

Nonprofit-as-supplement: Examining the link between nonprofit financial support and public service quality

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Abstract

This paper explores the link between nonprofit financial support and the service quality of city park systems. Specifically, this research constructs a longitudinal dataset and utilizes the fixed effects model to empirically investigate the relationship between nonprofit financial support for major U.S. city parks and service quality. The findings show that the level of nonprofit financial support to city parks has a positive relationship with two major indicators of city park service quality: the size of parkland and the public access to parks. However, a small statistically significant relationship is found for the number of playgrounds in parks and the level of nonprofit financial support. This research contributes to the theoretical understanding of government-nonprofit relationships which heavily emphasize the resource flow from park-supporting charities to governments. It also improves our empirical knowledge of the general associations between public service provision and nonprofit organizations in urban areas.

Key words: nonprofit support, public service quality, government-nonprofit relationships.

As governments at all levels have experienced severe fiscal pressure since the Great Recession of 2008 and are constantly seeking new ways to finance public service provision, the role of nonprofit organizations in terms of charitable support for public service should be highlighted (Brecher and Wise 2008). Nonprofit scholars have documented an increase in the scale of charitable support for public service provision. They find that the number of charities created to support public libraries, public parks and recreation, and primary and secondary public education has increased substantially (Nelson and Gazley 2014; Schatteman and Bingle 2015). Given the rapid growth of charitable activities and the increasingly important roles played by nonprofits in shaping public service provision, ensuring the quality of services as nonprofits supplement the resources and service provision responsibilities shared by public agencies will become a major challenge (Brecher and Wise 2008).

Nonprofit organizations often collaborate with governments, as contracting out government services to third parties has become prevalent (Milward and Provan 2000). As the recipients of extensive government contracts and grants, nonprofit organizations have been put on the central stage for public scrutiny (Smith and Grønbjerg 2018). There has also been a proliferation of scholarly investigation of the management issues facing government-nonprofit relationships under the contracting regime, particularly for topics related to accountability and performance measurement (Provan and Milward 1995; Van Slyke 2003). Indeed, the public and nonprofit administration literature in recent years has shown growing interests in how public/government funding affects nonprofit engagement in public service or advocacy and patterns of nonprofit governance (e.g., Guo 2007; Lu 2018; Mosley 2011).

This paper contributes to the theoretical development and advancement of empirical knowledge of government-nonprofit relationships. Despite some research regarding the influence

of government funding on nonprofit governance and government-nonprofit relationships, nonprofits' financial support for public service provision is rarely examined by public administration and nonprofit studies scholars. In terms of resource flows between the nonprofit and public sectors, previous research focus has primarily been on the consequences of public/government funding to nonprofits, with little attention paid to philanthropic support of public services (Brecher and Wise 2008). This study attempts to address this gap by using the model of Nonprofit-as-Supplement Collaboration (NSC) as an analytical lens to explore the relationship between spending by park-supporting charities and public service quality in the context of parks and recreation services within major U.S. cities.

The NSC model from Brecher and Wise (2008) presents a pattern of governance between nonprofit organizations and governments primarily in the context of public parks. In this model, nonprofits serve as a private funding source for a role that is already assumed by a public agency, with the money mostly derived from philanthropic sources such as private donations and individual contributions (Brecher and Wise 2008). The NSC model has been applied to a case study of New York City's public parks by Brecher and Wise (2008). This theoretical model has not yet been applied to any quantitative empirical studies. In this study, we use the NSC model to guide our regression testing with an emphasis on the financial resource flow from the park-supporting charities to public park services. Specifically, we examine the following research question: what is the relationship between financial support from park-supporting charities and the service quality of major U.S. city park systems?

An empirical study of this topic for U.S. major cities is challenging because it is difficult to compile data from multiple sources at the city level. The data for this study come from different sources, including the annual city park facts report issued by the Trust for Public Land,

the Fiscal Standardized Cities (FiSC), the National Center for Charitable Statistics (NCCS) dataset, and the U.S. Census Bureau. With this combined data, this study uses descriptive analyses and fixed effects analyses to improve the understanding about supporting activities of park-supporting charities, as well as the link between spending by park-supporting charities and public park services quality. We find that park-supporting charities can play a supplemental role in funding and supporting some low-priority public service areas like public parks and recreation. Moreover, spending made by park-supporting charities have shown a statistically significant and positive relationship with two public park service quality variables respectively, park land and access. In addition to the direct funding from these park-supporting charities, increasing county spending per capita on parks and recreation may improve park service quality.

Moreover, this study contributes to advancing our understanding of the relationship between charitable support and service quality outputs from the organization level to the system level. Kim (2017) and Berrett and Holliday (2018) conduct ground-breaking studies to explore the relationship between nonprofit financial conditions and program outcomes in nonprofit organizations. However, research with regards to the impact of nonprofit financial support on the quality of public services at the city level are scant. On one hand, scholars have called for additional empirical studies to measure and evaluate the system impact of the nonprofit sector (Flynn and Hodgkinson 2001). On the other hand, public service quality has been an important indicator of public organizational performance (Amirkhanyan, et al. 2009). It is critical to the level of public trust in the government (Kettl 2019) and can be a reflection of professionalism (Vamstad 2012). Public service providers should be accountable for service quality and public service quality may also be related to public values such as efficiency and effectiveness (Vamstad 2012). While most empirical studies use survey items to create a scale variable to

measure an organization's perceived service quality (Andreini et al. 2014; Becker 2018; Folz 2004; Leviten-Reid 2012; Taylor 2014; Vamstad 2012), our empirical study obtains park service quality data from a nonprofit organization (e.g., the Trust for Public Land) and uses numerical variables to measure public service quality output, such as public access. We will address this gap in the literature by empirically investigating the relationship between spending by park-supporting charities and the quality of urban park systems. Therefore, this study can offer a more nuanced understanding of government-nonprofit relationships and how such relationships will be influenced by the direct involvement in the form of financial supports of nonprofit organizations for public service provision.

The next section of the paper reviews the relevant theories of government-nonprofit relationships and introduces the NSC model, followed by an introduction of the research context and relevant hypotheses. The subsequent section describes variables, data sources, and research method, followed by a section that presents a descriptive analysis and the results of the estimation of the model. The paper concludes with a discussion of empirical findings, research limitations, and future research directions.

