Banking for the Public Good: Access to Credit and the Nonprofit Sector

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ABSTRACT

Does local access to bank finance matter for social institutions providing public goods, such as college education and medical services, to the public? Bank loans is a valuable tool for strengthening nonprofit organizations' financial stability and more importantly it enhances commitment to the mission by funding startup costs for social service programs. In this paper, we investigate the real effect of banking on the economic and social contribution of the nonprofit sector through the lens of relationship banking and market competition theory. We use the number of bank branches and the Herfindahl index of branch-level deposits in the 15-mile radius surrounding each nonprofit organization to measure the availability and competitiveness of local banking markets. We find that access to banking services is positively associated with the amount of social services provided by nonprofit organizations. The density of bank branches reduces obstacles to obtaining finance: the organization's borrowing costs are lower in neighborhoods with more bank branches, and nonprofit performance is linked to a lower cost of borrowing. Quasi-experimental estimates of the impact of local bank closures and mergers on nonprofit output and robust tests using detailed nonprofit hospital data on service quality and charity care expenditures provide further support. One important implication of these results is that bank holding companies that value corporate social responsibility (CSR) need to take into account the effect of branch location on nonprofits' access to credit in their decisions concerning the optimal extent of geographic expansion.

Keywords: access to banking, nonprofit organization, corporate social responsibility
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> Non-profit organizations, just like their for-profit brethren, often find themselves in need of capital to further their missions. Museums, theaters, and other arts organizations undergo capital campaigns in order to preserve and promote culture. Hospitals need funding to expand into larger, state-of-the-art facilities... In some instances, organizations can tap into the resources available through wealthy board members... Non-profits can also approach banks and non-bank lenders.
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> — Forbes Magazine[1]

INTRODUCTION

We examine the real and social impact of local bank finance by documenting a link between the availability and competitiveness of the local banking market and the performance of the nonprofit sector. The nonprofit sector has grown substantially in recent years: the share of the sector in GDP has increased from 4.4% in 1980 to 7.8% in 2017, based on the data from the U.S. Bureau of Economic Analysis.[2] As a comparison, the manufacturing sector and the retail trade sector account for 11.6% and 5.9% of the GDP respectively. The growth rate of employment in this sector was 8.5% during the Great Recession period (2007-2012) and currently, nonprofit businesses employ approximately one in ten workers in the U.S.[3] While a growing number of studies have provided ample evidence of the real effects of banking and credit markets on a broad range of economic and social issues including investment and growth (Cetorelli and Gambera, 2001; Klein et al., 2002), small business finance (Berger and Udell, 2002), productivity (Krishnan et al., 2015), innovation (Amore et al., 2013; Cornaggia et al., 2015), business size (Catorelli, 2004), real estate markets (Peek and Rosengren, 2000), rural poverty (Burgess and Pande, 2005) and community crime (Garmaise and Moskowitz, 2006), their effects on nonprofit organization productivity has not been given thorough attention in the literature.

Access to adequate financing is an important issue for the nonprofit sector. Financial constraints may arise when there are no substantial opportunities for nonprofit organizations to increase revenues. Given the critical role these social institutions play in providing public goods such as medical care, education and advocacy, it is not surprising that alleviating financial constraints is an issue of policy concern. While the focus on a mission to serve their communities makes them different from most businesses and corporations, which operate with

[1] An excerpt from the Forbes magazine article "Three Tips For Non-Profit Organizations Seeking Capital" contributed by Rohit Arora and published on January 5th, 2016.
[2] Recent data are retrieved from the FRED Economic Research at the Federal Reserve Bank of St. Louis: https://fredblog.stlouisfed.org/2017/10/a-30-year-growth-spurt/
[3] Data source: Bureau of Labor Statistics

a goal of making a profit for their owners, nonprofits share many characteristics with businesses—both have revenues, expenses, personnel, and facilities. Like their for-profit counterparts, nonprofit organizations sometimes need cash in the form of a loan to operate their programs effectively. Consider an organization that has an opportunity to open a new site for their social services. They research the location and find that it's a good fit with their services and mission. They develop a budget based on attainable fundraising and fees. The only obstacle is the upfront costs to prepare the facility and buy furniture and equipment. Without access to credit, the management can decline the opportunity because they don't have the necessary startup funds. In reality, it is often the case that they will choose to delay a decision for several months until a grant request for startup costs can be prepared and considered. In this case, it would be unfortunate to miss the opportunity. Alternatively, a local bank can provide a loan with minuscule monthly payments for several years and the nonprofit can start the program right away. Therefore, access to credit has been found to be crucial for this very special sector because the ability to provide socially desirable services more quickly and at a lower cost can protect and improve the welfare of society along with the organization's own interests.

Nonprofit borrowing is a valuable means for strengthening the organization's financial stability and enhances commitment to its nonprofit mission. Taking bank loans by nonprofit organizations is not necessarily a sign of financial distress in the organization. It has become more accepted among nonprofit financial managers. In fact, maintaining cash flow, taking loans, making interest payments, and planning for stable operations are all part of successfully managing this type of social institutions. However, when the deflation of the subprime mortgage bubble caused of the collapse of the financial services sector in 2008, many nonprofits were forced to reduce services, lay off staff, and take other extraordinary measures, clearly demonstrated how critical access to bank financing is, to that can help these organizations grow and succeed (Calabrese, 2013; Friedman, 2011). While prior studies have shown how availability of financing affects for-profit companies, in terms of Entrepreneurship (e.g., Black and Strahan, 2002; Kerr and Nanda, 2009), productivity (e.g., Krishnan et al., 2015), and innovation (e.g., Benfratello, 2008), no comprehensive empirical study has directly analyzed the link between increased access to bank finance and the performance of nonprofit organizations, particularly for those in areas where access to financing is critical. While financial management of nonprofit organizations do not differ from that of for-profit corporations, the existence of financial constraints in these social institutions can potentially constrain the overall level of

organizational activity despite their creditworthiness, resulting in a suboptimal social welfare level (Jegers, 2011). More importantly, even with potential grants, contributions and service program revenues, access to credit enhances the organization's ability to fund startup costs at a lower cost and hence enables it to provide more programs and services.

This study has two purposes. The first is to show how access to bank finance helps increase the output of nonprofit organizations in the form of program expenditures for social assistance. This provides a general measure of the economic link from the relationship banking and market competition in the banking sector to the economic and social contribution of the nonprofit sector. Second, we examine the channel through which access to banking affects nonprofit performance: the lower cost of borrowing. However, the more interesting question is whether it is more likely to find low interest rate loans in areas there are more bank branches residing in the neighborhood (i.e., relationship banking effect)? Or, simply the overall competition of banking markets bring down the interest rate in local areas (i.e., market competition effect).

Little work has been done to date on nonprofit organizations' access to credit and their performance, in part because of the lack of nonprofit financial data comparable to the Compustat database. On the other hand, some confusion in the literature based on the classic public and private distinction (i.e., government vs. for-profit sectors) fails to account for the economic activities and sizeable number of people who are not employed in either government or for-profit sectors. Yet, the nonprofit businesses employs approximately 10% of the U.S. workforce plus the equivalent of several million full-time volunteer workers (Brewer, 2011). Using the nonprofits' Form 990 fillings with the Internal Revenue Service (IRS) and the bank branch location data from the FDIC's Summary of Deposits (SOD), we find a positive relationship between the density of local banking markets, a measure we develop to capture the number of branches in the 15-mile radius surrounding a nonprofit organization, the cost of borrowing, and the organization's efforts to provide socially desirable services. To some extent, this finding is consistent with the evidence in Petersen and Rajan (1994) that bank-firm relationships are associated with greater availability of credit in the small-business-lending market, given that a vast majority of nonprofit organizations are small (De Vita and Fleming, 2001; Lohmann, 2007). We also find the favorable effects of banking market competition, measured by the Herfindahl concentration index based on bank branch-level deposits in the same 15-mile radius, on nonprofit performance. If nonprofit organizations can be considered to

be businesses who are financially underdeveloped, our finding is supportive of Beck et al. (2004) conjecture that bank concentration increases obstacles to obtaining finance in regions with low levels of economic development. However, when we combine these two channels in a two-stage least square (2SLS) analysis, it is the relationship-banking (i.e., the general availability of banking services to nonprofit organizations) that drives our results.

This paper makes two contributions to the literature. First, it expands the relationship lending literature, which primarily focuses on the funding needs of small businesses and has found mixed support for the relationship lending theory, to the nonprofit sector. Relationship lending is shown to alleviate information frictions in the small-business loan market, where borrowers' informational opacity is a well-known problem (Sharpe, 1990; Rajan, 1992; Petersen and Rajan, 2002; von Thadden, 2004; Brevoort and Hannan, 2006; DeYoung et al., 2008). Relationship banking in the nonprofit sector, on the hand, is not viewed as a major concern, in part because of the reliance on public funding sources including charitable donations and government grants. More often than not, nonprofit borrowing is considered a sign of financial trouble and donors feel less comfortable towards increasing leverage (Yan, Denison and Butler, 2009). Nevertheless, there appears to be a group of nonprofit organizations that may benefit from the assistance of a lender willing to invest in the collection of soft information. As a result, with the much needed capital on hand to fund startup costs, these institutions can provide more social services to the community. Second, our work complements studies on the real effects of banking market competition (Berger and Hannan, 1989; Hannan, 1997; Berger et al., 1998; Berger et al., 1999; Berger et al., 2007) by providing evidence of local credit markets having important impacts on local nonprofit borrowing and social activity. In an indirect way, this paper is also broadly consistent with the literature on finance and development that suggests that a large financial sector is critical for fostering growth (King and Levine, 1993; Rajan and Zingales, 1998; Demirguc-Kunt and Maksimovic, 1998; Cetorelli and Gambera, 2001; Guiso et al., 2004).

In addition, the present work can be viewed as an extension of the studies seeking to identify the role played by large enterprises and financial intermediaries in social responsibility activity. For example, Fortanier and Kolk (2007) illustrate various mechanisms through which multinational corporations can affect local social, environmental and economic development. In recent year, the government has been exerting much more significant control to promote social goals such as financing green investments, infrastructure schemes, cooperative firms for

employment generation. During the financial crisis of 2007–2010, governments in the United States, Europe, and elsewhere have invested billions of dollars in financial institutions to prevent them from going bankrupt and from further disrupting the global economy. One response to this massive public bail-outs has been the call for a socially oriented banks that such banks should provide lending to businesses and local governments that are trying to maintain employment and services and expand production (Epstein, 2010). One important implication of this research is that bank holding companies that value corporate social responsibility need to take into account the effect of branch location on nonprofits' access to credit in their decisions concerning the optimal extent of geographic expansion.

The remainder of the paper is organized as follows. Section II introduces the institutional background of banking in the nonprofit sector. Section III presents the sample data and measurement choice. Section IV analyzes the impact of an increase in access to bank finance (availability and competition) on nonprofit borrowing and subsequently, the performance. Section V examines the severity of the endogeneity problem and conducts robustness tests. Section VI provides summary and concluding marks.

II. BACKGROUND AND HYPOTHESES

Nonprofit executives and boards understand that nonprofit borrowing can be valuable means for cash flow and financial stability of their organizations (Bowman 2011). As the example in the introduction showed, taking out a bank loan to fund startup costs before the actual grants and program revenues arrive is a useful financial management tool that can helps their organization grow and succeed. Unfortunately, many managers and trustees of nonprofit organizations believe that borrowing is a sign of dire trouble—proof that the board and management have done something wrong. There is also a concern that foundations and other funders will look askance at nonprofits that "need to borrow" (Yan et al., 2009). Part of the basis for the controversy lies in the fundamental distinction between investor-owned for-profit companies and nonprofit organizations. In this section, we will discuss some of the factors that are potentially relevant to financing behavior.

Institutional Features of Nonprofit Organizations

The U.S. Bureau of Economic Analysis defines nonprofit organizations as tax-exempt institutions, specifically those serving households in the following major categories: religious

and welfare organizations, medical care, education and research, recreation, and personal business associations. What really distinguishes nonprofit organizations from for-profit businesses is the absence of owners: there can be no shareholders and hence they can not raise capital in the equity market. The absence of private owners subjects these social institutions to the nondistribution constraint which is the key to attracting voluntary charitable contributions (Hansmann, 1980). Essentially, capital campaigns and voluntary donations function like public equity issuance and donors are to a large extent the shareholders; however, the nondistribution constraint of nonprofit structure prohibits the distribution of earnings to donors in the form of dividends (Wedig, 1994). As a direct result of not having shareholders and the nondistribution constraint, some nonprofit organizations accumulate endowments, either through gifts, retained earnings or investment income. Unless donors restrict the use of their gifts, the endowment may be used to by the management to finance investment, subsidize operations, or provide precautionary saving (Hansmann, 1990). While these institutions are not regulated by the Securities and Exchange Commission (SEC), the IRS and state attorneys general are substitutes for the SEC in monitoring capital campaigns on behalf of donors in the nonprofit sector (Keating and Frumpkin, 2003). On the other hand, the "owner" (i.e., donors) seeks to maximize social benefits rather than to maximize profits which is the ultimate business objective of for-profit corporations. This is a real difference leading directly to different interpretations of performance metrics. Worse, there is no single performance measure that can be used as a basis for comparison across different types of nonprofits. For example, the output measure of nonprofit hospitals, such as medical service quality and charity care expenditures, is different to that of nonprofit universities, such as graduation rate and research publications. In a study of CEO incentives and operational performance in nonprofit organizations, Newton (2015) uses program expenses and fundraising revenue to capture the performance of all nonprofit types. We follow this approach with slight modifications. Specifically, we will focus on the program expenditures to construct our performance measures and include the donation income net of fundraising expenses as a control variable in the following empirical analysis as net receipts from fundraising activities is also a source of funding (as opposed to borrowing which is the subject of this study).

Without direct access to shareholders, nonprofit organizations often need to turn to debt markets for financing. Because lenders do not pay taxes on interest from tax-exempt debt (most bank loans to nonprofit organizations and municipal bonds issued by government authority on

behalf of nonprofits, Gershberg et al., 2001), they accept a lower interest rate on tax-exempt debt than on equally-risky taxable debt. Low interest rates make tax-exempt financing very desirable and encourages nonprofit borrowing even when there are sufficient internal resources to acquire needed capital. Indeed, by lowering the cost of debt, access to tax-exempt debt financing has accelerated the growth in borrowing by nonprofit organizations in recent years (Calabrese and Ely 2016). It is important to note that not all borrowing by nonprofit organizations is tax-exempt. Borrowing directly from individual investors through bond issuance may be taxable and only 501(c)(3) organizations are eligible to sell tax-exempt securities, provided the proceeds are to be used for their mission (Bowman 2002).

