Between 1922 and 1928 the median and mean savings rose substantially in Massachusetts. Between 1929 and 1932, the charities still managed to save, although the amounts were smaller. The charities used in the table all survived from 1922-1932. This could cause some selection bias as smaller charities that had poor financial planning were not included in the sample. It should be noted however that the average modern charity will also save even in periods of distress. This is consistent with Weisbrod and Asch's (2010) report that nonprofits were cutting expenditures when revenue fell instead of using their endowment as a rainy day fund.⁵ This might indicate that financial solvency might be the overriding factor in decisions by managers.

Table 2 also indicates that charities had a broad range of experiences. The much higher mean than median in all years suggests that a few large charities had a large share of the savings relative to the typical charity. The standard deviation and the minimums and maximums show that charities were sometimes caught with huge windfalls or deficits. Also the constructed liquid endowment based on investment return are a large percent of the total property reported by the charity.⁶ This is consistent with the 1921 report by the Department of Welfare on the size of the endowment related to physical property. Since I only observe total property, the endowment plus physical property, for estimation purposes I use total property as a proxy for endowment size of the charity.

Table 3 shows the total spending for the state, average spending by city, and the per capita spending for all private human welfare organizations and local government spending in 350 Massachusetts cities. Private spending, while greater than public spending during this time period, was more concentrated in large cities. Private spending as a whole nearly doubled from 1922 to 1932 while public spending doubled from 1922 to 1931 and then doubled again within a year. At the state level crowding out of spending did not seem to be occurring.

At the city level however there are substantial swings in funding by both the government and private charities. Government spending at the city level fell 35% of the time from 1922-1932. In 1924 a majority of the cities actually reduced spending on the poor. By 1931 and 1932 greater than 95% of all cities were increasing relief spending year over year. Total private spending in the city fell 74% of the time from 1922-1932. This means that private spending was retreating for a majority of cities during the time period studied. Total

⁵Their examples came mostly from colleges, not welfare charities.

⁶Endowment was constructed by assuming the charities were earning 5% on their endowment throughout the time period.

government relief spending and total private relief spending moved in opposite directions 53% of the time. Crowding out is unlikely to be a joint decision by all charities in a city. Instead individual charities are reacting to government spending and the sum of their decisions is recorded at the city level. To estimate the effect of government spending on the city total spending I measure the impact of government spending on individual nonprofits.

5 Empirical Strategy

The theoretical model suggests that the charities choose spending and the endowment (essentially how much to save) at the end of the period in response to the same set of factors, spending by the government, spending by other charities, changes in the size of the poverty gap, the prior endowment and revenue streams. Although I did not model donor activity, I also estimate an equation that shows how donations to the charity are influenced by the government spending and changes in the size of the poverty gap. There are numerous models of donor’s decisions, so there was no need to develop a new model here.

5.1 Charity Spending Specification

The choice functions from the theoretical model suggest that the empirical equation for charitable spending is

$$CS_{icnt} = \alpha + \beta GS_{cnt} + \theta X_{cnt} + \zeta End_{icn,t-1} + \delta W_{cnt} + \gamma Z_{nt} + \eta_{icn} + \mu_t + \varepsilon_{icnt}$$

where CS is the total per capita spending by charity i , in city c , which is located in county n , in the year t , GS is the total per capita net ordinary spending on poverty relief of all government agencies in the city; X is the sum of all human welfare charity spending in the city; End is the value of the previous period’s total property, W is a set of controls at the city level; Z is a set of controls at the county level; η is a set of fixed effects for each charity; μ is a set of year effects. The variable of interest is the coefficient of Government spending β which estimates final crowding out. A negative coefficient on Government spending $\beta < 0$ signals that an increase in government spending is crowding out private spending.

At the county level, the federal government reported statistics for several economic control variables. First, the number of federal income tax returns showed the amount of very rich in the county. The data comes from the Treasury department’s annual “Statistics of Income” report. Only families of four with incomes above \$5000 and individuals with incomes above \$2,000 were required to pay income taxes. Less than 10 percent of households had earnings that large during the period studied. This might have been important if charities received their funding from rich families or tax bases relied on the wealthy. All years and all counties had a reported Income Tax Return total in the sample. It should be noted that Massachusetts also had its own state income, corporate, inheritance, and property taxes. Unfortunately, data on the geographical distribution of revenue could not be found.

I also used data from the Biennial Census of Manufacturers to control for shifts in manufacturing activity. The Census reported information biennially for cities larger than 100,000. In Massachusetts the cities of Boston, Cambridge, Fall River, Lowell, New Bedford, Springfield, and Worcester were reported consistently over the years. Counties were assigned the

value of the nearest city that reported to simulate economic conditions in the region. The census contained data on the average number of manufacturing workers during the year, total wages, and total value of production. Unfortunately, in 1931, the census decided to enlarge the size of the region covered. To be able to compare values throughout the time period I use per worker data. I construct average wage per worker y dividing the total salary for the city by the average number of workers during the year. I also create an average value per worker by dividing the total value of products in the city by the average number of workers during the year.