Literature Review

Much of the theoretical literature in the fields of public and nonprofit studies focus on the origins of the relationships between the public and nonprofit sectors and the forms these relationships take (Brecher and Wise 2008). In this section, we first review three mainstream theories including resource dependence theory, government failure theory, and interdependence theory to understand the resource flow between governments and nonprofit sector and the influence of

governments on nonprofit growth. We also review Young's (2000) categorization to understand how nonprofits serve as supplements, complements, and adversaries to governments. We recognize that there are other promising research on ecological approaches (Potter and Crawford 2008) or institutional approaches (Brown and Potoski 2004) to explain the government and nonprofit relationships, but these theories are not meant to be mutually exclusive.

The most influential theory to explain the government and nonprofit relationship is the resource dependence (RD) theory, which posits that individual organizations need resources from external environments (or simply from other organizations) to survive and to pursue organizational goals (Emerson 1962; Pfeffer and Leong 1977; Pfeffer and Salancik 1978; Saidel 1991). According to this theory, organizations interact with each other when they need to attain resources to fulfill certain missions or tasks. The RD theory also implies that power plays a key role in understanding these inter-organizational relationships (Malatesta and Smith 2014).

Resource scarcity motivates organizational action (Malatesta and Smith 2014; Pfeffer and Salancik 1978). RD theory assumes that organizations seek for external support and become partners when they need resources critical to pursue their mission and their organizational survival and growth (Malatesta and Smith 2014; Pfeffer and Leong 1977; Pfeffer and Salancik 1978; Salamon 1995). Governments may lack certain expertise for social services and may thus rely on the nonprofit sector for skills, expertise, knowledge, information, experiences, and human resources (such as volunteers), while the nonprofit organizations may turn to governments for financial support as governments have the power to tax and have diversified revenue sources (Brecher and Wise 2008). However, nonprofit operations may be affected by government expectations and preferences when they rely heavily on government resources, especially funding (Lecy and Van Slyke 2012; Pfeffer and Salancik 1978). Based on these

assumptions in the RD theory, Malatesta and Smith (2014) argue that managers in the public and nonprofit organizations should play an important role in accessing to resources and employing effective management strategies such as merging, alliance, and co-opting to control resource dependencies. These strategies highlight the importance of interdependence and partnership among actors or entities from the environment.

Public sector leaders are often willing to establish partnership with nonprofits, as the governments ultimately deliver public goods which are not offered by the private sector and need to provide public goods and services to communities and citizens. Governments can benefit from stable relationships with certain nonprofit organizations who have organizational capacities and/or are able to respond to certain social problems more efficiently and effectively (Lecy and Van Slyke 2012). Recent research shows that the nonprofit sector can help city park departments with the construction and maintenance of facilities and the provision of recreational programs. They may also assist with fundraising, managing volunteer activities, and the planning and design of certain park-related activities (Cheng 2019).

Government failure theory explains the growth of the nonprofit sector due to diverse community demands (Hansmann 1987; Lecy and Van Slyke 2012). As demands increase, nonprofit organizations may create certain types of services or activities as a substitute for government-provided programs, accounting for the limits or failures of government services (Lecy and Van Slyke 2012). For example, in a diverse society, different groups may have different demands. Catholic parents may prefer private Catholic schools, while Jewish parents may prefer private Jewish schools (Lecy and Van Slyke 2012). Although the government failure theory was a prominent theory in the 1970s and 1980s, its application as a general theory of

nonprofit growth and density has been questioned more recently as little empirical evidence has been found to support it, with the notable exception of Matsunaga and Yamauchi (2004).

The partnership between government and nonprofit evolves in an interdependent approach (Lecy and Van Slyke 2012). Compared to RD theory and government failure theory, the interdependence theory implies a more complementary and a more formal collaborative nature of nonprofit activities. The interdependence theory is situated in the contracting out regime, therefore focusing on nonprofits' resource/funding dependence on the government. It receives the strongest support from existing empirical studies in the argument that more government spending in social services results in higher nonprofit density in the United States or cross-national comparative contexts (Corbin 1999; Gazley 2010; Grønbjerg and Paarlberg 2001; Lecy and Van Slyke 2012; Lu and Xu 2018; Luksetich 2008; Saidel 1991; Salamon 1995; Salamon et al. 2000). For example, Lecy and Van Slyke (2012) use nonprofit panel data from the U.S. Internal Revenue Service (IRS) 990 to empirically test the government failure and interdependence theories in an attempt to explain geographic variation in nonprofit density. They find that the interdependency theory may explain more growth in the human services sector of the nonprofit economy than the government failure theory (Lecy and Van Slyke 2012).

The three theories discussed demonstrate that governments play an important role in promoting the growth of nonprofit organizations through funding opportunities. The theories imply that a financial resource flow from governments to nonprofit organizations contributes to an evolving partnership between governments and the nonprofit organizations. Young (2000) provides three analytical views that have connections with these theories and presents a clear picture of roles of nonprofits in the government and nonprofit relationships. Young (2000) conceptualizes the mode of government and nonprofit relations as either adversarial,

complementary, or supplementary, and applies them into four different national contexts of the United States, the United Kingdom, Israel, and Japan.

In the adversarial category, nonprofits work as agents or advocates to persuade governments to reform or change public policies. For example, nonprofit organizations can advocate government operations for great efficiency or can advocate for new programs and regulation to increase government activities (Young 2000). In the complementary category, nonprofits form partnerships with governments and they help governments deliver public services primarily with the financial support from governments (Brecher and Wise 2008; Young 2000). This is also implied by the interdependence theory, as governments provide financial resources or grants to nonprofits for service delivery, which drives the growth of the nonprofit organizations (Grønbjerg 1993). In the supplementary category, nonprofits provide services that are not fulfilled by governments. In a similar approach, the government failure theory explains that nonprofits serve as a substitute for governmental provision of services. These three modes of the government and nonprofit relationships can be used to describe the ebbs and flows of relationship transitions over time in the United States and the United Kingdom, while the supplemental mode of government-nonprofit sector relations prevail in the history of Israel and the complementary relationship mode is mostly appropriate to describe the nonprofit sector (as extensions of the government) in Japan.

Nonprofit-as-Supplement Collaboration (NSC) Model

As the foregoing literature review indicates, most studies have focused on the exclusive resource flows from governments to nonprofits for various reasons. In the context of the contracting out regime and the New Public Management framework, a few studies have investigated the reverse resource flows from nonprofits to public agencies. In NSC model

proposed by Brecher and Wise (2008), nonprofits serve as a source of funding for public agencies with the money derived from philanthropic sources (e.g., individual contributions) and seeks to supplement the role of the public agencies' that ultimately remain responsible for basic roles and most direct service delivery to urban park systems (Brecher and Wise 2008).