There is a fundamental difference between borrowing (e.g., tax-exempt loans) and equity financing (e.g., endowments in nonprofit organizations) is that lenders are not bound by the non-distribution constraint. In other words, banks expect to be repaid for their loans to nonprofit borrowers. Thus, the only nonprofit organizations that can borrow are those that expect sufficient future cash flows from grants, donor contributions or program service revenues to repay the loan. Finally, there is a difference between the bankruptcy codes. When an investor-owned company is in financial distress, federal law entitles creditors to petition the court to order asset restructuring and liquidation; therefore, creditors have a strong incentive to take preemptive action before a debtor firm's equity turns negative. However, creditors of a financially distressed nonprofit organization do not have this means. Rather, only nonprofit borrowers can initiate action themselves to seek protection from creditors or to liquidate (Calabrese, 2011). In this case, individual collection actions of creditors are not cost-effective for debt recovery and may be unable to recover the full amount owed on a large debt if delayed too long (Bowman 1999).

Access to Bank Credit by Nonprofit Organizations

The claim that bank branch presence in the neighborhood may make credit more accessible to nonprofit organizations builds on the relationship lending literature (e.g., Sharpe, 1990; von Thadden, 2004; Rajan, 1992; Degryse and Ongena, 2005). Many nonprofit organizations are relatively small and they often operate with modest internal accounting staffs. Some smaller nonprofits maintain cash-basis records during the year and hire a part-time consultant or accountant to convert the books to an accrual basis before filling the Form 990, which serves as the only information disclosure mechanism, with the IRS. The generally small size of these

organizations and financial reporting staffs limit the ability to improve the quality and accessibility of accounting and operational information (Keating and Frumkin, 2003; Froelich, Knoepfle and Pollak, 2000; Krishnan, Yetman and Yetman, 2006). In 1999, the IRS issued regulations requiring nonprofits to make available the last three IRS filings to anyone requesting them in person or by mail. The lack of information about a borrower's credit quality in this sector may lead to credit rationing due to adverse selection (Stiglitz and Weiss, 1981). As a result, credit rating and relationship lending play a critical role in reducing the extent of credit rationing. Credit rating allows banks to assess the riskiness of nonprofit debtors based on incomplete but relatively low-cost information. Relationship lending, on the other hand, relies on soft information about the borrowing organization that is observed through a bank's interactions with the organization through time. The strength of this type of relationship depends on the continuity and diversity of these interactions (Berger and Udell, 1995; Degryse and Van Cayseele, 2000) and banks have the advantage to interact with borrowing institutions through both deposit-taking and lending. Of course, over time, bank can learn about the organization's credit quality. The types of information that relationship lending depends on can be most reliably collected and processed at a local level, which requires a physical presence in the market. Therefore, the distance between the banks and nonprofit organizations is important because proximity lowers the cost of collecting soft information. Evidence in the small business credit market has shown that "local loans" are more likely to be approved and less likely to default (Petersen and Rajan, 2002; Brevoort and Hannan, 2006; DeYoung et al., 2008).

At the same time, maintaining the relationship is a costly process as new entrants and competitors attempt to lure customers away and take some of the market away from incumbent banks. The entry of new competitors encourages incumbents to increase their supplies to more than offset their lost business, and it eventually stimulates competition in the local credit market. This phenomenon is very similar to small business lending (Berger et al., 2001) given that a vast majority of nonprofit organizations are small. The quality of financial information on these small social institutions is generally lower and hence credit ratings based on hard information such as financial accounting statements are likely to be less effective in nonprofit credit markets. In fact, many bonds issued by nonprofit organizations are not rated (Gaver, Harris and Im, 2016). For example, less than two-thirds of municipal conduit bonds for nonprofit hospitals in the U.S. are not rated by any of the three major credit rating agencies (Dong, 2018). This is where soft information on borrowers and communities may play an important role. It then

follows that the closer a branch is to the neighborhood in which a nonprofit resides, the greater should be the likelihood of establishing a relationship with the community. The dependence on soft information suggests that the nonprofit lending market depends on soft information in the same way small business lending does.

Testable Hypotheses

The main hypothesis of the paper is based on the premise that reducing information barriers through relationship lending mitigates adverse selection and enhances credit availability. As a result, access to credit enhances a nonprofit organization's ability to fund startup costs at a lower cost and hence enables it to provide more socially desirable services to the society.

Hypothesis 1 (Banking for the public good). Access to credit, measured by the number of bank branches in the neighborhood of a nonprofit organization, will increase the organization's performance, as measured by the total expenditures on service programs.

A related question is about the underlying mechanism by which access to banking services positively (or negatively) affects the output of nonprofit organizations: what happens to the price of credit in a market with increasing access to bank branches. Earlier studies in the small-business loan market find evidence supporting the predictions of the spatial-price-discrimination models. (Lederer and Hurter, 1986; Degryse and Ongena, 2005; Hauswald and Marquez, 2006; Agarwal and Hauswald, 2010). In these models, as the borrowing business is located farther from the informed lender, the loan rates approach the competitive rate as the ability of the lender to collect proprietary information and outcompete other lenders in the local market disappears. While almost all types of nonprofit borrowers get loans at some price, credit rationing can still be an important characteristic in this special credit market (Stiglitz and Weiss, 1981; Ling and Wachter, 1998). How well these theories grounded in for-profit credit markets applies to the nonprofit borrowing (i.e., tax-exempt credit) is not obvious. Nevertheless, we hypothesize that an increased number of bank branches in the neighborhood lowers interest rates because closeness (lower transportation costs) provides a greater opportunity to form relationships.

Hypothesis 2 (Relationship banking effect): Cost of credit will decline with greater access to

bank branches in the neighborhood of a nonprofit organizations.

Further, while the competitive threat to the monopoly rents of the informed bank generally reduce interest rates, the possible existence of credit rationing by uninformed banks may partially offset the effects. To the extent that the informed bank's monopoly rents are not challenged ex post, we may observe an ambiguous effect (reduction or increase) on interest rates when a nonprofit organization resides in an area with a lower degree of banking market concentration. It is important to note that, in general, loan officers located in the bank's branches enjoy substantial autonomy when granting and pricing business loans, especially of small amounts. Degryse and Ongena (2005) suggest that the lending decision is mainly based on the local officers' own assessment of the credit condition of the borrower, the development of their relationship, and the quality and performance of the business and its management team. Even in banks that require reporting of key statistics and detailed supplemental information to the central office, much local discretion remained. Therefore, the competition largely remains at the branch level (rather than the bank level).

Hypothesis 3 (Market competition effect). Cost of credit will decline (or increase) in neighborhoods with a higher degree of market competition.

III. SAMPLE DATA

We combine nonprofit organization data and bank branch information from two databases and we briefly describe the data sources and variable constructions in this section.

Data on Nonprofit Organizations

The IRS Form 990 fillings include detailed information on the nonprofit's mission, programs, and finances. We obtain the annual Form 990 fillings from the IRS. Tax-exempt organizations in the U.S. with annual gross receipts of $200,000 or more or assets of $500,000 or more must file Form 990 with the IRS in each calendar year. We exclude small institutions that make less than $200,000 in revenue and have less than $500,000 in assets, in which case they file Form 990-EZ, and those making less than $50,000, in which case they file Form 990N. Our final sample contains all Form 990 filings (excluding 990-EZ and Form 990N) for the 2011-2017 fiscal years. The map in Figure 1 plots the total number of nonprofit organizations in each state in Panel A

and in each ZIP code area in Panel B based on our sample. Clearly most of them are located in coastal and Great Lakes regions or, in other words, it is very likely that the states with better economic conditions enable an efficient and sustainable environment for nonprofit organizations. Access to bank finance can be an important part of such environment, and that is precisely the question this paper seeks to address.

[Insert Figure 1 Here]

We create three variables to measure the performance of a nonprofit organization. The first variable, *Total Program Expenses*, is the total program service expenses (Part III Line 4e on Form 990) that have occurred in a fiscal year. Program service expenses are costs related to providing the nonprofit organization's programs or services in accordance with its defined mission. The public generally prefers to see a nonprofit organization with the largest allocation to this category; indeed, it is often the case that program service expenses represent the majority of the overall expense of the organization. Hence, this variable measures the scale of public goods the organization can produce. One caveat is that the level of program expenses varies with the program services revenue, such as grants from government agencies and investment income. For hospitals and universities, program services revenue also include patient service revenues and student tuitions. In other words, a higher level of program expenses simply reflects a larger amount of revenue that the organization receives in the same year. Therefore, we construct a second variable, *Excess Program Revenue*, which is the difference between the sum of total program service revenues and contributions and grants (Part I Line 8 on Form 990) and the total program service expenses (Part I Line 9 on Form 990). This variable measures the "net operating income" to the not-for-profit organization, or the extent to which the organization can maximize its contribution to society. Because these two measures in dollars are heavily skewed to the right, it is more appropriate to use the logarithm of the value than to use its crude value. Even with this scale-adjustment both measures have a major shortcoming: it is also possible that organizations that spend heavily on social programs or incur a great loss are the ones that have a large endowment to begin with. Therefore, the third variable of nonprofit performance measures an organization's capacity in generating revenue from acquiring grants, contributions and program services relative to its endowment size. Unfortunately, not all organizations report the dollar amount of endowment in form 990 fillings, and we have to use the total assets on their balance sheets to proxy for it. More specifically, this variable is calculated using the sum of contributions and grants (Part I Line 8 on Form 990), and program service revenue divided by

total assets (Part I Line 20 on Form 990). This measure is also used by Newton (2015) as a performance measure (Program Expenses to Asset) to study the relationship between CEO compensation, nonprofit governance and organizational performance. In addition, we group nonprofit organizations into 22 different business types based on their main activities recorded in the Exempt Organizations Business Master File Extract (EO BMF) from the IRS. The business type identification and detailed description are reported in Table 1 and they are similar to the Standard Industrial Classification (SIC) code used to classify for-profit businesses.

[Insert Table 1 Here]

Data on Bank Branches

The FDIC's Summary of Deposits (SOD) is an annual survey of branch office deposits for all FDIC-insured institutions, including insured U.S. branches of foreign banks. This database provides information on branch location, the level of deposits, and associated bank names of all bank holding companies. We use this database to construct two measures of access to bank finance. The first variable is the number of bank branches in the 15-mile radius surrounding each nonprofit organization and it reflects the availability of commercial banking services to all institutions residing in the neighborhood (Figure 2). Because the SOD provides the coordinates (Latitude and Longitude) of each bank branch, we only need to geocode the addresses reported by nonprofit organizations on their Form 990 fillings. The distance between a nonprofit organization and a bank branch is the actual geographic distance without correcting for the topography (elevation). In cases where addresses can not be geocoded, for example, postal office box number is reported in the office address line on its Form 990 filing, we use the zip code of the organization and the coordinates of a bank branch to calculate the distance.

[Insert Figure 2 Here]

In addition, for each nonprofit organization, we compute the degree of bank competition using a local bank branch Herfindahl concentration index as the second variable. As we discussed in the previous section, the local competition is at the branch level (rather than the bank level); therefore, we use the deposits of each bank branch in an area to calculate the Herfindahl index as a measure of local market competition. More competitive bank markets are those with lower Herfindahl indices. The local nature of the nonprofit social services dictates that the local bank concentration index is the relevant measure in terms of not only the

availability of credit but also the cost of credit. For any given nonprofit organization *i* in year *t*, we identify all bank branches *j=1..N* residing in the 15 mile radius surrounding the nonprofit organization and their total deposits in each year, $Total\ Deposits_{j,t}$. The competition index of local banking market for this nonprofit organization, $HHI_{i,t}$, is calculated as below:

$$HHI_{i,t} = \sum_{j=1}^{N} \left(\frac{Total\ Deposits_{j,t}}{\sum_{j=1}^{N} Total\ Deposits_{j,t}} \right)^2 \quad (1)$$

In the robustness check section, we will consider local banking market radius of 5, 10 and 20 miles.

The map in Panel A of Figure 3 shows the average number of bank branches residing within the 15-mile radius of a nonprofit organization in each state. The states with a higher level of bank density are in costal regions. Both the state-level and ZIP code level distribution (Panel B) of branch density resembles that of nonprofit organizations shown in Figure 1.

[Insert Figure 3 Here]

Similarly, in Figure 4, we plot the average level of bank concentration index within the 15-mile radius of a nonprofit organization in each state (Panel A). Because HHI measures the opposite of local market competition, namely the degree to which a nonprofit organization can choose a bank branch with easy access and lower cost, the distribution of bank branch concentration at the state level mirrors the location of nonprofit organizations in Figure 1 (Panel A) as well. The map of branch concentration at the ZIP code level (Panel B) is quite blurry because there is great variability in the size of a zip code. For example, the average size of a ZIP code area in Wyoming is 1,430 km whereas the average size of a ZIP code area in New Jersey is 12.8 km Grubesic, 2008). The smaller size and higher density of ZIP code areas in the eastern states make them appear darker on the map.

[Insert Figure 4 Here]

In this study assessing the link between access to banking and nonprofit performance, it is important to include a set of organization-specific variables as control measures to capture possible sources of cross-sectional differences in organizations that may be correlated with our variables of interest. They include: size (the natural logarithm of total assets), liquidity (cash to assets ratio), financial leverage (gross debt ratio), profitability (ROA) and income from other sources (other income to revenue). There is extensive evidence that business size is related to

nonprofit performance. For example, larger institutions are likely to attract more charitable donations, to purchase non-labor inputs for less, and to offer better opportunities for career advancement and therefore can hire more capable employees for a given level of pay (Rose-Ackerman, 1996; Becker and Sloan, 1985). The value of cash in the liquidity ratio is the sum of non-interest bearing cash (Part X Line 1 on Form 990) and savings and temporary cash investments (Part X Line 2 on Form 990). The gross debt ratio is the ratio of total liabilities (Part I Line 21 on Form 990) to total assets and it captures the organization's capital structure. ROA is calculated as the revenue less expenses (Part I Line 19 on Form 990) divided by total assets. Whereas ROA measures financial returns to the organization regardless of capital structure, there is no reason to expect that managers of nonprofit organizations will maximize their profits; rather, ROA serves as an indicator of financial sustainability in the nonprofit sector. Other income to revenue ratio is defined as the income from other sources including investment (Part I Line 10 on Form 990) and other revenue (Part I line 11 on Form 990) divided by total revenue (Part I Line 12 on Form 990). Income from other sources includes dividends, interest income, royalties, net sales of assets and inventory, net rental income, net fundraising income and miscellaneous revenue. A more detailed definition of variables as well as the data sources are given in Table 2.

[Insert Table 2 Here]

All variables used in this research are winsorized at the 0.50% level in both tails of the distribution. Sample descriptive statistics are presented in Table 3. For total assets, the sample mean (median) value is $16,601 ($907) million, indicating that our sample is populated with a few of very large nonprofit organizations with total assets up to $2.4 billion. The mean and median of the liquidity ratio (cash to assets) are 0.40 and 0.26 respectively. The average gross debt ratio is 0.37 and many of them are not profitable with an average ROA of -1.9%. In terms of alternative income sources (other than contributions, grants and social program services), on average, 13% of total revenue come from investment and leasing. In regard to access to banking services, there are 324 bank branches residing in the 15-mile radius surrounding a typical nonprofit organization and the average local bank concentration index (HHI) is 0.083. If we enlarge the radius to 20 miles, there will be more banks (437) and the markets are less concentrated (HHI=0.069). On the other hand, if we shrink the radius to 10 miles, there will be fewer banks (204) and the markets are more highly concentrated (0.108). For the variables of nonprofit performance, the mean (median) of total expenses on social services is $6,002 ($436)

thousand. The total grants, contributions and service revenue that an average nonprofit organization raised in addition to its expenditures on social service is $1,043 thousand and the median is $43 thousand. Its minimum value is negative because some organizations were not able to obtain enough program revenues to cover their costs providing services to the community. Using borrowed capital, especially bank loans at a lower cost, could have enabled them to start the program earlier and potentially attracted more grants, contributions and program revenue.