City level controls were harder to find, as statistics consistently reported for all 340 cities in Massachusetts were rare. Birth and Marriage data was kept by the Division of Vital Statistics throughout the time period. Marriage records could be thought of as a crude measurement for economic conditions in the city as couples would most likely delay marriage during economic downturns. Births are included because a number of charities were orphanages or homes for single mothers. Records were also kept on whether those getting married and having children were born in the United States. The percent of marriages with at least one foreign partner is a proxy for the number of immigrants in the city. More immigrants might have signaled a lower level of income in the city because immigrants tended to earn lower wages.

Population at the city level was recorded from the Decennial Census of the United States and the Decennial Census of Massachusetts. The Decennial Census of the United States was collected in 1920 and 1930, while the Decennial Census of Massachusetts was collected in 1925 and 1935. A linear interpolation between periods was used to fill in the missing years. Population is included as an independent variable as private charities were clustered in larger cities.

City records of voting patterns were reported biennially in the Manual of General Court. Each city recorded the percent of the population voting for a Democratic Governor Candidate in the last election. I use this variable to control for political leaning of the city. This controls for a number of other demographic variables as well including percent foreign in the city.

To control for heterogeneity in time-invariant features across charities, I added fixed effects for each charity. Fixed effects estimation controls for any systematic features of each charity that did not change from 1923 to 1932. These include the mission of the charity, the city in which it was located, and if the charity was under the guidance of the same manager and volunteers. Year dummies were also included to account for statewide weather, economic, and political shocks.

The summary table of city statistics shows that the average charity spending by city was greater than government spending in absolute terms; however, in per capita terms it was smaller. This effect mostly arises because many of the private charities were located in larger cities, whereas government relief agencies were present nearly everywhere. All government and private spending is therefore reported in per capita terms using the population of the town where the charity was located to take into account differences in the potential size of their target audiences.

5.2 Instrumental Variable Strategy

The estimate of government spending on charity spending has well known issues with omitted variable bias. Although I can control for many city and statewide variables, there are disasters as well as an omissions in fund raising expenses that are unobserved. Fund raising and disasters would most likely be positively correlated with both public and private spending. This would cause the coefficient on per capita government spending to be overestimated. To control for the omitted variable bias I use an IV estimation technique.

A good instrument in this case is one correlated with changes in city government's per capita spending but not correlated with changes in a private charity's per capita spending. The instrument that I use is based on the work of Susan Traverso (2003). She observed that per capita welfare spending in Boston was driven by the political party of the mayor and state legislature.

The state legislature provided funds to the city for the total amount of poverty relief, while the mayor of the city was in charge of controlling the Overseers of the Poor who distributed the relief. When a poor person in Massachusetts needed help and did not have any relatives to aid them, they were brought in front of the Overseers of the Poor. The Overseers board would then provide funds to each person on a case by case basis. The Overseers allocated funds based on their religious beliefs and also the level of funding from the government. The mayor was able to place persons on the board thereby controlling how much per capita spending was present.⁷

5.3 Endowment Specification

The poverty gap model presents a clear prediction for the amount of the endowment passed into the next period, unfortunately, I do not directly observe the size of the endowment in the data. Instead I observe total property held by the charity which includes the endowment. Data from 1920 and 1921 when property was divided into physical and interest bearing accounts showed that endowments make up a large percent of total property and are more volatile than physical property. Therefore, I use the change in total property held by the charity as a proxy for changes in the endowment.

The estimating equation comes directly from the model and is similar to the expenditure equation:

$$End_{icnt} = \alpha + \beta GS_{cnt} + \theta X_{cnt} + \delta W_{cnt} + \gamma Z_{nt} + \eta_{icn} + \mu_t + \varepsilon_{icnt}$$

where End is the per capita total property reported at the end of the year by charity i , in city c , which is located in county n , in the year t ; GS is the total per capita net ordinary spending of all government agencies on poverty relief in the city; X is the sum of all other charity spending in the city; W is a set of controls at the city level; Z is a set of controls at the county level; η is a set of fixed effects for each charity; μ is a set of year effects. The variable of interest is the coefficient of Government spending β which estimates final

⁷Traverso gives an example in Boston where a Republican mayor fired four members of the Overseers board who he thought were too generous to the poor.

crowding out. A positive coefficient on Government spending $\beta > 0$ signals that an increase in government spending is increasing charity endowments.