Despite its close relationship to the supplementary model proposed by Young (2000), the NSC model has some noticeable differences regarding the forms of governance and support. In terms of governance, NSC model assumes that nonprofit organizations do not play a major role in raising resources or filling in the gaps in direct service areas or activities provided by public agencies (Brecher and Wise 2008). Nonprofits in the NSC model do not have operational responsibilities for services, do not serve as substitutes for major public services, do not serve as a bridging mechanism that channels financial support from the civil society to governments and support public service provision indirectly, neither.

Moreover, the NSC model assumes that nonprofit organizations raise private resources or funds derived from philanthropic sources to establish a direct funding mechanism from nonprofit organizations to public agencies such as public cultural institutions or services such as park systems or social services (Brecher and Wise 2008). However, the funding sources in the NSC model can be diverse, ranging from private contributions to grants, or in the form of physical activities such as paid or volunteer staff and others. Financial support can be used for ongoing operations or for capital projects (Brecher and Wise 2008).

The funding mechanisms in the NSC model have been shown in several service sectors including educational services, public libraries, the performing arts, and public park systems (Brecher and Wise 2008; Nelson and Gazley 2014; Schatteman and Bingle 2015). In public elementary and secondary schools, there are nonprofit parent-teacher associations that raise

money to support supplementary activities in schools. In public universities, nonprofit alumni associations raise money to supplement tax dollars and tuition in support of some activities. Brecher and Wise (2008) apply the NSC model in the New York City parks and have a deep understanding of the experience of that city. From this case study, they learn that the reliance on nonprofits in the provision of park services may lead to both positive and negative outcomes. The positive consequences include additional resources to parks and innovation in the management of the parks, while obvious challenges that require the attention of public managers include handling inequality and balancing broad public service goals and nonprofit goals that match the needs of selected constituents (Brecher and Wise 2008; Gazley et al. 2020).

Service Quality

Given that the research focus on the relationship between nonprofit financial support to urban park systems and their service quality, we conduct a brief review of service quality research in the nonprofit literature and find that most empirical studies use perceived service quality to evaluate the performance of a product or service. Andreinie et al. (2014) define perceived service quality as “the customer’s judgement about the performance of a product or a service.” Pfiffner (2020) argues that quality requirements by funders and laws/regulations are shown to be a quality system. Organizations need to be equipped with adequate resource, such as time, money and staff to create quality measurement systems.

Some scholars argue that perceived service quality should be evaluated based on dimensions. Folze (2014) states that service quality has two related but distinct dimensions, including input (e.g., the bundle of service features) and output (e.g., actual service outcome). In particular, Folze (2014) points out that the output dimension measures of service quality should consider the following items, including reliability, thoroughness, efficiency, effectiveness and

timeliness. Vaughan and Shiu (2006) also use different dimensions to measure service quality in their survey items. These dimensions are access, responsiveness, communication, humaneness, security, enabling/empowerment, competence, reliability, equity and tangibles.

When measuring perceived service quality, empirical studies rely heavily on survey data and create service quality variables based on survey items or scale for different institutional contexts and nations. For example, Anna et al. (2009) explore the impact of network and ownership of the organizations on organizational performance measured by service quality and access in the U.S. Zafra-Gomez et al. (2009) investigate local financial condition system in Spain by focusing on quality of service based on outputs and create a measure of service quality. Vamstad (2012) uses user perceived satisfaction of service quality to compare and contrast service quality offered by nonprofits, governments and private sectors in Austria. Taylor (2014) uses survey data of perceived service quality at local fire and police departments and finds that reduced property tax decline is related to declining citizen perception of local government service quality in the U.S. Becker (2018) uses data collected from students in the universities to examine the impact of nonprofit accountability activities on perceived service quality.

Overall, by reviewing these empirical studies, we find that most studies use survey data to measure perceived service quality and perceived service quality is likely to be affected by the network structure, the ownership of the organization, the institutional type of the organizations and the price of the services offered. However, few empirical studies on service quality have focused on a particular type of public service or product or have linked the funding from nonprofit organizations to service quality. Thus, our study aims at filling in this gap of the existing literature.

Context and Hypotheses

The context of this study is the major U.S. city park systems where nonprofit organizations play an increasingly important role in financing and supporting the provision of these services (Pincetl 2003; Walls 2014). Harnik and Martin (2005) find that private park conservancies spend more than city park departments on public parks on a per acre basis. Park conservancies and friends' groups serve as platforms for citizens and residents to become engaged in the provision of local parks and recreation services (Pincetl 2003). Not only do they provide financial resources (such as cash) for parks, but also engage in mobilizing human resources, such as volunteers for trash pickup, tree planting, and trail maintenance (Madden and Schwartz 2000).

We count the number and frequency of park-supporting activities by nonprofits included in the sample, summarized in Table 1. Most park-supporting activities provided by nonprofits in our sample focus on fundraising (e.g., raising philanthropic funds for the benefit of a park), volunteer recruitment and management (e.g., providing an internet portal for volunteer recruitment for city park systems), natural resource maintenance and construction (e.g., coordinating volunteer days for trail construction), public education and outreach, and facility construction and repair. A few activities with low frequencies include park management and park land increase. These findings show that a park-supporting nonprofit can play an active role in some activities in terms of volunteer management, fundraising for parks, and natural resource maintenance for city park systems.

[Table 1]

There are potential concerns that financial support from park-supporting charities may compromise the quality of park services. Specifically, financial support may be less stable

overtime and may crowd out public funding. It is expected that nonprofit spending on park services brings a collective benefit to the community if nonprofit spending along with government spending can improve public park service quality (Walls 2014; Cheng et al., 2020). If we take into consideration of volunteering and advocacy work performed by these nonprofit organizations, which are not directly captured by nonprofit financial support, this positive impact on service quality may be even larger. In contexts beyond park services, recent studies also find that nonprofit organizations help reduce community crime rate (Sharkey et al. 2017) and improve city sustainability in terms of reducing toxic contamination and increasing the number of buildings with an environmental certification (Rousseau et al. 2019).

Based on these prior findings on city park systems and our discussion in the literature review section, we propose that nonprofit financial support is positively associated with city park service quality. More specifically, we develop the following testable hypotheses on each indicator of park service quality:

Hypothesis 1a: Everything else being equal, nonprofit financial support is positively associated with park land area.

