

**Provision of Local Public Goods with Spillovers: Implications of Green Open  
Space Referenda**

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THESIS

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## **LIST OF ABBREVIATIONS**

COSP	Consolidated Open Space Plan
CWMTF	Clean Water Management Trust fund
DUTAG	Durham Urban Trails and Greenways Commission
DOST	Durham Open Space Trails Commission
ERCD	Environment Recreation Conservation Department
FCT	Florida Communities Trust
HUD	Housing and Urban Development
NCSL	National Conference of State Legislatures
NRPA	National Recreation Protection Agency
NCADFTF	North Carolina Agriculture Development and Farmland Preservation Trust Fund
NCNHTF	North Carolina Natural Heritage Trust fund
NCDENR	North Carolina Department of Environment and Natural Resources
OMB	Office of Management and Budget
POSE	Partners for Open space and Environment
PRA	Park And Recreation Agencies
PARTF	Parks and Recreation Trust fund
TLC	Triangle Land Conservancy
TPL	Trust for Public Land

# 1. INTRODUCTION

## **1.1 Background**

Green open space is an important amenity that affects the *quality of life* offered by a local government. Green open space not only increases property values (Anderson *et al*, 2006; Nicholls, and Crompton, 2005; Asabere and Huffman, 2009) it also provides public health benefits (Tzoulas *et al*, 2007) and ecological services (Wolf, 2008). In the last two decades local governments have found overwhelming support for the creation of green open space through referenda (Lubell *et al*, 2005).

Referenda are tools of direct democracy. They are “proposals to repeal or enact laws or constitutional amendments placed on the ballot for approval or rejection by the electorate” (Initiative and Referendum institute, 2011). Data collected by the Trust for Public Land (TPL) shows that from 1988 local governments in the US have voted on 2,331 open space<sup>1</sup> referenda of which 1,754 were successful. About 87 percent (2031) of the ballot measures were voted on in the last two decades (1990-2010).

Two plausible explanations for the popularity of green open space referenda are increasing ‘growth pressure - civic environmentalism’ (Knopman *et al*, 1999) and, amenity based competition (Rogerson, 1999; Lambiri *et al*, 2007). Most academic inquiry on local green open space referenda has centered on the former. Conclusions from empirical inquiries have comprehensively identified the median voter demand factors associated with occurrence of successful green open space referenda.

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<sup>1</sup> The term open space is consistent with TPL terminology and other published studies (Kline and Wilchens, 1994; Nelson *et al*, 2007). I adopt the term green open space in the study.

Other explanations for the occurrence of green open space referenda, including the role of amenity based competition, have not been explored in the literature. Research from public administration has shown that spillovers from public goods provision results in fiscal and policy interdependence among neighboring local governments (Brueckner, 2003).

This dissertation focuses on the role of green open space referenda in spreading information about green open space policies in a region. Information is generated as part of the campaigning conducted before a green open space referendum is voted on (Kelly and Zieper, 2001; McQueen and McMahon, 2003). Campaigning and adoption of a referendum generates an information flow to the neighboring elected representatives and voters about the offered change in tax/services bundles for referendum government citizens.. It is expected this information would facilitate a comparative performance of neighboring governments by its voters, also called a yardstick competition which leads to policy dependence.

A successful green open space referendum creates additional public goods in a region. In this process, the produced benefit spillovers promote a yardstick competition effect or a free riding behavior among neighboring jurisdictions. As a result it is possible to observe fiscal interdependence among neighboring governments. The research on green open space has not ventured into the areas of fiscal and policy outcomes including interdependence that could be affected by the occurrence of green open space referendum.

The phenomenon of green open space referendum is unique to the US<sup>2</sup>. Even amidst growing economic uncertainty 112 green space referenda were voted on in the last three years (2009-2011). Of these 78 referenda were successful. In the context of continued popularity of the

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<sup>2</sup> The occurrence of green open space referenda is only observed in the US. Recent research on green open space provision by governments in Europe acknowledge the potential of interjurisdictional competition among local governments to promote voluntary actions by local governments in creating green open space (Choumert and Cormier, 2011).

green open space referenda it is necessary to expand the literature on how referendum decisions translate into policy implementation and expenditure effects.

This dissertation examines three research questions related to fiscal and policy effects of green open space referendum. Two of the three questions concern expenditure effects of the green open space referenda. Specifically I ask: *How does a successful referendum affect local government's green open space expenditures?* and *Does a successful referendum affect neighboring governments' expenditures on green open space?* The third question explores the causes of successful referenda. Figure 1 presents the spatial distribution of successful

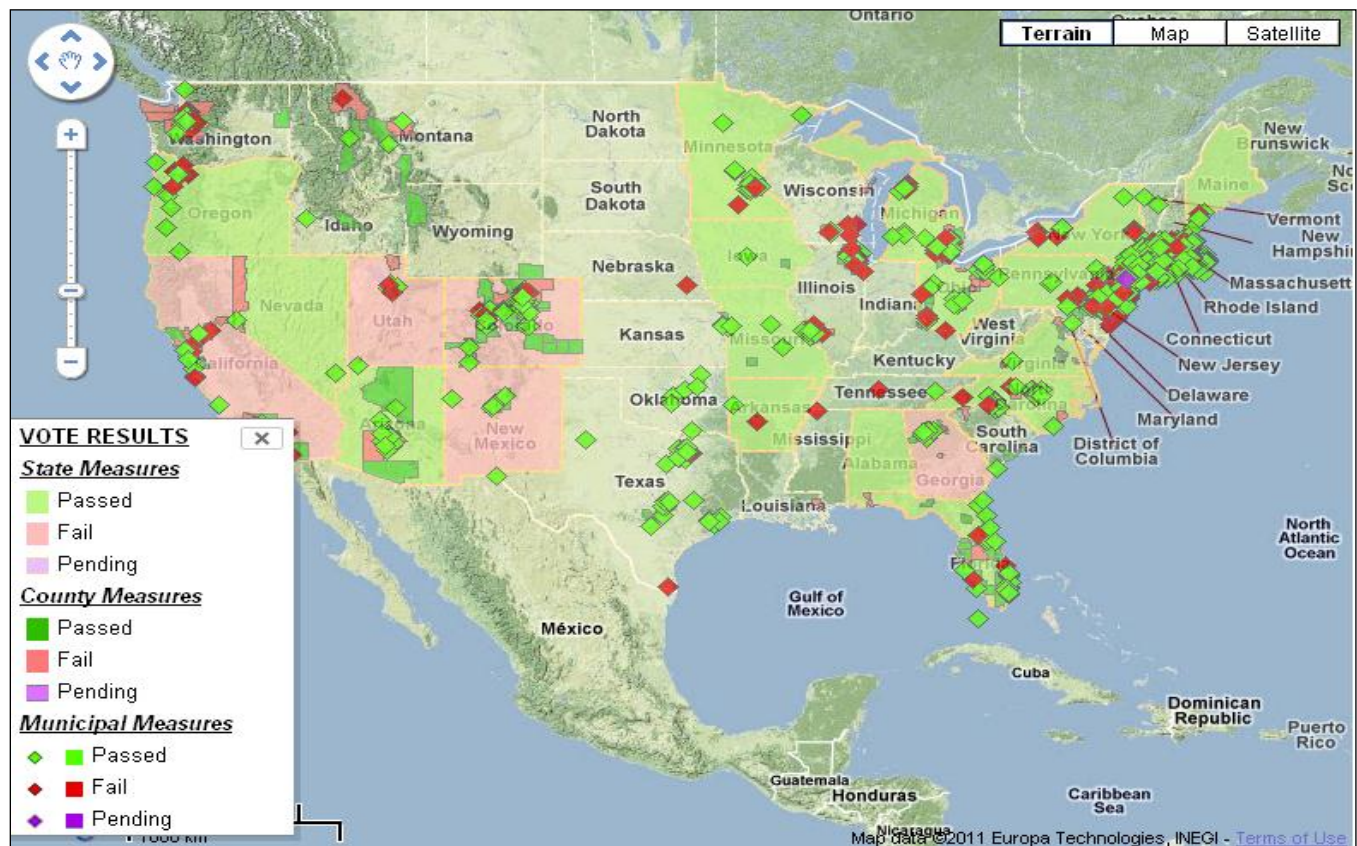


Figure 1: The spatial distribution of green open space referenda from 1988 to 2011

referendum across states. The distribution of successful referenda shows that the green open space referenda agglomerate in specific regions. Studies have identified demand factors that predict the occurrence of referenda. However there is no examination of how governments in regional proximity consider the same policy tool for green open space creation. The policy question examined in this dissertation is: *By which mechanisms do successful green open space referenda diffuse in a region?*

The spatial plot of the referendum occurrences [figure 1] shows regional concentration of successful referenda. Such distribution increases the potential for adjacency effects. Previous studies have concluded that spatial policy dependence is a result of shared contextual factors, resources or incentives (Moscone and Knapp, 2005). The regional concentration of green open space referenda and conclusions about adjacency effects prompt an inquiry into how referenda is brought for a vote by multiple governments in the same region. Chapter three examines the question of mechanisms responsible for the diffusion of successful green open space referendum in a region.

A qualitative research design is adopted to answer this question. Interview data along with content analysis of published records helps to identify diffusion mechanisms. The results show domination of two policy diffusion mechanisms namely policy learning and incentives. This finding is useful for stakeholders who are interested in promoting voluntary action to preserve more green open space in municipal actors.

The first empirical analysis presented in chapter four examines the effect of referendum on own green open space expenditures. Expenditures for referendum cities, from six different

states in the US, is examined for a period of ten years (1996-2006). Results show that municipal expenditures on green open space are significantly higher after the referendum. This finding is important for the literature on green open space referenda because it tests an assumption in literature<sup>3</sup>. The analysis finds that financing instruments influence the per capita expenditures change caused by green space referenda. Bond financing yields a positive and sustained expenditure slope compared to property taxes finance.

The second empirical chapter studies the effect of green open space referendum on neighbors' expenditures. Research has shown that jurisdictions alter their expenditure levels due to the positive or negative spill-ins from neighboring jurisdictions. As a result interdependency in fiscal behavior can be detected in a regional space (Case *et al*, 1993). Local governments in Florida are used as a case study for this question. Data shows that neighboring cities in a ten mile radius increase their expenditures with an increase in the number of green open space referenda. The spatial dependence of green open space expenditures is found to vary with the number of referendum in the region.

The dissertation is structured to feature three independent yet connected questions arising from green open space referendum. The green open space literature is still evolving. However questions of expenditure and policy effects of green open space referenda have not been explored in literature. The dissertation provides insight into how policy developed through direct democracy affects expenditures for a government. The effect of information spillovers, generated in the process of referendum, on strategic expenditures response by neighbors is also studied. A policy implication of this finding is that green open space referendum can be viewed as tools to boost total regional expenditures on green open space. The dissertation also provides an insight

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<sup>3</sup> Increase in expenditures signal either creation of new goods or extension of services both of these are required conditions for the assumption of benefit spillovers becoming available to the neighbors.

into how spatially proximate green open space referenda are an outcome of policy diffusion mechanisms. This finding provides an alternative explanation for the occurrence of green open space referenda. In literature referenda are perceived to be an outcome of citizen demand. This finding presents referenda as a result of institutional factors along with median voter demands.

The dissertation is organized in the following manner. The next chapter, Literature Review, introduces the existing research which supports inquiry into the three aforementioned questions. It features the methodology section of dissertation which outlines the research approach adopted for the three analysis chapters.

Chapter three presents the analysis for the first question. It is a qualitative inquiry on green open space referendum diffusion. The chapter is followed by the two empirical chapters, four and five, that are exclusively concerned with the effect of referendum on green open space expenditures. Concluding thoughts and directions for future research are presented in chapter six.



## 2. LITERATURE REVIEW

### 2.1 Introduction

In US the local governments provide many public goods. The provision of such goods enables interjurisdictional competition and residential sorting among regional local governments (Tiebout, 1956; Oates, 1999). Green open space is included in the bundle of goods provided by the local governments. There is no single definition of what constitutes green open space. As Backlund *et al* (2004) have found the perception of what constitutes green open space varies among citizens and researchers. In published literature green open space is termed as *open space*, *green space*, or *public green space*<sup>4</sup>. In this study I use the term *green open space* and adapt the definition Backlund *et al* (2004). I define green open spaces as publicly accessible natural areas, parks and recreation areas, wildlife habitat, and lakes and streams<sup>5</sup>.

Historically governments have adjusted the supply of public goods on the basis of public demand that filters up through elected representatives (Bergstrom and Goodman, 1973; Deacon and Shapiro, 1975; Holcombe, 1980). In some cases governments present proposal for public goods provision through ballot measures. These ballot measures are viewed as instruments of direct democracy i.e. the unmediated public opinion expressed through majority voting.

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<sup>4</sup> The literature uses three different terms to describe green open spaces. The most widely used term is *open space*, this term is consistent with use by Trust for Public Land and some peer reviewed literature (Kline and Wichelns, 1998; Nelson *et al*, 2007). There is no operational definition of open space provided by the literature. The other term in use is public green space (Choumert and Cormier, 2011) which is defined as open spaces... primarily covered by vegetation which are directly (active or passive recreation) or indirectly (positive influence on the environment) available for users (Levent-Baycan and Nijkamp, 2005)

<sup>5</sup> Agricultural areas are not considered green open spaces because they are not accessible to the public.

Over the last two decades there has been a notable increase in the number of ballot measures for creation of additional green open space. In general ballot measures serve a range of roles from being strictly advisory to seeking voter approval for an increase in government's resources through sale of bonds or tax increases. In the US green open space ballot measures have unequivocally approached the public to increase the revenue sources available to create additional green open space<sup>6</sup>. Above 75 percent of such ballot measures have been ratified over the last two decades. The popularity of green open space referenda and its unique method of supply through direct public participation make it a subject of research in public administration and public finance.

## **2.2 The Benefits of Green Open Space**

Green open spaces like parks, ball fields and greenways are valued amenities. Provision of green open space involves positive spillovers and joint products, i.e. private and public goods. (Revelli, 2003) classified green open space as an impure public good<sup>7</sup>. Green open space goods are consumed by residents and non residents in varying degrees<sup>8</sup> resulting in a different set of localized and regional benefits.

Another way to categorize benefits obtained from green open space is to classify the categories of benefits received. This characteristic of green open space is termed as co-occurrence of benefits<sup>9</sup>(Ahern, 2002). Localized benefits are classified into *fiscal benefits*, gained in the form of increased property values (Fausold and Lilieholm, 1999; Nicholls and Crompton, 2005; Anderson and West, 2006; Asabere and Huffman, 2009; Heintzelman, M.,

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<sup>6</sup> About 45 percent of successful referenda are financed by bonds, compared to 39 percent that are financed by property taxes. Other financing mechanisms include 7 percent by sales taxes and 3 percent by income taxes.

<sup>7</sup> A good that generates both public and private benefits (Kotchen, 2005)

<sup>8</sup> Furseth and Altmann (1991) found that local greenways drew 21 percent of its users from a distance of over 5 miles.

<sup>9</sup> That ecological, physical, recreational and cultural resources are spatially concentrated (Ahern, 2002: 37)

2010), and *aesthetic benefits* which are public and occur in the form of amenity and existential value (Brueckner, 1998; Smith *et al*, 2002), quality of life, health, economic development and nature conservation (Lambiri *et al*, 2007; Tzoulas *et al*, 2007). Green open space also contributes to *community benefits* by increasing the cohesiveness among residents (Wolf, 2008).

The regional *ecological benefits* derived from green open space come in the form of avoided environmental costs, and enhanced ecological benefits like increase in the water table, better air quality etc. (De Groot, 1994; Stanners and Bourdeau, 1995; Wolf, 2008).

### **2.3 Quality of Life and Green Open Space**

The competitive behavior of local governments with regard to tax and expenditure decisions is an established ‘public choice’ concept (Breton, 1998). Complementary observations in urban economics literature note that the ‘quality of life’ offered by a city determines its competitiveness for capital and human resources (Lambiri *et al*, 2007). Empirically, *urban growth* and *productivity* have been associated with positive quality of life, and favorable environmental quality in particular (Nelson, 1978; Marans and Mohai, 1991; Rudzitis, 1999). Theories of urban development have moved beyond the industrial framework of intensive land use for maximizing rents (Molotch, 1976) and now focus on how amenities spur urban growth (Logan *et al*, 1997; Molotch *et al*, 2000).

Upon studying the migration decisions of people, it was found that ‘quality of life’ played an important role in deciding residential location (Wingo, 1973; Rogerson, 1999, Shapiro, 2006, Ezzet-Lofstrom, 2006). The importance of environmental quality in citizen’s locational decisions is summarized by Marans (2003) as:

“...[as] urban areas continue to grow throughout the world, it is likely that the quality of cities and their suburbs and the quality of ambient environment will become even more important in defining quality of life.”

U.S. economy is dominated by the services sector, which employs higher educated, high income, human capital that values amenities like environmental quality. “The important local amenities are no longer schools, churches and neighborhood associations...a residential population of young professionals with more education and fewer children create a social profile geared towards recreation and consumption concerns”. (Clarke *et al*, 2002: 500). Green open space offers many recreational opportunities like parks, trails, hiking, wildlife habitat etc.

It is plausible that the decision of a local government to hold a green open space referendum is an attempt by the government to improve its ‘image’ and competitiveness by enhancing the basket of ‘amenities’ that highly educated, mobile, tax paying citizens seek. Governments can rely on the campaigning process involved in the referendum process to disseminate the information about its green open space policies.

The overwhelming citizen support received by green open space referenda signal that green open space is a valued amenity and is increasingly being preferred by the citizens.

## **2.4 Trend in Green Open Space Referenda Literature**

Green open space literature is multidisciplinary and reflects the variety of benefits obtained from this group of goods. Primarily the disciplines of public economics and urban planning have been associated with the study of green open space and referendum successes. Some research has also been linked with the disciplines of urban sociology and public health.

The majority of research on green open space referendum describes the success of referendum measures. Public voting data has been used to make inferences about individual demands for public goods (Borcherding and Deacon, 1972; Bergstrom and Goodman, 1973; Baumgardner 1993; Turnbull and Djoundourian, 1993) including environmental goods (Nicholls

and Crompton, 2005; Murdoch *et al*, 1993; Bates and Santerre, 2001; McAusland, 2003). The framework to determine the demand for environmental goods was outlined in Deacon and Shapiro (1975). The authors modified the ‘median voter model’ by using referendum voting data as the dependent variable instead of average expenditures. The use of referendum voting data helps to approximate the revealed preference for the public good.