5.4 Donations to the Charity Specification

The theory behind the crowding out of donations has been well documented and will not be repeated here. For an overview of basic results of the literature refer to Andreoni (2006). The estimating equation is similar for donations and expenditures.

$$CD_{icnt} = \alpha + \beta GS_{cnt} + \theta X_{cnt} + \zeta End_{icn,t-1} + \delta W_{cnt} + \gamma Z_{nt} + \eta_{icn} + \mu_t + \varepsilon_{icnt}$$

where CD is the total per capita donations to the charity i , in city c , which is located in county n , in the year t ; GS is the total per capita net ordinary spending of all government agencies on poverty relief in the city; X is the sum of all other charity spending in the city; D is the sum of all other charity donations; End is the value of the previous period's total property; W is a set of controls at the city level; Z is a set of controls at the county level; η is a set of fixed effects for each charity; μ is a set of year effects. The variable of interest is the coefficient of Government spending β which estimates final crowding out. A negative coefficient on Government spending $\beta < 0$ signals that an increase in government spending crowds out donations to the charity.

6 Results

The results from the estimation of the impact of government spending on private charity spending appear in Table 7. ⁸The instruments have strength, as the Kleibergan Paap Rank F-statistic is 25, well above the critical value required to reject weak instrument bias at the 10 percent level. The coefficient on the instrument has the expected sign and is statistically significant. Having both a Democratic Senator and Representative in the State Legislature greatly increased per capita poverty relief spending in the towns.

The OLS results suggest a small degree of crowding out. An additional dollar per capita of government spending is associated with a reduction of 4 cents in spending per capita by a private charity. However, there are reasons to believe that there is positive endogeneity bias, which would imply that 4 cents is the lower bound estimate of the relationship.

Comparisons of the IV and OLS results are consistent with my expectation of positive omitted variable bias. The IV coefficient on government spending of -0.16 has a p-value of 0.028. The coefficient implies that spending by the individual charity would fall by 16 cents in response to an additional dollar spent by the government. There was also the possibility that spending by other charities would reduce spending by a specific charity. However, the

⁸The standard errors reported in the table are robust to serial correlation and heteroskedasticity. Conditional serial correlation existed in the data set. I assume that serial correlation only exists within a charity through time rather than between charities for a given year. To correct the problem I use robust Newey-West standard errors. For all 2SLS estimations I use `xtivreg2` command developed by Schaffer (2007) for Stata. Specifically I used the `robust` and `bw` options.

IV results show that the response of an individual charity to an additional dollar of spending by other charities is a very small and statistically insignificant 0.3 cent.⁹

Table 8 shows the impact of government spending on the change in the total property for the charity. The instrument is not weak, and its coefficient in the first stage is statistically significant in the expected direction. The results from the OLS estimation indicate that managers increased their total property (and therefore their endowment) by 1 cent for every dollar spent by the government. The results were statistically significant at the 1 percent level. Since the endowment might react to fund raising changes or other specific city events there exists an omitted variable bias that must be corrected to make government spending exogenous.

The IV estimation lowered the coefficient estimate, such that an additional dollar of government spending decreased the charity's endowment by 8 cents. The coefficient was statistically significant at the 10 percent level with a p-value of 0.087. Government spending, was correlated with decreasing the total assets of the charity. This is not consistent with the predictions made by the poverty gap relief model. One explanation for the overall decrease in spending is that government spending decreases donations by such a degree that charities are forced to reduce their endowment to pay for the revenue shortfall.

To address this issue further, I estimated the impact of government spending on donations to charity, and the results are in Table 9. The OLS results show that an additional dollar of government spending reduced private donations to the charity by 4.2 cents. I use a 2SLS approach to correct for omitted variable bias as fund raising expenditures by the charity were not reported by the Department of Welfare. The sign of the bias is not as apparent in the case of donations to the charity. On one hand, fund raising expenses and government spending could be positively correlated, resulting in an overestimation of the government spending coefficient. This would occur if the number of poor increase resulting in greater effort to both fund raise by the charity and spend by the government. On the other hand, fund raising and government spending could be negatively correlated, resulting in an underestimation of the coefficient. An increase in government spending might signal to the charity that in the future less funds will be needed to care for the poor. This would reduce fund raising expenditures in the current period.

The instruments again are strong with statistically significant coefficients. The IV estimate is less negative than the OLS estimate, suggesting a negative endogeneity bias. The coefficient for government spending for the IV estimate was -0.001. This indicates that donations fell by less than a cent for every dollar spent by the government. However, the results are not statistically significant at the 10% level. A negative bias would indicate that the OLS estimate is the maximum drop in donations to the charity from government spending. This would indicate that donations to the charity would fall by less than the 4.2 cents for every dollar spent by the government. This 4.2 cents also would be less than the total reduction in spending of 16 cents.

⁹The coefficient for other charitable spending in the city might also suffer from positive endogeneity bias but I have not been able to develop instruments for that spending. To the extent that this is true, the total effect of government spending in the city might be overstated.

7 Conclusion

Most studies of crowding out focus on donations to charities, but these studies are likely missing a great deal of the crowding out action because they are not looking at the spending and savings activity of private charities. Using a very rich panel data set of private charities and local governments from Massachusetts between 1922 and 1932 I examine the impact of government spending on donations to, spending by, and the changes in total property reported by individual charities devoted to poverty relief. The focus on Massachusetts, which did not allow governments to transfer money to private charities, allows me to get a clean estimate of crowding out of private charitable spending.