[Insert Table 3 Here]

The correlation matrix among the major variables is presented in Table 4. The size of nonprofit organizations is significantly related to many variables. For example, larger organizations have a higher level of cash reserves but are less profitable. They also raise more grants, contributions and program revenue and at the same time, spend more on social service programs. More importantly, access to banking services exhibits a significant relationship with nonprofit performance: all three measures (program expenses, excess program revenue and program-related revenue to assets) are positively related to the number of bank branches within the 15-mil radius of nonprofit locations. The degree of concentration in local banking markets (HHI) displays a significant negative relation to nonprofit performance metrics. To account for organization-specific, market-wide, and macroeconomy-wide factors, a multiple regression framework will be employed in the empirical analysis section to further explore these effects.

[Insert Table 4 Here]

IV. EMPIRICAL ANALYSIS

Cross-sectional Regression Analysis

The paper focuses upon assessing the real effects of banking on nonprofit performance and the first test conducts a set of panel OLS regressions that relate the level of social contribution by nonprofit organizations to their access to banking services. The regression model takes the following form:

$$Performance_{i,t} = \alpha + \beta Banking_{i,t} + \lambda X_{i,j,t} + FE(Year) + FE(State) + FE(Industry) + \varepsilon_{i,t} \quad (2)$$

The dependent variable is one of the three performance indicators of organization i in year t: 1) the natural logarithm of total program service expenses, 2) the natural logarithm of excess program service revenue, and 3) program-related revenue to assets. The independent variable

of interest is one of our two measures of access to banking: 1) bank density or the number of bank branches in the 15-mile radius surrounding each nonprofit *i*, and 2) market competition or the Herfindahl concentration index based on bank branch-level deposits in the same 15-mile radius. All regression specifications include year, state and industry fixed-effects and the standard errors are clustered on two dimensions (organization and year). The year fixed-effects capture time-specific shocks common across all organizations (i.e., macroeconomy-wide factors), for example, the changes in economic conditions and interest rates. The state fixed-effects controls for time-invariant differences in the need and demand for nonprofit services due to unexplained factors that differ across states (i.e., market-wide factors), for example, the clustering of nonprofit locations shown in Figure 1. The industry fixed-effects help absorb other service area specific characteristics that may determine the size of program expenditures. For example, universities often provide tuition aid for underprivileged students (or in the form of scholarship) and hospitals are likely to provide medical services free of charges to the uninsured (i.e., charity care).

The estimation results on the association between access to banking and nonprofit performance are reported in Table 5. The coefficients of the number of bank branches are significantly positive at the 1% level, indicating that being close to bank branches helps a nonprofit organization finance its operation. The magnitude of the coefficient estimate in column (1) is 0.000132, suggesting that an increase of one standard deviation in this measure is associated with an increase of 2.7% in program expenses serving the community. The corresponding (negative) effect for local bank concentration index in column (2) is a 1.8%. The economic effects on excess program revenue based on the coefficient estimates in columns (3) and (4) are 2.2% from bank density and -4.14% from market competition. While the economic significance of market competition effect (-2.52%) on the program-related revenue to asset ratio is similar to those of the other two measures, the significance of bank density is much greater (10.8%). These results support our hypothesis that increased access to banking service provides nonprofit managers the finance tools to fund their social programs. Among the control variables, total assets and cash holdings are positively related to program expenses and excess program revenue, suggesting that nonprofit performance increases with organization size, but negatively related to program-related revenue to assets ratio. The negative sign is partly attributable to the ratio's definition that is scaled by organization size. The value on the denominator of the ratio on the LHS is negatively related to the same value on the RHS especially when the value of total

assets is larger than the value on the numerator of the ratio. The coefficient estimates for profitability also have inconsistent signs and we suspect that the inconsistency might have resulted from the substantial variation in nonprofit practices in managing profit-generating activities in this very special tax-exempt sector. It is noteworthy that organizations relying on other income sources for their operation contribute less to society whereas those with a higher level of gross debt ratio contribute more, suggesting an important role of credit constraint in nonprofit operation.

[Insert Table 5 Here]

Bank loans is a valuable means for strengthening nonprofit organizations' financial stability and more importantly, it enhances commitment to the mission by funding social services earlier and successful programs help attract more grants, contributions and program revenue in the future. While in our sample, every organization has some amount of debts outstanding at one time or another during the sample period from 2011 to 2017, the degree to which the effects of access to credit on nonprofit performance between the organizations and periods with and without the need of credit in the coming years. Therefore, in the second set of empirical tests, we examine the relationship between the amount of debts outstanding in the current year and the amount of social service contribution in the next year. The assumption is that organizations without outstanding debts are the ones expecting incoming program revenue and bank finance helps facilitate this process. In Table 5 we split the sample to two subsamples. The subsample used in columns (1), (3) and (5) includes organization-years without debts outstanding and the one in columns (2), (4) and (6) are those with outstanding debts. The coefficient estimates for both measures of access to banking are statistically significant in all specifications using both subsamples. However, the test of differences in coefficients between (1) and (2) and between (5) and (6) are significant, suggesting that the magnitude of effects on future performance (total expenses and program-related revenue to assets ratio) is greater for those without debts in the current year. The test result is reversed in the difference between (3) and (4) meaning there is a larger effects on future expenditures than on future revenue. Organizations with better access to banking are able to contribute more to the society than what they can bring in to support their efforts.

[Insert Table 6 Here]

Two-Stage Least Squares Regression Analysis

To understand the channels through which access to banking services affects nonprofit performance, we will conduct a third empirical test to examine how organizations take advantage of branch density and market competition to lower their borrowing costs. The first channel is "relationship banking": the existence of a lender-borrower relationship lowers the cost of public debt financing (e.g., Datta et al., 1999). The identifying assumption is that the number of bank branches around the nonprofit organizations is an exogenous characteristic of states that can function as an instrumental variable for the cost of borrowing, potentially through relationship banking,. More importantly, local branch density is assumed to be correlated with nonprofit performance through its effect on cost of credit to fund nonprofit operation. We run the following two-stage least squares (2SLS) regression to endogenize the borrowing cost:

First-stage:

$$Cost_{i,t} = \beta_0 + \beta_1 Banking_{i,t} + \beta_2 X_{i,j,t} + FE(Year) + FE(State) + FE(Industry) + e_{i,t} \quad (3)$$

Second-stage

$$Performance_{i,t} = \lambda_0 + \lambda_1 \widehat{Cost}_{i,t} + \lambda_2 X_{i,j,t} + FE(Year) + FE(State) + FE(Industry) + \varepsilon_{i,t} \quad (4)$$

The first-stage models the relationship between local bank density and the cost of borrowing. The second-stage then models how these density-induced borrowing costs affect nonprofit performance. It is very difficult, if not impossible, to find actual loan rates for nonprofit organizations in all sample years, we calculate the effective interest costs using the ratio of interest expenses (Part IX Line 20 on Form 990) and total debts (details in Table 2) to proxy for borrowing costs. On the LHS of the second stage regression, we use the natural logarithm of total program service expenses to measure nonprofit performance.

Column (1) of Table 7 reports the first-stage estimates and the coefficient for the number of bank branches within the 15-mile radius reduces has a negative sign, significant at 1% level, suggesting that a higher density of local banking markets reduces effective interest costs. In the second stage estimates in column (2), the coefficient on the predicted interest costs is negative, significant at 5% level, suggesting that a higher borrowing cost reduces program expenditures. The "double negative signs" indicate that the predicted reduction in interest costs increase the total expenditures on social services.

[Insert Table 7 Here]

The second channel through which access to banking services affects nonprofit performance is simply that the overall banking market competition will bring down interest rates in local areas. The first-stage models the relationship between the concentration of local banking markets using HHI index based on branch-level deposits and the effective interest costs. The second-stage then models how these competition-induced borrowing costs affect nonprofit performance. The first-stage estimates of this 2SLS regression are shown in column (3). The coefficient for HHI in local markets is not statistically significant and not surprisingly, the predicted interest cost is not a significant predictor of program expenses either (column 4). Finally, we include both instrument variables in one 2SLS specification in column (5). Whereas only the density measure is significantly related to the cost of borrowing in the first-stage, the predicted lower cost does benefit nonprofit organization in the second-stage (column 6). We also conduct a test of overidentifying restrictions, regressing the residuals from the 2SLS regression on the instrument, and the endogeneity test of endogenous regressors, a Hausman-type test of comparing IV and OLS estimates. The Sargan–Hansen statistics and Hausman test statistics suggest that the excluded instruments (the number of bank branches and HHI index) are independent of the error term and their exogeneity is supported by the data.

Combining these two findings, we argue that the branch density, a measure of relationship banking in this study, helps lower the cost of borrowing. Of course, it is also possible that if there are more bank branches residing in the neighborhood, nonprofit organizations are more likely to find low interest rate loans; in other words, branch density increases the opportunity for matching nonprofit borrowers with banks offering loans at a lower rate of interest.

An immediate concern arises that the apparent borrowing-cost linkage in banking-driven nonprofit performance is merely an artifact of business expansion following capital investment. It may be that nonprofit organizations use cheap bank loans (or mortgages) to acquire new buildings and equipments, rather than to "advance" the grants and service revenues before they finally arrive. If a better-equipped organization can also attract more grants and revenue, then our finding may simply mirror the capital expansion effect. To explicitly address this issue, we report the 2SLS regression using two measures of capital expenditures as the dependent variable in second stage. The first measure is simply the total fixed assets in columns (1) to (3) of Table 8 and the second measure is the change in fixed assets from the previous year to the current year, and we call it capital investment in columns (4) to (6).

For brevity the coefficients in the first-stage regression are not reported in Table 8. The coefficients on the instrumented interest costs are positive and significant at 1% level in specifications that include the number of bank branches as the instrumental variable (columns 1, 3, 4 and 6). The positive effect of interest costs on the overall fixed asset size and capital investment suggests that nonprofit organizations will expand business regardless of their borrowing costs. This finding indirectly answers our concern. Access to banking services does help fund program services with a lower loan rate.

[Insert Table 8 Here]

V. ROBUSTNESS CHECKS

Before concluding, we must emphasize three empirical challenges in identifying the responses of nonprofit organizations to improved access to bank finance, and subject our results to an extensive battery of robustness tests.

Alternative Performance Measures

The first is the measurement of performance because apparently organizations in different industries (or service areas) use different metrics to quantify the social return on investment. For example, for educational institutions (e.g., nonprofit universities), they are the effectiveness of teaching and the amount of scholarship aid (Forbes, 1998) and for health organizations (e.g., nonprofit hospitals), they the provision of charity care and the quality of medical services (Mann et al., 1997; Chassin et al. 1998). To deal with this potential problem, in the first robustness check, we will focus on a single narrowly defined industry (acute care hospitals) rather than examining a cross-section of industries (service areas) within the nonprofit sector. We link the Form 990 fillings with hospital-level service quality data in the Medicare Hospital Compare database and uncompensated care information in the Cost Reports, both from the Centers for Medicare & Medicaid Services (CMS).

Worksheet S-10 of the Cost Reports provides both the reimbursed and unreimbursed amounts of uncompensated and the amount of bad debt incurred from the provision of charity care in a fiscal year. In most of the charity care cases, hospitals receive reimbursement from Medicare, CHIPS, and state, and local government programs for treating uninsured individuals; therefore, the "actual" financial assistances provided by hospitals are much smaller. To be consistent with the definition of uncompensated care by the American Hospital Association

(AHA), we use the sum of unreimbursed financial assistance to construct the variable of charity care. In the following regression analysis, we will use the natural logarithm of charity care costs to mitigate the outlier effect. The primary measure of service quality of hospitals is based on the clinical process measures from the Hospital Compare data. Clinical process-of-care measures are commonly used to assess the quality of health care not only for internal quality control purpose but also for external accountability, pay-for-performance, value-based purchasing, and regulatory purposes. In this study, we collect the scores of the following 15 process measures as detailed in Panel A of Table 9 and calculate the percentile for each measure for each hospital in a given year. The aggregate index of hospital service quality is the average percentile of the 15 measures of service process quality in each hospital-year.

[Insert Table 9 Here]

The summary statistics of the hospital subsample is presented in Panel B of Table 9. The sample size of (N=10,386) is much smaller than that of the original sample (N=828,792 in Table 3), suggesting that approximately one out of 80 nonprofit organizations in the U.S. is an acute care hospital. Overall, the mean values of size, profitability and leverage of hospitals are higher than that of the entire sample, and on the other hand, the level of cash and other income are lower than their non-hospital counterparts. It is more interesting to not that nonprofit hospitals are more likely to reside in neighborhoods with fewer number of bank branches (181 vs. 324 in Table 3) and a higher degree of bank concentration (HHI=0.114 vs. 0.083 in Table 3). We repeat the previous analysis using this subsample of nonprofit hospitals and report the coefficient estimates in Table 10. The results of OLS regressions in columns (1) and (2) with the dependent variable being the natural logarithm of charity care costs and service quality score respectively are very similar to the ones in Table 5 except that cash is not a significant factor and bank density does not predict medical service quality. To investigate the channel of borrowing costs that connects banking markets to hospital performance, we conduct a set of 2SLS regressions using bank density and HHI as instrumental variables in columns (3) to (6) of Table 10. Because the first-stage uses the exact same set of predictive variables, we tabulate the estimated coefficients only once in column (3). While a higher degree of access to banking reduces the effective interest costs in the first-stage (column 3), a lower cost of bank loans (instrumented by branch density and competition) is associated with a higher level of charity care costs (column 4) and service quality (column 5). However, it is not related to capital investment in the hospital (column 6), which is consistent to our findings using the entire nonprofit sample (Table 8). The

relationship between hospital borrowing and uncompensated healthcare services is consistent with the findings in Hassan et al. (2000) that tax-exempt debt is positively associated with charity care among California hospitals. The authors further suggest the interest rate may not fully reflect the cost of tax-exempt debt.

[Insert Table 10 Here]

One of the major advantages in this robustness test focusing on nonprofit hospital sub-sector is that we can avoid the problem of attributing observed differences in nonprofit performance to industry (or service sub-sector) differences.