Studies examining the demand for green open space, have adopted Deacon and Shapiro’s (1975) methodology<sup>10</sup>. Voter characteristics like income, education, homeownership, family size, race and political ideology have been found associated with the likelihood of a successful green open space referendum (Kline & Wichelns, 1994, 1998; Kline, 2006; Bates and Santerre, 2001; Halbheer *et al*, 2006; Kotchen and Powers, 2006; Nelson *et al*, 2007; Bornstein and Thalmann, 2008; Bornstein and Lanz, 2008; Banzhaf *et al*, 2010<sup>11</sup>). The majority of published research concerning green open space referendum is dedicated to identifying the determinants of successful referendum.

A parallel research track visible in the literature is contributed by the urban planning literature and echoes the opinion of smart growth advocates. The common view adopted in this group of research studies is that changing land use patterns<sup>12</sup> trigger the demand to preserve land. Increasing population density, rapid development and loss of open space prompt preventive measures in the form of a referendum to protect undeveloped land. Studies have found that green

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<sup>10</sup> Studies have used contextual variables to improve the explanatory power of the model. Some variables used in the studies are physical locational characteristics, employment in construction and industry, environmental disamenity, percentage migrant population, environmental substitutes, advocacy organizations, tax rates, general economic conditions and land ownership to estimate demand for environmental goods (Dubin *et al*, 1992; Kahn and Matsusaka, 1997; Halbheer *et al*, 2006).

<sup>11</sup> This is not an exhaustive list of studies on green space.

<sup>12</sup> Studies found in urban planning propose that demand for protection of green space originates from the problem of sprawl and increasing population density. These studies include location specific characteristics like -inclusion of farmland protection, availability of state/federal protected lands, proximity to high amenity natural areas, and open space loss, along with individual income and education as the explanatory factors (Staley, 2001; Romero and Liserio, 2002; Howell-Moroney, 2004). The conclusion that open space conservation promotes growth management has been challenged in literature (Wu and Plantinga, 2003)

open space ballot measure are common in communities who have access to green open space, who recognize its value and take steps to preserve it. Green open space referenda are associated with local government efforts of growth management. (Romero and Liserio, 2002; Howell-Moroney, 2004; Kotchen and Powers, 2006; Nelson *et al*, 2007; Schmidt, 2008).

A separate set of inquiries in the literature originating from urban design and public health disciplines include green open space planning and allocation (Wu and Plantinga, 2003; Maruani and Amit-Cohen, 2007). Allied to this research area are inquiries of green open space access by different age and income groups (McGonagle and Swallow; Heynen *et al*, 2006; Hillsdon *et al*, 2006; Schmidt and Paulsen, 2009).

The role of local governments in green open space referendum process has not been addressed by any published study. Existing research presents governments as conduits of green open space supply. It does not consider an entrepreneurial role of the government commonly assumed in studies on economic development and tax policy (Wasylenko, 1997). The presence of spatial agglomeration of green open space referenda, shown in figure 1 (pg. 3) supports an interjurisdictional strategic interaction inquiry (Brueckner, 1998; 2003). In general the questions that need to be addressed are *how do green open space referenda cluster?* and *what expenditure effects do they have on governments?*. In the next section I present the research questions for the study.

## **2.5 Research Questions**

Green open space policies are determined by the ‘policy capacity’ of the local governments (Press, 2002). Local initiative in protecting green open space is influenced by public demand along with the state policy environment. State policies such as fiscal incentives

stimulate local initiatives to protect green open space. Alternatively state owned preserved land crowds out local investment in green open space (Bates and Santerre, 2001).

Figure 1 (pg.3) shows the geographic distribution of local government referenda in the country from year 1988 onwards. As previously noted the spatial aggregation of referenda is a distinctive feature which has not been examined in the literature. The geographic proximity of green open space referenda measures indicates a regional effort to preserve land. This is a result of similar policy positions adopted by neighboring governments.

From studies in policy literature it is known that spatial dependence of policies and policy instruments are motivated by one or more of the following mechanisms, namely *coercion*, *competition*, *learning* and *imitation* (Elkins and Simmons, 2005; Shipan and Volden, 2008).

*Coercion* denotes a vertical direction of government interaction through which policies are dictated by a hierarchically superior institution. Coercion is channeled through a set of carrots and/or sticks. The latter is visible in the form of strict regulations and strong penalties while set of incentives offered to promote a desired behavior is an example of the carrots approach (Franzese and Hays , 2007). In this dissertation I will be focusing on the role played by incentives, as a form of coercion, to stimulate desired policy response.

The mechanism of *competition* is supported by theories of interjurisdictional competition that predicts mimicking of policy positions among neighboring governments to maximize revenues. In public policy literature *learning* refers to adaptation of a successful policy position to the local context with the expectation of similar outcomes. It is one of the most widely examined mechanisms of policy diffusion. It involves satisficing where the rational decision makers look to other successful examples as a heuristic aid. *Imitation* as a policy diffusion

mechanism is understood when contrasted with learning. Unlike learning, in imitation there is no customization of policy content or instrument to suit local context.

Literature on local government co-operation to solve regional environmental problems has shown that local governments can adopt the same policy. . Green open space unlike air and water is not a pure public good. Secondly there are no prescribed directives on land preservation. In this context, voluntary adoption of similar policy tool by multiple governments in a region justifies an inquiry into the mechanism that could be responsible for the clustering of referenda. The first question considered in this dissertation is,

**Research Question 1: Which policy diffusion mechanism contributes to the occurrence of multiple referenda in a region?**

Public land use decisions are not solely determined by public demand. Theoretically, fiscal decision<sup>13</sup> making in a local government has been approached in three ways. A view given by Westhoff (1977) and Rose-Ackerman (1979) posits that, majority voting shapes community tax and spending policies. A competing view suggested by Wildasin (1979) and Brueckner (1979), proposes that local policies are chosen to maximize aggregate property values in a community. A potential synthesis of these two views is found in the *homevoters hypothesis* which suggests that homeowners vote to maximize their home values (Fischel, 2005). The third alternative view built on the work of authors like Molotch (1976) and Hall and Hubbard (1996) that assigns an entrepreneurial image to local governments and discusses the role of private actors. The median voter approach is congruent with the first view of government fiscal decision making where policies are decided by the choice of majority voting. The remaining views promote a strategic image of local governments in pursuit of maximizing the taxable resources in

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<sup>13</sup> A land use decision is inherently fiscal in nature, or what is called as the ‘fiscalization of land use’ (Lewis, 2001).



their jurisdiction<sup>14</sup>. The literature helps to argue that public goods are provided not only in concert with local demand, but also serve as a means to attract new residents<sup>15</sup>. It is plausible that cities hold green open space referenda not only to meet local demand but also to signal the availability of a higher quality of bundle of goods. This leads to the expectation that the policy diffusion mechanism of *competition* will be evident in the context of green open space referenda diffusion. The role of *learning*, *incentives* and *imitation* cannot be dismissed in the context of green open space referenda diffusion.

Invariably, it is assumed that any local government that experiences a green open space referendum will improve on its bundle of green open space goods. The improvement in the availability of green space goods is associated with higher quality of life, attracting high income residents and increasing the competitiveness of the jurisdiction. One way in which changes in green open space bundle is examined, is through changes in the expenditures after the occurrence of a referendum. The link between referendum occurrence and change in expenditures has not been empirically verified. The second question addressed in this dissertation is,

**Research Question 2: What is the effect of a referendum on own expenditures on green open space?**

It is important to empirically link expenditure changes with occurrence of referendum to transition into the third question considered in the dissertation. The third question considers the

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<sup>14</sup> Theoretical constructs which promote a self interested image of bureaucrats include Niskanen's theory of the budget maximizing bureaucrat (Niskanen, 1975). On the basis of principal agent theory, Niskanen proposed that bureaucrats are rational individuals interested in maximizing their profit, i.e. the budget of their agencies. In order to achieve this, bureaucrats propose an inflated budget to the legislature, which lacks sufficient information to verify the budget estimates. This results in the bureaucrats getting their way and is ultimately linked with the growth of government sector (leviathan hypothesis). Further modification of self interested bureaucrat is visible in the agenda setter model in which the bureaucrats present a budget which has the highest likelihood of getting accepted by the voters when compared with status quo (Flowers, 1981).

<sup>15</sup> Fiscal policies are also designed with mobile capital in mind. There is expansive literature on local fiscal policies, competition for capital and provision of public goods. For some leading conclusions refer to Oates(1999).

role of referendum as an information shock in a region and examines the effect of green open space referenda on neighbor's expenditures on green open space.

Local government strategic interactions have been modeled through studies in *tax competition* (Wildasin, 1986); *spill over-externality model* (Case *et al*, 1993) and *political agency or yardstick competition model* (Besley and Case, 1995; Bivand and Zymanski, 2000)<sup>16</sup>.

Literature on strategic interaction among local governments is extant and dominated by investigations of horizontal tax competition (Ladd, 1992; Case *et al*, 1993; Brueckner and Saavedra, 2001; Hendrick *et al*, 2007; Pinto, 2007). More recent work in this area has examined the vertical and horizontal dimensions of tax competition (Madiès *et al*, 2004; Foucault *et al*, 2008; Wu and Hendrick, 2009).

Tax competition is the extensively examined strategic behavior among governments. Expenditures are equally important fiscal tools available to local governments and have the potential to stimulate strategic behavior among governments<sup>17</sup>. Yet there have been only a handful of studies in the US that have considered expenditure competition (Gordon and Wilson, 2001) or empirically examined it (Murdoch *et al*, 1993; Turnbull and Djoundourian, 1993; Keen and Marchand, 1997, Rincke, 2007; 2009). From the work of Peterson (1981) in *City Limits* it is shown that local governments increase developmental expenditures to increase their competitiveness.

Due to the association between green open space and city development, using Peterson's (1981) criteria, green space goods would constitute 'developmental' expenditures. From the

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<sup>16</sup> According to Brueckner (2003) strategic interaction models can be split into *spillover models* and *resource flow models*. Pollution externalities are an example of spillover models, and models of tax and welfare competition represent resource flow models (Saavedra, 2000).

<sup>17</sup> Local governments have been found to engage in strategic interactions in policy areas like, land use change (Brueckner, 1998), mental health expenditures (Moscone and Knapp, 2005) and education policies (Rincke, 2007).

review of Peterson (1981) it is expected that developmental expenditures promote strategic behavior. Empirically, Murdoch *et al* (1993) examined expenditures on parks and recreation for 85 cities in Los Angeles region and found evidence of complementary strategic expenditure interaction. The authors found that an increase in parks and recreation expenditures for a city stimulate its neighboring cities to follow suit. Similar conclusions for parks and recreation expenditures have been drawn from the study of 161 cities in France (Choumert *et al*, 2007) and 205 cities in Czech Republic (Gregorova and Gregor, 2007). However Hanes (2002) and Lundberg (2006) have concluded that there is a strategic substitution relationship between jurisdictions. This means that neighboring cities free ride on the benefit spillovers experienced due to the expenditure increases by a city.

The change in expenditures and benefit spillovers from the creation of additional green space goods promote the likelihood of strategic behavior from neighboring local governments. The third question addressed in this dissertation is,

**Research Question 3: What is the effect of a referendum on neighbors' expenditures on green open space?**

## **2.6 Methodology**

The three research questions outlined for examination in this dissertation justify a mixed methods research. Questions one and three are concerned with a regional phenomenon, while question two is a more generalized inquiry. Question one investigates the mechanism (s) of policy diffusion responsible for multiple referenda occurrences in a region. Question three concerns the strategic behavior of neighboring governments in response to expenditure increases and benefit spillovers after the referendum.

Question one is exploratory and requires investigation into the diffusion of green open space referendum. The qualitative methodology is useful in understanding green open space referendum diffusion. Use of secondary data for this inquiry will not be helpful because it would not capture the role played by political actors and policy entrepreneurs. Therefore a qualitative case study research design is adopted to answer question one. Two metropolitan areas in North Carolina, which show multiple referenda, are chosen to investigate this question.

Question two is an inquiry into change in expenditure levels on green open space goods before and after the referendum. An interrupted time series research design is adopted to examine the changes in expenditures on green space good. The analysis examines local government expenditure data for a period of ten years to observe differences in trend attributable to green open space referendum.

Question three is an empirical inquiry into the expenditure reaction of neighbors after the occurrence of a green open space referendum. A quantitative research methodology that tests for the presence strategic interaction between neighboring governments is adopted. The investigation of strategic expenditure responses is carried out at the regional and metropolitan level. To limit the influence of contextual variables the empirical inquiry is limited to data from one state. Local government expenditure data for the state of Florida is examined to observe neighbors expenditure responses to green open space referendum.

In the next chapter I present the qualitative analysis for the first question.

### 3. GREEN OPEN SPACE REFERENDUM: DETECTING POLICY DIFFUSION MECHANISM IN NORTH CAROLINA LOCAL GOVERNMENTS

#### 3.1 Introduction

Decentralization of environmental policy making has been a long standing debate in the literature (Schwab 1988, Levinson, 1997; Kuncie and Shorgen 2005). Provision of environmental goods is accompanied by spillovers. Clear definition of property rights solves the problem of spillovers. However the issue is complicated because natural resource boundaries rarely coincide with political boundaries. This dissertation concerns *land* and its protection. Being a localized environmental resource *land* is not prone to jurisdictional issues and has historically been managed and protected by local governments (Platt, 2004).

The involvement of the federal government in land protection has been through its different agencies. Bureau of Land Management's National Landscape Conservation Program has the mission to "conserve, protect, and restore ....nationally significant landscapes ...[of] cultural, ecological, and scientific value". Through this program significant green open spaces like the Red rock canyon and the Sonoran desert are preserved (Bureau of Land Management, 2011).

The national park system protects over 84 million acres of parks across the country. The federal government also offers grants to subnational governments for the protection of land resources (Zube, 1995). Even though the federal government manages land resources across the country, the bulk of responsibility to plan, manage and maintain land resources rests with the local governments<sup>18</sup>.

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<sup>18</sup> Local governments shape and plan their land resources through euclidean zoning (Platt, 2004:262-3) on the basis of police powers of the granted to state and local governments through the tenth amendment.

In the late 1990s and early 2000s local governments displayed an increased activity in land preservation through public referenda (Hooper and Cook, 2004). The noticeable focus on land preservation by governments coincides with rising civic consciousness about maximizing quality of life (McCann, 2004; Lambiri *et al*, 2007) through environmental goods. In literature this notable shift towards environmental protection has been termed as ‘civic environmentalism’ and the rise of New Political Culture in literature (O’Connell, 2008)<sup>19</sup>. The evidence of transformed government priorities is visible in how governments embrace the idea of smart growth (O’Connell, 2008), climate change (Wheeler, 2008) and land conservation (McQueen and McMahon, 2003) which prioritize environmental quality. The rise in land preservation within urban areas through referendum supports the observation of a new political culture and shifting priorities of governments.

The observation of referendum occurrences in US [figure 1, pg. 3] reveals two characteristics. First, referenda occurrences are proximate. Second they more frequently occur in counties that have experienced a referendum. Green open space referenda appear to be a regional event.

Clusters of green open space referenda is similar to policy clusters formed after policy diffusion in a region. Essential step mediating policy diffusion is the spread of information (Rogers, 2003). In the case of green open space referenda, the occurrence of a referendum provides the necessary information through the campaigning process that is conducted with the help of mass media resources. The availability of information promotes awareness and gives momentum to issue networks within neighboring jurisdictions to initiate a similar discussion in their jurisdiction. Regional clustering of referenda implies that neighboring jurisdictions with

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<sup>19</sup> New Political culture emphasizes issues rather than political parties (Clark, 1998) and a lifestyle in which environmental issues take pre-eminence (Inglehart, 1997).

successful referendum share similar land preservation policy goals. This creates spatial dependence in policy choices<sup>20</sup>.

Previous studies have shown that spatial policy dependence results from contextual factors or a demonstration effect among local governments (Moscone and Knapp, 2005). A set of directives or incentives received from a higher tier government may induce policy dependence as well (Revelli, 2002; Shipan and Volden, 2006).

The literature on green open space referendum has not explored the spatial agglomeration observed in figure 1(pg.3). It is plausible that green open space referendum cluster in a region due to overlapping boundaries of an environmental resource. For example a joint action to protect a wetland would require all governments along the boundaries to adopt similar policy goals and tools. Referendum clusters could also result from a shared resources effect seen in the context of intergovernmental grants. For example, the state of New Jersey has an incentive matching grant program for land protection. It is not a coincidence that New Jersey also has the highest number of municipal green open space referendum in the country (Solecki *et al*, 2004). Finally, referenda clusters could simply be a result of similarity in demand for more environmental goods (Fieock and West, 1993).

In the published literature on green open space referenda, advocacy organizations like the Trust for Public Land and Nature Conservancy have highlighted the need for green open space (Sherer, 2006) and the strategy of organizing the referenda (McQueen and McMahon, 2003; Hopper and Cook, 2004). However, the cause of spatial agglomeration of green open space referenda has been unexplored in advocacy literature as well as peer reviewed research. This

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<sup>20</sup> Homogeneity in regional policy choices is not a new idea and has been widely studied in the political science literature (Franzese and Hayes, 2006).

chapter explores the policy diffusion mechanisms through which green open space referendum are adopted by governments in a regional space.

### **3.1.1 Importance of Research Question**

This chapter sheds light on two related questions

1. Which mechanisms of policy diffusion are identifiable among local governments holding a green space referendum in the region?
2. Which diffusion mechanism is responsible for the referendum clusters observed in the regional space?

Studying the mechanism of referendum adoption and subsequent referenda diffusion in a region is important for the field of public administration and public policy. The question relates to the emerging field of subnational policy diffusion mechanisms.

The usefulness of the study is that it identifies the mechanism that drives the local governments to voluntarily adopt favorable environmental policies like green open space referenda.

The analysis will highlight the role of risk taking among elected officials by examining multiple referendum in a region. The decision to hold a referendum is important and has political repercussions for the elected officials. If voters view the referendum as unnecessary spending and perceive elected officials as fiscally irresponsible, then they hold them accountable by voting them out of office (Hirschmann, 1970). On the other hand, if a referendum is in line with public demand then the political payoff is substantial in terms of achievement of the administration and legacy of the elected officials.



I shed light on these issues by collecting interview data from representatives from cities in a region that has multiple referenda. Document search and content analysis of popular media provide other sources of information in the analysis.

The remaining part of the chapter is arranged in four sections. In the next section, I survey theoretical and empirical conclusions related to policy adoption and diffusion. Section three conveys the research design of the study and introduces the case study area. Section four presents the analysis. In the final section, I discuss the findings and present relevant inferences.