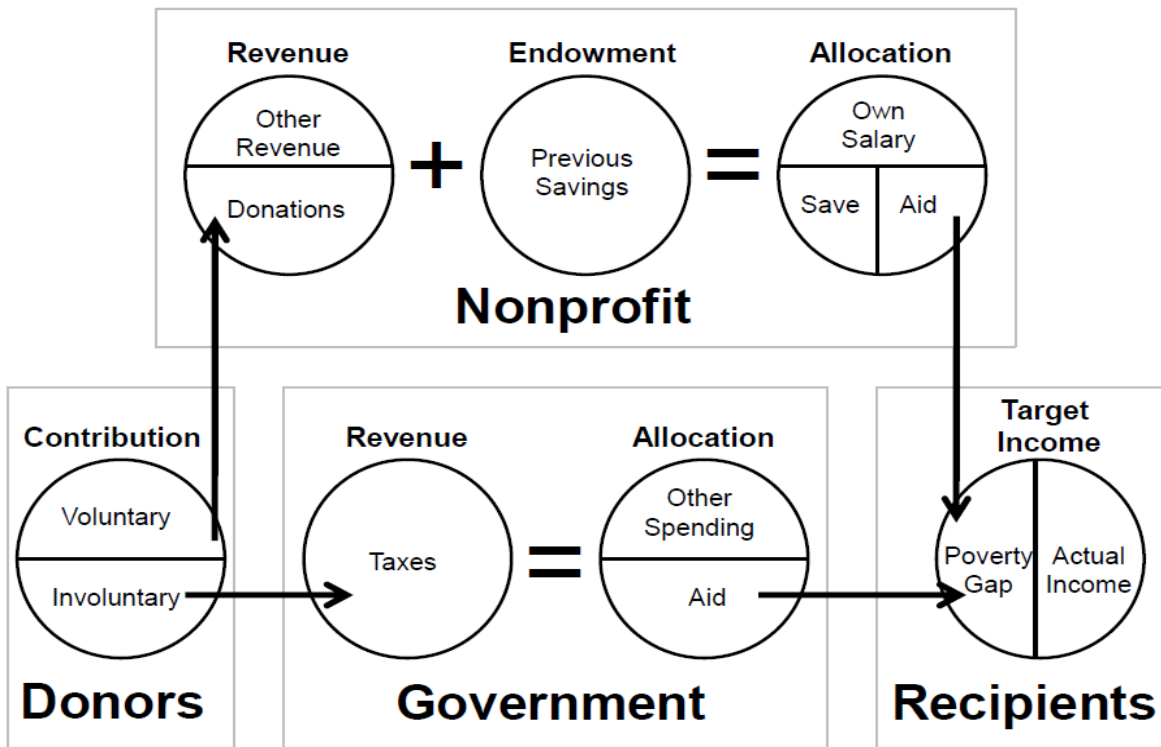
The results of the study show the importance of looking at all three pieces of the puzzle. I find that government had no impact on donations to the charity. This is similar to recent papers finding the effect of the government spending is not having an impact on donors. But the impact on donations is only part of the story. The extra dollar of government spending reduced spending on poverty relief by the charity by 16 cents, and total property fell by 8 cents. This indicates that the governmental sector was having an impact on charity managers who had greater knowledge of the size and scope of governmental work than their donor counterparts.

When policy makers set a target for expansions of government relief programs it should be understood that the private sector will most likely retract. The reasons behind withdrawal are important. If nonprofit managers are the source of crowding out then who to collect taxes from is not as important as the distribution of spending.

More work needs to be done to investigate how charity managers make decisions about spending and saving decisions. Weisbrod and Asch's (2010) call for nonprofit managers to spend down their endowment instead of cutting staff during economic downturns illuminates the peculiar actions taken by nonprofit managers. I give one possible explanation for why managers would exhibit this behavior by constructing a model that predicts spending and saving decisions based on a reaction to a poverty gap. Further expansions of the model must deal with both the dynamic nature of planning for the future as well as a more intensive look at how managers spend funds between aid, overhead, salary, and the quality of the in-kind goods they provide.

Finally, the results of the paper teach us a great deal about how charities and governments interacted before the New Deal. There are very few quantitative studies that can show the size of private charities and public spending prior to the 1930s. The same debates over the appropriate level of public spending and private charity that occurs today raged back then during a period with much less in the way of social insurance and government involvement in the economy. There were extensive public debates about what the target minimum income should be for the poor in society and how aiding the poor influenced their incentives to work. In fact, there were extensive shifts back and forth in the shares of poverty relief controlled by and funded by private charities. In 1930 private income maintenance charities in Massachusetts were spending twice as much as local governments. By 1932, government welfare expenditures had already caught up with private spending even though both sources had increased. The results of the paper show that private spending would have expanded further had there not been an increase in government spending on the poor.

Appendix A
Figure 1.