Hypothesis 1b: Everything else being equal, nonprofit financial support is positively associated with park access.

Hypothesis 1c: Everything else being equal, nonprofit financial support is positively associated with the number of playgrounds in city parks.

Data, Variables, and Method

Data sources

This study draws on several primary data sources for information on the characteristics of city park systems, local government finance, nonprofit finance, and communities. Primary data come from the annual city park facts report issued by the Trust for Public Land (TPL). The TPL is a national nonprofit organization that works with local communities across the country to ensure that all citizens live within walking distance of a well-maintained park. TPL collected data on the city park systems of the hundred largest U.S. cities from 2012 to 2017 with the purpose of guiding local park improvement efforts. Practitioners and scholars have used some important characteristics of an effective park system, including acreage, amenities, access, and investment, in their studies (e.g., Rigolon et al. 2018).

The data provided by the TPL are used to study how well 100 large U.S. cities meet the needs for public parks, and they also reflect the quality of local park systems because good park systems require adequate levels of acreage, services, and access. Rigolon et al. (2018) find that the variables from the TPL provide a valid instrument to measure the quality of urban park systems in the U.S because these measures were developed by a team of national experts over ten years (content validity), have been used by practitioners and scholars (practical validity), and have been proven to be significantly correlated with health outcome variables such as physical activity (criterion-related validity) (Anglin et al. 2016; Besenyi et al. 2016; Drost 2011; Edwards et al. 2013; Markevych et al. 2017; Roubal et al. 2015; Sullivan 2011; Wolch et al. 2011).

The data from TPL has a few limitations. One is that it only recently – since 2019 – started to providing data on nonprofit volunteer hours and public agency volunteer hours and their values for 100 major U.S. cities. Before that, there were no annual data on volunteer hours and values offered by the TPL. The sample cities included in the data also lacks of consistency from 2012 to 2019, but the number of cities has increased each year. For example, the data in the

year of 2012 only included 40 largest U.S cities, while the data in the year of 2018 have 97 U.S major cities. In terms of amenities, only the measure – playgrounds per 10,000 residents – has consistent data from 2012 to 2018.

Data on park-supporting charities were obtained mainly from the National Center on Charitable Statistics (NCCS) Core PC files, which provides information about the numbers and the financial information (e.g., expenditure, revenue, assets) of registered and reporting public charities in the U.S. Park-supporting charities are identified through a combination of keyword search and the National Taxonomy of Exempt Entities (NTEE) codes. Each organization identified in the NCCS dataset is then verified through the information on their websites to ensure that the primary purpose of these charities is to support a city park. Each identified and verified park-supporting charity from 2013 to 2016 is then linked to the historical NCCS dataset to construct the full panel dataset of park-supporting charities in these cities. It is also important to notice that these nonprofits provide these financial supports directly to urban park systems.

The third data source is the Lincoln Institute’s Fiscally Standardized Cities (FiSCs) database, which contains different categories of revenues, expenditures, and debt information for the 150 largest U.S. cities from 1977 to 2016. The advantage of using the FiSCs database over the U.S. Census Bureau data is that the FiSCs data capture public spending of overlapping local governments in a given jurisdiction on various public service functions (Lincoln Institute of Land Policy 2017). The fourth source is the U.S. Census American Community Survey (ACS) that provides important community-level characteristics such as race, homeownership, and education levels.

Dependent variables: City park service quality

The dependent variable, the service quality of a city park system, is measured using several numerical variables created by the Trust for Public Land (TPL). The TPL developed these variables for the purposes of having a comprehensive evaluation of park access and quality for the 100 largest U.S cities. This nonprofit organization addresses the importance of having access to close-to-home parks in a community's quality of life.

These indicators are categorized by the TPL into three major groups. The first group is *the acreage* of the city parking system, which has been developed to measure how well the cities are meeting the needs for city parks. The TPL conducted an annual survey to collect data for this numerical variable measured as the percentage of park land as a share of total city area. This variable has a mean of 0.110, a median of 0.090, and a standard deviation of 0.085.

The second dependent variable is *public access* to urban parks, measured using the percentage of city residents that live within 10 minutes (half a mile) of a city park. Good park systems need to have adequate access by local communities to reflect the quality and effectiveness of park systems in a city. This variable is a numerical measure with a mean of 0.648, a median of 0.640, and a standard deviation of 0.195. For some cities in the Trust for Public Land city park facts dataset, the data on park access are missing. This leads to a significant reduction in the number of cities in the dataset.

The third dependent variable is *the facility* of the city park system, which is measured by the number of playgrounds per 100,000 residents in parks. This variable is a numerical variable with a mean of 2.400, a median of 2.200, and a standard deviation of 0.989. Hunter et al. (2015) find that there is a relationship between park amenities quality and playground use by kids. However, we are unable to include other common types of facilities such as dog parks,

basketball hoops, recreation and senior centers, or restrooms because these data were not collected by the TPL for the years of 2012, 2013, and 2014.

We acknowledge that these variables might not be able to measure service quality perfectly and objectively, and they are different from perceived service quality measures used by some prior studies on service quality (e.g., Andreini et al. 2014; Becker 2018; Leviten-Reid 2012; Taylor 2014;).

Key independent variable: Nonprofit financial support for parks services.

This study constructs a nonprofit financial support variable that reflects the amount of financial resources spent by nonprofits to support local park systems. It is operationalized as total spending of park-supporting charities per 1,000 residents aggregated at the city level.

Expenditures of these park-supporting charities are aggregated at the city level by years to construct total spending from nonprofit organizations to public parks in a city.

More control variables

Drawing on existing studies of the determinants of the quality of public services, several independent variables are included in the regression models to control for socio-demographic characteristics; intergovernmental financial transfer; and public spending from city, county, and special districts on parks and recreation services, respectively. City spending on parks is measured as total expenditure of city governments on parks per 1,000 residents. County spending on parks is measured as total expenditure of county governments on parks per 1,000 residents, while special district spending on parks is measured as total expenditure of special districts on parks per 1,000 residents.

To explore how such a diversified spending structure in a city will affect its park service quality, we follow Cheng et al. (2020) research on city's fiscal arrangement in public service

provision to construct an expenditure diversification index, measured as the Hirschman-Herfindahl Index (HHI) with a range from 0 to 1 in the regression models. The index is calculated using four spending categories, including city spending, county spending, special district spending, and nonprofit spending as a percentage share of total spending on parks, respectively. The equation for expenditure diversification index is shown below, where E_j is the fraction of expenditure generated by each category of city governments, county governments, special district governments and park-supporting nonprofit organizations:

$$ED_{it} = \frac{1 - \sum_{j=1}^4 E_j^2}{0.75}$$

Index values closer to 1 indicate a more diversified spending structure. Per capita state aid is also included to understand how intergovernmental revenues from states to city parks will affect public service quality.