### **3.2 Policy Diffusion among Governments**

Policy diffusion is defined as the, “pattern of successive or sequential adoption of practice, policy or program” across different units of government (Eyestone, 1977 cited in Freeman, 2007). Policy diffusion is an umbrella term that concerns the transfer of policies across governments. The study of policy diffusion cuts across government hierarchies. Researchers have examined the diffusion of policies at international, national and local government levels. Evidence of international policy diffusion is found in studies of international relations (Gilardi, 2010). At the national and local government levels, policy diffusion has been examined among governments in the same tier (*horizontal*), as well as (*vertical*) top-down and bottom-up (Boehmke and Witmer, 2004; Shipan and Volden, 2006).

The theory of policy diffusion borrows heavily from the theory of technological innovation diffusion given by Rogers in 1962 (Rogers, 2003). Essentially, Roger’s theory is based on the model of social learning (Mooney, 2001) and is recognized by distinct steps in the process of innovation diffusion. At first, there is *knowledge* of the innovation, followed by *persuasion* where innovation is viewed as an advantage. Persuasion leads to *decision*, *implementation* and a feedback loop of *confirmation* that asserts the positive change induced by

the adopted innovation. Earlier literature in policy diffusion was dominated by the systems perspective (Walker, 1969). However, with an expansion of scholarship it is now known that diffusion is a complex non linear process (Karch, 2007).

A government's decision to adopt a policy is affected by internal (*push*) and external (*pull*) factors (Berry and Berry, 1999). A prominent internal factor is 'realized need' for a policy adoption in the community (Feiock and West, 1993). Other 'internal' factors for policy diffusion include city wealth, city size, political ideology, severity of the issue, and pressure from advocacy groups (Walker, 1969, Crain, 1966; Gray, 1973; Nalbandian, 1989; Daley and Garand, 2005; Grossback *et al*, 2004; Shipan and Volden, 2006; ).

The role of external factors in policy diffusion has been examined following Walker (1969). Scholars have found that geographical proximity and ideology are important factors contributing toward policy diffusion (Walker, 1969; Berry and Berry, 1999; Feiock and West, 1993; Graham *et al*, 2010). Other factors include intergovernmental grants (Welch and Thompson, 1980) and activity of interest groups and professional networks (Mintrom, 1997; Mintrom and Vergari, 1998; Mossberger, 2000; Balla, 2001).

### **3.2.1 Mechanisms of Policy Diffusion**

Policy decision is partly a function of the type of public policy being considered (Gray, 1973), along with a host of political factors including the activity of interest groups, action of neighboring jurisdictions, and the presence of a policy entrepreneurs (Mintrom, 1997). In the case of green open space, due to its implication on growth and development opportunities<sup>21</sup>, the question of what motivates local governments to pursue land conservation is intriguing.

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<sup>21</sup> Land conservation reduces developable land in a locality. Therefore, the decision to conserve land within corporate limits of a jurisdiction has implications for growth and economic development (Platt, 1972).

Although policy diffusion has been examined in a number of subfields related to political science, literature in policy diffusion is mainly empirical and without a unified theoretical framework (Glick, 2011). Recently research in the field has concentrated on the mechanisms through which policies diffuses (Braun and Gilardi, 2006; Shipan and Volden, 2008). Empirical evidence has shown support for learning from neighbors (Berry and Berry, 1999) and ideologically similar governments (Grossback *et al*, 2004). At the same time empirical evidence has accumulated on learning through mimicking of successful policies (Shipan and Volden, 2006) and imitating the experience of others (Weyland, 2005)<sup>22</sup>.

Four mechanisms of policy diffusion are identified in the literature: namely policy learning, economic competition, imitation and coercion<sup>23</sup> (Elkins and Simmons, 2004; Meseguer 2005; Weyland, 2005; Braun and Gilardi, 2006; Karch, 2007; Shipan and Volden, 2008).

Policy learning as a mechanism of policy diffusion was one of the main ideas contained in the article by Walker (1969). The idea of policy diffusion as social learning or lesson drawing has been an important concept in the diffusion literature (Rose, 1991; Dolowitz and Marsh, 1996; Bohemke and Witmer, 2004; Glick, 2011). Freeman (2006) identifies three different approaches to thinking of policy learning in literature. The first is the rationalist perspective which assumes a causal effect between a problem and policy choice. The chosen policy is arrived at by evaluating the information associated with the problem and using pre-existing methods of judging its effectiveness. Governments rely on bounded rationality to identify policy options. Studies have found that policies diffuse among governments' that are ideologically close (Grossback *et al*, 2004).

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<sup>22</sup> Drawn from the discussion in Glick (2011:5-6)

<sup>23</sup> A fifth category called –socialization- which is defined as inducting actors in a process of norms and rules of a community, to change their preferences (Checkel, 2005: 804 as cited in Graham *et al*, 2010) is observed in studies of international relations. It is a form of coercion, disguised as conditionality (Simmons *et al*, 2007) and privileged membership into a group of regional or international organizations.

Freeman (2006) terms this type of policy learning to be closest to the concept of 'lesson drawing' by Rose (1993). Policy *learning* in this view is understood by applying the rational choice theory (Braun and Gilardi, 2006), particularly bounded rationality subsumed in Rogers (2003) and Walker (1969). In the process of policy learning policy makers' beliefs and expectations change based on the experience of others (Braun and Gilardi, 2006).

In the second view policy learning is understood from an institutionalism perspective. The literature pays attention to how the institutional capacity of a government exposes them to flows of information. Important role is attributed to bureaucrats and professionals (Heclo, 1978) who are the receivers and interpreters of information. Their activity determines how the information reaching the institution is defined and used.

The third view focuses on the collective and interactive process of policy learning. It is a constructionist perspective which defines policy problem as a function of local context and tries to identify solution through practice. Freeman (2006) cites Pressman and Wildavsky (1984) view of implementation as learning and Lipsky's (1980) street level bureaucrats in this view of policy learning.

Wolman and Page (2002) propose that policy diffusion is essentially about learning, which in turn is about transfer of information. In this dissertation referenda act as source of information for the community and its neighbors'. The occurrence of referendum provides the information, and using that information to arrive at useful policy actions constitutes policy learning.

A characteristics step in learning is the evaluation of policy success in other contexts<sup>24</sup> (Shipan and Volden, 2008). This is a particularly difficult task in the process of diffusion (Mossberger and Wolman, 2003). For this reason, decision makers rely on bounded rationality to evaluate the policy and its potential. Policy learning is identified if there is a diffusion of institutional design, policy instruments and policy goals (Wolman and Page, 2002).

*Economic competition* is recognized as policy diffusion mechanism in the literature (Mossberger, 1999; Boehmke and Witmer, 2004). However the literature on the mechanism of economic competition is sparse in comparison with policy learning (Baybeck *et al*, 2011). Generally, the mechanism of competition can be understood in the larger design of fragmented governance structure in the US. This structure forces local governments to compete for residents and revenue sources (Tiebout, 1956). Policies that increase the revenue stream of local governments (for example liquor sales laws, or tax incentives) are popularly diffused among local governments<sup>25</sup> (Boehmke and Witmer, 2004). Policy makers focus on policy effectiveness in this mechanism (Braun and Gilardi, 2006).

Policy learning and economic competition are compared by Boehmke and Witmer (2004)<sup>26</sup> in a study on the diffusion of Indian gaming pacts. The authors found that policy learning affects policy innovation, while competition affects innovation and leads to policy expansion among neighboring governments (pg: 47).

Berry and Baybeck (2005) examine the role of economic competition in the diffusion of state lottery and welfare policies. The authors find support for role of economic competition in

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<sup>24</sup> The definition of policy transfer given by Dolowitz and Marsh (1996) resembles the mechanism of policy learning. They define policy transfer as the process by which actors borrow policies developed in one setting to develop programs and policies in another region (pg:357).

<sup>25</sup> The opposite is also true, for example the race to the bottom by states in the case of welfare policies (Bailey and Rom, 2004)

<sup>26</sup> Authors use an event count model to separate the differences in policy innovation and expansion owing to learning and economic competition.

the diffusion of state lottery policies but not in the spread of state welfare policies. The conclusion points to state's preferences in adopting a policy which is economically beneficial while shying away from policies which increase their liabilities.

Baybeck *et al* (2011) further investigate economic competition as a diffusion mechanism in state lottery policies. In this study the authors point out that empirical studies on economic competition showcase governments acting defensively against potential revenue loss. They argue that governments can act strategically in policy diffusion, by reducing costs and increasing revenue while operating through the mechanism of economic competition. They differentiate between defensive, offensive and anticipatory competition mechanisms in their study<sup>27</sup>. The conclusions drawn from the analysis presents evidence of competition as a diffusion mechanism in state lottery policy adoptions.

Green open space offers specific economic, aesthetic and ecological benefits. They are viewed as important amenity goods by residents and businesses looking to relocate. It is plausible that by creating a green open space policy and conducting a referendum governments' engage in an offensive competition mechanism. They use a referendum to signal a commitment on part of the government to provide the green open space amenities to its residents.

The third mechanism identified in the literature is policy *imitation*. It is identified in cases when a successful policy from a reference government is adopted '*as is*', i.e. there is no modification of policy at the time of adoption. This is the case when governments facing some socio economic conditions adopt a policy innovation (*imitate*) that has worked in a similar context elsewhere while expecting similar results. The simple mimicking of policy is one of the reasons why successful policy solutions fail in a different context (May, 1992). The critical

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<sup>27</sup> I do not discuss the three economic competition mechanisms in detail. For a detailed discussion and theory development see Bayeck *et al* (2011).

factor for policy adopters in this mechanism is the knowledge that the problem, context and actors of a policy problem are the same as in the reference government (Shipan and Volden, 2008).

Braun and Gilardi (2006: p312) further characterize this mechanism by coining the term *symbolic imitation*. According to them symbolic imitation “...does not alter beliefs on the effectiveness of policies; rather, it rewards behavior that conforms to socially valued models”. In comparison when policy learning occurs, the adoption is contingent on who identifies the innovation, the content of policy and its political consequences (May, 1992; Mooney, 2001; Shipan and Volden, 2008).

Given the public support for green open space, governments perceive green open space referenda to create more green open space as desirable. As a result, governments could be motivated to adopt a green open space referenda without much customization to their specific needs. In short, they symbolically imitate a policy which has proven to be success in a different context.

The final policy diffusion mechanism distinguished in literature is *coercion*. Generally coercion is identified when one government forces another to adopt a policy. The reference to coercion as a policy diffusion mechanism is commonly observed in cross national policy diffusion (Simmons *et al*, 2007). It operates among nation states when a powerful nation pressurizes a weaker nation into accepting a set of policies or standards.

Dolowitz and Marsh (1996) make a distinction between direct and indirect coercive policy. Indirect coercive policies are a result of negative externalities (in environmental policy issues); requirement of technological compliance and the ‘fear of being left behind’ by other governments.

In a hierarchical system of governance coercion operates in a top down direction. Conceptualized differently, coercion could be comprehended as a network of incentives designed by a higher tier government that conditions the policy responses of the subordinate governments (Dolowitz and Marsh, 1996). In the literature the coercive role of the federal government has been identified in instances where states have been forced to adopt federal policies (Welch and Thompson , 1980; Kincaid, 1990; Allen *et al*, 2004). Cases of coercive policy diffusion from counties to cities are rare (Shipan and Volden, 2008).

Coercion connotes a negative external pressure which forces a government towards the adoption of a particular policy. However coercion can also be expressed through a set of incentives to encourage adoption of a policy. A strong example of the use of coercion and incentives is seen in the environmental policy area. Federal government has encouraged green technology diffusion through a set of ‘command and control’ measures which include standard setting and mandatory technology changes. At the same time, federal government has also resorted to ‘market based’ measures such as tax breaks and other subsidies to encourage green technology diffusion in the industrial sector (Jaffe and Stavins, 1995).

A strong case for incentives is suspected in the diffusion of green open space policies in some states that have aggressive matching grant funds for local governments. An example is seen in the Green Acres program of New Jersey that provides matching grants to local governments for green open space protection. The grant requires that certain percentage of the funds are expended on objectives of historic preservation and affordable housing along with green open space. New Jersey has the highest frequency of successful green space referenda in the country. Governments react favorably towards the availability of matching grants for green open space protection. A local government desiring to avail the matching grant monies for green



space preservation invariably commits itself to promoting affordable housing and historic preservation objectives and vice versa.

Incentives offered by state and county governments in the form of matching grants can explain the cluster of green open space referenda in a region.

Conceptually policy diffusion mechanisms of imitation and coercion resemble the processes outlined in the institutional isomorphism theory given by DiMaggio and Powell (1983). The theory explains homogeneity of institutional structure for organizations that face similar environmental factors. The authors argue that institutional homogeneity can result from uncertainty which causes firms to mimic the standard processes of other successful firms. This process is termed as *mimetic isomorphism*. Competitive pressure and governmental regulations force the institutions to undergo *coercive isomorphism* where the production processes are standardized within an industry.

A complementary discussion of policy diffusion mechanisms is found in Weyland (2005) in the form of a simple heuristic. Weyland (2005) differentiates between two distinct causes of policy diffusion, they are: *external pressures* and *domestic initiatives*. The external pressure framework leads to the discussion of coercion as a policy diffusion mechanism.

The second impetus, *domestic initiatives*, is differentiated into a quest for legitimacy and pursuit of interests. The quest for legitimacy is seen as a mechanism driving the adoption of policies to conform to a socialized norm among governments. The difference between external pressure and quest for legitimacy is that the latter is self-directed (conceptually close to mimetic isomorphism), whereas the former is forced (example of coercion).

Rational learning and Cognitive Heuristics are identified as two mechanisms which are differentiated from *pursuit of interests*. Pathways of rational learning and cognitive heuristic

include the mechanism of policy learning. Cognitive heuristics particularly applies to the role of bounded rationality in the operation of policy learning as a diffusion process.

The discussion of policy mechanism in this section is helpful to recognize the possible pathways of how green open space referenda spread in a region. However, the discussion is limited in its scope because it does not convey details about how the process of referenda diffusion unfolds in a region. The process of policy diffusion proceeds through motivated actors who are an important part of the narrative in the discussion of how green open space referenda spread in a region. In the next section I succinctly discuss two concepts which help to identify actors involved in the process of policy diffusion. The discussion will aid the understanding of how the process unfolds on the field.

### **3.2.2 Process of policy diffusion**

Policy diffusion literature lacks theoretical model which address the variety of research questions originating from the process of diffusion (Glick, 2011). The study of policy diffusion is traced back to the article by Walker (1969)<sup>28</sup> who examined the diffusion of eighty eight policies among US states. The article was intended to be an exercise in theory building with two central questions: why states innovate and how do policies spread among states (Walker, 1969: 881).

The latter question is of interest to this dissertation. In trying to present a rationale of how policies spread among states, Walker theorized about policy diffusion mechanisms, which have been discussed in the previous section, and the role of professional associations. According to him, policy makers take cues from other governments in the region, and operating under bounded rationality satisfice in their decision making on policy adoption.. This pathway of policy diffusion among governments is the mechanism of policy learning. The other policy

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<sup>28</sup> Walker's conclusions were challenged by Gray (1973) who concluded that policy innovativeness among states varied with respect to time and policy content. Subsequent research by Savage (1985) disputed this conclusion and reported that some states are more innovative, hence more prone to adopt new programs.

diffusion mechanism Walker mentioned was economic competition which is driven by the competitive behavior among states. Walker presented a theory of policy diffusion which credits external influences, namely regional neighbors as a source of policy diffusion. In addition he emphasized the role of professional associations and formal networks of bureaucratic organizations in the process of policy diffusion.

The model of policy diffusion presented by Walker serves as a heuristic to arrange various processes involved in the process of diffusion. Walker himself acknowledged that the diagram was an abstraction of the ‘fundamental processes’ which occur in most cases of diffusion (pg: 896).

Walker’s framework was modified by Berry and Berry (1999) who added internal determinants of policy diffusion<sup>29</sup> to Walker’s construct. The authors are also credited with introducing the empirical methodology of event history analysis to study policy diffusion.

Building on insights from Walker and other scholars in political science, policy diffusion can be explained through the action of policy networks (Raab, 2002). Different forms of interest group activity are evident throughout the policy cycle, especially in relation to policy diffusion (Sabatier and Smith, 1993).

A different way of presenting policy diffusion process is found in the adaptation of Kingdon’s (1984) multiple streams model by Mistretta and Ness (2009). The adaptation of the model helps to identify different group of actors involved in the policy diffusion process. In this chapter, I will discuss policy networks as bearers of information in policy diffusion process. I

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<sup>29</sup> The external determinants are represented in two types of models by Berry and Berry (1999): the ‘neighbor models’ hypothesize that the probability of policy adoption by a state is influenced by how many of its neighboring states have adopted the policy<sup>29</sup> and the ‘fixed region models’ which assume that states tend to take policy preferences from those who share its geographical region. The two concepts are related and used interchangeably (Stoutenborough and Beverlin, 2008), however researchers have found that diffusion can occur in spite of large geographical distances, where the definition of a ‘neighbor’ state is dependent on ideological and budgetary similarities (Grossback *et al*, 2004; Shipan and Volden, 2006).

add insights from Mistretta and Ness (2009) to discuss the role and activity of various actors involved in the policy diffusion process in the case study area.

### **3.2.2.1 Policy Networks**

Policy process is affected by the influence of external actors (*pluralism*), namely interest groups (Cobb and Elder, 1971). Placed under the rubric of *policy networks* Raab (2002) states that different forms of interest group activity is evident throughout the policy cycle. It is not necessary that interest groups or issue networks consist of external actors. Sometimes internal actors, namely bureaucrats, are a part of issue networks. In agenda setting literature the role played by issue networks (Heclo, 1978) and advocacy coalitions (Sabatier, 1993) is well documented. Interest groups have been found to push an item on the policy agenda (Cobb and Elder, 1971), create a policy image (Stone, 1997; Baumgartner and Jones, 1993) and engage in policy implementation (Rhodes, 1997).

The role of policy networks is recognized in policy diffusion. Policy network is defined as a group of actors who have an interest in a policy area and are linked to each other through direct and indirect contacts (Mintrom and Vergari, 1998:128). The discussion on policy networks often highlights the role of policy entrepreneurs (Mintrom, 2000). However, policies have been found to diffuse across state and national boundaries through the activity of social and professional networks (Mintrom and Vergari, 1998; Mossberger, 2000; Balla, 2001; McNeal *et al*, 2003). According to Raab (2002) the need for policy networks arise due to a) ease of access to technical information, b) comparative advantages of network forms of governance in specific situations, c) power and interest, d) contextual factors, and formal and informal institutions (Raab, 2002).