Appendix B

Table 1: Mean Donations and Spending by Human Service Charity in Massachusetts, 1922-1932

Year	Donations	Other Revenue	Spending	Spending Minus Other Revenue	Unemployment
1922	120,513	230,701	291,818	61117	6.93
1923	98,935	223,628	290,863	67236	4.80
1924	87,375	234,963	301,279	66316	5.80
1925	94,387	239,783	312,187	72404	4.92
1926	111,232	240,125	317,777	77651	4.02
1927	114,229	264,951	324,201	59249	4.57
1928	143,935	292,610	360,631	68021	5.02
1929	116,657	305,347	372,970	67624	4.61
1930	125,181	313,349	393,453	80104	8.94
1931	140,841	338,706	434,976	96269	15.90
1932	169,320	371,803	499,533	127730	23.60

Observations: 418 Human Welfare Charities. Monetary Figures in 2008 Dollars.

Source: Annual Report of the Department of Welfare 1922-1932

Source: Romer (1986) and Coen (1973)

Table 2: Total Revenue Minus Total Expenditures in Massachusetts, 1922-1932

Year	Median	Mean	Std. Dev.	Min	Max	Endowment	Total Property
1922	1,368	59,397	507,291	-699,474	9,025,408	1,636,842	1,927,081
1923	3,020	31,699	175,632	-517,679	1,937,032	1,516,213	1,956,845
1924	2,720	21,059	144,602	-904,965	1,837,944	1,631,127	2,022,626
1925	2,063	21,984	128,627	-508,946	1,081,437	1,602,696	2,088,156
1926	3,752	33,580	155,761	-308,232	1,992,024	1,707,752	2,164,351
1927	3,836	54,980	239,657	-426,596	2,523,026	1,778,400	2,316,038
1928	8,226	75,914	303,556	-405,400	3,118,809	1,899,835	2,498,255
1929	6,265	49,033	191,601	-877,590	1,785,733	1,908,645	2,731,334
1930	3,468	45,077	206,290	-885,102	2,883,795	2,106,921	2,918,469
1931	3,237	44,572	217,631	-418,513	3,127,788	2,386,684	3,254,652
1932	1,561	41,590	213,463	-843,159	2,065,435	2,712,241	3,903,951

Observations: 418 Human Welfare Charities. Monetary Figures in 2008 Dollars

Endowment = Interest Income divided by 0.05

Source: Annual Report of the Department of Welfare 1922-1932

Table 3: City Totals for Spending in Massachusetts, 1922-1932

Year	Private Spending Total for State	Average Private Spending by City	Average Private Spending Per Capita	Public Spending For State	Average Pubic Spending by City	Average Public Spending Per Capita
1922	194,719,648	557,936	10.14	65,160,960	190,529	11.95
1923	197,519,648	565,959	11.34	77,474,808	221,991	16.61
1924	208,613,216	597,746	11.33	75,952,008	217,628	15.67
1925	225,165,264	645,173	11.87	85,621,296	245,333	16.06
1926	225,977,760	647,501	11.40	87,723,240	251,356	17.34
1927	231,610,000	663,639	12.98	97,804,488	280,242	18.97
1928	265,375,616	760,389	13.54	110,923,312	317,832	20.83
1929	270,859,296	776,101	14.26	129,664,112	371,530	23.09
1930	291,505,376	835,259	15.39	135,197,728	387,386	25.11
1931	332,153,664	951,730	21.25	194,152,400	556,311	33.65
1932	390,616,224	1,119,244	26.53	384,248,128	1,100,998	62.22

Observations: All Human Welfare Charities Reporting. Number of Cities: 350. Observations: 3850.

Monetary Figures in Year 2008 Dollars.

Source: Annual Report of the Department of Welfare 1922-1932

Table 4: Summary Statistics at the City Level for Massachusetts 1922-1932

Variable	Mean	Std. Deviation	Min	Max
Total Government Spending	376,807	2,740,212	0	1,290,000,000
Total Government Spending Per Capita	23.79	24.78	0	585
Total Private Spending	738,243	7,720,469	0	2,030,000,000
Total Private Spending Per Capita	14.55	55.76	0	1,355
Population	12,016	46,645	36	795,798
Marriages	85	402	0	8,243
% of Marriages Where 1 or More Partner Classified as a Foreigner	0.24	0.18	0	1
Births	229	1,084	0	19,776
% of Births Where 1 or More Parent Classified as a Foreigner	0.39	0.21	0	1
(1 = Both City Representative and Senator are Democrats)	0.02	0.14	0	1

Groups: 350 Cities. Observations: 3850

Private Spending is by All Human Welfare Charities Within the City.

Monetary Figures in Year 2008 Dollars.