Payne et al. (2002) contend that the role of race is a significant predictor of park and recreation preferences and behaviors. They find that blacks are more likely to demand more park land than whites. Thus, we include the percentage of white population in total city population. We also include population density and the educational status of the population (in percentages) to explore demographic influences on city park access and quality. Table 2 presents a description of variables and data sources.

[Table 2]

Estimation Method

After merging multiple data sources, we created an unbalance panel data which includes a total of 297 cities from 2012 to 2015. The unit of analysis is the city. The sample cities in the year of 2015 has been displayed in the Figure 1 located in the appendix. The cities in the sample represent the municipal sector across states and provide sufficient variation in terms of

population size, fiscal structure, political cultures and economic conditions, as well as metropolitan statistical area (MSA) of the country with data availability.

To investigate the effect of the amount of nonprofit financial support per 1,000 residents on the service quality of city park systems, we estimate both fixed effects (FE) and random effects (RE) models. The FE approach generally requires sufficient within-unit variation in the independent variables over time. We also include year fixed effects to control for all factors that are constant across cities in a specific year and city fixed effects to control for all factors that are constant within a city over time. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity also indicates that the estimated residuals are heteroskedastic. All standard errors are thus heteroskedasticity robust. Finally, in estimating both models we cluster standard errors at the city level to address potential heteroscedasticity and serial correlation of errors within each city over time.

Multicollinearity was tested for using the mean variance inflator factor (VIF), meanwhile the pairwise correlations among the regressors were used to ensure that a high degree of correlation does not exist between independent variables. The correlation matrix table is provided in the appendix. All independent variables are lagged by one-year to avoid potential issues of endogeneity in the models. Table 3 provides the summary statistics for each of the variables in the study.

[Table 3]

Findings

Given that this research focuses on the role of nonprofit financial support on public park systems, Table 4 shows the percentage of funding from park-supporting charities to public parks in some sample cities (i.e., only cities with four consecutive years data are included) spanning the time period from 2012 to 2015. Houston had the highest percentage of spending from nonprofits (43.02%) in the sample in 2015, followed by Memphis (26.86%), Baltimore (17.07%), Atlanta (14.88%), Louisville (11.55%), and New York (11.36%). Throughout the four years of observation in this study, a few cities (such as Houston, Baltimore, Atlanta, and Memphis) had over 10% of their total funding for their park systems from park supporting charities.

[Table 4]

We observe that a few cities' shares of expenditures from nonprofits have increased from 2012 to 2015. For example, Houston's nonprofit spending share was 10.64% which was 3.00% below Boston in 2012. However, its spending from nonprofits increased to 16.34% in 2013, 26.65% in 2014, and 43.02% in 2015. Cities like Memphis, Atlanta, Louisville, and New York exhibit similar patterns over time. Until 2015, over 15.00% of cities in our data had nonprofit spending percentage shares over 10.00%.

Table 5 shows the estimation results for three park service quality-related dependent variables in the FE analyses. Due to similar results in the FE model and RE models, we only present the results in the FE analyses in this section. The RE models are presented in the appendix. This study finds a positive relationship between per capita total nonprofit expenses on parks and the quality of city park systems across two indicators of city park service quality, according to Table 5. The statistically significant and positive coefficient of 0.224 on nonprofit spending in Model 1 of Table 5 suggests that a one-unit increase in per 1,000 residents nonprofit

spending on city parks is predicted to increase the percentage of park land as a share of city area by approximately 0.224 percentage points, all else being constant.

[Table 5]

According to the Trust for Public Land (TPL), everyone in the local community deserves to have a park within a 10-minute walk of home. The measure of public access is an essential reflection of park service quality. The statistically significant and positive coefficient of 0.696 on nonprofit spending in Model 2 of Table 5 suggests that a one-unit increase in per 1,000 residents nonprofit spending on city parks is predicted to increase park access to urban parks (measured using the proportion of city residents that live within half a mile of a city park) by approximately 0.696 percentage points, all else being constant.

It is important for this study to present the link between nonprofit financial support and people's access to city park systems. These results highlight the important role played by park-supporting nonprofit across urban areas. However, statistically significant results were not found in Model 3. Funding from park-supporting charities is not substantial enough to affect the number of playgrounds provided by local governments.

Although nonprofit spending does not have a statistically significant impact on the number of playgrounds in Model 3 of Table 5, the analysis of spending from city and county governments revealed some interesting findings. City spending per 1,000 residents has a negative and significant relationship with two dependent variables, including public access and playgrounds in Models 2 and 3 in Table 5. Given that city spending has accounted for the majority of spending on parks, this study finds that increasing city spending does not help enhance park service quality. We also find that county spending per 1,000 residents has a positive and significant relationship with public access and playgrounds in the Models 2 and 3,

respectively. In particular, the significant level of city spending per 1,000 residents on playgrounds is around 0.01. Compared to city spending, it seems to indicate that county spending has a greater potential to significantly increase park service quality.

This study also revealed some findings from other independent variables. Spending diversification on parks shows consistent negative and significant relationships with dependent variables across the three models. This result suggests that diversifying the spending from various levels of local government does not help improve city park service quality. The population density variable only has a positive and significant relationship with city park land in Model 1. The percent of white population has shown a positive and significant relationship with parkland in Model 1. Furthermore, educational status was not found to have any significant relationship with the dependent variables in Models 1 to 3.

Discussion and Conclusion

This study seeks to further our understanding of the relationship between nonprofit financial support and public service quality using evidence from major U.S. city park systems. Using several indicators, the findings suggest that nonprofit financial support has a positive relationship with two quality indicators of city park systems: the size of parkland and public access to city parks. The NSC model proposed by Brecher and Wise (2008) guides the study with regards to the resource flow from nonprofit organizations to governments. This study offers empirical investigation of NSCs model's service quality implications for public service provision. As public-nonprofit partnerships become more prevalent in the subfield of parks and recreation (Harnik and Martin 2015; Walls 2014), the resources offered by these park-supporting charities and public-nonprofit partnerships are likely to become more important over time.