Walker (1969) pointed to the role of well informed and competent staff as one of the explanations of why some states are pioneer innovators (pg: 885). Similarly in their analysis of e-gov innovation diffusion, McNeal *et al* (2003) reported that states with highly professionalized legislatures were leaders in offering online services to their residents. In addition, states with more developed professional networks had more advanced websites. Presence of a highly skilled and informed bureaucracy expedites the adoption of policies.

Walker (1969) emphasized the information availability through professional associations which helps in policy diffusion. He stated that professional associations help in the exchange of ideas by gathering professionals from different parts of the country. As a result the participants increase their 'awareness' about the best practices in the field. Secondly the associations help individuals to locate new work opportunities, as a result officials and their inherent skills are transferred between different regions of the country. The transfer of officials contributes to the diffusion of best practices and policies. The role played by professional associations was empirically established through a study of health maintenance organization model (HMO) adoption by Balla (2001). The empirical analysis proved that participation in a professional association was positively associated with policy adoption across states.

Mintrom and Vergari (1998) classify two kinds of state policy networks in a federal system. They make a distinction between external and internal policy networks. External policy networks are formed around an issue. It provides a platform for exchange of ideas and building strategies for policy lobbying. The exchange of information is a main function served by an external policy network. On the other and, the internal policy networks are constituted by local actors interested in the issue area and who are linked with local policy making. The internal network participants are also exposed to the external policy network which helps them to be

informed of the current policy trends. It is possible for the external network to be a formal policy network whereas the internal network can be established and sustained informally, through social contacts. The formal and informal policy networks channel relevant information for policy diffusion (Mintrom and Vergari, 1998; True and Mintrom, 2001; Freeman, 2007). Recognizing the importance of information flow in a policy network Wolman and Page (2002) constructed a communication- information analytical framework to study policy transfer. The authors concluded that informal networks play a significant role in policy diffusion among local government bureaucrats.

Policy networks result from the activity and involvement in professional organizations (Balla, 2001), that play a role in horizontal policy diffusion across states. However in the vertical diffusion (top-down or bottom-up) of policies the activity of intergovernmental policy networks has been noted. The activity of federal and state organizations tied in an interactive network was pivotal in explaining the diffusion of enterprise zone policy across the states (Mossberger, 2000).

In the diffusion of green open space referenda, the occurrence of a referendum acts as a source of information to the neighboring governments. Based on the literature on green open space referenda, a role for informal policy networks is expected due to the activity of advocacy organizations (Kline and Wichlens, 1998). However there is no previous literature to support an expectation of a role of hierarchical governments and formal policy networks in the diffusion of green open space referenda and policy.

### **3.2.2.2 Adapted multiple streams model**

The second framework reviewed for this study is an adaptation of the ‘multiple streams model’ which was developed by Kingdon (1994, 1995). The model shares its intellectual roots

with the ‘garbage can model’ of organizational choice (Cohen and March, 1972), which is as a critique of the rational (linear) model of decision making (Simon, 1955).

The multiple streams framework views the policy process as a nonlinear interaction between three streams namely ‘policy, problem and politics’. The interaction of two of the three streams is necessary around the time of the ‘window of opportunity’ to result in policy making. Kingdon’s model is widely used to examine agenda setting, but can be equally applied to the study of policy diffusion (Ness and Mistretta, 2009). However this is a limited model to describe the policy diffusion process. The limitations of the model are summarized at the end of the section.

Figure 2 displays the adapted version of Kingdon’s model. I discuss Ness and Mistretta’s (2009) version of the multiple streams model for this chapter.

In the adapted model, Ness and Mistretta (2009) present revised positions and role played by the multiple streams. The inclusion of institutional variables through the rubric of policy milieu expands the applicability of Kingdon’s framework. The recognition of institutional variables in policy adoption helps to explain the influences of fiscal health and ideology on policy diffusion. In the adapted model the layer of policy milieu contains all the institutional and organizational variables that affect policy adoption<sup>30</sup>.

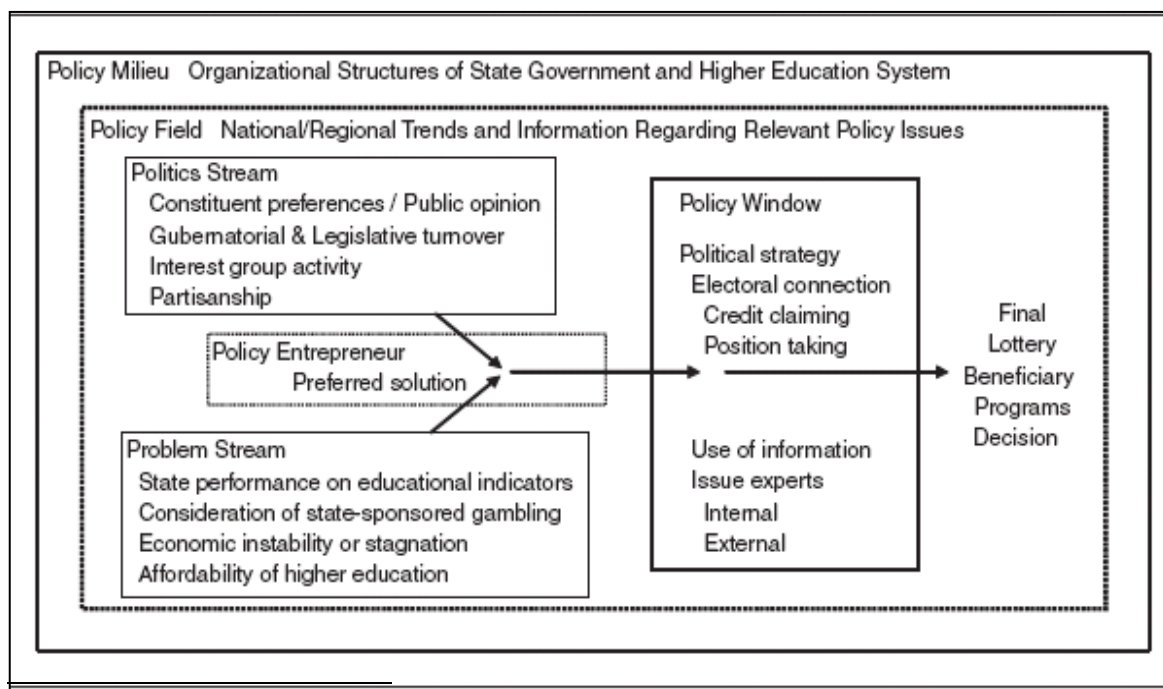
Given the knowledge of how governments process information and incorporate it in policy making decisions, the policy stream is modified to serve as a framework in which politics and problem streams are defined and interact with each other. In the adapted model the policy

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<sup>30</sup> As national and regional trend of information is a much larger stream of influence than the state institutional structure policy milieu should be drawn within the policy field. However Wolman and Page (2002) report that institutional structure provides the incentives which prompt the governments to seek information about policies. Following this rationale the position of policy milieu determines the information flow contained within the policy field. As a result the positioning of policy milieu in the model can be explained.

stream is termed as a policy field<sup>31</sup>. It is defined to contain information on national and regional trends in the policy area in addition to the policy issues (refer to figure 2). It has to be pointed that use of policy ‘field’ as a label for policy stream generates confusion. The policy field is the exclusive source of information in the model. Information is important at every juncture in the policy making process within the multiple streams setting. Information contained in the policy stream helps to define the issues in the problem stream. For example information on best practices, regional efforts etc. get introduced in the system through the policy stream. After processing the information introduced in the system, the problem stream is identified. Whether used to define a problem or mobilize support; information is required throughout the process to arrive at a policy adoption.

The politics stream is a set of actions by various actors involved in the policy making process. Elected officials, ideological leanings, popular opinion and interest groups influence this



<sup>31</sup> The terminology of policy ‘field’ instead of policy ‘stream’ conveys a strong sociological influence on the adapted model. In their explanation of policy field Ness and Misretta (2009) state that expanding policy stream to contain problem and politics stream conveys the importance of information in the policy process. The policy field also contains concepts of the advocacy coalition framework namely the use of intra and inter state sources of policy information (pg:492).



stream. This stream showcases the groups of actors involved in the policy adoption process.

Source: Ness and Mistretta, 2009:707

## **Figure 2: Adapted Multiple Streams Model**

It is notable that in the adapted model the policy entrepreneur is placed outside the politics stream, similar to Kingdon's (1984) original framework. It is difficult to predict the source of the policy entrepreneur in any given policy process. In some cases there might be more than one policy entrepreneur. The separate placement of this strategic actor in the policy adoption process indicates the catalytic role they play in the process.

The problem stream supplies information that serves to increase awareness about an issue. Through traditional media sources and use of symbols (Stone, 1997) the policy issue achieves a problem status. The window of opportunity, original to Kingdon's model, is retained in Ness and Mistretta's (2009) framework. The outcome explains the policy adoption.

Discussion of Ness and Mistretta's (2009) model is useful for the study as it helps to place the actors, processes and institutional variables that affect policy adoption. However the model is a limited framework to examine policy diffusion among governments. Unlike other frameworks available to study policy diffusion, the model presented by Ness and Mistretta (2009) has limitations. It does not acknowledge the role played by external precursors to policy diffusion. There is no discussion of how policy diffusion mechanisms may manifest themselves in the adapted multiple streams model. The model does not provide an opportunity to explore the role played by advocacy organization and policy networks, whether they are internal or external. The model does not have the space to discuss vertical and horizontal directionality of policy diffusion and information flow through networks in the process of diffusion. The only source of information acknowledged in the model is through the policy field. However it is

known that information can be introduced through technical experts, policy entrepreneurs and professional networks.

As previously stated the model is introduced in the chapter to help discuss the actors involved in the policy diffusion process.

### **3.2.3 Diffusion of Green Open Space Referenda**

Figure 1 shows the spatial pattern in the occurrence of green open space referenda. Existing literature on green open space referendum which extensively uses median voter model can be used to explain the clustering of referenda. It could be argued that the neighboring jurisdictions share similar socio demographic profile and median voter demands. The result is a common policy choice; a green open space referendum.

However, this is a limited explanation of the green open space referenda in a region. It ignores the literature on policy diffusion mechanisms. Based on the literature I propose that governments act on a variety of reasons when holding a referendum for green open space (Dolowitz and Marsh, 1996). Available literature offers some clues about the role of government in the adoption of a referendum. The structure of governments (Nelson *et al*, 2007), and favorable policy climate (Press, 2002<sup>32</sup>) affect the outcome of a referendum. In a separate study of county open space policy decisions Smith (2009) found that local government officials exchanged information during professional conferences that aided the adoption and diffusion of land preservation policy.

On the basis of literature on mechanisms of policy diffusion I hypothesize that green open space referenda diffuse as a result of competition, policy learning, imitation and coercion. The argument for competition is drawn from the theory of yardstick competition (Kenyon,

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<sup>32</sup> Environmental Policy capacity initially proposed by Robertson and Judd (1989) is comprised of 1)past and present land use policies 2)administrative capacity of local governments 3)nature of land ownership and use 4)political culture and demographics and 5) principal sources of funding (Press *et al*, 1996)

1997). The role of incentives is anticipated due to state policies, particularly matching grant programs, which influence the frequency of referenda. This is demonstrated in the case of Massachusetts and New Jersey where higher frequency of referenda is linked to the aggressive state matching grant programs for land preservation (Nelson *et al*, 2007, Hopper and Cook, 2004). The presence of policy learning and imitation are suspected in cases where there is a cluster of similar policy actions within the region.

The models reviewed in this section provide the analytical framework to position the concept and actors involved in the process of diffusion. The next section presents the research design of the study.

### **3.3 Research Design**

To explore the mechanisms of referendum diffusion I adopt a qualitative research design<sup>33</sup>. In the literature the evidence on subnational policy diffusion mechanisms has been gathered from secondary sources (Bohemke and Witmer, 2004; Shipan and Volden, 2008). In this chapter, primary data, in the form of interviews, will provide nuanced details about the policy process that accompanies referendum adoption and diffusion.

A case study methodology is an efficient way to explore the decisions of local governments. It involves exploration of an issue through one or more cases within a bounded context (Cresswell, 2009: 73). Good case study design requires that all cases have a similar context, so that the cases display “characteristics and problems identified in the underlying theoretical propositions” (Yin, 2008). I use the *focused comparison* analytical approach in the case study design, which collects data on a limited number of cases to examine the research problem (Denters and Mossberger, 2006). I limit the case study to two two metropolitan areas in

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<sup>33</sup> There are five approaches in qualitative research inquiry: Narrative research, Phenomenological research, Grounded Theory research, Ethnographic research and Case Study research (Cresswell, 2009: 53).

North Carolina that had clusters of referenda. The policy framework of North Carolina is suitable for generalization as it resembles the green open space policies of most states in the country.

In each case, I identify the agenda setting of the referendum (i.e. how was it first proposed? how did it get on the ballot?), policy process (pre referendum policy activities) and information on relevant policy outcomes that occurred following the referendum (e.g. changes in the level of expenditures, new land use policies etc.).

### **3.4 Case study of local governments in North Carolina**

Since 1988 local governments in North Carolina and the state of North Carolina have brought 58 green open space referenda to the public for approval. In the time period of this study, 1996-2006, a total of 42 local government referenda were voted on. The case study is bound between 1990 and 2010, due to the availability of documents required to supplement the information from interviews.

#### **3.4.1 General Context of land conservation policy in North Carolina**

North Carolina was the first state in the country to enact a conservation tax credit program in 1983. This program is still offered by the state government. The state established the parks and recreation trust fund (PARTF) in 1994 which is a dedicated source of grants available to local governments for land acquisition. Since 1995, PARTF has leveraged a total of \$230 million in local matching, for a total investment of \$370 million in state and local parks and recreation infrastructure (North Carolina Parks, 2010).

Along with the above programs the Agriculture Development and Farmland Preservation Trust Fund promotes sustainable agriculture, and purchase of agricultural conservation easements (NCADFTF, 2010); and the Natural Heritage Trust fund provides supplemental

funding to state agencies for conservation of natural areas (NCNHTF, 2010). Both grant programs are financed by proceeds from real estate deed transfers and license plate fees.

North Carolina disburses grants through the Clean Water Management Trust fund (CWMTF) established in 1996 for the protection of water quality. The fund supports conservation of unpolluted water bodies and the creation of a network of riparian buffers and greenways.

State policy goals for green open space conservation are visible in the *million acre initiative* that was started in 1999 under Governor Michael Easley<sup>34</sup>. The program aimed to invest \$1.25 billion (UNC, 2001) to conserve a million acres of land in North Carolina by 2009 (NCDENR, 2010). The 2010 annual report of the million acres program revealed that the state had not met its goal due to insufficient funds. In 2008, the amount of land preserved through the program was less than two thirds the acreage initially planned to be preserved. Resources notably deteriorated in 2008, as the funds were diverted to meet a state budget deficit (Environment North Carolina, 2010). Unmet objectives of the ‘million acre initiative’ demonstrate a lack of political commitment on behalf of the state government. In this context the voluntary referenda on green open space demonstrate the ability of local governments to create and fund environmental policies.

### **3.4.2 Case Study**

#### **3.4.2.1 A Background of the Triangle Region in North Carolina**

The Raleigh-Cary and Durham-Chapel Hill metropolitan areas are chosen for the case study. They include three counties: Durham, Wake and Orange. Figure 3 displays the spatial location of the case study counties and cities.

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<sup>34</sup> N.C. General Statutes § 113A-241] (NC General Assembly, 2010).

Between 1996 and 2008 the case study area witnessed 19 successful green open space referenda. Of these, 14 were voted on in the cities. Four land trusts<sup>35</sup> are active in the region including the Trust for Public Land, a national level stakeholder in green open space preservation. The details of the referenda, including the amount voted and percentage of votes approving the referenda are provided in table 1 .

### **3.4.2.2 Data Collection and Field Work**

For case study analysis, Yin (2008) recommends the following types of data: documents, archival records, interviews, direct observation, participant observation and physical artifacts. I used a semi structured interview schedule (appendix A 3.1) to collect information and impressions from relevant actors in the referendum process.

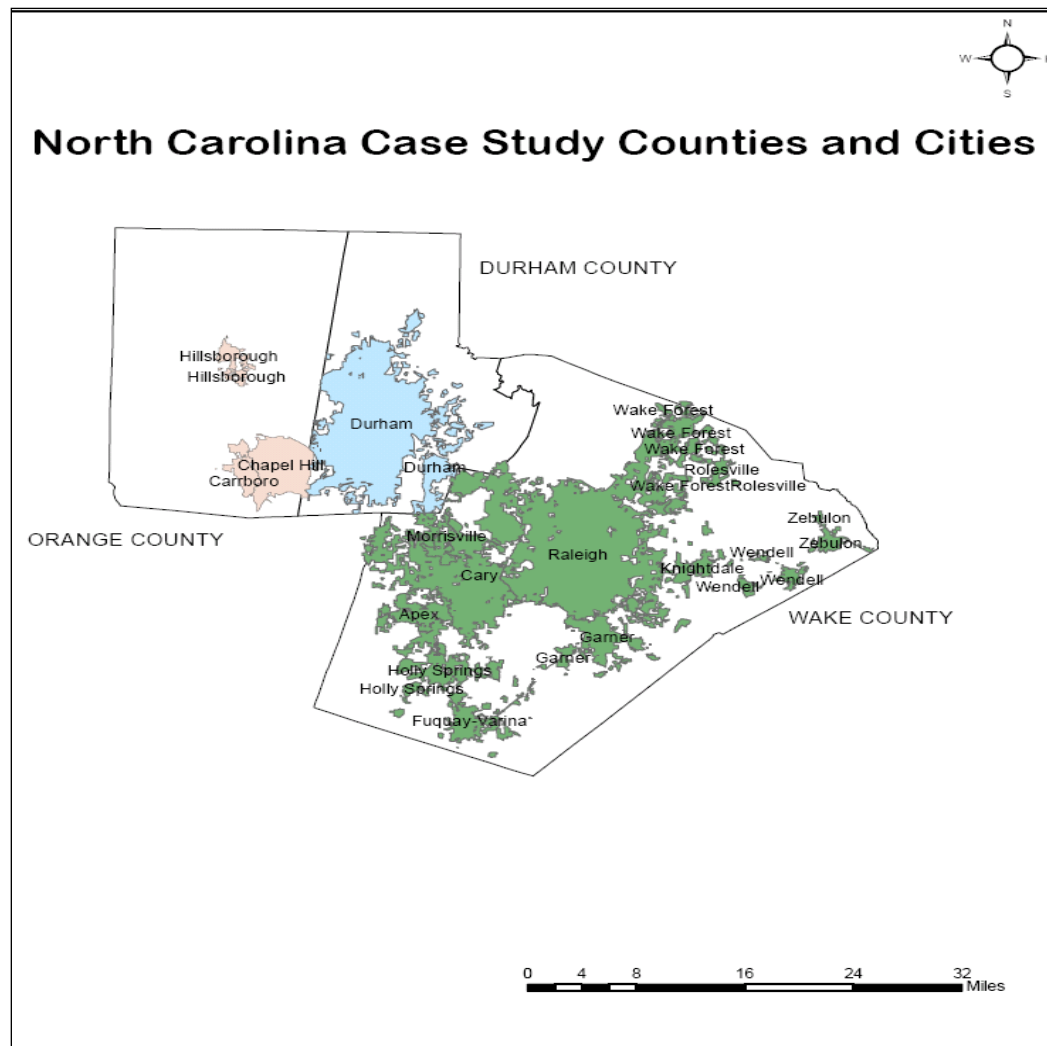
“Interview is an alternative method, seeking through a surrogate observer what [I] might not have seen for my self” (Asmussen and Creswell, 1995). Interviews provide an “access to the context of people’s behavior and thereby provide a way for the researcher to understand the meaning of that behavior” (Seidman, 2006:10). Interviews offer the advantage of capturing impressions from the actors who were associated with the referendum process. One disadvantage of interviews is that they constitute subjective data. To correct for response bias in the interviews I supplement the interviews with information from other sources.