Source: Annual Report of the Massachusetts Department of Welfare 1922-1932

Source: Annual Report of Vital Statistics of Massachusetts 1922-1932

Source: Biennial Report of the Manual for the General Court for Massachusetts

Table 5: Summary Statistics at the County Level in Massachusetts 1922-1932

Variable	Mean	Std. Deviation	Min	Max
County Tax Returns	21,590	24,841	76	109,755
Average Wage of Manufacturing Worker in Nearest City	15,097	2,166	11,180	19,232
Average Output of Manufacturing Worker in Nearest City	69,840	18,660	41,882	110,987

Groups: 13 Counties. Observations: 143

Monetary Figures in Year 2008 Dollars.

Source: Annual Report on the Statistics of Income 1922-1932

Source: Biennial Census of Manufactures 1921-1933

Table 6: Summary Statistics at the Charity Level in Massachusetts 1922-1932

Variable	Mean	Std. Deviation	Min	Max
Charity Total Spending	354,517	1,011,380	0	21,500,000
Charity Total Spending Per Capita	6.13	35.63	0	1,041
Charity Total Donations	120,237	415,525	0	9,321,444
Charity Total Donations Per Capita	2.09	19.77	0	929
Property Reported	2,681,535	5,888,379	0	82,800,000
Change in Property	208,095	716,238	-4,594,267	12,500,000
Earnings from Programs	151,705	756,884	0	19,100,000
Interest Earnings	94,943	224,609	0	3,782,785
Legacies Restricted to Capital Expenditures Only	27,617	145,836	0	3,827,526
Legacies Unrestricted to Capital	31,167	134,784	0	3,126,628
Salary	110,277	285,155	0	4,587,867

Groups: 438 Counties. Observations: 4818

Monetary Figures in Year 2008 Dollars.

Source: Annual Report of the Massachusetts Department of Welfare 1922-1932

Table 7: Charitable Spending for Massachusetts 1922-1932 in 2008 Dollars

	(1)	(2)	(3)
	Pooled OLS	First Equation 2SLS	Second Equation 2SLS
Dependent Variable	Charity Spending Per Capita	Government Spending Per Capita	Charity Spending Per Capita
City Variables of Interest			
Government Spending in Dollars Per Capita	-0.036 (0.011)		-0.16 (0.07)
Sum of All Other Charity Spending in Dollars Per Capita	-0.048 (0.044)	0.43 (0.02)	0.003 (0.04)
City Controls			
Total Marriage (Per 1000 Persons)	0.92 (0.75)	-0.63 (0.29)	0.86 (0.60)
Total Births (Per 1000 Persons)	-0.10 (0.13)	0.09 (0.13)	-0.08 (0.19)
% of Marriages with at Least One Foreigner in the Couple	-10 (15)	8.26 (4.85)	-9 (12)
% of Births with at Least One Foreign Parent	1 (7)	-0.99 (6.41)	1 (16)
Log City Population	-4 (4)	-15 (6)	-5.78 (3.48)
% Voting Democratic in the Last Governor Election	5 (5)	-7.67 (7.24)	4.57 (12.90)
Charity Controls			
Last Property Value (in millions of dollars)	0.073 (0.040)	0.61 (0.17)	0.79 (0.36)
County Controls			
Average Manufacturing Wage Per Worker in the Nearest City	-0.0005 (0.0002)	0.0009 (0.0006)	-0.0003 (0.0004)
Average Output Per Worker in the Nearest City	-0.000009 (0.00003)	-0.0004 (0.00006)	-0.00007 (0.00004)
Number of Tax Returns By County	-0.000006 (0.00001)	-0.0001 (0.00002)	-0.00002 (0.00003)
Instrument			
(1= if City had a Democrat in the State's House of Representatives and Senate)		10.87 (2.21)	
Year Dummies at State Level	Included	Included	Included
Charity Organization Fixed Effects	Included	Included	Included
Number of Groups	438	438	438
Number of Obs	4380	4380	4380
F-Stat	4.49	1017	3.35
Underidentification Test (Kleibergen-Paap LM)		19	
Weak Identification Test (Kleibergen-Paap Wald F statistic)		25	

Robust Standard Errors are reported in parentheses.

Coefficients in bold are statistically significant at $p < 0.05$

Table 8: Total Property (Endowment at the end of the Period) for Massachusetts 1922-1932 in 2008 Dollars