Alternative Radii and Fixed-Effects at the Organization Level

The results based on cross-sectional analysis with state, year and industry fixed-effects do not explicitly capture the responses of individual organizations to the changes in local banking markets over time (i.e., the with-in effects). Additionally, the choice of this 15-mile radius is more or less arbitrary. In this robustness check, we will estimate our model including fixed effects at the organization level and consider local banking market radius of 10, 15 and 20 miles in calculating the number of bank branches. The results are shown in columns (1) to (3) of Table 11 and they are generally consistent with the ones reported in Table 5. The coefficient of bank density within 10-mile radius in column (1) is positive and significant at the 5% level and the coefficient of bank concentration within 10-mile radius is negative and significant at the 1% level. As we expand the geographical area within which the banking density and concentration are calculated to 15 and 20 miles (in columns 2 and 3 respectively), the significance of the effects of our variables of interest tends to diminish. This diminishing effect is also evidenced in the 2SLS regression in columns (4) to (6): the statistical significance of the instrumented interest costs is reduced from the 1% level in case of the 10-mile radius (column 4) to 5% level in the 15-mile radius (column 5) and 10% in the 20-mile radius (column 6).

[Insert Table 11 Here]

Difference in Difference Test Using Bank Closures and Mergers

The third concern is the identification in the sense that the changes in local banking markets are not exogenous. While a randomized experiment in changing the availability and competition of branches is not feasible in this case, our solution to this endogeneity problem is to use an

exogenous event or a "shock" that caused sharp differential changes in local banking services within a narrow time frame (i.e., quasi-experimental design) to identify the access-to-credit effect on nonprofit performance. The shock is the sharp decline in the number of branches due to bank closures and mergers that has reduced the availability of banking services to local business including nonprofit borrowers. Some of the largest corporate events include the bankruptcy of First National Bank ($3.1 billion total assets at time of failure) in 2013 and Key Bank acquiring First Niagara Financial ($4.1 billion at time of M&A) in 2016. We identify all corporate events including bankruptcies and M&As of bank holding companies and construct a sub-sample of treated group including nonprofit organizations residing in the zip code areas that have experienced these events. In addition, we locate other organizations in the (closest distance) neighboring zip code areas that have no closure or merger events and construct a control sub-sample. The two sub-samples are pooled together for the following difference-in-difference (DID) test. The basic specification of the DID regression to estimate the effect of bank closures and mergers on nonprofit output is given by

$$y_{i,t} = \alpha_0 + \beta_1 Treated_{i,t} + \beta_2 Post_{i,t} + \beta_3 Post_{i,t} \times Treated_{i,t} + \varepsilon_{i,t} \quad (5)$$

where $y_{i,t}$ can be the effective cost of borrowing and the natural logarithm of total program expenditures of organization i at year t; $Treated_{i,t}$ is an indicator for residing in a zip code that has bank closures or mergers; and $Post_{i,t}$ is an indicator for the (one) year before or after the closure or merger. We exclude the years 2-year before or after the event reduce the possibility of confounding from the impacts of other macroeconomic shocks on business behavior. The difference-in-differences estimate is given by β_3, which measures the relative change between the output over these two years.

[Insert Table 12 Here]

The coefficient estimates for the first set of DID regressions using the effective borrowing cost as the dependent variable are reported in columns (1) to (3) of Table 12. While the organizations in the treatment group can borrow at a lower cost (significant at the 10% level), the cost increased after a reduction in the number of local bank branches as compared to the ones in the control group. In columns (4) to (6), the dependent variable is the total output measured by the logarithm of total program services, and the level of output decreased for those in the treatment group and after the bank closure or merger events. The signs of the coefficients on other control variables are generally consistent with the ones reported in

previous tables. Overall, the results of this set of DID tests suggest that, when faced with fewer banking options, nonprofit organizations are likely to pay a higher borrowing cost and hence reduce the amount of social services.

Average Distance to Bank Branches and MSA Level Measures

In addition to the measures of bank branch density and competition, the geographical distance between borrowers and lenders and the number of branches in a MSA area are also used in the literature to measure the availability and pricing of bank loans. For example, using detailed contract-level data of commercial loans to small businesses by a large Belgian bank, Degryse and Ongena (2005) study the spatial price discrimination in bank lending. For our study, however, loan-level information on nonprofit borrowing are generally not available. We tried to link the borrower names in the DealScan dataset with the names of nonprofit organizations in Form 990 filings, and there are fewer than 800 closely matched pairs during a 7-year period. Nonetheless, we calculate the average distance (in miles) from a nonprofit organization to all bank branches residing within a 15-mile radius (Figure 5).

[Insert Figure 5 Here]

The mean (median) distance from a nonprofit organization to all bank branches residing in a 15-mile radius is 7.5 (7.9) miles with a standard deviation of 2.2 miles, and the average (median) number of branches in a MSA area is 1,114 (568). We plot the average distance to bank branches within the 15-mile radius of a nonprofit organization in Figure 6 (state-level in Panel A and ZIP-level in Panel B). It is interesting, yet not surprising, to note the similarity between the distribution of borrower-lender distance and that of nonprofit organizations shown in Table 1. To determine the actual statistical significance, we re-run the OLS and 2SLS models, employing the average distance in miles (rather than the number and HHI of local branches) on the RHS, and report the results in Table 13. The distance variable has a significant and negative coefficient in the panel specifications with organization and year fixed-effects in column (1). The negative coefficient suggests that nonprofit output can be expected to decline with increasing distance to bank branches. In the first-stage of the 2SLS specifications with organization and year fixed-effects, the effective interest costs increase with the distance between the borrowing institution and the lending bank (columns 2), however, at a low level of significance (10%). High borrowing costs, in the second stage, impede the ability of nonprofit organizations to provide and expand services, but again the significance level is only at the 10% level (columns 3).

Similarly, the number of branches in a MSA area has a significantly positive effect on nonprofit output in the panel specifications with organization and year fixed-effects in column (4), and a negative effect on the effective interest costs in the first-stage of the 2SLS specifications with organization and year fixed-effects in columns (6). In turn, a higher cost of borrowing is related to a lower level of output in the second stage, however, only at the 10% significance level. (column 6). While both the average distance to bank branches and bank density in a MSA area are reasonable proxies for relationship lending, it largely ignores the "availability" dimension of access at the very "local" level, which have become the main focus of recent attention (e.g., Bruhn and Love, 2014).

[Insert Table 13 Here]

VI. CONCLUSION

This paper assesses the importance of access to bank finance for nonprofit financing and performance. We obtain two comprehensive datasets of nonprofit organization finance and bank branch location to show that the availability and competitiveness of local banking markets can have a sizable positive effect on social activity in the nonprofit sector. The number of bank branches in the 15-mile radius surrounding a nonprofit organization is positively associated with its contribution to society whereas the Herfindahl index of banking market concentration is negatively related to nonprofit performance. In terms of the channels through which access to banking services affects nonprofit borrowing, we find that the density of branches in their neighborhoods lowers the costs of borrowing, suggesting that relationship banking plays an important role facilitating nonprofits' access to bank credit, whereas the competitiveness of local banking markets does not necessarily bring down borrowing costs. In addition, we show that the borrowing-cost linkage in banking-driven nonprofit performance is not related to nonprofit organizations' business expansion following capital investment. The quasi-experimental evidence based on bank closure and merger-driven variation in local banking markets that is exogenous to nonprofit behavior provides further support. Our results are robust to using a local banking market radius of either 10, 15 or 20 miles and focusing on a single industry of nonprofit hospitals using alternative performance measures.

Overall, these findings indicate that access to bank finance can contribute significantly to social well-being in an indirect way. They shed new light on the channels through with increased access to banking services promote nonprofit performance, allowing the matching of

organizations in need of startup capital for social service programs and banks offering credit at lower rates. The results also suggest that bank holding companies that value corporate social responsibility (CSR) need to take into account the effect of branch location on access to credit by nonprofit organizations in their decisions concerning the optimal extent of geographic expansion.

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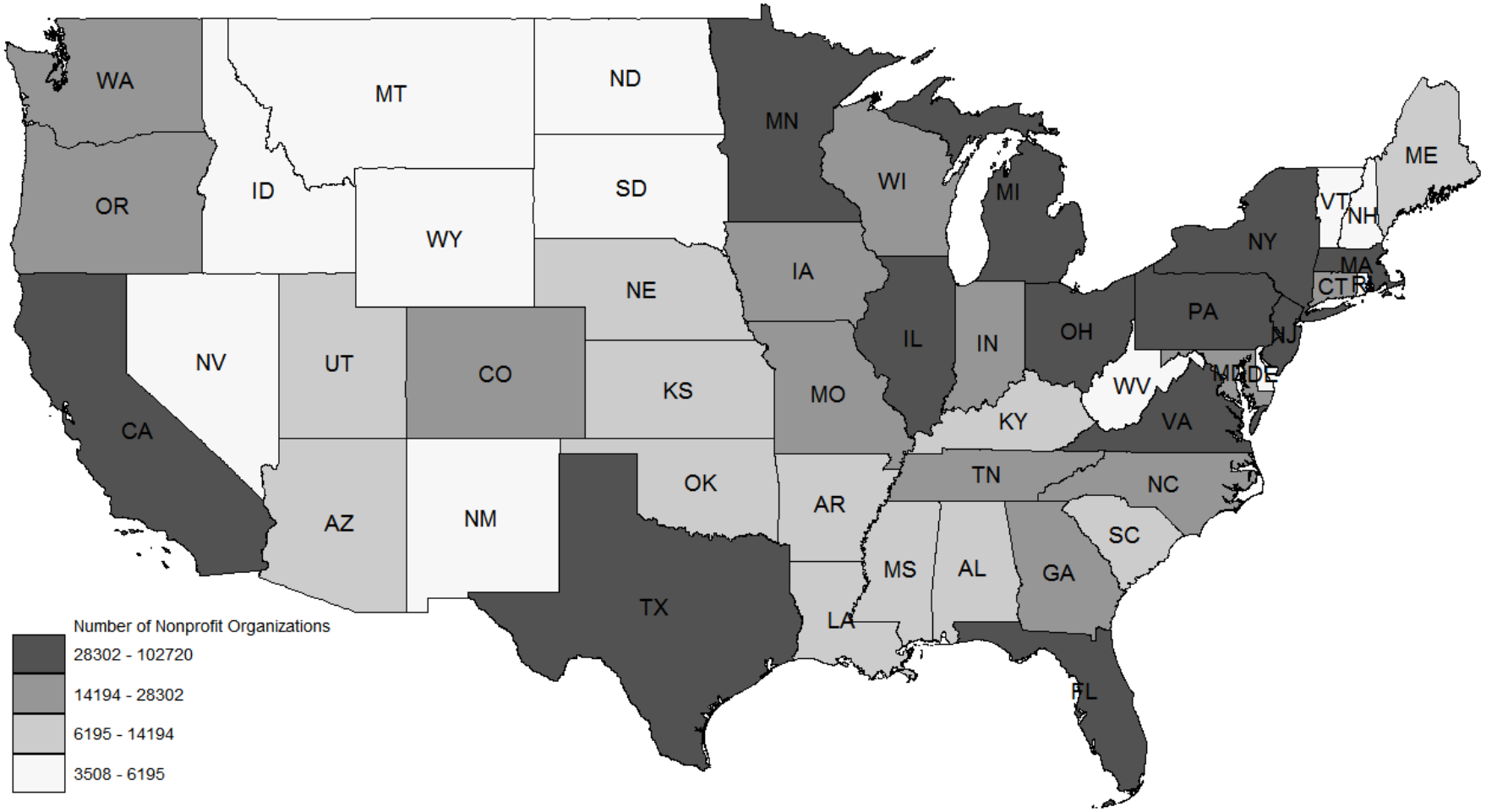
Figure 1. Number of nonprofit organizations by state

Panel A. State level distribution.



Panel B. ZIP code level distribution.