Use of supplementary information, called *triangulation* is an extremely important tool because it allows a researcher to become confident of the interpretations emerging from the

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<sup>35</sup> In wake county two local land trust are operational the triangle greenways council and the triangle land conservancy. In Durham and Orange County along with the two non profit organizations previously mentioned, the Eno river association is active (Conservation Trust of North Carolina, 2010).

analysis (Stake, 1995). In this study I use methodological triangulation<sup>36</sup> which combines interviews with a ‘review of old records’ (*ibid*, p.114).



**Figure 3: Spatial Location of Case Study Counties and Cities**

<sup>36</sup> Other types of triangulation include Data triangulation which involves multiple sources of data; investigator triangulation which uses multiple researchers; theory triangulation which uses more than one theory to comprehend the research problem (Denzin, 1978).

**Table I: Amount Voted and Percentage of Votes Approving the Referendum in Case Study Area**

	Jurisdiction Name	Jurisdiction Type	Year	Total Funds at Stake (million)	Conservation Funds at Stake (million)	Total Funds Approved (million)	Vote Yes	Vote No
1	Apex	Municipal	1996	\$6	\$6	\$6	85.3%	14.7%
2	Durham	Municipal	1996	\$20	\$5	\$20	67.4%	32.7%
3	Chapel Hill	Municipal	1996	\$14	\$3	\$14	65.3%	34.7%
4	Orange County	County	1997	\$6	\$3	\$6	54.4%	45.6%
5	Wake Forest	Municipal	1998	\$3	\$3	\$3	68.9%	31.1%
6	Garner	Municipal	2000	\$4	\$4	\$4	68.5%	31.5%
7	Wake County	County	2000	\$15	\$15	\$15	76.6%	23.4%
8	Orange County	County	2001	\$20	\$20	\$20	66.9%	33.1%
9	Carrboro	Municipal	2003	\$5	\$3	\$5	72.9%	27.1%
10	Cary	Municipal	2003	\$30	\$15	\$30	56.1%	43.9%
11	Chapel Hill	Municipal	2003	\$2	\$2	\$2	76.1%	23.9%
12	Raleigh	Municipal	2003	\$47	\$47	\$47	69.1%	30.9%
13	Wake County	County	2004	\$26	\$26	\$26	74.8%	25.2%
14	Apex	Municipal	2004	\$13	\$13	\$13	85.8%	14.2%
15	Morrisville	Municipal	2004	\$4	\$4	\$4	78.4%	21.7%
16	Cary	Municipal	2005	\$10	\$10	\$10	75.2%	24.8%
17	Fuquay-Varina	Municipal	2007	\$2	\$2	\$2	79.2%	20.8%
18	Raleigh	Municipal	2007	\$89	\$40	\$89	72.4%	27.6%
19	Wake County	County	2007	\$50	\$50	\$50	71.4%	28.6%

Source: *LandVote*, Trust for Public Land



I triangulate information collected from interviews with a review of publicly available policy documents including comprehensive green space plans, open space plans, city ordinances, council meeting minutes, newspaper articles and special reports. Additional sources of information used in the analysis include reports published by local land trusts, and archived newspaper and television report transcripts. In addition I explored online citizen discussion boards and blogs to gather expressed public opinion about green open space in the region.

*Designing the interview protocol:* The interview schedule approved by the Institutional Review Board (IRB) contained 12 questions organized around three themes (Appendix A3.1). The first part of the interview schedule asked information about the start of green space policy dialogue (agenda setting) in local governments. Subsequent questions (policy process) related to the details referendum campaigning, future strategies and local partnerships. The final part of the interview schedule (policy outcomes) gathered opinions related to the outcomes from the referendum. All the questions in the interview schedule were open ended to facilitate maximum response from the respondents.

The interview schedule was pilot tested on one of the municipalities and two planners who had experience working with local governments. Their comments and suggestions were incorporated after the pilot testing and interview schedule was revised. The revised interview schedule was submitted to the IRB in March 2010 and was approved in May 2010.

*Sampling Strategy & Method of Contact:* A purposive sampling strategy was adopted (Miles and Huberman, 1984) in identifying the interviewees. For each local government within the two metropolitan areas, I started with accessing the employee directory listed on the city website. In the case study area I found some cities with a dedicated planner for green open space. Therefore I decided to contact both the department of planning and the parks and recreation

department. To identify preliminary respondents from each government I targeted the employees listed with the departments of parks and recreation, and planning.

In governments where a green open space planner was listed, they became my first contacts, otherwise I started primary contact with planning and parks and recreation department. In most cases I spoke with representatives from the parks and recreation department. They commonly handle all issues associated with green open space planning, acquisition and development.

I emailed the officials with an introductory script and a document approved by the IRB which conveyed the purpose of the study and information on interview questions [Appendix A3.2]. If the staff responded to the email, I set up an appointment with them to conduct the interview. If there was no response then I made a second contact by telephone and set up an interview time. In cases where they were out of office, I left a voice message and followed up. When there was no response, I made one more attempt to contact them through email and then stopped. In the course of the interview I was not able to make any contact in three cities. Officials from two cities responded to the initial contact but declined to be interviewed further.

In the process of the study I conducted interviews with current or past employees of 12 governments including counties. I conducted a total of 17 interviews, including cities, counties and local land trusts. The respondents included planners (5), departmental directors (7), greenways advisory members (2) and a representative from the land trust (1).

The variance in the title of respondents is explained by the size of the city. In larger cities with more personnel it was easier to find one person, often a planner, associated with green open space issues. In smaller cities, the parks and recreation department was represented by one or

two personnel. In such cases the departmental directors' served a lot of functions and were the best and only source of information.

I engaged in snowball sampling to identify second and third interviewees in the cities for additional information. As a result I was referred to and interviewed the finance directors (2) and director of public safety (1) of two case study cities. Table 2 presents the two metropolitan area counties, their incorporated cities and the status of their involvement in the case study.

**Table II: Distribution of cities and interview status for the case study**

<b>Raleigh-Cary Metropolitan Area</b>			
Counties	Cities	Referendum Year	Status
Wake		2003,2005,2007	Interview ( 2)
	Apex	2004	Interview (1)
	Cary	1994, 2003, 2005	Interview (2)
	Fuquay-Varina	2007	Interview (1)
	Garner	2000	Interview (1)
	Holly Springs		Declined
	Knightdale		No response
	Morrisville	2004	Interview (3)
	Raleigh	2003, 2007	Initial contact. No response further
	Rolesville		No response
	Wake Forest	1998, 2005	Interview (1)
	Wendell		Interview (1)
	Zebulon		No response
<b>Durham-Chapel Hill Metro area</b>			
Counties	Cities	Referendum Year	Status
Orange		1997,2001	Interview (1)
	Carborro	2003	Interview (1)
	Hillsboro		No parks department
	Chapel Hill	1989, 1996, 2003	Interview (1)
Durham			Interview
	Durham city	1990, 1996	Interview (1)
Land Trusts	Trust for Public Land		Interview (1)
	Triangle Land Conservancy		No response

While conducting the interview, I pre arranged for the respondent to look over the '*subject information sheet*' so that they have full knowledge about their rights and participation during the interview. This sheet was sent to them as part of the initial contact email. In cases where the respondent first replied through a phone, I asked for their email address so that I could

send them the '*subject information sheet*'. Before starting the interview I asked the respondent for their permission to use a voice recorder. The shortest interview in the course of this study was 23 minutes and longest was 1 hour and 15 minutes.

The next section presents the information collected from the case study. The analysis is arranged according to the Lasswell's (1950) policy process model<sup>37</sup> to follow the process of referendum and policy adoption. I discuss the policy stages as they apply to the discussion of open space policy and adoption of open space referenda in two metropolitan areas.

### **3.4.3 Analysis**

#### **3.4.3.1 Agenda Setting: Awareness of problem**

Between 1999 and 2000 state, many county and local governments in North Carolina took action to preserve land through green open space referenda. In the case study area, as one respondent put '*it was something that everyone was talking about*'.

The role played by contextual factors in the case study area needs to be highlighted. In the 1980s and 1990s an increase in the *development pressure* experienced by the region led to a felt need in the community to protect available green open space. Secondly *the abundance of natural resources* due to the Neuse river basin justified policies and action for land protection in the region. These two factors influence the problem stream following the theoretical framework of Mistretta and Ness (2009).

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<sup>37</sup> Laswellian policy process model starts with the problem identification and then goes into the policy making process, policy adoption, implementation and loops back into the problem identification. Even though there is consensus in literature that the policy process is more fluid than the stages model predicts, the utility of the model lies in isolating important steps in the policy making process.

### **3.4.3.1.1 Agenda setting in Wake County and its municipalities**

Wake County articulated the need for green open space protection in its master plan published in 1989 (interview notes). In interviewing a past member of the county government, I learned that there were multiple attempts to initiate green open space conservation in early 1980s. The impetus came from the bureaucracy<sup>38</sup> but these attempts did not get political traction. Even though the parks and recreation master plan (1989) highlighted the need for green open space (pg:1-3) it took 17 years for policy implementation (Wake County COSP, 2006:1-2)

The first concrete step for the county in green open space creation came in 1998 with the appointment of Open Space Task Force (interview notes). Wake County appointed the task force after recognizing the rapid pace of land development. According to the county statistics, each year 10,000 acres of land was being developed, which convinced the elected officials that an intervention was necessary. On recommendation of the task force the county held its first bond referendum for green open space protection in 2000 for \$15 million which was approved by 78 percent of the voters.

The novelty of Wake county's approach lies in the action it took after the bond referendum was passed. In 2000, the county approached its 12 cities and provided them with grants from the bond issue to prepare a green open space plan. The funding had two conditions. First, cities were to aim for a linked green open space component as a connector between neighboring cities. Second, greenways were mandatory in the plan. The county forged partnerships with local land trusts and citizens groups meeting them for periodic discussions on the strategy to procure land for green open space.

In 2003, the county released a consolidated open space plan (COSP) included the plans of its constituent municipalities, and a map of proposed interconnected green open space (Wake

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<sup>38</sup> The agents for 'agitation' (Walker, 1969) in this case are the bureaucrats. The observation fits well with the mobilization model of agenda setting given by Cobb *et al* (1976) where the policy is initiated by the bureaucrats.

COSP, 2003). In the plan, the county identified 11 stream corridors that were prioritized for land protection throughout the county. About 90 percent of the land identified for acquisition was drawn from municipal plans (Wake COSP, 2006: ES-2). The consolidated green space plan for the Wake County is attached in Appendix A3.3.

The COSP set a goal of conserving at least 30 percent or 165,000 acres of county land as open space. As of 2006, the county had 9.5 percent of its land protected. In order to reach its goal, the county actively acquired land along the 11 identified stream corridors. COSP features a matching grant program to provide funds to cities, non profit organizations and other actors to jointly protect land primarily land outside of the prioritized stream corridors.

In Wake County the agenda building for policy action on green open space began with awareness of the pace of development by a bureaucratic actor. To overcome political hostility, the bureaucrat acted as a policy entrepreneur educating the county management about green space. Part of the strategy to convince the county management the bureaucrat organized parks and recreation representatives from constituent municipalities into an association. The Partners for Open space and Environment (POSE) included parks and recreation representatives from the 12 municipalities and served as a strategic think tank as well as a platform to provide green open space policy ideas. The association was instrumental in building a consensus among constituent municipalities to lobby for open space protection with the county government. This association met monthly from the 1980s to the mid 2000s and included government representatives. Land trust organizations were invited to participate on significant issues and for information sharing. The initial objective was to form consensus on need for green open space protection. Later the objective changed to strategize policy making on green open space.

The POSE was an internal (informal) policy network formed in Wake County. This internal network benefitted from the occasional involvement of the land trusts (external network) that provided relevant information about green open space policy trends in the country.

In the 1990s, a change in county leadership provided the right *window of opportunity* for the bureaucrat turned policy entrepreneur to lobby the issue. His efforts were supplemented with the activity of a citizen policy entrepreneur. The combined efforts of these two policy entrepreneurs led to the first successful bond referendum for green space in 2000.

The county held subsequent referenda in 2003 and 2007<sup>39</sup>. A total investment of \$91million dollars has been made in land conservation by the county and its partners. In 2006 a total of 55,000 acres of protected land existed in Wake County (Wake COSP, 2006).

The municipal grant issued by Wake County in 2000 facilitated policy action on the issue of green open space. From the interviews I infer that the issue gained relevance for the municipal representatives as a result of monthly meetings of POSE. The grant in 2000 gave the cities a fiscal push to create additional green open space. Among the 12 municipalities in Wake County, seven have held a referendum to get voter approval for additional funding to create green open spaces.

Agenda Setting in Wake County Municipalities: Wake County has a population of 900, 993 people (US Census Bureau, 2011). Its 12 municipalities (figure 4) differ in size from Roxboro (population 9,000) to the city of Raleigh which has a population of 1.2 million and is the state's capital.

Raleigh differs from other municipalities as it is the state capital and the largest city in the county. It had an early start on green open space protection. The *capital area greenway system*

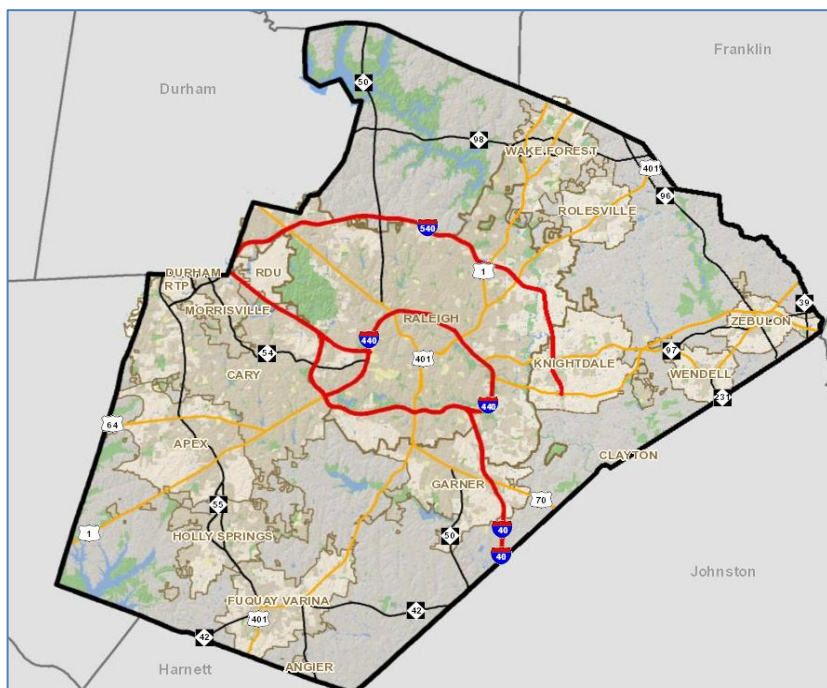
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<sup>39</sup> Although the county's referendum was a success the voter turnout in 2007 was very low. About 10 percent of registered voters came to cast a ballot, sparking an interesting citizen discussion on local chat boards favoring low turnout for vote on issues like green space (ApexNC.com, 2007).

began in 1974 to preserve green space and land prioritized for an interconnected green space corridor in the city. The city's website states that the capital greenway system was started due to a concern over 'rapid growth and urbanization' (City of Raleigh, 2010). Raleigh made a decision to enact ordinances to protect stream corridors, along with actively purchasing land. The city's bond referenda are tools that extend the implementation of a policy goal agreed to by the town since the 1970s. In the last 40 years, the city has constructed 63 miles of interconnected greenways and about 300 acres of protected land within city boundaries.

The second largest city in Wake County, the Town of Cary, states on its website that it has been involved in creating greenways since the 1980s. However this information could not be verified. The first documentary evidence of the town's policy on green space is shown in the parks and recreation master plan adopted in 1998. In this plan rapid population growth and land development were listed as the justification for green open space protection. It was not until 2001 that the town council allocated \$12 million for green open space protection (Town of Cary, 2001). In 2001, the town adopted its 'Open Space and Historic Preservation plan' which was prepared with the grant given in 2000 by Wake County to all municipalities.





**Figure 4: Wake County and its Municipalities**

In the remaining ten municipalities of Wake County I notice a geographical difference in green open space policy. Towns east of Raleigh show less activity in green open space development. The towns on the west have a more active policy framework along with a higher economic and demographic profile in comparison. This observation is interesting because it fits the conclusions of previous studies that have linked higher socio-economic profile with demand for green open space (Kline and Wilchens, 1994; Bates and Santerre, 2001; Nelson *et al*, 2007).

Towns of Morrisville and Apex occupy the north western part of Wake County. They share boundaries and have a similar socio-economic profile. A large percentage of residents from both towns are employed in the Research triangle park which borders Morrisville and Cary towns. In the interview with the towns, Apex and Morrisville, respondents invariably focused on ‘quality of life’ and ‘public demand’ as two reasons for pursuing referendum. As one respondent put it:

*“In this community bond referendums for parks and recreation are a no brainer at all. The folks that may have moved here expect a certain level of service, most of them are folks with younger families.....highly educated from places that have pretty extensive parks systems ....they understand quality of life issues”.*

Before the grant given in year 2000 by the county Apex and Morrisville did not have an active green open space acquisition program or a policy position on the issue. The issue awareness in these municipalities started as a result of the POSE meetings. The grant for green open space plan by the county in year 2000 provided added incentive to think and plan for green open space.