This study helps researchers and practitioners better understand both the idea of nonprofit-as-supplement and the relationship between charitable support for public service provision and city park service quality. According to the NSC model, local nonprofits may not take responsibility for the operation of public park services, nor will they substitute the governance of local park systems. However, public parks may benefit from the supplemental resources provided by nonprofit organizations. It is likely that nonprofit participation in the collaborations influence the management of parks and raise the standards of service quality (Brecher and Wise 2008). For example, in the case of the parks system of New York City, Brecher and Wise (2008) find that the involvement of nonprofits in collaborations alters the design of capital projects and operating practices and led to new leadership. NSCs also enhanced the participation of community volunteers in that case. But they do not provide empirical support from statistical analyses for these positive impacts collaborations may have on the quality of public services.

In addition to empirically examining the service quality implications of the NSC model, this study helps bridge the nonprofit finance literature with the public finance literature. Existing studies of nonprofit financial management and nonprofit performance focus on the impact of different nonprofit financial management practices and financial health conditions on organizational level outcomes (Berrett and Holliday 2018; Kim 2017). We find partial evidence that nonprofit financial support is positively correlated to the public service quality (in this case, the size of parkland and public access to city parks), conditioning other types of local government spending. The introduction of the overall spending diversification index also provides promising alternatives to integrate nonprofit financial support into the overall financial planning of local governments.

Although the main contribution of this paper is mainly empirical, our findings have important implications about how we could reassess the dominant theories of government-nonprofit relations. No matter for the resource dependence theory or the interdependence theory, the premises lie on the assumption that government funding dictates and directs the actions of nonprofit organizations, particularly in the contracting regime. As nonprofits become an important player in financing and creating public services, we should advance our understanding about the potential role of nonprofit organizations and volunteers in the co-governance and coproduction of public service provision and production in order to enhance public values such as efficiency, effectiveness, accountability and others. As pointed out by Bryson et al. (2014), one approach is to blend the existing frameworks in government-nonprofit relations to new theoretical frameworks such as Public Value Governance. In future studies, we also need to think about what unique value could nonprofit organizations contribute to society in addition to their financial contributions or serving as a tool for the government. Another consideration for research is the process for how nonprofit organizations develop their roles in certain public service subsectors. If so, can this happen in other types of public services, such as homelessness? We hope this research provides an opportunity to further enrich and refine the theories of government-nonprofit relations.

This research is not without certain limitations that must be acknowledged. First, despite the use of the fixed-effects model and lagged independent variables to control for time-invariant characteristics across the city park systems and account for the lagged impact of nonprofit financial support, a complete causal argument about whether nonprofit financial support improves the quality of city park services was not able to be made. We cannot rule out the

possibility that nonprofit organizations invest more in larger and more popular parks. In addition, there might be other casual pathways between nonprofit financial support and public service quality. The positive association between nonprofit financial support and public service quality may be moderated or mediated by government spending. For example, nonprofit financial support may help improve public service quality by advocating for more public spending on these parks through funding levers such as matching fund. Future research may take advantage of possible policy shocks to nonprofits (e.g., certain tax reforms) to construct a more robust causal identification strategy to answer this question. Methodology advancement in structural equation modeling may also help us unpack those more complex and nuanced causal pathways.

Second, due to a lack of available data, only major cities in the U.S. are included in this study. The dynamics of nonprofit financial support and public service provision may be different in smaller cities or cities in other countries. However, because of the limited attention paid to this type of government-nonprofit partnership, this study provides a starting point for researchers to continuously track the development of this important phenomenon.

Additional work is still needed to better understand the roles played by nonprofits in public service provision and production. Future quantitative research may find innovative measures for some other aspects of park performance. Fundamentally, visitation and user experiences are better measures for how a park system performs compared to the acreage or the spatial distribution of parks. Scholars have also identified ways to collect user data from participatory observations, surveys, and social media platforms (Donahue et al. 2018; Kornblum et al. 2001).

Future research may also shift the focus of analysis from park systems to individual park units inside or across multiple park systems. This finer level of analysis will allow scholars to

better understand the specific mechanisms of how park-supporting charities might influence park-level outcomes, such as user experiences and interaction in parks. Future research may also be conducted to demonstrate how these park-supporting charities are managed and governed to ensure both user engagement and public accountability. Some potential questions include: should there be stronger public representation on nonprofit boards (Brecher and Wise 2008)? How should government agencies and nonprofit partners design and structure their contracts or formal agreements? Whose interests do these charities truly represent? Answering these questions may help public administration scholars to better understand the democratic and equity implications of the increasing level of charitable support for public service provision.

Moreover, certain qualitative or case studies can be conducted in the future to understand the exact causal mechanisms of how nonprofit financial support may influence the quality of public services. Is it because of the engagement and advocacy role played by these nonprofits and their supporters? Or is it because of the direct financial benefits brought by these government-supporting nonprofits? What type of funding contributed by these nonprofits seems to have the biggest leverage for additional government funding? What systematic impacts these nonprofits may have on the urban politics of the locality they are serving? This study opens up a fruitful future research agenda to examine the role of nonprofits in providing urban public services.

In conclusion, this study is one of the first few empirical studies to explore the relationship between nonprofit financial support and the service quality of major city park systems in the U.S. It contributes to our understanding of how nonprofit financial resources can supplement service delivery and public service production. The findings and empirical strategies used in this study can also be applied to other urban and financial management contexts. The

implications of this research are essential under a governance system in which governmental actors and nonprofits are jointly involved in providing public services, both via governments contracting out services to nonprofits and nonprofits' financial support for public service provision.

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Table 1 The frequency of supporting activities of park-supporting nonprofits in the sample cities, 2015.

Categories	Frequency
Fundraising	High
Volunteer recruitment and management	
Natural resource maintenance	
Public education and outreach	
Facility construction and repair	
Membership organization	
Recreational and cultural programs	
Planning design	
Advocacy	
Park management	Low

Note: The frequency is measured using the number of nonprofits conducting activities for specific categories (See Cheng 2019).