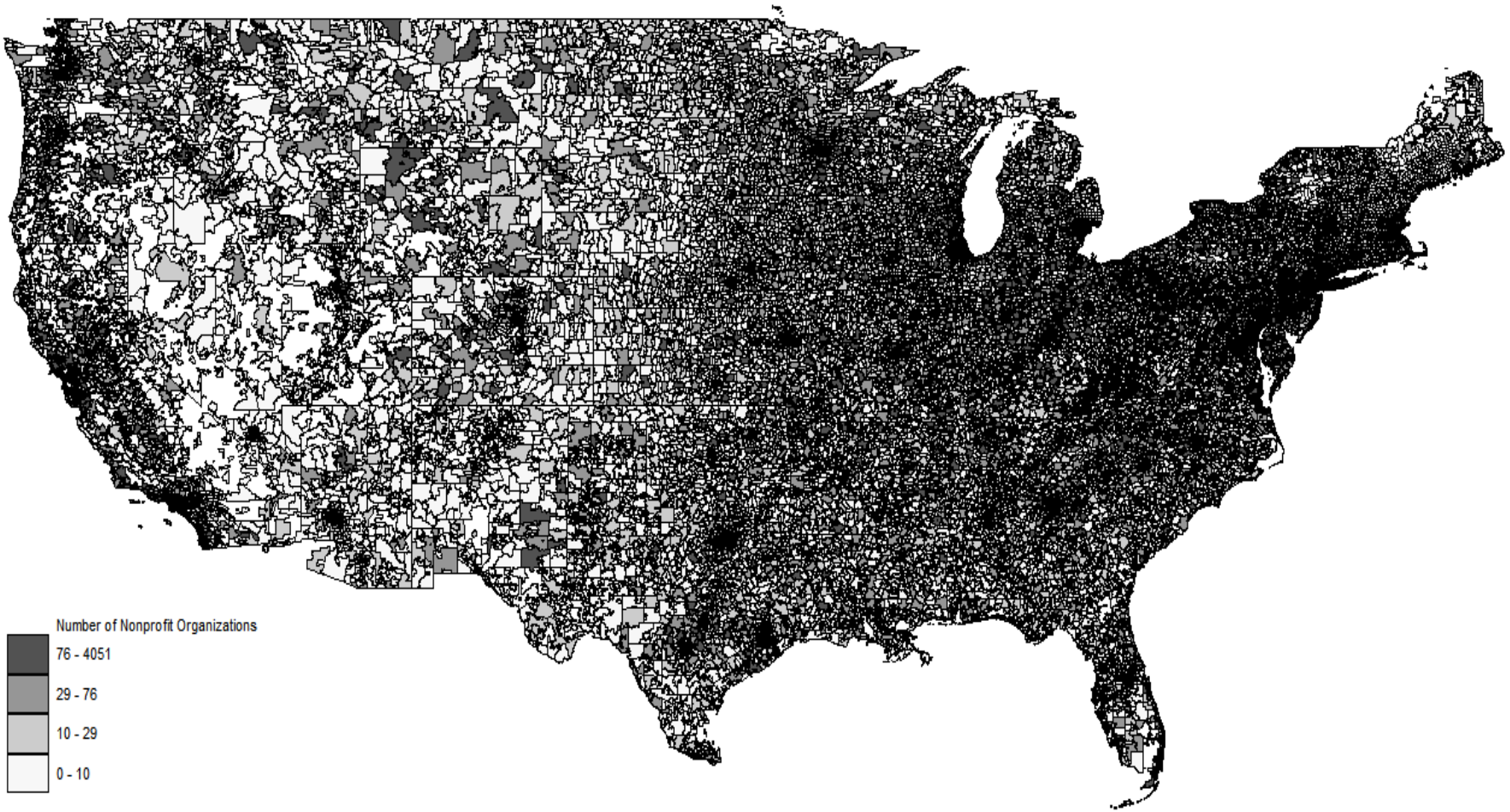


Figure 2. Local banking market radius of 15 miles

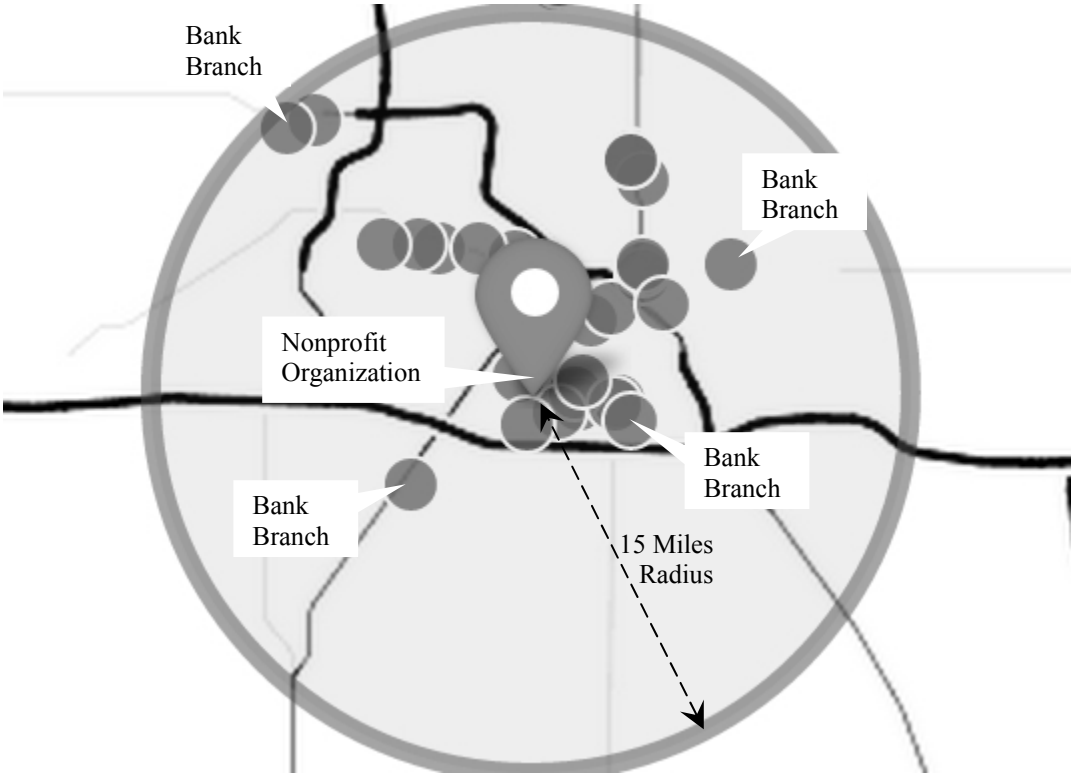
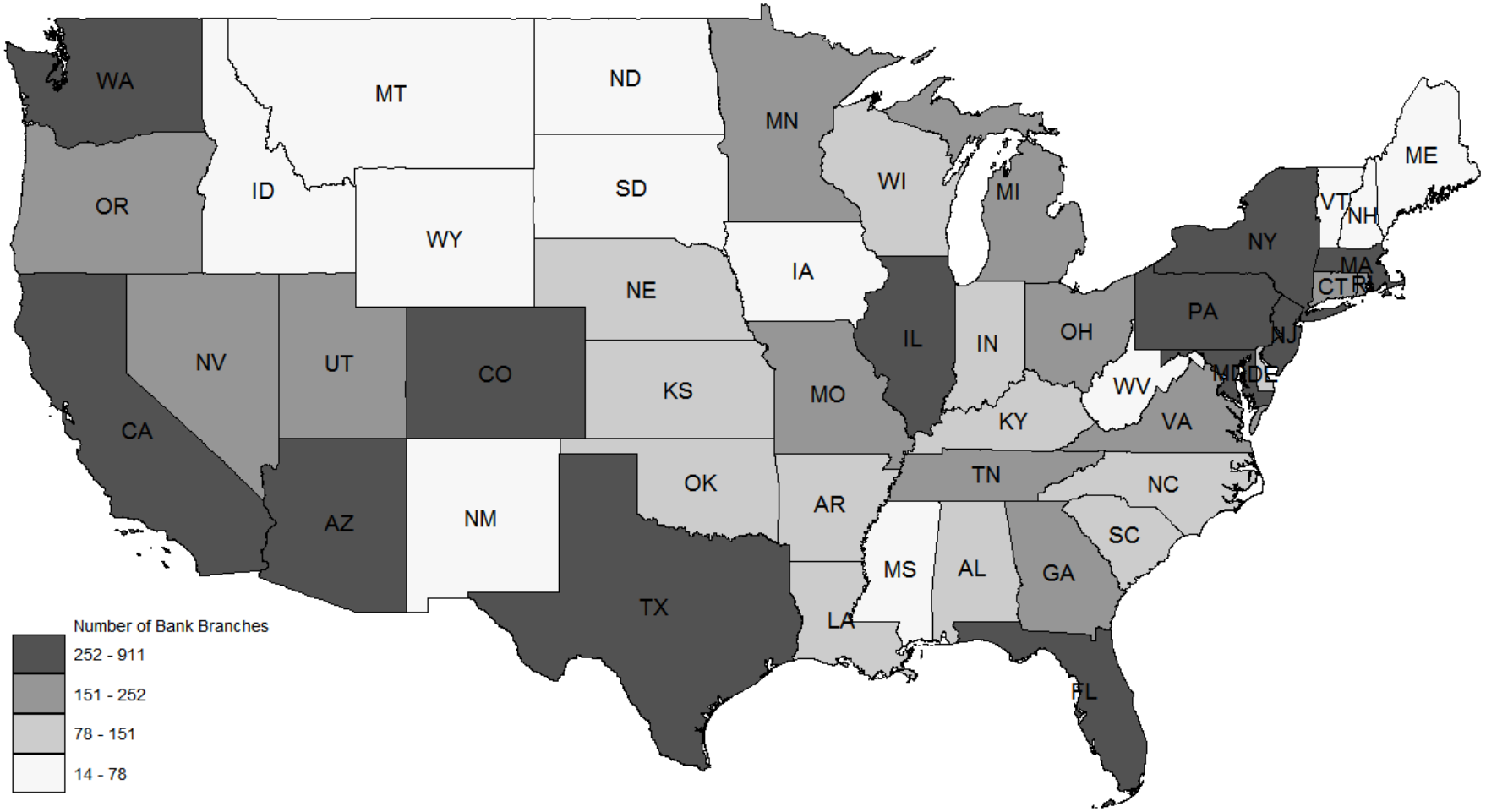


Figure 3. Average number of bank branches within 15-mile radius of nonprofit organizations

Panel A. State level distribution.



Panel B. ZIP code level distribution.

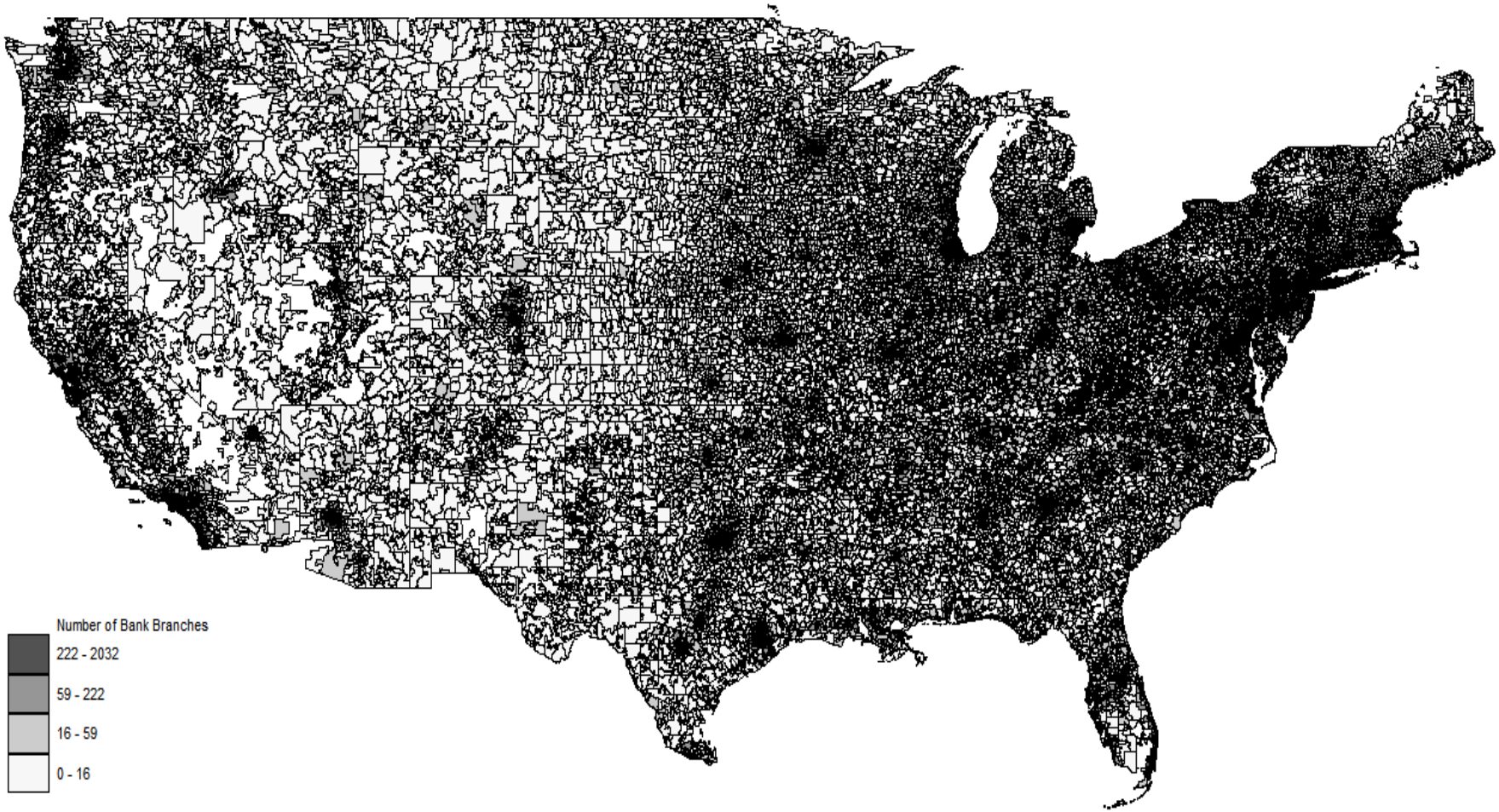
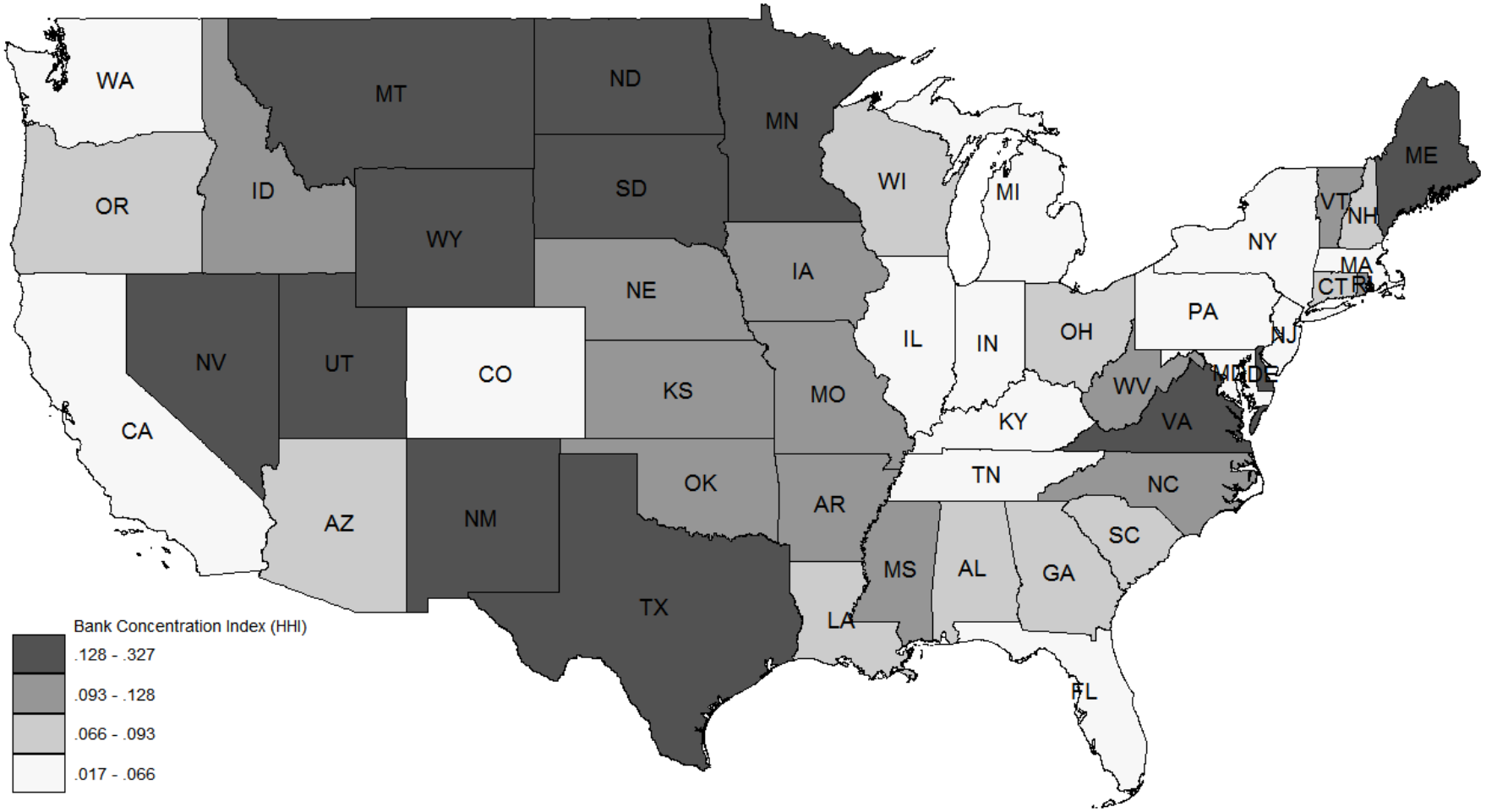


Figure 4. Average bank concentration (HHI) within 15-mile radius of nonprofit organizations

Panel A. State level distribution.



Panel B. ZIP code level distribution.