The observation fits the account from other municipalities as well. In most cities land set asides were built into the code and development review process. It was the only tool available to protect land within the jurisdiction. The grant for green open space plans by Wake County served as the push factor for towns to think and build a green space policy. Among the remaining towns, Garner, Fuquay-Varina (Niolet, 2007) and Wake Forest (Town of Wake Forest, 2007) held successful green open space referenda. Smaller towns like Zebulon, Wendell and Rolesville have not held referenda but have availed themselves of county grants to design a plan and acquire land along targeted stream corridors (interview notes).

#### **3.4.3.1.2 Agenda Setting in Orange County and its municipalities**

Orange County borders Durham and Wake Counties and is part of the Durham Chapel Hill metropolitan area. It contains the following incorporated municipalities-Chapel Hill, Carrboro and Hillsborough and parts of Durham and Mebane. Orange County has experienced an increase in population in the last two decades. A recent county comprehensive plan reports that the population doubled from 57,000 in 1970 to about 121,000 residents in 2005 (Orange County, 2008:A2-2). Between 2000 and 2009 the population grew by 12 percent, and the 2010 census estimated a population of 131,801 living within the county boundaries. Incorporated

municipalities only account for eight percent of the county's land but house more than 62 percent of its population. The population density is highest in the town of Chapel Hill due to the presence of the University of North Carolina Chapel Hill.

Agenda Setting: Orange County: The respondent from Orange County stated that from the 1980s concern for preservation of natural areas and the '*rural character*' of the county was being voiced. The growing population and urbanization of the county deepened such concerns. The presence of a strong agricultural community in the county was key in the establishment of a voluntary farmland preservation plan and an agricultural district program in 1992. The program, the first of its kind in the state, aimed to increase the "*identity and awareness of agricultural community and its role in the economic and cultural quality of life for all residents*"<sup>40</sup>. In 2009, the county had 11 farms and 2,700 acres of farmland enrolled in the program (Schultz, 2010). The county has identified 38,000 acres of rural buffer beyond the extra territorial jurisdiction (ETJ) that surrounds the towns of Chapel Hill and Carrboro. This rural buffer is not available for annexation and functions as an urban growth boundary.

A 1996 report by the county planning director titled 'Preservation as a Function of Local Government' started the discussion for the preservation of natural and historically significant land. This report was the basis for county commissioners to establish a new Environment and Resource Conservation department in 1998.

In 1999, the county commissioners requested the Environment Recreation Conservation Department (ERCD) to prepare a report to guide future land preservation strategies of the

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<sup>40</sup> The county is divided into seven preservation districts and each farmland owner who enrolls in the program enters into a 10 year renewable non binding conservation easement agreement. The farmland owners are offered benefits such as community 'recognition' by placing signs on the road that indicate that the farm is a protected land. They are also offered waiver of water and sewer assessment as long as they are connected to the program and become eligible for preservation funds whenever funding was available.

county. There was one county commissioner in particular who operated as a policy entrepreneur and lobbied common consensus among her colleagues.

The report prepared by the ERCD developed a point system through which the county was able to prioritize and weight land parcels for acquisition. The timing of the county report coincided with an assessment the Triangle Land Conservancy (TLC). The conservancy is a local land trust that owns significant parcels of conserved land in the county. Its report assessed the ecological value of conserved land in the county (TLC, 2002). This report was important in the discussion of green open space in Orange County.

On the basis of available information, from the county and the land trust, the county commissioners adopted the '*Lands Legacy*' program in April 2000<sup>41</sup>. The ERCD report produced in 1999 showed that Orange County had a parkland deficit of 245 acres. Initially parks acquisition was the sole priority for the Land Legacy program. In the last ten years, the program has acquired 1,275 acres of parkland and 540 acres of open space (Orange County, 2010; Ferral, 2010).

The ERCD report recommended that the county government should increase its funding for environment and resource conservation. One option suggested in the report was a bond referendum, in the form of a parks bond or an open space bond. Throughout the report, there was a mention of the rise in the number of local governments in the US (pg: 4, 54) who were opting for a general obligation bond referendum for land acquisition. There is documentary evidence that the Trust for Public Land (TPL), a national land trust, approached Orange County with a suggestion to hold a referendum. The respondent acknowledged the solicitation of TPL.

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<sup>41</sup> Lands Legacy program was established with the following priorities: natural areas, wildlife habitat, lands of cultural and archeological significance, future parkland, watershed and riparian buffers.

However it was maintained that the county conducted the referendum without any help from TPL.

A coordinated bond referenda was proposed in the ERCD 1999 report as a strategy for land acquisition by the county and its towns (p: 36). The agenda for Orange County to establish a green open space protection and acquisition program was set in motion by the action of the bureaucracy, supported by one of the county commissioners and the local land trust.

Agenda Setting: Orange County Municipalities: Three of the five municipalities –Chapel Hill, Carrboro and Hillsborough –which are completely within the corporate limits of Orange County will be discussed here. Towns of Chapel Hill and Carrboro have an independent green open space program. The town of Hillsborough relies on the county for its parks and recreation services.

The town of Chapel Hill proposed planning for green space in the decade of the 1960s (Town of Chapel Hill 2006: pg. 3). The town adopted its first open space plan in 1965, but the council did not agree to the acquisition and construction of greenways until 1979. According to a respondent, *“the town council supported the idea as long as they did not have to spend any money”*.

From the interview I learned that the pace of development in the 1970s and 1980s mobilized public opinion in favor protecting land and preserving the character of the town. The respondent stated that the town has a significant presence of ‘Sierra Club’; the national environmental group which influences public opinion and consequently the decision of the council.

The town has implemented two land preservation strategies since early 1970s. On the insistence of one council member the town started collecting conservation easements along a

major stream that runs through the town. Another strategy was the creation of a ‘*resource conservation district*’ in downtown. Both policies have resulted in restricted and controlled development in downtown Chapel Hill.

The town’s Greenways Comprehensive master plan (2006) marks the 1980s as the decade when efforts in greenway development became formalized. The formalization process included citizen surveys and setting up of a greenways task force, which was later converted into a permanent Greenways Commission in 1985.

A bond referendum was held in 1986 for \$2.5 million for parks and green open space. Subsequent referenda were passed in 1989, 1996, and 2003. Voters have approved a total of \$17.5 million through public referendum for greenways acquisition in the town. The town also received \$ 1 million from the bond that Orange County passed in 2001, specifically for greenway development.

The town of Carrboro also had an early start in forming a green open space policy. The town introduced a planned development strategy in the early 1980s that focused on limiting development to selected pockets of the town. This strategy was the brainchild of a prominent urban development expert who was appointed as a consultant. The town supported the strategy with a tough development ordinance that required five percent open space dedication in any new residential development. The dedication requirement was revised in 1987 to 15 percent and in 1995 to 40 percent. Carrboro is the only town with a 40 percent dedication ordinance in the entire research triangle area.

The town commissioned a greenway plan in 1980. It was prepared by the staff with inputs from a citizens group who proposed “the use of stream corridors for greenways in existing neighborhoods”. Although the plan was voted down in a public hearing, the town council chose

to go ahead with the recommendations of the plan. The council “worked with the staff” to introduce the open space requirement in the development review process. According to the respondent “it was a top-down initiative”.

Compared to other towns Carrboro adopted a different policy route by requiring a large percentage of its land to be left protected in the development review process. The town held one referendum in 2003, for the purpose of gathering matching funds for a grant program available from the federal government.

A document search showed that Orange county government had commissioned a joint study of green open space issues with the municipalities in 1999. The report of the ‘Joint Master Recreation and Parks Work Group’ encouraged the county to work with the municipalities to protect green open space. In the report joint bond referenda with the municipalities was identified as one of the future strategies.

The report shows that Orange County demonstrated leadership in creating a common vision for green open space in the county. A number of issues ranging from funding constraints to mixed program priorities proved to be barriers in the implementation of the vision. The county and its municipalities have functioning green open space programs but the lack of interlinked green spaces and a coordinated green space policy limits success.

#### **3.4.3.1.3 Agenda Setting: Durham County and Durham city**

Durham County contains only one incorporated city, i.e. Durham city in its boundaries. According to census information since the last census in 2000 the county grew 19.8 percent in population to 267,587 in year 2010.

Agenda setting in Durham County and the city of Durham: Durham county and Durham city have merged departments that provides parks and recreation services in the city-county

region. The interview with Durham city representative conveyed the idea of support for green open space. The county is not as active as the city in this policy area.

The county receives recommendations from an advisory board consisting of representatives from the county and Durham city government. The Durham Urban Trails and Greenways (DUTAG) commission was constituted in 1983 following a feasibility study of greenways and trails in Durham. This study was undertaken in the early 1980s at the request of the chairman of the Public Works Committee in the Durham city council.

DUTAG was a citizens group and its mission was to ‘develop and implement a plan for trails and greenways system’. A plan for developing greenways in Durham was released in 1989. The plan recommended the use of bond referenda for funding greenway land acquisitions. Acting on this recommendation the city held two successful bond referenda in 1990 and 1996 for a total of \$7.3 million (City of Durham (a), 2005). In 1990 the name of the commission changed to the Durham Open Space Trails commission (DOST)

Durham County started a matching grant program suggested by the DOST in the 1990s. The initial funding for the matching grant program came from the bond referendum that was conducted in 1986. Since January 2009, the matching grant program has been suspended due to budget deficits.

From 1988 Durham County started requiring dedication of open green space as part of its land development ordinance. Publicly available documents show that from 1996 onward the county offers a voluntary farmland preservation program that is managed by the soil and water conservation district.

Durham city and county documents note the long history of green space development and conservation efforts. It appears that the appointment of citizen advisory committee in the 1980s



resulted in agenda building for green open space in the county and city. The committee lobbied for action on the greenway plan which was adopted in 1985.

In the case study area the sources of ‘information’ identified are: initiative of county governments, intergovernmental communication, exchange of ideas in professional associations, presence of ‘reference cities’, and influence of an external technical expert.

I found that county and city governments in both metropolitan areas developed distinct approaches to green open space protection. They differed on leadership and the coordination of county-municipality plans for green open space. County governments were focused on conservation while municipal governments viewed green open spaces as recreational amenities.

### **3.4.4 Policy Process**

The questions asked within this section provide insight into the policy diffusion processes active in the case study. A summary of the central points gathered from the analysis is presented below.

#### **3.4.4.1 Why Bond Referendum?**

In the last section I gave the background on how green open space policy and its tool i.e. the referendum was used in the case study area. In this section I delve into the details of the referendum process. In the case study area the referendum was considered as an important tool of green open space policy. The decision to pursue bond referendum was adopted by cities selectively and at different time periods. When asked why the city chose to have a bond referendum the responses fell into the following categories.

1. Appropriateness of Bond Referendum: Land acquisition and green space development is a capital investment. Governments’ favor bonds (pay as you use) to taxes (pay as you go) for such expenditures. The effect of bonds on voter’s taxes is

negligible as the repayment schedule of bonds is long (30 years). This minimizes the political repercussions. In the words of one of the respondent:

*“Our town council has been very clear that they would support bond referendum... provided the result of that was not a property tax increase”*

2. Trend of Green Open Space Referendum: The comprehensive plans of many local governments referred to the similar referenda across the country. The referenda were seen as a trend or signature move of local governments interested in preserving green space.
3. County Strategy: In Orange County, the comprehensive plan suggested a series of coordinated bond referenda in order to ensure funding for interconnected green space.
4. Availability of matching grants: Availability of matching grants featured in the decision of cities to conduct a bond referendum. Towns of Wake Forest and Carrboro held referenda to avail matching intergovernmental grants.

#### **3.4.4.2 Campaigning**

Campaigning is identified as a critical and strategic step in winning public support for referendum. NGO actors and land trusts argue that it is important to have a campaign and media strategy before embarking on public approval for increasing indebtedness (McMahon *et al*, 2000; Kelly and Zieper, 2001). The important role played by media in promoting the desired policy image has been established in the literature (Edelman, 1985; ; Baumgartner & Jones, 1993; Stone, 1997).

In the interviews the unanimous response was that that campaigning and bond referendum in neighboring government does not impact the decision to follow suit. It is important for the local politics, financing and timing (general elections preferred over special

elections) to align before considering a bond referendum.. However, in the case study it is interesting to notice that towns of Morrisville and Apex held referenda in 2004 after their neighboring town of Cary's referendum in year 2003. Cary is identified as a trendsetter and serves as the reference point for smaller cities in the region. The spatial proximity of Apex and Morrisville to Cary and the assumed intergovernmental competition for residents among cities supports the notion that Cary's referendum influenced the two towns. However, none of the respondents from either town accepted that notion.

Responses demonstrated that governments with growing population and public consensus on need for growth management were confident of referendum success. As a result there was a wide variation in campaigning approaches among governments. Literature has shown that along other considerations, the level of campaigning, is affected by the fiscal condition of the government<sup>42</sup>, the necessity of the referendum<sup>43</sup> and whether or not there is overt opposition to the referendum proposal. Cities invested resources into campaigning for their first green open space bond referendum or in the face of unfavorable public opinion. In cities with positive public opinion and political will, I found minimal referendum campaigning, yet in certain cases cities actively campaigned for the referendum to pass<sup>44</sup>.

Before beginning the campaign, city officials gauge voters' reaction through public opinion surveys. In the case study area cities with larger staff the referendum process was more

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<sup>42</sup> Compared to Orange and Durham counties, Wake County's campaign was designed professionally and incorporated current social marketing tools (Gazella Communications, 2010)

<sup>43</sup> Every local government considering a referendum in North Carolina requires the approval of the state 'Local Government Commission. The commission evaluates whether the fiscal health of the local government is sound enough to undertake the debt obligation. Upon approval from the commission a government can pursue campaigning.

<sup>44</sup> This is an example of how cities can do active campaigning and put money into it. In 1999, the town of Cary had a sidewalk and street improvement bond. The bond package also contained funding of 10 million for parks. TV news reports that "The Town of Cary spent an estimated \$30,000 on an "education" campaign for the bonds (1999) whereas, last year, Raleigh spent only \$2,000 for a similar campaign on a \$50 million bond issue.

organized (Nalbandian, 1989) and usually followed projects identified in a capital improvement plan. In smaller cities, the process was not as structured.

Campaign media products included brochures detailing the type of projects targeted for development, funding requirements, promotional videos, press releases, and comprehensive plans. A common product released by all governments was a list of frequently asked questions [FAQs<sup>45</sup>], in which the information is packaged as answers to common questions that citizens could ask about the referendum [refer to appendix 3.4].

One respondent stated that when the bond referendum causes the property tax rates to increase, campaigning helps them to present their case in front of the public, and change the tone of the public opinion.

*“Yea if they say we do not want any taxes raised ... we say your taxes would go up a penny but this is all that you get for it. We slant the campaign...”*

Along with print media<sup>46</sup>, cities actively used their websites to spread information about the referendum. Some cities had separate webpages and websites created for the purpose of campaigning for the referendum (for example: Apex, Durham, Cary, Raleigh, and Wake County).

Most cities campaigned through an invited group of citizens from the community<sup>47</sup> referred to as the *bond campaigning committee*. In select cases these committees were allowed rights for fundraising towards bond publicity (for example Chapel Hill, Apex). In smaller

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<sup>45</sup> The samples collected from the field showed that FAQs contained messages of fiscal prudence and responsibility. Governments find it important to highlight past success in fiscally conservative communities. In cases of repeat referenda subsequent FAQs contained information on the status of projects funded by the past referendum (City of Durham(b), 2005; City of Raleigh, 2007).

<sup>46</sup> There was limited mention of endorsement of open space referenda by local organizations in the media. Wake County bonds for open space were endorsed by one of the most popular news paper in the region, the *News and Observer*. Another popular newspaper *The Independent*, endorsed city of Raleigh bonds in 2007 (The Independent Weekly, 2007). Town of Cary bonds were endorsed by Rotary Club in 2003.

<sup>47</sup> One of the newspaper reports states that Mayor/council invited citizens to form a committee.

municipalities, staff and elected officials assumed an important role in campaigning. Larger cities did not allow their staff to participate in any politicking (for example Cary, Durham, Morrisville).

### **3.4.5 Policy Outcome**

The third part of the interview schedule asked respondent about the outcomes as a result of green open space referendum. Most respondents agreed that referendum has helped in active acquisition of land (Orange County), for an interconnected greenways system (Chapel Hill) and has helped in achieving the goal set out in the green open space plans (Wake county). It has provided required funding for new parks and green space in growing municipalities (Fuquay-Varina, Apex and Morrisville). In some cases the referendum provided the funding to preserve existing community resources, for example in the town of Wake Forest, the referendum proceeds helped the town to protect historic fruit grove within the Joyner Park (Town of Wake Forest, 2005). Respondents agreed that referendum has helped improve the quality of life for residents in the cities and county. Through the interviews it was clear that there is a caveat to the use of bonds. Many municipalities had not expended the bond authority approved through the referendum<sup>48</sup>. Table 3 shows the distribution of available bond funds among with the cities that held green open space referenda.

**Table III: Sale of Bond funds approved by voters by referendum**

<b>Raleigh-Cary Metropolitan Area</b>				
Counties	Cities	Referendum Year	Status of bond funds approved	Comments
Wake		2003,2005,2007	All bonds sold	
	Apex	1996, 2004	6 million unsold from	

<sup>48</sup> Few exceptions to this were 1) Wake county respondent who informed that they are in process of proposing a 100 million bond to the county commissioners and 2) Town of Chapel Hill who informed that they have run out of space to acquire in the town, i.e. the town is totally built up. Raleigh voted on another green space referendum in 2011 which was approved.

Cary	1994, 2003, 2005	2004 referenda some bonds not sold	Bond anticipation notes issued in 2010.
Fuquay- Varina	2007	some bonds not sold	
Garner	2000	some bonds not sold	Bond anticipation notes issued.
Morrisville	2004	some bonds not sold	
Raleigh	2003, 2007	Not sure	
Wake Forest	1998, 2005	some bonds not sold	
<b>Durham Chapel Hill Metropolitan Area</b>			
Orange	1997, 2001	All bonds sold	Bond anticipation notes issued in 2010.
Carrboro	2003	Bond not sold yet.	
Chapel Hill	1989, 1996, 2003	All bonds sold	
Durham city	1990, 1996	All bonds sold	

Source: Field interviews

Two outcomes from the green open space referenda are summarized below.