	(1)	(2)	(3)
	Pooled OLS	First Equation 2SLS	Second Equation 2SLS
Dependent Variable	Total Property	Government Spending	Total Property
City Variables of Interest			
Government Spending	0.011 (0.003)		-0.084 (0.048)
Sum of All Other Charity Spending	0.0006 (0.004)	1.12 (0.01)	0.11 (0.05)
City Controls			
Total Marriage (Per Million People)	-3973 (21723)	-20298 (116729)	-1711 (18986)
Total Births (Per Million People)	16320 (12244)	-356934 (58652)	-17516 (19145)
% of Marriages with at Least One Foreigner in the Couple	22149 (262262)	3301629 (1911160)	346584 (346745)
% of Births with at Least One Foreign Parent	-249142 (377749)	1865575 (2438516)	-62837 (345252)
Log City Population	196096 (409406)	1119430 (1865255)	294308 (229828)
Percent Voting Democratic in the Last Governor Election	1096770 (409406)	-30500000 (4747738)	-1727934 (1590120)
County Controls			
Average Manufacturing Wage Per Worker in the Nearest City	89 (57)	-2753 (242)	-163 (143)
Average Output Per Worker in the Nearest City	-14 (6.6)	204 (26)	4 (12)
Number of Tax Returns By County	-5.3 (2.7)	253 (13)	18 (13)
Instrument			
(1= if City had a Democrat in the State's House of Representatives and Senate)		3599687 (647660)	
Year Dummies at State Level	Included	Included	Included
Charity Organization Fixed Effects	Included	Included	Included
Number of Groups	438	438	438
Number of Obs	4380	4380	4380
F-Stat	12.12	1268	25
Underidentification Test (Kleibergen-Paap LM)		27	
Weak Identification Test		39	

Robust Standard Errors are reported in parentheses.

Coefficients in bold are statistically significant at $p < 0.05$

Table 9: Donations to Charities for Massachusetts 1922-1932 in 2008 Dollars

	(1)	(2)	(3)
Dependent Variable	Pooled OLS	First Equation 2SLS	Second Equation 2SLS
	Donations to the Charity Per Capita	Government Spending Per Capita	Donations to the Charity Per Capita
City Variables of Interest			
Government Spending in Dollars Per Capita	-0.042 (0.028)		-0.001 (0.11)
Sum of All Other Charity Spending in Dollars Per Capita	-0.06 (0.05)	0.43 (0.02)	-0.075 (0.05)
City Controls			
Total Marriage Per Capita	1.50 (1.52)	-0.63 (0.28)	1.5 (1.2)
Total Births Per Capita	0.05 (0.09)	0.09 (0.13)	0.04 (0.19)
% of Marriages with at Least One Foreigner in the Couple	2 (5)	8 (5)	1 (12)
% of Births with at Least One Foreign Parent	8 (12)	-0.99 (6)	8.5 (17.5)
Log City Population	0.37 (3)	-15 (6)	0.99 (3.5)
% Voting Democratic in the Last Governor Election	23 (15)	-7.6 (7)	23 (16)
Charity Controls			
Last Property Value (in millions of dollars)	0.04 (0.04)	0.06 (0.02)	0.04 (0.04)
County Controls			
Average Manufacturing Wage Per Worker in the Nearest City in Dollars	-0.0006 (0.002)	0.0009 (0.0005)	-0.0006 (0.001)
Average Output Per Worker in the Nearest City in Dollars	-0.00004 (0.0001)	-0.0004 (0.00006)	-0.00002 (0.0001)
Number of Tax Returns By County	-0.00006 (0.00003)	-0.0001 (0.00002)	-0.00005 (0.00004)
Instrument			
(1= if City had a Democrat in the State's House of Representatives and Senate)		10.87 (2.20)	
Year Dummies at State Level	Included	Included	Included
Charity Organization Fixed Effects	Included	Included	Included
Number of Groups	438	438	438
Number of Obs	4380	4380	4380
F-Stat	0.45	903	0.67
Underidentification Test (Kleibergen-Paap LM)		20	
Weak Identification Test (Kleibergen-Paap Wald F statistic)		26	

Robust Standard Errors are reported in parentheses.

Coefficients in bold are statistically significant at $p < 0.05$

Appendix C

A charity manger that is motivated by the poverty gap follows the maximization problem:

$$\begin{aligned} \max_{e_{it}, x_i} u(e_{it}, x_i + G + X_{-i} - P, x_i) \quad & st(e_{it} + x_i \leq TR_i + e_{i,t-1}) \\ & st(G + X_{-i} - P \leq 0) \\ & st(e_{it} \geq 0, x_i \geq 0) \end{aligned}$$

e_{it} = total endowment at the end of the period for charity i

x_i = total spending on poverty relief by the charity

G = government spending on poverty relief

X_{-1} = contribution of all other charities

P = poverty gap (sum of target income minus actual income for all persons below the poverty line)

TR_i = total revenue

$e_{i,t-1}$ = total endowment at the beginning of the period

The Lagrangian can be written as:

$$\begin{aligned} L = u(e_{it}, x_i + G + X_{-i} - P, x_i) - \lambda_1(e_{it} + x_i - TR_i - e_{i,t-1}) \\ - \lambda_2(G + X_{-i} - P) + \lambda_3 e_{it} + \lambda_4 x_i \end{aligned}$$

Assume an interior solution where only λ_1 is binding. The first order conditions for a maximum after differentiating with respect to e_{it} , x_i , and the Lagrange multiplier, λ_1 , respectively, are:

$$\begin{aligned} e_{it} : u_1 - \lambda_1 &= 0 \\ x_i : u_2 + u_3 - \lambda_1 &= 0 \\ \lambda : TR_i + e_{i,t-1} - e_{it} - x_i &= 0 \end{aligned}$$

Where u_1 is derivative of the first term of the utility function with respect to e_{it} ; u_2 is the derivative of the second term with respect to x_i ; and u_3 is the derivative of the third term with respect to x_i .