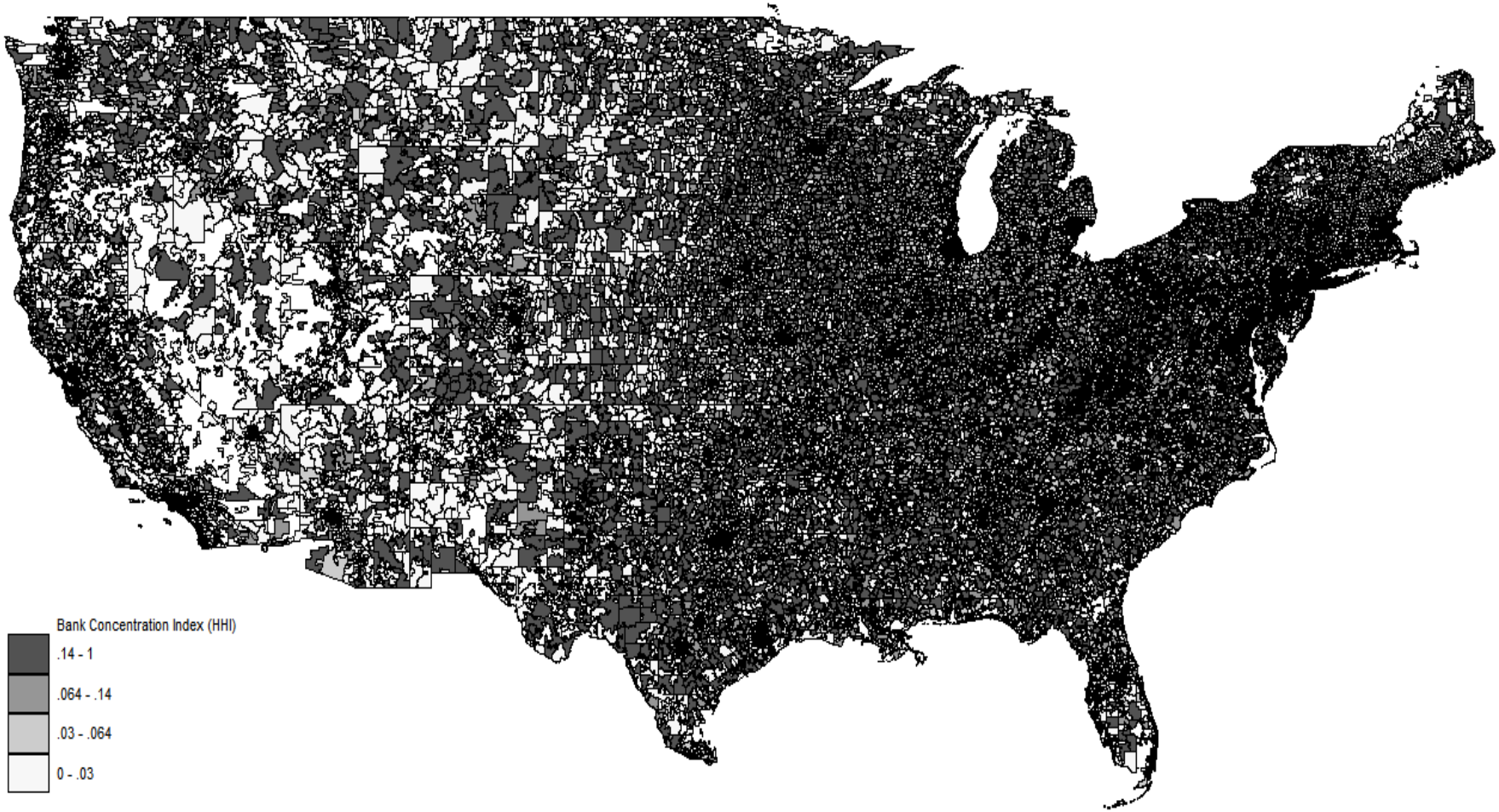


Figure 5. Average distance from a nonprofit organization to banks within a 15-mile radius

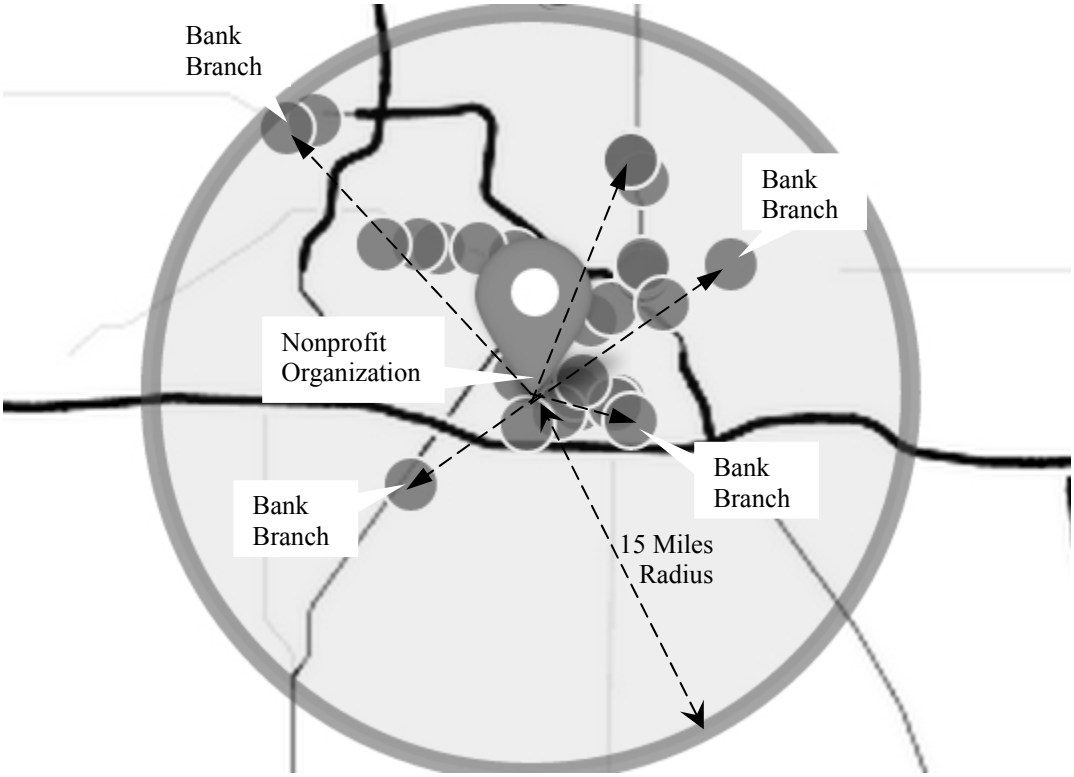
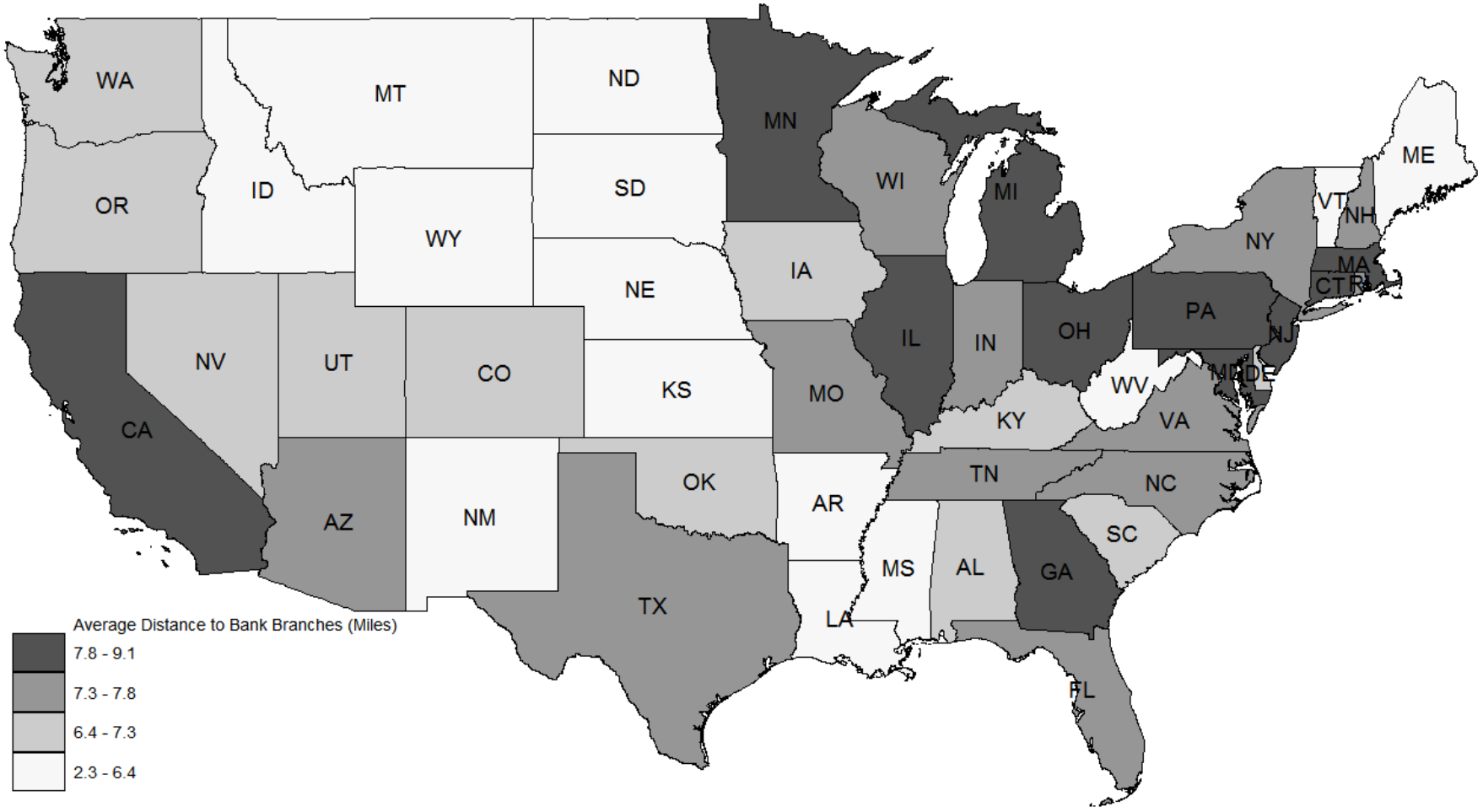


Figure 6. Average distance to bank branches within 15-mile radius of nonprofit organizations

Panel A. State level distribution.



Panel B. ZIP code level distribution.

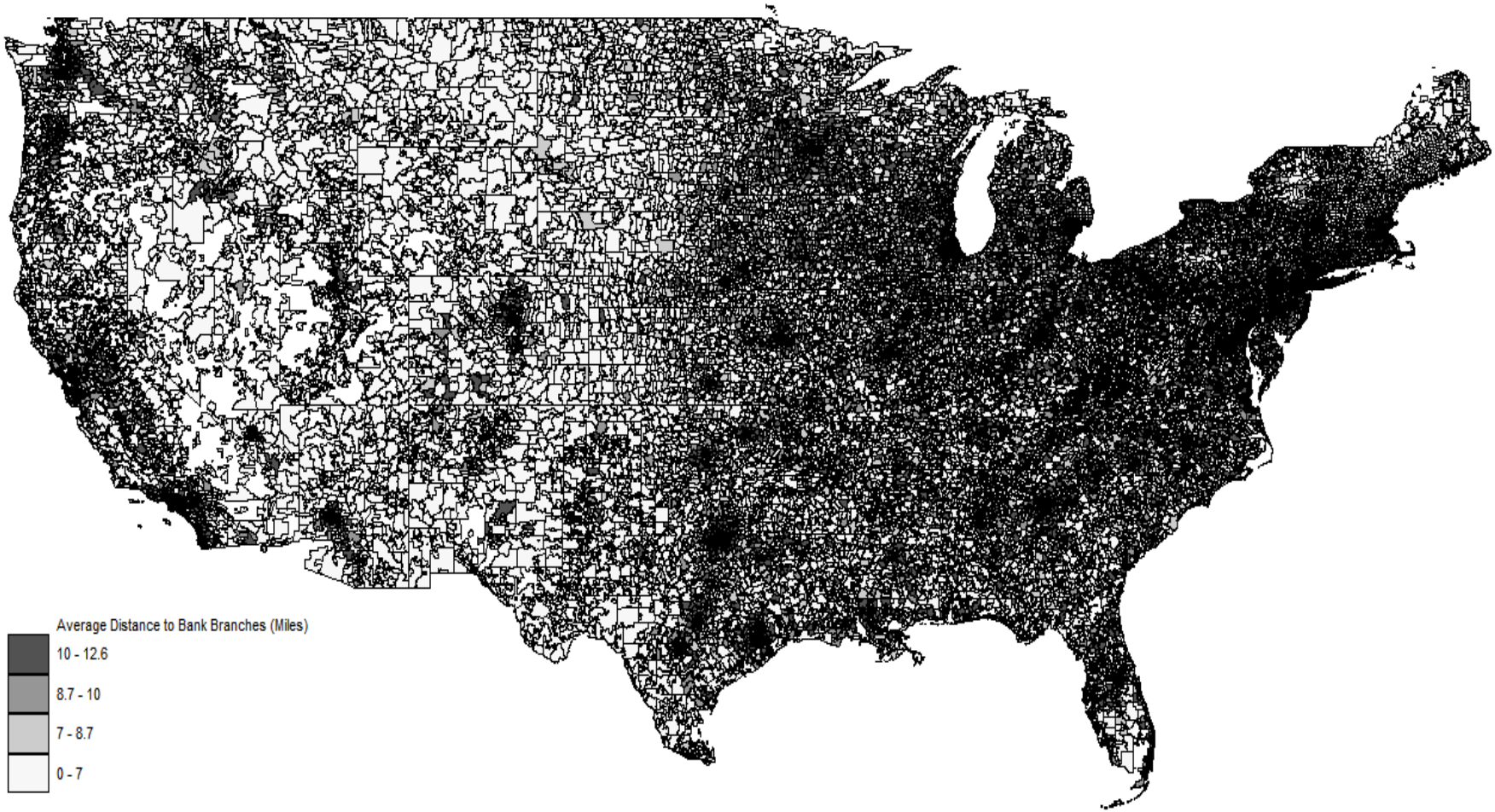


Table 1. Nonprofit Business Type (Industry Classification)

Nonprofit Type ID	Nonprofit Type Details
1	Religious Activities
2	Schools, Colleges and Related Activities
3	Cultural, Historical of Other Educational Activities
4	Other Instructions and Training Activities
5	Health Services and Related Activities
6	Scientific Research Activities
7	Business and Professional Organizations
8	Farming and Related Activities
9	Mutual Organizations
10	Employee of Membership Benefit Organizations
11	Sports, Athletic Recreational and Social Activities
12	Youth Activities
13	Conservation, Environmental and Beautification Activities
14	Housing Activities
15	Inner City or Community Activities
16	Civil Rights Activities
17	Litigation and Legal Aid Activities
18	Legislative and Political Activities
19	Advocacy Attempt to influence public opinion
20	Other Activities Directed to Individuals
21	Activities Purposes and Activities
22	Other Purposes and Activities