### **3.4.5.1 Professionalism in Bureaucracy**

In the study of interstate HMO policy diffusion, Balla (2001) mentions the role of various committees within the professional associations. The committees are constituted on the basis of their expertise in different areas of policy for example finance, evaluation, planning etc. The committees help the professional association to develop in the advisory role, produce guidelines for best practices and suggest future initiatives.

In the case study area the local governments showed a notable increase in the number of advisory commissions and boards (para-bureaucracy) on green open space. Table 4 lists additional details of the commissions set up by the cities and counties.

**Table IV: Green space advisory commissions in case study cities**

Town	Number	Specific to green open space	Created	Members	Appointed	Frequency of meetings
Wake county	1	1	1997	All	Monthly	
Apex	1		1987	8	All	Monthly

Cary	1	1	1982	10	All	Monthly
Fuquay-Varina	0					
Garner	1	1	1981	8	All	Monthly
Holly Springs	1		1982	9	All	Monthly
Knightdale	0					
Morrisville	3	1	1990	5		Monthly
Raleigh	3	2	1985	15	All	Monthly
Rolesville	1	1	N/A	7	All	Monthly
Wake Forest	3	2	1985	9		Monthly
Wendell	1		N/A	9	All	Monthly
Zebulon	1		1991	7	All	Monthly
Durham	4	2	1983	15/8	All	Monthly
Chapel Hill	1		1977	11	All	Monthly
Carrboro	2	1	1979/ 2007	11	All	Monthly

Source: field interviews and local government documents.

### **3.4.5.2 Effect on competitiveness of the city in the region**

The final question in the interview schedule, inspired by Tiebout (1956), probed whether the city's competitiveness has been affected by creation of additional green open space after the referendum. Most respondents agreed that green space development has contributed to the quality of life which is an important aspect in attracting new residents. A very small number of cities realized the importance of green space as a tool for attracting businesses.

A systematic assessment of the impact on economic competitiveness has not been carried out by any local government. There was skepticism among officials about conducting such a study.

*I think it would be a complicated study for someone who wanted to do it, but we have not done it.*

In other cases, if the bureaucrats are interested in demonstrating the effects of additional green space, they face an unsympathetic council:

*“Every time we go and talk to them about money we take statistics with us how much value properties next to parks have and how much property tax value it is and how much it is saving them in water and air quality management. We tell them all that, I don’t know if they believe us or not.”*

There is anecdotal evidence from one city that has realized that green space gives them an edge over their competitors in the region. In the words of the respondent

*“There maybe statistics out there....I cannot put my hand on it.....but in example ..when they say Caterpillar was looking for location...quality of life was one of the deciding factors...and that really gets down to parks and greenways.”*

### **3.5 Discussion**

#### **3.5.1 Mechanism of Policy Diffusion**

Literature suggests that policy diffuses through the mechanism of competition, coercion, imitation and learning. Imitation and learning have commonly been associated with local government policy diffusion (Shipan and Volden, 2008). Coercion is common in the diffusion of policies among nations. In the US coercion is visible in policy mandates dictated by federal to state government in the U.S (Shipan and Volden, 2006). The other form of coercion, also known as incentives are commonly visible in the federal to state context (Welch and Thompson, 1980). It is rare to find an example of incentives in subnational policy diffusion literature. I summarize findings pertaining to the different mechanisms of diffusion identified in the case study area.

##### **3.5.1.1 Incentives**

Governments in Wake County were sensitized about green open space conservation through the actions of the county government. Before 2000, when the county approached municipalities to design a green open space plan, only two of the 12 cities were active in green open space protection. Regardless of how many cities have held bond referenda after the plan, it is clear that all 12 have been sensitized to the issue of green open space conservation and the



potential of implementing it within their boundaries. In this manner, the consolidated plan has provided a roadmap for local governments to move ahead in an integrated manner.

The term coercion can be viewed as a set of incentives to condition the response of subordinate governments. In Wake County, the mechanism of incentives was introduced as matching grants for completing a municipal open space preservation plan. The county continues to offer matching grants for green open space land acquisition. The respondent from the town of Wake Forest stated that if it were not for the matching grant money, they would not have created a plan or conducted the bond referendum to protect the green space around the town.

The tool of bond referendum to protect green open space was strictly suggested to the bureaucratic actors during monthly discussions at POSE meetings. In the words of one of the respondent:

*“The idea of referendum was discussed in POSE. The county commissioners strongly encouraged the municipalities to pass bond measures, or have some dedicated source of funding for open space”*

Incentives are important for the counties to achieve its green open space policy goals. Due to the fragmentation in the governance of land resources, counties require the collaboration of other local governments (Smith, 2009). Hence incentives prove an effective way to enter into collaboration with other governments. The presence of federalism in US governance system has aided in the policy diffusion by limiting the arena of policy decision making to the state, local and federal levels (Baumgartner and Jones, 1993)

It needs to be stated that incentives are one of the ways through which intergovernmental interaction manifests itself in the process of policy diffusion. The role of intergovernmental policy networks in providing the information required for policy diffusion has been identified in

literature (Mossberger, 2000). In the case study area, local governments' interaction and information dissemination was facilitated through the policy networks formulated at the county level. The interactions of such policy networks visible in the case study area will be further elaborated on in the section on policy networks.

### **3.5.1.2 Competition**

Interjurisdictional competition is a prominent mechanism that promotes the diffusion of economic development policies (Boehmke and Witmer, 2004). Green open space policies be classified as an economic development policy (Jordan, 2003; Choumert and Cormier, 2011). On the basis of demonstrated economic effects due to green space (Nicholls and Crompton, 2005) competition could potentially affect bond referendum decisions<sup>49</sup>. From the interviews and content analysis of the documents, I learned that competition is not a pervasive mechanism of green open space referendum diffusion.

The respondents did not believe that cities compete with each other in providing quality of life amenities like green open space. The local governments viewed the issue as meeting the median voter demands and providing a good quality of life. However traces of interjurisdictional competition are visible in the timing of the referendum among the cities of Cary, Morrisville and Apex. The timeline of referendum conducted in these three cities are very close suggesting 'adjacency effects' among the three neighbors. The following comments received from one of the respondents suggests that intercity competition played some role in the timing of these referendum

*I would say that subconsciously that does go on.....say if Cary puts a bond and has a great program and there is a buzz about it...it's the power of language and the power of the conversation that people are having. You know Cary may be just talking too much and that creates this awareness and other communities like Apex say we need to do that.*

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<sup>49</sup> By extension of the median voter model which is popular in literature on green open space.

The effect of green open space referenda on neighbors' expenditures is empirically examined in chapter five. The chapter investigates the hypothesis of Interjurisdictional competition on the expenditure behavior of neighbors after the green open space referenda.

### **3.5.1.3 Policy Learning**

The case study shows that local governments took into consideration the example of other cities before settling on the tool of green open space referendum. This is the mechanism of policy learning that is alluded to in Walker's model.

Orange County and the town of Carrboro reference other cases of green open space referendum in the master plans. The town of Cary referred to the referenda held in Colorado and Pennsylvania in one of its earlier master plans and suggested referendum as one of the ways in which funding for green open space could be gathered.

Looking at the timeline of policy development in the three counties, I asked whether counties learned from the policy approaches of their neighbors. I was surprised to learn that the counties did not acknowledge each other's green open space program as a model to learn from. Neither have the three counties developed a joint strategy to protect green space in the region. In the words of Orange County respondent

*"Wake County is a few counties over, we are not as interested in what goes on there".*

The respondents denied any policy learning in green space issues but acknowledge that in economic development and public health policy areas they try to observe the policy practices of neighboring governments. In my opinion, the respondents were not willing to admit that they consider others in the region as a model for their policies.

### **3.5.1.4 Policy Imitation**

Policy adoption as symbolism is called policy imitation, where policy is adopted without policy learning. In other cases, it may mean adoption of vague terms and processes, that resembles initiatives in a reference group (Mossberger, 2000). In the issue area of green open space local governments have the incentive to hold a referendum and join in a notable trend within the region.

One case stands out as an example of policy imitation. In Wake County, the town of Morrisville held a bond referendum along with Apex, in 2004. The town does not have any trails according to the last updated master plan (Town of Morrisville, 2006). The town was found under the national average for park acreage per resident (Town of Morrisville, 2006: 52)<sup>50</sup>. The town has one greenway of 1.8 miles, while its neighboring community of Cary has 31 greenways totaling 35 miles, and Apex has six greenways and a nature park being developed in 2011.

When interviewed in 2010 Morrisville officials mentioned that bond referendum was a way to “let others know that the town was acquiring land for park and green open space development”. It was considered a policy position for others to acknowledge. In the same interview I learned that a part of the approved 2004 bond was yet to be sold. The authorities were in process of acquiring the land. After the 2004 bond the town used the proceeds and other grants towards acquiring a 25 acre property. Plans for its development were drafted in 2005 and assumed a contiguous parcel of 30 acres. The town expected to acquire the remaining 5 acres.

In 2010 the town council was informed that the drafted plans failed to align with the land preservation requirements attached with the county grant used to acquire the property (Cooke, 2010). In addition the town had failed to acquire the remaining five acres of contiguous parcel.

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<sup>50</sup> The guideline for standard park acreage per resident is given by National Recreation and Park Association, a national non-profit organization. The mean acreage of parkland according to NRPA standards is 8.3, and the town recorded its provision at 7.77 acres in 2006. It was expected to acquire 8.3 acres annually to sustain its 2006 level of service, and more to reach national standards.

Unfortunately in 2010 the town council voted to return 40 percent of the grant funds received from the county. The current plan shows that Morrisville will leave 11 percent of the property as open space, while developing other recreational amenities as planned (Cooke, 2010).

Morrisville is a good example of a case that shows cities operating under the mechanism of policy imitation do not always have desired outcomes. The town council of Morrisville was willing to let go of the grant funding from Wake County, but not alter plans to incorporate more green open space. The lack of effort for land acquisitions and development of plans without concerns for grant conditions from the county convey a picture of an uninterested local government and lack of green space policy vision. According to literature policy imitation is characteristically temporal (Shipan and Volden, 2008). In Morrisville this temporal quality is visible. The town was quick to conduct a bond referendum in 2004 following its neighbors but six years later they were not able to effectively translate it into additional green space.

Through the case study approach it has been demonstrated that the above four mechanisms are not solely responsible for policy diffusion. The role played by county governments and policy networks are part of the explanation of how green open space referenda spread in the region.

### **3.5.2 County Policies and Institutional Capacity**

In the case study, the three counties differed from each other substantially in terms of their institutional structure. Examining the transfer of urban regeneration policies among local governments in UK Wolman and Page (2002) found that the institutional environment in which local governments function affects the activity to search for new policy initiatives. The set of rules and regulations create different incentives for different kinds of search activity.

In the case study area, the three counties with markedly different institutional set up created different opportunities for their local governments to seek information on green open space policies. The counties vary in their policies on green open space creation. On one extreme is Wake County which is the second largest county in the state. It has an organized and well established parks and recreation department. On the other extreme is Durham County which does not have a parks department.

In a study of collaboration across county governments Smith (2009) concluded that county institutional variables have an impact on the collaborations formed in the issue area of green open space policy. The author empirically demonstrated the positive association between collaboration in green open space policy area and the presence of a county manager form of government, general obligation debt for green open space and established green open space office.

Wake County has a dedicated program in the parks and recreation department for green open space acquisition. Wake County had experienced three green open space referenda between years 2000 and 2007. According to Smith (2009) Wake county government is highly likely to enter into collaboration with other governments. Orange County has a dedicated department for green open space and a clear policy for green open space acquisition. However the county has only experienced one green open space referenda since the initiation of the program in year 2000. Durham County is the other extreme of the spectrum as it does not have a program on the protection of green open space.

Looking at the case study area there are two distinct approaches are visible among local governments and their adoption of green open space referenda. The first approach, a coordinated effort, is visible in the case of Wake County and its constituent municipalities. The county

government emerged as a leader in green open space policy making through the creation of an informal professional association of municipal representatives. The partners in open space (POSE) was the brainchild of a county bureaucrat who was an instrumental policy entrepreneur. The association played a role in lobbying for green open space policy with the county management. The activity of the association also prepared participant municipal representatives to initiate green open space policy objectives in their own governments.

The county sustained its position as a leader and coordinator of local initiatives when it approached its municipal governments with grants to create a green open space plan. The county provided technical support for creation of the plan and consolidated individual plans into a county wide greenprint to guide land acquisition efforts in the county. Wake County continues to provide matching funds to municipal governments for land acquisition identified in the consolidated plan.

The second approach of autonomous policy development is seen in the municipal governments of Durham and Orange counties. Durham County has shown limited efforts for the protection of green open space. The city of Durham was in the process of creating a green open space policy document to guide its policy at the time the interview was conducted. Although the city has been advised by an advisory commission on green space related policies, the initiatives taken by Durham city and county on green open space is limited.

Orange County, which is organizationally more evolved than Durham County, lacks the financial commitment as Wake County, toward its green open space policies. There is some documentary proof that Orange County tried to get its municipal governments to collaborate and work together on a joint green open space plan. There was no evidence that the collaboration was actually attempted or whether it resulted in any tangible policy effort. The towns of Chapel Hill

and Carrboro have distinct approaches to green open space protection. Town of Chapel Hill is inclined towards restricting development whereas the town of Carrboro had adopted the route of planned development areas. The latter is influenced by the thinking of a policy expert whereas the efforts in Chapel Hill are a result of a strong agricultural lobby in the local government that is focused on protecting farmland. As a result both towns have a green open space policy, but their focus is different and their efforts are not synchronized with the county efforts. Consequently, the green open space acquired and protected within Orange County is not interlinked.

Governments that are institutionally strong and have the policy capacity (Press, 2002) defined as fiscal resources and political will, are much ahead in the implementation of the green open space policies. Wake County, Raleigh and Carrboro fit the description outlined by Press (2002). The local political context in the case study area was a non issue due to favorable public opinion since the 1990s. However, in the 1980s and early 1990s, institutional factors, ideology, and lack of political will contributed to failed policy making attempts. Institutional inertia in Wake county, defeated land use referenda in Carrboro and Orange County are examples of an ideology that was present in the 1980s. Comparatively in the cities of Raleigh and Chapel Hill, political willingness to take action on land use issues resulted in an elaborate greenways program in both jurisdictions in the late 1970s.

In the case study area, non referendum cities identified limited institutional and fiscal capacity as reasons for not undertaking debt to develop green open space. Lack of green open space is not a problem for these cities. The jurisdictions contain large tracts of undeveloped land because they are economically under developed. Lack of high income residents further contributes to lack of demand for green open spaces.



### **3.5.3 Policy entrepreneurs**

Policy entrepreneurs have been associated with policy making (Walker, 1969; Kingdon, 1984; Sabatier, 1991; Mintrom, 1997) and their diffusion (Mintrom, 1997, 2000). They are defined as ‘political actors who promote policy ideas’ (Mintrom, 1997:738). Literature on leadership and empirical work suggests an entrepreneurial role played by elected officials in policy making at the state (Weissert, 1991) and local government level (Schneider and Teske, 1992).

Citizen actors also function as policy entrepreneurs when they influence policy making, especially policy innovation (Roberts and King, 1991). Policy entrepreneurship can arise from within government too. The role of the bureaucrat in policy making has been debated passionately in public administration, in the context of the politics-administration dichotomy (Lipsky, 1980). Literature suggests that bureaucrats play a very important role in the policy process. In agenda setting activities the *mobilization model* described by Cobb *et al* (1976) features bureaucratic actors initiating a policy change from within the government.

In the case study I noticed instances where the role of policy entrepreneur was played by citizen representatives, bureaucrats and elected officials. Elected officials have played a major part in acting as policy entrepreneurs. According to one county respondent,

*This had interestingly enough driven, by leadership. This is being driven on a municipal level as a result of a visionary mayor(s) in a respective town, who recognized the value of something like [green space].*

Visionary mayors view green open space efforts as a way of leaving an administrative legacy. Within the case study area, mayors and council members in Orange County, Durham city, Wake Forest, Chapel Hill, and Carrboro have promoted green space creation within their jurisdictions. The concern for the kind of legacy their administration would be remembered for was a factor in them promoting green space policies.

In Orange County the county commissioners were especially active in recognizing that rapid development was a threat and land needed to be protected. This movement was spearheaded by a county commissioner who is recognized for being pro environment and has served the town for six terms. In the town of Carborro elected officials jointly acted as policy entrepreneurs when they adopted pro rural development strategy and incorporated a high land dedication ordinance into the development review process.

In some instances bureaucratic actors in county and city governments served as policy entrepreneurs. The bureaucrats aided diffusion of green space policies by becoming aware of policy options and supporting implementation with data and methodological application. For example in Wake County, it was the bureaucratic actor who first started lobbying the management for a policy on green open space. The town of Wake Forest is another example where the staff first became aware of the grant being given by Wake County for land preservation. The bureaucrat actively pursued the idea by lobbying for it with the city council before the mayor bought into the idea of green space protection (Town of Wake Forest, 2005).

Generally interest groups act as policy entrepreneurs. Their activity is visible especially in bringing an issue to the attention of elected officials in the agenda setting phase (Kingdon, 1984). In the case study area four different land trusts are actively working to protect land. National level land trust, the Trust for Public Land (TPL) is one of them. The agency has been associated with bringing the issue of green open space to the attention of political actors and media through its vigorous advocacy campaigns. Local land trust the Triangle Land conservancy acquires land within Orange County. One of its white papers was significant in framing the issue for political action in Orange County.

I expected that the land trusts will be associated with the spread of green open space referenda in the region. However, in the interviews and through the content analysis it appeared that they were not directly involved in the green open space referenda in any of the local governments. The Trust for Public Land was consulted by Wake County for its consolidated green open space plan. The land trust helped the county and its local governments to locate independent technical experts for the design of county and municipal green open space plans. Trust for Public land was not politically involved in any process of Wake County referenda or municipal referenda.

Respondents shared that they did not directly hire any land trust or a non- profit organization to design and execute the referendum campaign for them. Although government officials do consult and partner with the land trusts on legal matters pertaining to land acquisition, the interest groups did not play a significant role in the referendum process. One of the reasons that interest groups were not so involved was because the governments were self-motivated to create additional green open space. The governments were on a land protection trajectory that the interest groups approved of.

#### **3.5.4 Policy Networks**

Through the case study it is demonstrated that policy networks played an important role in the pattern of referenda observed in Wake County. Literature on policy networks emphasizes the interaction of actors across the horizontal level. However the case study shows that the policy network in operation within the spread of green open space referenda transcends municipal interactions, but it is mediated by county governments.