Table 2 Variables in the analysis

Variable name	Definition	Data source
<i>Dependent variables</i>		
Park land	Parkland as a percent of city area	TPL
Access	Percent population within 0.5 miles (10-minute walk) of a city park	TPL
Playgrounds	Park playgrounds per 100,000 residents in a city	TPL
<i>Independent variables</i>		
Nonprofit spending on parks	Total expenditure of park-supporting charities in a city per 1,000 residents	NCCS
City spending on parks	Total expenditure of city governments on parks in a city per 1,000 residents	The Fiscally
County spending on parks	Total expenditure of county governments on parks in a city per 1,000 residents	Standardized Cities
Special district spending on parks	Total expenditure of special districts on parks in a city per 1,000 residents	(FiSC) database
Spending diversification on parks	HHI of local spending on city parks	
State aid to parks	Per capita state intergovernmental revenues to city parks	BEA
Population density	Total city population divided by land area (in thousands)	Census Bureau
Educated population	The percent of population with a Bachelor degree or higher (in %)	Census Bureau
White population	The percent of population who are white (in %)	Census Bureau

Table 3 Descriptive statistics for variables in the analysis

Variables	Obs	Mean	Median	Std.Dev.	Min.	Max.
<i>Dependent variables</i>						
Park land	317	0.110	0.090	0.085	0.010	0.846
Access	317	0.648	0.640	0.195	0.260	0.990
Playground	317	2.400	2.200	0.989	0.500	7.300
<i>Independent variables</i>						
Nonprofit spending on parks	415	0.004	0.000	0.008	0.000	0.084
City spending on parks	415	0.130	0.107	0.081	0.005	0.404
County spending on parks	415	0.024	0.007	0.032	0.000	0.202
Special district spending on parks	415	0.018	0.000	0.040	0.000	0.248
Expenditure diversification on parks	415	0.405	0.327	0.240	0.000	0.969
State aid to parks	415	1.564	1.350	0.718	0.469	4.445
Population density	481	0.280	0.327	1.183	-2.695	4.277
Educated population (%)	481	0.331	0.310	0.084	0.144	0.607
White population (%)	481	0.513	0.668	0.121	0.287	0.916

Table 4 The percent of park-supporting charities spending on major cities' parks, from 2012 to 2015.

2015	percent	2014	percent	2013	percent	2012	percent
Albuquerque	0.00%	Albuquerque	0.00%	Albuquerque	0.00%	Albuquerque	0.00%
Atlanta	14.88%	Atlanta	12.41%	Atlanta	11.68%	Atlanta	8.67%
Austin	2.58%	Austin	0.16%	Austin	0.99%	Austin	0.70%
Baltimore	17.07%	Baltimore	15.21%	Baltimore	9.06%	Baltimore	9.13%
Boston	6.88%	Boston	14.11%	Boston	12.70%	Boston	14.10%
Charlotte	0.34%	Charlotte	0.11%	Charlotte	0.10%	Charlotte	0.03%
Chicago	0.49%	Chicago	0.71%	Chicago	0.82%	Chicago	0.61%
Columbus	0.37%	Columbus	0.51%	Columbus	0.64%	Columbus	0.56%
Dallas	3.08%	Dallas	3.44%	Dallas	2.39%	Dallas	1.99%
Denver	0.49%	Denver	0.57%	Denver	0.47%	Denver	0.66%
Detroit	5.77%	Detroit	8.77%	Detroit	9.39%	Detroit	9.25%
El Paso	0.03%	El Paso	0.14%	El Paso	0.35%	El Paso	0.26%
Fort Worth	0.00%	Fort Worth	0.00%	Fort Worth	0.00%	Fort Worth	0.00%
Houston	43.02%	Houston	26.65%	Houston	16.34%	Houston	10.64%
Indianapolis	6.59%	Indianapolis	7.24%	Indianapolis	3.24%	Indianapolis	1.25%
Jacksonville	0.20%	Jacksonville	0.16%	Jacksonville	0.18%	Jacksonville	0.09%
Kansas City	0.00%	Kansas City	0.00%	Kansas City	0.00%	Kansas City	0.00%
Las Vegas	0.00%	Las Vegas	0.00%	Las Vegas	0.00%	Las Vegas	0.00%
Long Beach	0.21%	Long Beach	0.95%	Long Beach	0.43%	Long Beach	0.51%
Los Angeles	0.92%	Los Angeles	0.62%	Los Angeles	0.56%	Los Angeles	0.48%
Louisville	11.55%	Louisville	11.45%	Louisville	7.19%	Louisville	6.15%
Memphis	26.86%	Memphis	12.58%	Memphis	11.00%	Memphis	9.82%
Mesa	0.04%	Mesa	0.01%	Mesa	0.02%	Mesa	0.09%
Milwaukee	1.62%	Milwaukee	1.49%	Milwaukee	1.18%	Milwaukee	1.37%
Nashville	6.07%	Nashville	1.30%	Nashville	1.15%	Nashville	1.43%
New York	11.36%	New York	10.85%	New York	7.82%	New York	7.66%
Oklahoma City	0.00%	Oklahoma City	0.00%	Oklahoma City	0.00%	Oklahoma City	0.00%
Philadelphia	2.34%	Philadelphia	1.08%	Philadelphia	8.14%	Philadelphia	5.54%
Phoenix	0.00%	Phoenix	0.23%	Phoenix	0.00%	Phoenix	0.20%
Portland	4.37%	Portland	3.93%	Portland	4.21%	Portland	4.11%
Sacramento	0.00%	Sacramento	0.00%	Sacramento	0.02%	Sacramento	0.00%
San Antonio	0.53%	San Antonio	1.11%	San Antonio	0.67%	San Antonio	0.22%
San Diego	2.50%	San Diego	2.96%	San Diego	1.78%	San Diego	1.71%
San Francisco	4.80%	San Francisco	4.29%	San Francisco	3.74%	San Francisco	4.40%
San Jose	0.43%	San Jose	0.37%	San Jose	0.40%	San Jose	0.44%
Seattle	1.47%	Seattle	0.98%	Seattle	1.19%	Seattle	0.00%
Tucson	0.10%	Tucson	0.12%	Tucson	0.36%	Tucson	0.32%
Virginia Beach	0.04%	Virginia Beach	0.03%	Virginia Beach	0.02%	Virginia Beach	0.04%

Data Source: National Center for Charitable Statistics (NCCS) dataset.

Notes: This is not a complete list of sample cities in the dataset. Only cities with four consecutive years data (2012-2015) have been listed in the table. Cities are listed in an alphabetical order.