Table 2. Variable definitions

Variable	Definition	Data Sources
Log(Total Assets)	The natural logarithm of total assets	Part I Line 20 on Form 990
Cash to Assets	The sum of non-interest bearing cash and savings and temporary cash investments divided by total assets	Part X Line 1 and Line 2 and Part I Line 20 on Form 990
Gross Debt Ratio	Total liabilities divided by total assets	Part I Line 21 and Line 20 on Form 990
ROA	Revenue less expenses divided by total assets	Part I Line 19 and Line 20 on Form 990
Other Income to Revenue	The sum of investment income and other revenue divided by total revenue	Part I Line 10, Line 11 and Line 12 on Form 990
Log(Total Program Expenses)	The natural logarithm of total program service expenses	Part III Line 4e on Form 990
Log(Excess Program Revenue)	The difference between the sum of contributions and grants and total program service revenue and the total program service expenses	Part III Line 8, Line 9 and Part I Line 4e on Form 990
Program-related Revenue to Assets	The sum of contributions and grants, program service revenue and investment income divided by total assets.	Part I Line 8, Line 9, Line 10 and Line 20 on Form 990
Number of Bank Branches	The number of bank branches in the 15 mile radius surrounding each nonprofit organization	The coordinates (Latitude and Longitude) of each bank branch in the FDIC's Summary of Deposits
HHI	Bank branch Herfindahl concentration index in the 15 mile radius surrounding each nonprofit organization: $\sum_{j=1}^{N}\left(\frac{Total\ Deposits_{j,t}}{\sum_{j=1}^{N} Total\ Deposits_{j,t}}\right)^2$	The coordinates and total deposits of each bank branch in the FDIC's Summary of Deposits
Effective Interest Costs	Total interest expenses divided by the total amount of debts including loans, mortgages, municipal bonds	Part IX Line 20 and Part X Line 20, Line 23 and Line 24 on Form 990
Log(Fixed Assets)	The natural logarithm of fixed assets including land, buildings and equipment in	Part X Line 10c on Form 990
Log(Capital Investment)	The net change in fixed assets over a year $Fixed\ Assets_{i,t} - Fixed\ Assets_{i,t-1}$	Part X Line 10c on Form 990

Table 3. Summary statistics

Variable	N	Mean	Median	Std. Dev.	Minimum	Maximum
Total Assets ($ thousand)	828,792	16,601	907	113,418	1.51	2,397,865
Log(Total Assets)	828,792	13.8	13.7	2.23	5.15	21.6
Cash to Assets	828,792	0.396	0.26	0.362	0	1
Gross Debt Ratio	828,792	0.368	0.097	0.872	0	9.03
ROA	828,792	-0.019	0.018	0.604	-5.75	1.23
Other Income to Revenue	828,792	0.131	0.018	0.247	0	1
Total Program Expenses ($ thousand)	828,792	6,002	436	27,316	0	289,621
Log(Total Program Expenses)	828,792	12.8	13.0	3.04	0	19.5
Excess Program Revenue ($ thousand)	828,792	1043	67.4	5,304	-5,972	56,748
Log(Excess Program Revenue)	828,792	5.72	11.1	10.5	-15.6	17.9
Program-related Revenue to Assets	828,792	2.56	0.782	7.80	0	83.7
Number of Bank Branches (15-mile radius)	828,792	324	200	395	2	1869
HHI (15-mile radius)	828,792	0.083	0.051	0.097	0.004	0.638
Number of Bank Branches (5-mile radius)	828,792	86	49	132	1	803
HHI (5-mile radius)	828,792	0.158	0.089	0.186	0.009	1
Number of Bank Branches (10-mile radius)	828,792	204	125	273	2	1,429
HHI (10-mile radius)	828,792	0.108	0.061	0.125	0.005	0.837
Number of Bank Branches (20-mile radius)	828,792	437	246	510	3	2,291
HHI (20-mile radius)	828,792	0.069	0.041	0.083	0.003	0.558
Effective Interest Costs	267,202	0.0475	0.0358	0.0859	0.002	0.701
Log(Fixed Assets)	267,202	12.4	12.9	2.95	4.80	19.3
Log(Capital Investment)	267,202	2.29	0.00	8.78	-15.2	16.4

Table 4. Correlation matrix

The Pearson's correlation coefficients are shown in the lower triangle, and the Spearman's rank correlations are shown above the diagonal.

	Log(Total Assets)	Cash to Assets	Gross Debt Ratio	ROA	Other Income to Revenue	Log(Total Program Expenses)	Log(Excess Program Revenue)	Program-related Revenue to Assets	Number of Bank Branches	HHI
Log(Total Assets)		-0.578	0.258	-0.014	0.262	0.626	0.364	-0.484	0.034	0.342
Cash to Assets	-0.574		-0.295	0.167	-0.212	-0.245	-0.039	0.451	0.059	-0.056
Gross Debt Ratio	-0.120	-0.008		-0.149	-0.189	0.446	0.235	0.182	0.061	0.004
ROA	0.156	-0.044	-0.391		-0.046	-0.060	0.406	0.098	-0.001	-0.008
Other Income to Revenue	0.057	-0.099	-0.041	-0.002		-0.093	-0.243	-0.554	-0.085	0.028
Log(Total Program Expenses)	0.465	-0.213	0.016	-0.004	-0.251		0.428	0.228	0.102	-0.008
Log(Excess Program Revenue)	0.126	0.032	-0.035	0.151	-0.441	0.101		0.271	0.067	-0.010
Program-related Revenue to Assets	-0.274	0.125	0.335	-0.384	-0.061	-0.011	0.001		0.086	-0.056
Number of Bank Branches	0.028	0.061	0.039	-0.021	-0.035	0.042	0.029	0.027		-0.308
HHI	0.009	-0.037	-0.013	0.008	0.007	-0.012	-0.011	-0.014	-0.179	

Table 5. Regression of nonprofit performance and access to banking

The dependent variable is the natural logarithm of total program service expenses in columns (1) and (2), the natural logarithm of excess program service revenue in columns (3) and (4), and the program-related revenue to total assets ratio in columns (5) and (6). The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA) and other income to revenue ratio. The number of bank branches residing in the 15-mile radius surrounding the nonprofit organization is included in specifications (1), (3) and (5) to measure access to bank finance and the Herfindahl concentration index is included in specifications (2), (4) and (6) to measure local market competition for banking services within the 15-mile radius. All specifications use OLS regressions with state, year and industry fixed-effects with standard errors clustered on two dimensions (both year and organization). t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable:	Log(Total Program Expenses)		Log(Excess Program Revenue)		Program-related Revenue to Assets	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Total Assets)	0.696***	0.698***	0.832***	0.833***	-2.135***	-2.114***
	(35.20)	(34.72)	(60.52)	(58.57)	(-46.93)	(-46.45)
Cash to Assets	0.629***	0.637***	2.992***	2.993***	-0.858***	-0.752***
	(20.69)	(19.93)	(38.10)	(38.16)	(-7.30)	(-6.44)
Gross Debt Ratio	0.0487***	0.0492***	0.0903***	0.0906***	1.732***	1.737***
	(21.94)	(21.39)	(11.65)	(11.72)	(18.62)	(18.68)
ROA	-0.135***	-0.135***	0.946***	0.946***	-4.065***	-4.069***
	(-56.44)	(-56.62)	(66.99)	(66.82)	(-33.24)	(-33.28)
Other Income to Revenue	-3.073***	-3.077***	-17.43***	-17.44***	-3.526***	-3.573***
	(-71.11)	(-71.31)	(-82.08)	(-82.07)	(-44.15)	(-44.07)
Number of Bank Branches	0.000132***		0.000110**		0.00138***	
	(5.00)		(2.07)		(14.11)	
Herfindahl Competition Index		-0.357***		-0.830***		-1.266***
		(-6.38)		(-4.08)		(-4.71)
Constant	3.449***	3.463***	-5.055***	-4.994***	32.75***	32.67***
	(10.57)	(10.57)	(-18.02)	(-17.60)	(43.38)	(43.34)
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Year	Yes	Yes	Yes	Yes	Yes	Yes
N	828,792	828,792	828,792	828,792	828,792	828,792
F-statistic	4381.94***	4373.91***	1350.20***	1350.07***	138.18***	138.07***
Adj. R-squared	0.363	0.363	0.247	0.247	0.232	0.232

Table 6. Outstanding debt and future nonprofit performance

The dependent variable measures nonprofit performance in the next period (year): the natural logarithm of total program service expenses in columns (1) and (2), the natural logarithm of excess program service revenue in columns (3) and (4), and the program-related revenue to total assets ratio in columns (5) and (6). The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA), other income to revenue ratio, the number of bank branches residing in the 15-mile radius and the Herfindahl concentration index in the 15-mile radius. Organizations in years without outstanding debts are included in columns (1), (3) and (5) and those without are used in columns (2), (4) and (6). All specifications use OLS regressions with state, year and industry fixed-effects with standard errors clustered on two dimensions (both year and organization). t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable:	Log(Total Program Expenses)		Log(Excess Program Revenue)		Program-related Revenue to Assets	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Total Assets)	0.621***	0.779***	0.714***	0.938***	-3.007***	-0.576***
	(27.11)	(50.47)	(42.06)	(46.78)	(-34.07)	(-24.12)
Cash to Assets	0.509***	1.535***	2.283***	7.801***	-3.399***	4.811***
	(19.40)	(29.45)	(31.04)	(53.35)	(-23.77)	(19.69)
Gross Debt Ratio	0.0479***	0.0450***	0.0712***	0.0562***	1.398***	2.591***
	(14.75)	(16.51)	(6.07)	(5.27)	(8.84)	(20.62)
ROA	-0.135***	-0.0904***	0.965***	0.910***	-4.369***	-2.131***
	(-50.44)	(-17.85)	(73.85)	(25.74)	(-31.95)	(-5.20)
Other Income to Revenue	-2.922***	-3.048***	-17.11***	-17.75***	-3.497***	-2.261***
	(-66.96)	(-25.19)	(-75.34)	(-52.11)	(-29.16)	(-13.90)
Number of Bank Branches	0.000202***	0.0000598**	0.000560***	0.000750***	0.00194***	0.0000059***
	(5.50)	(2.54)	(9.76)	(6.55)	(16.54)	(8.06)
Herfindahl Competition Index	-0.383***	-0.182***	-0.648***	-1.212***	-0.818**	-0.333**
	(-5.90)	(-2.72)	(-2.71)	(-4.26)	(-2.20)	(-2.47)
Constant	4.306***	2.425***	-3.555***	-6.927***	45.42***	8.178***
	(11.93)	(8.63)	(-9.98)	(-14.94)	(33.36)	(19.58)
Has outstanding debts at t-1	No	Yes	No	Yes	No	Yes
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Year	Yes	Yes	Yes	Yes	Yes	Yes
N	561,590	267,202	561,590	267,202	561,590	267,202
F-statistic	1641.69***	2683.42***	1005.47***	419.63***	107.32***	50.80***
Adj. R-squared	0.276	0.468	0.264	0.202	0.215	0.409

Table 7. Instrumental variable (IV) regression using effective interest costs

In the first-stage regression in columns (1), (3) and (5), the dependent variable is the effective interest costs which is the ratio of interest expenses and total debts. The instrument variables (IVs) include the number of bank branches and the Herfindahl concentration index in the 15-mile radius surrounding the nonprofit organization. In the second stage in columns (2), (4) and (6), the dependent variable is the natural logarithm of total program service expenses. The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA), other income to revenue ratio and the effective interest costs instrumented by the IVs. All specifications use OLS regressions with state, year and industry fixed-effects with standard errors clustered on the organization level. t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
Log(Total Program Expenses)	1st-stage	2nd-stage	1st-stage	2nd-stage	1st-stage	2nd-stage
Log(Total Assets)	-0.000564***	0.771***	-0.000665***	0.881***	-0.000565***	0.773***
	(-2.80)	(123.68)	(-3.35)	(4.22)	(-2.81)	(131.35)
Cash to Assets	0.00621***	1.618***	0.00575***	0.668	0.00620***	1.605***
	(4.31)	(31.78)	(4.01)	(0.37)	(4.30)	(33.06)
Gross Debt Ratio	-0.000337***	0.0406***	-0.000374***	0.102	-0.000338***	0.0415***
	(-3.04)	(9.76)	(-3.38)	(0.87)	(-3.04)	(10.39)
ROA	0.000654***	-0.0818***	0.000650***	-0.189	0.000655***	-0.0832***
	(3.10)	(-10.06)	(3.08)	(-0.92)	(3.10)	(-10.58)
Other Income to Revenue	-0.00750***	-3.146***	-0.00731***	-1.941	-0.00750***	-3.130***
	(-6.77)	(-38.99)	(-6.60)	(-0.85)	(-6.78)	(-39.68)
IV: Number of Bank Branches	-0.00000493***				-0.00000500***	
	(-5.51)				(-5.57)	
IV: Herfindahl Competition Index			-0.00131		-0.00272	
			(-0.48)		(-1.01)	
Instrumented: Interest Costs		-13.11**		151.7		-10.90**
		(-2.41)		(0.49)		(-2.13)
Constant	0.0660***	3.272***	0.0671***	-7.770	0.0662***	3.124***
	(15.72)	(8.45)	(16.01)	(-0.37)	(15.75)	(8.55)
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
N	267,202	267,202	267,202	267,202	267,202	267,202
F-statistic (1st-stage)	11.00***		10.38***		10.86***	
Wald Chi-square (2nd-stage)		48061.98***		1700.36***		54002.86***
Adj. R-squared	0.007	0.259	0.007	0.274	0.007	0.317

Table 8. IV regression using interest costs to predict capital investment

In the first-stage regression the effective interest costs is predicted using the instrument variables (IVs) include the number of bank branches and the Herfindahl concentration index in the 15-mile radius surrounding the nonprofit organization. The 1st-stage results are shown in the previous table therefore omitted here. The dependent variable in the second-stage is the natural logarithm of Fixed Assets such as land, buildings and equipment in columns (1) to (3) and the capital investment which is the net change in fixed assets (Fixed $Assets_t$ - Fixed $Assets_{t-1}$) in columns (4) to (6). The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA), other income to revenue ratio and the effective interest costs instrumented by the IVs. All specifications use OLS regressions with state, year and industry fixed-effects with standard errors clustered on the organization level. t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable:	Log(Fixed Assets)			Log(Capital Investment)		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Total Assets)	0.979***	0.848***	0.973***	1.120***	1.981	1.121***
	(44.74)	(9.47)	(50.14)	(18.15)	(0.25)	(17.94)
Cash to Assets	-3.620***	-1.335	-3.521***	3.385***	-10.87	3.346***
	(-13.95)	(-0.87)	(-15.50)	(5.57)	(-0.08)	(5.45)
Gross Debt Ratio	0.0210	-0.0416	0.0182	0.0843**	0.692	0.0858**
	(1.22)	(-0.89)	(1.18)	(2.34)	(0.12)	(2.35)
ROA	-0.0323	0.0560	-0.0285	0.272***	-0.943	0.268***
	(-0.86)	(0.73)	(-0.85)	(3.67)	(-0.08)	(3.59)
Other Income to Revenue	0.186	-1.238	0.124	-13.33***	-3.235	-13.30***
	(1.08)	(-1.30)	(0.82)	(-24.32)	(-0.03)	(-24.06)
Instrumented: Interest Costs	75.01***	-99.79	67.36***	225.4***	1701.5	229.4***
	(4.28)	(-0.86)	(4.43)	(4.63)	(0.12)	(4.68)
Constant	-4.264***	7.482	-3.749***	-21.54***	-106.3	-21.77***
	(-3.43)	(0.96)	(-3.46)	(-7.03)	(-0.14)	(-7.05)
IV: Number of Bank Branches	Yes	No	Yes	Yes	No	Yes
IV: Herfindahl Index	No	Yes	Yes	No	Yes	Yes
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
N	267,202	267,202	267,202	267,202	267,202	267,202
Wald Chi-square (2nd-stage)	6206.88***	3614.78***	7625.32***	2550.01***	71.04***	2490.49***
Adj. R-squared	0.007	0.259	0.007	0.274	0.007	0.317