Solving the first order conditions yields.

$$u_1 = u_2 + u_3$$

The first order conditions state that at the optimum the marginal utility from an additional dollar spent on the endowment is equal to the marginal utility gain from spent on the poor.

Comparative Statics for TR_i

To solve for the comparative statics for total revenue TR_i , I start with the second order conditions.

$$\begin{bmatrix} u_{11} & u_{12} & -1 \\ u_{21} + u_{31} & u_{22} + u_{32} & -1 \\ -1 & -1 & 0 \end{bmatrix} \begin{bmatrix} \frac{\partial e_{it}^*}{\partial TR_i} \\ \frac{\partial x_i^*}{\partial TR_i} \\ \frac{\partial \lambda_1^*}{\partial TR_i} \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ -1 \end{bmatrix}$$

I then solve for $\frac{\partial e_{it}^*}{\partial TR_i}$ using Cramer's rule.

$$\frac{\partial e_{it}^*}{\partial TR_i} = \frac{\begin{vmatrix} 0 & u_{12} & -1 \\ 0 & u_{22} + u_{32} & -1 \\ -1 & -1 & 0 \end{vmatrix}}{\begin{vmatrix} u_{11} & u_{12} & -1 \\ u_{21} + u_{31} & u_{22} + u_{32} & -1 \\ -1 & -1 & 0 \end{vmatrix}}$$

I assume that the utility function is strictly quasi-concave, then the determinant of the denominator is positive. To determine the sign of the comparative static I solve the determinant of the numerator.

$$u_{12} - u_{22} - u_{32}$$

$u_{12} > 0$. If the marginal utility of additional dollars put into the endowment is increasing as the marginal utility from closing the gap is increasing.

$u_{22} < 0$. If the marginal utility of closing the poverty gap has diminishing marginal utility.

$u_{32} < 0$. If the marginal utility from the warm glow is decreasing with an increase in the marginal utility from closing the gap.

These assumptions lead to the numerator being positive. Therefore, an increase in total revenue TR_i will increase the end of period endowment e_{it}^* .

For the $\frac{\partial x_i^*}{\partial TR_i}$ case the numerator is equal to:

$$u_{21} + u_{31} - u_{11}$$

$u_{21} > 0$. If the marginal utility of closing the gap is increasing as the marginal utility from investment increases.

$u_{31} > 0$. If the marginal utility of investment of the warm glow is increasing as the marginal utility of investment in the charity is increasing.

$u_{11} < 0$. If the marginal utility of investment in the charity has diminishing marginal utility.

These assumptions lead to the numerator being positive. Therefore, an increase in total revenue TR_i will increase the spending on the poor for the year x_i .

The size of the endowment from the previous period $e_{i,t-1}$ enters the constraint in the same way as TR_i

Comparative Statics for G

To solve for the comparative statics for government spending G , I start with the second order conditions.

$$\begin{bmatrix} u_{11} & u_{12} & -1 \\ u_{21} + u_{31} & u_{22} + u_{32} & -1 \\ -1 & -1 & 0 \end{bmatrix} \begin{bmatrix} \frac{\partial e_{it}^*}{\partial G} \\ \frac{\partial x_i^*}{\partial G} \\ \frac{\partial \lambda_1^*}{\partial G} \end{bmatrix} = \begin{bmatrix} -u_{12} \\ -(u_{22} + u_{32}) \\ 0 \end{bmatrix}$$

I then solve for $\frac{\partial e_{it}^*}{\partial G}$ using Cramer's rule.

$$\frac{\partial e_{it}^*}{\partial G} = \frac{\begin{vmatrix} -u_{12} & u_{12} & -1 \\ -(u_{22} + u_{32}) & u_{22} + u_{32} & -1 \\ 0 & -1 & 0 \end{vmatrix}}{\begin{vmatrix} u_{11} & u_{12} & -1 \\ u_{21} + u_{31} & u_{22} + u_{32} & -1 \\ -1 & -1 & 0 \end{vmatrix}}$$

For the $\frac{\partial e_{it}^*}{\partial G}$ case the numerator is equal to:

$$u_{12} - u_{22} - u_{32}$$

But the signs have already been determined previously. With the previous assumptions the numerator is positive. Therefore, an increase in the size of government spending G will increase the end of the period endowment level x_{it}^* .

The numerator for $\frac{\partial e_i^*}{\partial G}$:

$$-u_{12} + u_{22} + u_{32}$$

The values of u_{12} , u_{22} , and u_{32} have already been assigned. With the previous assumptions the numerator is negative. This indicates that increases in government spending G will decrease expenditures on the poor x_i^* .

X_{-i} enters into the objective function in a similar way as G , therefore the comparatives are the same.

P enters into the objective function similar to G , but is negative. The comparative statics are the opposite sign of G .

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