Table 5 Fixed effects (FE) regression results

Variables	Park land (1)	Access (2)	Playground (3)
Nonprofit spending on parks	0.224** (0.096)	0.696** (0.313)	4.469 (5.156)
City spending on parks	-0.009 (0.019)	-0.178** (0.078)	-1.895** (0.821)
County spending on parks	0.037 (0.090)	1.111** (0.545)	9.896*** (3.034)
Special district spending on parks	0.138* (0.078)	0.121 (0.239)	-4.871 (3.558)
Expenditure diversification on parks	-0.024** (0.011)	-0.102** (0.039)	-1.228*** (0.403)
State aid to parks	-0.002 (0.005)	0.005 (0.015)	-0.261 (0.226)
Population density (ln)	0.161** (0.070)	0.079 (0.176)	0.850 (3.262)
Educated population (%)	-0.012 (0.060)	-0.115 (0.179)	-2.566 (3.176)
White population (%)	0.140** (0.068)	0.163 (0.147)	-0.410 (1.150)
N (observations)	297	297	297
R ²	0.298	0.458	0.186

Notes: Significance levels indicated by: *p<.10, **p<.05, ***p<.01; two-tailed tests. Robust standard errors in parentheses. City effects and year effects are included. All independent variables are lagged by one year.

Appendix.

Figure 1 Sample cities in the United States in the year of 2015.

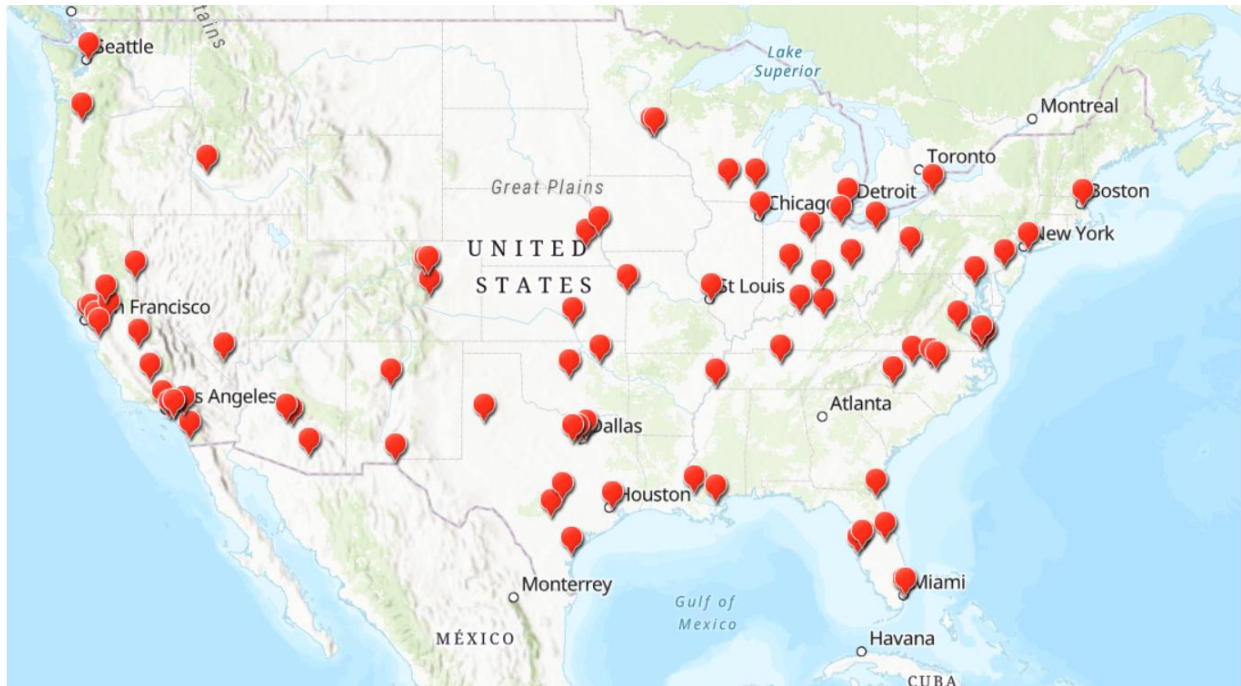


Table 1 Correlation Matrix of Independent Variables.

Correlation	Park land	Access	Playground	Nonprofit spending on parks	City spending on parks	County spending on parks	Special district spending on parks	Expenditure diversification on parks	State aid to parks	Population density	Educated population	White population
Park land	1											
Access	0.2655*	1										
Playground	0.0403	0.2735*	1									
Nonprofit spending on parks	0.1415*	0.2275*	0.1867*	1								
City spending on parks	0.1983*	0.1547*	0.0008	-0.0254	1							
County spending on parks	-0.1861*	0.0359	-0.1186	-0.1032*	-0.0617	1						
Special district spending on parks	-0.0215	0.3387*	0.0938	0.0458	-0.2058*	-0.0089	1					
Expenditure diversification on parks	-0.1635*	0.0573	0.0587	0.2893*	-0.3450*	0.4766*	0.4220*	1				
State aid to parks	0.1158	0.3821*	-0.0426	0.0775	-0.0811	0.0666	0.0825	0.2614*	1			
Population density	0.1611*	0.4855*	-0.01	0.2614*	0.2061*	-0.1620*	0.1283*	-0.1589*	0.1633*	1		
Educated population	0.2846*	0.4033*	-0.0324	0.2050*	0.3080*	-0.1714*	0.0903	-0.066	-0.0879	0.4293*	1	
White population	-0.1557*	-0.2538*	0.0912	-0.1877*	-0.0454	0.2015*	-0.1868*	0.0884	-0.2600*	-0.5245*	-0.1296*	1

Note: The significance level is at 0.05.

Table 2 Random effects (RE) regression results

Variables	Park land (1)	Access (2)	Playground (3)
Nonprofit spending on parks	0.224** (0.114)	0.696* (0.371)	4.469 (6.118)
City spending on parks	-0.009 (0.022)	-0.178* (0.092)	-1.895* (0.975)
County spending on parks	0.037 (0.107)	1.111* (0.646)	9.896*** (3.600)
Special district spending on parks	0.138 (0.093)	0.121 (0.284)	-4.871 (4.222)
Expenditure diversification on parks	-0.024* (0.013)	-0.102** (0.046)	-1.228** (0.478)
State aid to parks	-0.002 (0.006)	0.005 (0.018)	-0.261 (0.268)
Population density (ln)	0.161* (0.083)	0.079 (0.209)	0.850 (3.871)
Educated population	-0.012 (0.072)	-0.115 (0.212)	-2.566 (3.769)
White population	0.140* (0.081)	0.163 (0.174)	-0.410 (1.364)
N (observations)	297	297	297
R ²	0.298	0.458	0.186

Notes: Significance levels indicated by: *p<.10, **p<.05, ***p<.01; two-tailed tests. Robust standard errors in parentheses. City effects and year effects are included. All independent variables are lagged by one year.