Table 9. Summary statistics and quality measures of nonprofit hospitals

Panel A. Quality measures of medical service in nonprofit hospitals

Measure	Detailed Description of Quality Measure
OP2/AMI7a	Heart attack patients given drugs to break up blood clots within 30 minutes of arrival
OP4	Heart attack patients given aspirin within 24 hours of arrival
AMI8a	Heart attack patients given PCI within 90 minutes of arrival
HF2	Heart failure patients given an evaluation of Left Ventricular Systolic (LVS) function
OP1	Median time from ED arrival to administration of fibrinolytic therapy in patients
OP3b	Median time to transfer to another facility for acute coronary intervention
OP5	Average number of minutes before outpatients with chest pain or possible heart attack got an ECG
PN6	Pneumonia patients given the most appropriate initial antibiotics
SCIPCARD	Surgery patients who were taking heart drugs called beta blockers before coming to the hospital
SCIPINF1	Surgery patients given an antibiotic within one hour before surgery
SCIPINF2	Surgery patients given the right kind of antibiotic to help prevent infection
SCIPINF3	Surgery patients whose preventive antibiotics were stopped within 24 hours after surgery end time
SCIPINF9	Surgery patients whose urinary catheters were removed on the first or second day after surgery
SCIPVTE2	Surgery patients received thromboembolism prophylaxis within 24 hours before or after surgery
CAC3	Children and their caregivers received a home management plan of care document while hospitalize

Panel B. Summary statistics

Variable	N	Mean	Median	Std. Dev.	Minimum	Maximum
Total Assets ($ thousand)	10,386	393,187	125,643	965,649	634	2,397,865
Log(Total Assets)	10,386	18.61	18.6	1.58	13.3	21.6
Cash to Assets	10,386	0.107	0.069	0.122	0	1
Gross Debt Ratio	10,386	0.531	0.461	0.422	0	5.94
ROA	10,386	0.032	0.038	0.114	-1.45	0.681
Other Income to Revenue	10,386	0.038	0.022	0.08	0	1
Charity Care Costs ($ thousand)	10,386	8,045	3,784	13,084	0	154,311
Log(Charity Care Costs)	10,386	15.1	15.2	1.30	10	18.9
Service Quality Score	10,386	44.3	45.5	16.1	1	96
Number of Bank Branches (15-mile radius)	10,386	181	44	306	2	1,840
HHI (15-mile radius)	10,386	0.114	0.074	0.123	0.003	0.966
Effective Interest Costs	10,386	0.105	0.044	0.224	0.002	0.49
Log(Capital Investment)	10,386	0.324	1.15	14.763	-18.6	19.8

Table 10. Regressions of nonprofit hospitals using alternative performance measures

The unbalanced panel OLS regressions are in columns (1) and (2) with the dependent variable being the logarithm of charity care costs and service quality score respectively. The 2SLS regressions are in columns (3) to (6). In the first-stage in columns (3), the dependent variable is the effective interest costs which is the ratio of interest expenses and total debts. The instrument variables (IVs) include the number of bank branches and the Herfindahl concentration index in the 15-mile radius surrounding the nonprofit organization. In the second stage in columns (4) to (6), the dependent variable is the natural logarithm of charity care costs, service quality score and the natural logarithm of capital investment respectively. The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA), other income to revenue ratio and the effective interest costs instrumented by the IVs. All specifications use state and year fixed-effects with standard errors clustered on the hospital level. t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable:	Log(Charity Care Costs)	Service Quality Score	Effective Interest Cost	Log(Charity Care Costs)	Service Quality Score	Log(Capital Investment)
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	2SLS 1st-stage	2SLS 2nd-stage	2SLS 2nd-stage	2SLS 2nd-stage
Log(Total Assets)	0.542***	2.938***	0.0689	0.601***	4.121***	1.782***
	(34.41)	(10.11)	(1.63)	(35.30)	(10.82)	(8.83)
Cash to Assets	-0.0993	-3.074	-1.117**	0.189	-12.86**	2.340
	(-0.95)	(-1.17)	(-2.35)	(0.83)	(-2.40)	(0.81)
Gross Debt Ratio	0.238***	-0.459	-0.258**	0.446***	-0.621	0.282
	(6.45)	(-0.63)	(-2.33)	(7.98)	(-0.42)	(0.34)
ROA	0.155	8.653***	0.0363	0.287*	15.82***	18.08***
	(1.30)	(3.60)	(0.10)	(1.65)	(4.06)	(6.50)
Other Income to Revenue	0.0886	2.395	-1.170**	-0.469	-14.91*	4.800
	(0.43)	(0.80)	(-1.96)	(-1.09)	(-1.82)	(1.07)
Number of Bank Branches	0.000345***	-0.000259	-0.000426***			
	(5.50)	(-2.24)	(-2.67)			
Herfindahl Competition Index	-0.895***	-10.96***	0.853			
	(-6.43)	(-3.90)	(1.01)			
Instrumented: Interest Costs				-0.162**	-6.298***	1.466
				(-2.15)	(-2.70)	(0.93)
Constant	5.144***	-5.859	-1.139	3.925***	-27.93***	-38.63***
	(12.46)	(-1.06)	(-1.36)	(11.16)	(-3.61)	(-9.11)
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Hospital	Yes	Yes	Yes	Yes	Yes	Yes
N	10,386	10,386	10,386	10,386	10,386	10,386
F-statistic	345.10***	40.65***	1.88***			
Wald Chi-square (2nd-stage)				4311.93***	727.40***	489.89***
Adj. R-squared	0.687	0.201	0.032	0.647	0.093	0.015

Table 11. Alternative radii and fixed-effects regressions

The unbalanced panel OLS regressions are in columns (1) to (3) with the dependent variable the natural logarithm of total program service expenses. The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA) and other income to revenue ratio. The numbers of bank branches residing in the 10-mile, 15-mile and 20-mile radius surrounding the nonprofit organization and the corresponding HHI indices are included in specifications (1), (2) and (3) respectively. The 2SLS regressions are in columns (4) to (6). In the first-stage, the dependent variable is the effective interest costs which is the ratio of interest expenses and total debts. The instrument variables (IVs) include the numbers of bank branches residing in the 10-mile, 15-mile and 20-mile radius surrounding the nonprofit organization and the corresponding HHI indices are included in specifications (4), (5) and (6) respectively. The 1st-stage results are omitted for brevity. In the second stage, the dependent variable is the natural logarithm of charity total program service expenses. The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA), other income to revenue ratio and the effective interest costs instrumented by the IVs. All specifications use organization and year fixed-effects with standard errors clustered on the organization level. t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable: Log(Total Program Expenses)	(1)	(2)	(3)	(4)	(5)	(6)
Log(Total Assets)	0.323***	0.323***	0.323***	0.687***	0.633***	1.058
	(98.03)	(98.03)	(98.04)	(2.98)	(2.67)	(0.92)
Cash to Assets	-0.186***	-0.186***	-0.186***	-0.783*	-0.677	-1.515
	(-17.46)	(-17.46)	(-17.46)	(-1.71)	(-1.44)	(-0.67)
Gross Debt Ratio	-0.00906***	-0.00906***	-0.00906***	0.0364**	0.0324*	0.0643
	(-9.63)	(-9.62)	(-9.62)	(2.06)	(1.79)	(0.74)
ROA	-0.0910***	-0.0910***	-0.0910***	-0.102***	-0.0945***	-0.150
	(-79.10)	(-79.10)	(-79.10)	(-3.30)	(-3.00)	(-0.99)
Other Income to Revenue	-0.578***	-0.578***	-0.578***	-0.923***	-0.878***	-1.234
	(-56.02)	(-56.02)	(-56.02)	(-4.64)	(-4.32)	(-1.27)
Number of Branches (10 miles)	0.0000836**			Instrument in 1st-stage		
	(2.19)					
HHI (10 miles)	-0.114***			Instrument in 1st-stage		
	(-2.75)					
Number of Branches (15 miles)		0.0000544*			Instrument in 1st-stage	
		(1.83)				
HHI (15 miles)		-0.0927*			Instrument in 1st-stage	
		(-1.84)				
Number of Branches (20 miles)			0.0000341*			Instrument in 1st-stage
			(1.92)			
HHI (20 miles)			-0.0945*			Instrument in 1st-stage
			(-1.70)			
Instrumented: Interest Costs				-36.32***	-30.69**	-75.02*
				(-2.51)	(-2.24)	(-1.65)
Constant	8.492***	8.487***	8.488***	2.219	3.260	-4.935
	(180.76)	(179.42)	(178.77)	(0.50)	(0.71)	(-0.22)
Organization Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
N	828,792	828,792	828,792	828,792	828,792	828,792
F-statistic	1535.94***	1535.48***	1535.51***	833.53***	877.77***	750.21***
Adj. R-squared	0.256	0.255	0.256	0.108	0.121	0.075

Table 12. Difference-in-difference tests using bank closures and mergers

The dependent variable is the effective interest costs which is the ratio of interest expenses and total debts in columns (1) to (3) and the natural logarithm of total program service expenses in columns (4) to (6). The treatment group includes nonprofit organizations residing in zip codes experienced branch closure due to either bankruptcy or merger and control group includes organizations residing in the neighboring zip codes. The value of *Post* variable is one if the year is after the bank closure or merger for institutions in both treatment and control groups and zero otherwise. Other independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA), and other income to revenue ratio. Specifications (2), (3), (5) and (6) use state, year and industry fixed-effects and all specifications have standard errors clustered on the organization level. t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable:	Effective Interest Cost			Log(Total Program Expenses)		
	(1)	(2)	(3)	(1)	(2)	(3)
Treated	-0.00176*	-0.00142	-0.00159*	-0.0517*	-0.0193	-0.0125
	(-1.92)	(-1.52)	(-1.71)	(-1.93)	(-0.79)	(-0.54)
Post	-0.000912	-0.000918	-0.000967	0.0929***	0.0847***	0.0126
	(-1.36)	(-1.36)	(-1.43)	(10.33)	(9.62)	(1.44)
Post × Treated	0.000577*	0.000577*	0.000561**	-0.0269**	-0.0213*	-0.0198**
	(1.67)	(1.67)	(2.14)	(-2.33)	(-1.88)	(-1.97)
Log(Total Assets)			0.000505			0.419***
			(1.35)			(44.06)
Cash to Assets			0.00574**			0.0162
			(2.40)			(0.35)
Gross Debt Ratio			0.00110			0.154***
			(1.48)			(10.88)
ROA			0.00401***			-0.336***
			(3.40)			(-22.20)
Other Income to Revenue			-0.00621***			-3.557***
			(-3.27)			(-63.23)
Constant	0.0499***	0.0598***	0.0516***	11.43***	12.95***	7.506***
	(62.75)	(9.24)	(6.01)	(492.91)	(83.37)	(36.58)
State Fixed-Effects	No	Yes	Yes	No	Yes	Yes
Year Fixed-Effects	No	Yes	Yes	No	Yes	Yes
Industry Fixed-Effects	No	Yes	Yes	No	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
N	92,650	92,650	92,650	92,650	92,650	92,650
F-statistic	65.35***	91.02***	91.96***	67.84***	244.11***	395.48***
Adj. R-squared	0.001	0.006	0.091	0.001	0.201	0.265

Table 13. Average distance to branches and MSA-level measures of local markets

The OLS regressions are in columns (1) and (4) and the 2SLS regressions are in columns (2), (3), (5) and (6). The dependent variable the natural logarithm of total program service expenses. The independent variables include the natural logarithm of total assets, cash to total assets ratio, gross debt ratio which is the total liabilities divided by total assets, return on assets (ROA) and other income to revenue ratio. The variable of interest is the average distance (miles) from a nonprofit organization to all bank branches residing in a 15-mile radius, and the total number of branches in a MSA in columns (4) to (6). In the first-stage of the 2SLS regressions in columns (2) and (5), the dependent variable is the effective interest costs which is the ratio of interest expenses and total debts. The instrument variables (IVs) is the average distance from a nonprofit organization to all bank branches residing in a 15-mile radius in column (2), and the total number of branches in a MSA in columns (5). In the second stage in columns (4) and (6), the main variable of interest is the effective interest costs instrumented by the IV. All specifications use organization fixed-effects with standard errors clustered on the organization level. t-statistics are shown in the parentheses with ***, ** and * indicating its statistical significant level of 1%, 5% and 10% respectively.

Dependent Variable: Log(Total Program Expenses)	(1) OLS	(2) 2SLS 1nd-stage	(3) 2SLS 2nd-stage	(4) OLS	(5) 2SLS 1nd-stage	(6) 2SLS 2nd-stage
Log(Total Assets)	0.399***	-0.0127***	0.455*	0.361***	-0.0140***	0.621***
	(114.87)	(-24.97)	(1.76)	(73.20)	(-30.14)	(56.81)
Cash to Assets	-0.105***	0.0164***	-0.130	-0.0820***	0.0147***	1.203***
	(-9.87)	(10.77)	(-0.39)	(-5.53)	(10.78)	(13.58)
Gross Debt Ratio	-0.0136***	-0.00592***	0.0685	-0.0160***	-0.00775***	0.137***
	(-4.20)	(-15.76)	(0.57)	(-3.17)	(-20.89)	(6.80)
ROA	-0.309***	0.00371***	-0.218***	-0.294***	0.00368***	-0.312***
	(-110.52)	(9.00)	(-2.88)	(-71.34)	(9.41)	(-9.10)
Other Income to Revenue	-0.773***	0.0124***	-0.928***	-0.691***	0.0112***	-4.139***
	(-63.08)	(7.81)	(-3.68)	(-40.55)	(8.22)	(-39.39)
Average Miles to Bank Branches	-0.00372**	0.000297*				
	(-2.06)	(1.71)				
Number of Branches in MSA				0.0000123**	-0.0000016**	
				(2.03)	(-2.57)	
Instrumented: Interest Costs			-6.230*			-17.02*
			(-1.93)			(-1.79)
Constant	7.491***	0.237***	6.908	6.590***	0.0645***	5.547***
	(134.85)	(28.51)	(1.45)	(93.59)	(15.99)	(7.11)
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Organization Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
S. E. Clustered by Organization	Yes	Yes	Yes	Yes	Yes	Yes
N	828,792	828,792	828,792	828,792	828,792	828,792
F-statistic	2265.25***	91.45***			126.17***	
Wald Chi-square (2nd-stage)			17420.07***			662497.67***
Adj. R-squared	0.268	0.006	0.328	0.299	0.007	0.259