In literature the working of an intergovernmental network involving interstate professional organizations was highlighted in the study of diffusion of enterprise zones by Mossberger (2000). The author found that the organizations were involved in an interactive network which helped in the diffusion of enterprise zones. Mossberger defines this as *polydiffusion* as it involves interaction with the hierarchical government organizations (vertical level). In the case of diffusion of enterprise zones these organizations included federal organizations such as housing and urban development (HUD) and a professional organizations such as National Conference of State Legislatures (NCSL). The federal organizations were a major source of information in the policy network.

Similarly, in the case study the policy network formed in Wake County included both the county department and the municipal government professional association in an interactive network. The network was initiated by the county department that provided the information once the green open space referenda were initiated by municipalities in the county. The county department provided technical support through the trust for public land

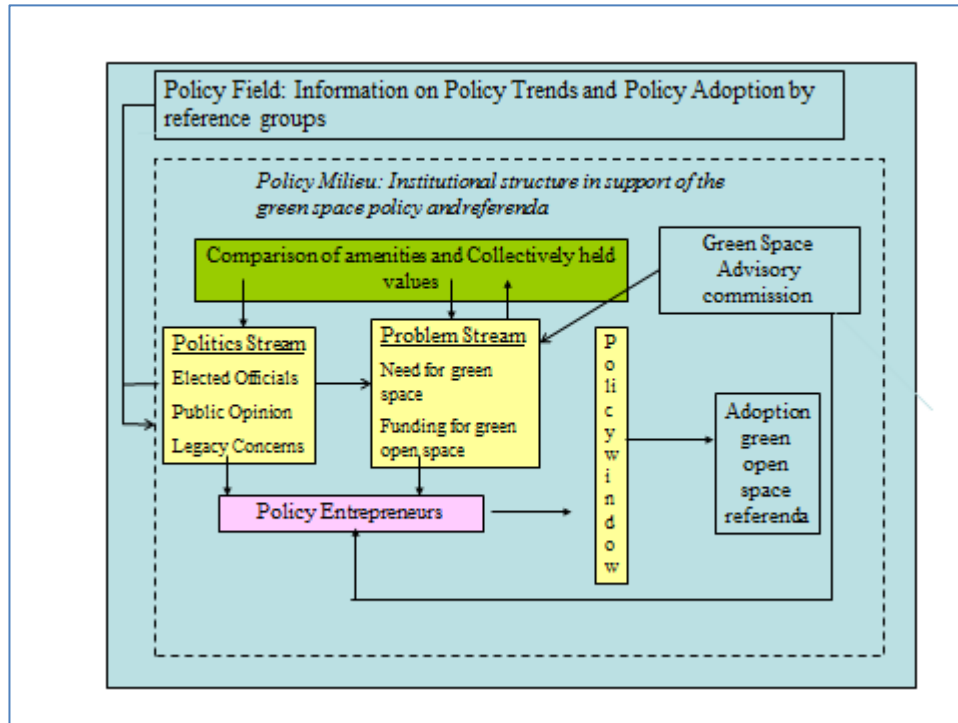
### **3.5.5 Consolidated Model of Referendum Adoption in the Case Study Area**

In the interviews respondents cited rapid land development and population growth in 1990s as the point of ideological change. Coupled with the presence of issue experts and policy entrepreneurs, the problem and politics stream, explains the extent of green open space policy among city and county governments in the region. The preferred solution for financing green open space protection was referendum, as indicated by documents and interview responses. In the case study the mechanism incentives appears to be dominant. The incentives were channeled through the action of the green space advisory commission. The financial stimulus plus the institutional support from Wake County helped the cities to take fiscal responsibility for creating

additional green space. Policy learning was another mechanism of policy diffusion which was evident in the case study cities. The mechanisms of competition and imitation were not supported by the respondents' views. However through the timeline of policy events and the documentary evidence they could be identified in the case study area.

On the basis of case study research I propose the following model [Figure 5] which portrays the main actors in the policy diffusion process identified in the case study area. As seen from the structure of the model, I rely heavily on Ness and Mistretta's (2009) interpretation of the multiple streams model because policy diffusion is a non linear process. Throughout the interviews I noticed that governments were aware of the policies and actions of the perceived leaders in green space policy within the region. Their response often included references to the values held dearly by the community. In addition, they were careful in how these values were being affected by the action of their neighbors. This process included measuring the amenities provided by their jurisdiction against the perceived first adopters in green open space policy. These two observations led me to conclude that there is an active awareness of neighboring governments policies .

Figure 5 shows the influence of the concept of 'collectively held values' on the quality of life. Cities that pioneered green open space protection in 1970s and 1980s were motivated by their concern to preserve green open space as it was highly valued in the community. Cities like Raleigh and Carrboro are prime examples. Therefore, preservation of green open space can sometimes be motivated by a system of values and beliefs specific to the government. In literature scholars have found that agricultural communities support growth management efforts because they value the rural setting and see urbanization as an unwelcome change to their quality of life (Kline and Wilchens, 1996).



**Figure 5: Consolidated model of diffusion process in the case study area**

The politics stream is composed of motivation of elected officials. Comparison of amenities and the concern for ‘quality of life’ affects public opinion and electoral futures which determine the actions of the political actors. Legacy concerns feature within this stream. This stream contains factors that influence the political actors to strategically support a policy and referendum on green open space.

The problem stream includes the demand factors that have been identified by previous studies on the success of green open space referendum (Nelson *et al*, 2007; Banzhaf *et al*, 2010). The demand factors help to elevate the issue to a problem status. Through interviews I learned that some governments struggle with funding to implementing green open space policy. For such governments referendum is considered an appropriate policy tool. The role of green space advisory commissions is crucial in defining the problem and providing the solutions for it. In most cases, the occurrence of green open space referendum in a local government has been preceded by the establishment of a green space advisory commission.

### **3.6 Conclusion**

The chapter focuses on cities and counties in two metropolitan areas in North Carolina that have experienced numerous green open space referenda. To answer the question of how referenda diffuse in a region the study adopted a case study approach. The primary question in the analysis was to identify the diffusion mechanisms causing multiple referenda in the region. Through the interviews and document search the following conclusions are drawn:

#### **3.6.1 Role of County Leadership**

The study found counties more inclined than municipalities to protect land for ecological purposes. Municipal governments favored green space provision to meet voter demands. In the context of this difference of motivation, the case study provided insight into how county leadership alters green space outcomes.

Wake County is a good example of a county assuming a leadership role and encouraging its municipal governments to adopt a similar policy position. The result is a sustained, shared vision for interconnected green space in the region. In the case of Orange County and its municipal governments public consensus on limiting growth and preserving the rural setting led to the formation of green open space policies. However weak leadership by the county resulted in independent and uncoordinated decisions by the county and municipal governments with regard to the trajectory and goals of green open space policies. Occurrence of county referenda provided the financial resources required to provide the incentive to local governments to enter into an agreement with the county government. Although the county and its municipalities did vote on a referendum the county's role in such decisions was limited.

The case study example suggests the importance of interaction and networking between county and municipal governments in a policy area (Mossberger, 2000). The presence of a

network of bureaucrats made a difference in the policy activity between Wake County and others in the case study area.

In the empirical exercise included in this dissertation (chapter five), the role of county government's through their expenditures and land preservation programs is discussed. The findings show that county land preservation programs positively influence the expenditures of municipal governments. County governments have emerged as critical actors in the effort to protect green open space at the local government level.

The case study suggests a link between municipal and county referendum. Nelson *et al* (2007) examined this association in a nationwide dataset, and did not find any association between municipal referendum and a prior county referendum. However the authors assume that county referendum occurred prior to municipal referendum. If the inquiry is set up as a correlation without assuming that county was the first mover, then results would be different.

An important observation with regard to county governments needs to be addressed. In the case study area, county leadership was extended to the municipal governments but counties did not cooperate with each other on green open space issues. When asked whether they were aware of what the other counties were doing, the response received showed indifference. The lack of strong collaboration among counties in green open space policy, which is a policy that is most effective if implemented regionally, is discouraging. The findings from the case study show that counties need a hierarchical agency like the metropolitan planning organizations or a federal agency field office to co-ordinate such efforts. The role played by federal agency in interstate policy diffusion efforts was discussed by Mossberger (2000).



### **3.6.2 Mechanism of Diffusion**

The study has attempted to identify the presence of various diffusion mechanisms namely learning, competition, imitation and incentives. The analysis isolated examples where learning and incentives were dominant. Policy learning was identified as a main mechanism through interviews and content analysis. However, similar to the finding of Wolman and Page (2002), the local government representatives did not acknowledge that it was a major factor in their decision making.

Although there was a theoretical expectation in this study that competition is an important diffusion mechanism, the interviews did not support this view. In the following chapters (chapter four and chapter five) the empirical question will provide evidence of how interjurisdictional competition affects expenditures of neighboring communities.

Imitation as a mechanism, although identified in one city was not generally supported by the study. Policy learning and imitation are difficult to disassociate and are often assessed in terms of policy implementation. As the case study did not focus on the implementation process, it was difficult to point out the differences between policy learning and imitation.

The anecdotal evidence in this study complements the empirical conclusion drawn by studies that have provided evidence of coercion and learning as policy diffusion mechanisms (Shipan and Volden, 2008 and Boehmke and Witmer, 2004).

In the matter of diffusion mechanisms, incentives seem to hold the most promise for creating a mature and interlinked policy on green space. Future efforts by state and non profit agencies should involve the county governments in designing an incentive mechanism. This will create common ground for green space policy for the region. Such an approach will ensure an integrated, evenly paced development of green open spaces.

It has to be acknowledged that policy diffusion mechanisms are not complete explanation of how green open space referenda spread through the region. County leadership in green open space policy making and the role of policy networks requires acknowledgement in the spread of referenda in the region.

Within the issue area of green open space, the details on diffusion mechanisms are relevant to land trusts and private foundations who are working toward adoption of more green space referenda. Knowledge about diffusion mechanisms is also important for higher tier government organizations such as metropolitan planning organizations, regional governments and county governments in order to recognize the potential for green space policy diffusion.

### **3.6.3 Elected Officials**

The analysis has highlighted the role of elected officials who consider green open space policy as an issue area through which they can demonstrate the achievements of their administration and leave a legacy. A recent study by Lewis and Nieman (2009) finds that the city mayor and council act as ‘custodians’ of the government. “They are motivated by a *vision* of what their community ought to become” (pg:8). The case study has identified multiple cases where elected officials functioned as policy entrepreneurs and promoted green space policy and referendum. The elected officials associate themselves with green space policy because it is viewed as a progressive policy.

The role of elected officials and the value of ‘credit taking’ has been unexplored in the green open space policy literature. This is a new insight that could be used to generate interest of elected officials on the green open space policy issue by advocacy organizations.

In general, the study has found that multiple green open space referenda are an outcome of multiple diffusion mechanisms including but not limited to competition. This finding is

complementary to the studies of Bohemke and Witmer (2004) and Shipan and Volden (2008) who examined the presence of more than one diffusion mechanism in a given policy context. The limitation of the case study approach is that its inferences cannot be extended to other cases of green open space referenda clusters in the country. Future research in this policy area should empirically study the referenda clustering phenomenon.

The case study has provided an exploratory look into the agenda setting and policy process involved in three counties and their constituent cities in the policy area of green space. The aim of the chapter was to find out what causes cities to hold green space referenda. The evidence is a mixed bag of the role played by policy networks, county leadership and the influence of incentives and policy learning.

## **4. EXPENDITURE TRENDS IN REFERENDUM CITIES: EVIDENCE FROM SIX STATES**

### **4.1 Introduction**

Literature on green open space referendum emphasizes the increase in frequency of referenda across the country in the last decade (McQueen and McMahon, 2003; Nelson *et al*, 2007; Banzhaf *et al*, 2010). Local governments holding green space referenda are labeled as progressive entrepreneurial governments (Hopper and Cook, 2004) by issue advocates. The recognition of local government referenda by national level green space advocates and associated accolades cultivates a positive image in public.

The main assumption that the issue advocates operate under is that successful referendum results in greater funding for the protection of green open spaces. More funding for green open space is thought to yield benefits associated with green space goods including a higher quality of life. Following the logic of the assumption referenda are tied to the expenditure increases on green open space goods. However, in the literature, the assumption persists without empirical proof or systematic questioning.

Over the course the last three decades local governments have gained public support to spend \$73 billion through green open space referendum. Of this amount \$33 billion was solely dedicated towards land conservation (Trust for Public Land, 2010). There is no statistic available on how many state and federal dollars were leveraged as part of matching grant programs towards additional green space. Neither is there a study on how expenditures on green space differ after a referendum.

It is important for this chapter to establish an expectation for the trend of parks and recreation expenditures over the study period. The examination of expenditure trends and changes is critical to the argument presented in the introduction of the dissertation that green open space referendum exert information and benefit spillovers which cause policy and fiscal interdependence among neighboring governments. The information externalities are generated as part of the referendum campaigning process. Benefit externalities result from the provision of additional green open space goods after the referendum. This chapter examines whether there is a change in the expenditures on green open space good after the occurrence of a referendum. In this way the chapter tests for the availability of benefit spillovers assumed in the dissertation. In addition this chapter functions as the logical bridge for the argument that referendum impacts neighbors' expenditures (chapter five) and as a result policy and fiscal interdependence can be observed among the governments in a region. By establishing that a referendum causes a change in own spending on additional goods and services, the argument can be made that neighbors are affected by the benefit spillovers from the additional green open space goods. Hence they are faced with a decision to adjust their own spending resulting in an observable expenditure reaction function (Brueckner, 1998).

I ask two simple questions from the data.

1. Does referendum affect spending of local governments on green space goods? If so does the spending increase after the referendum?
2. Are green open space expenditures of referendum governments different from non-referendum governments?

I compare referendum cities to a control group of cities. Since I do not directly observe green open space spending I study parks and recreation expenditure differences. If referendum

cities are found similar in expenditures before referendum and different after referendum then I will conclude that, all else equal, referendum affects expenditures. If expenditures increase after the referendum and are sustained, then I can infer that referendum impacts spending on green open space goods.

Theoretically it is possible for a local government to experience a referendum and not show an increase in parks and recreation expenditures<sup>51</sup>. However these conditions are rare. In this analysis I assume that the expenditure change is observable in all the referendum cities.

I answer the two questions with the help of an interrupted time series study design with a control group. Annual expenditures on parks and recreation for referendum and control cities from six states (Florida, North Carolina, Pennsylvania, Colorado, Washington and California) are analyzed to detect the effect of the referendum. The sample drawn from the six states offers variability in the use of different financial mechanisms by local governments to support the referendum. I use this additional detail to comment on the effect on expenditures post referendum.

The chapter is organized in the following manner. Section two reviews literature which aids hypothesis formation about local government annual expenditures. The third section profiles the parks and recreation expenditures data drawn from the six states. Section four presents the research questions and hypotheses to be tested in the empirical analysis. Sections five and six introduce the data and methodology and section seven contains findings. Section eight and nine discusses the findings and its relevance to public administration literature.

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<sup>51</sup> There are some possible scenarios in which there will be no change in total expenditures on parks and recreation immediately after the referenda. In the case of bond supported green open space, if governments are faced with an unfavorable economic environment it will delay the sale of bonds and consequently delay the change in expenditures. If the government reallocates resources after the referenda and substitutes its existing program funding with the anticipated expenditures on green open space with, then the net change will be unobservable. If the government loses population after the referenda then total expenditures will not show an increase.

## **4.2 Literature Review**

I have not found any other study that has examined the effect of green open space referendum on the expenditures of local governments. To observe the effect of referendum I formulate a theoretical expectation of annual parks and recreation expenditures in the absence of a referendum.

There are many theories of budgeting that predict the process and outcomes of the annual budgetary allocations for governments<sup>52</sup>. These theories have tried to answer the basic question posed by Key (1940) “on what basis shall it be decided to allocate x dollars to activity A instead of activity B?”

Over the years, budgeting theories have provided different frames to view the political and bureaucratic actors involved in budgeting and expenditure decisions. They have also provided different techniques and tools to study the government budgets. However, the presence of multiple views on budgeting process has contributed to a lack of a unified budgeting theory. There is no consensus among scholars about how governments make annual allocation decisions (Key, 1940; Kahn and Hildreth, 2002). I will be discussing two prominent theories in government budgeting in this chapter: *incrementalism* and *punctuated equilibrium theory*. These theories are relevant to drawing conclusions about the effect of referendum on parks and recreation expenditures.

Incrementalism is a popular theory that has captured the attention of the public administration field from the time it was introduced by Aaron Wildavsky in 1960s. He defined it as “... an agency budget is [. . .] based on last year's budget, with special attention given to a narrow range of increases or decreases. Thus, the men who make the budget are concerned with relatively small increments to an existing base” (Wildavsky, 1964:15). Incrementalism posits

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<sup>52</sup> There are seven identified theoretical perspective of public budgeting: incrementalism, budget process, organization theory, post modern, greedy bureaucrat model, transaction cost and median voter model (Bartle, 2001).

stable decision rules or bounded rationality of budgetary decision making actors and does not allow for drastic deviations from the observed trend.

In lay terms budgetary incrementalism is understood as small deviation from previous year's budget base. Incrementalism is defined as 'routine behavior' in expenditure decisions (Davis, Dempster and Wildavsky, 1966). In a review study Berry (1990) argued that the term incrementalism has multiple interpretations. The author identified 12 different meanings of incrementalism in the literature, with little concurrence among studies. In part the varied use of the term 'incrementalism' has to do with its intellectual roots within the field of policy sciences (Lindbloom, 1959; 1963) and its simple application by Wildavsky (1961) to government budgeting. The theory of *disjointed incrementalism* (Lindbloom, 1963) was a process based theory focusing on the bounded rationality of policy makers and its differences with the rational comprehensive model. Its application to budgeting by Wildvasky resulted in separate set of predictions for budgetary outputs as well as processes.

There are three commonly used interpretations of incrementalism theory (Boyne *et al*, 2000). First, it is understood as a change in budgetary outputs that are classified as incremental if a marginal change is observed from previous years' base. Secondly, the budgetary process is termed incremental if the decisions follow simple heuristics, and adhere to the previous years' decision rules. Finally, incrementalism is understood to be a theory where incremental budget outputs result due to application of simple budgeting rules. In their examination of English municipal governments Boyne *et al* (2000) isolate two concepts meshed in the general understanding of incrementalism theory. Incrementalism is understood in terms of *marginal changes in budgetary outputs* as well as *minimal deviations from the rules* that govern the budgetary processes.



The theory of incrementalism has drawn a fair amount of criticism. Over the years studies have not found support for the incremental theory of budgeting in empirical analysis (Bailey and O'Connor, 1975; Tucker, 1982; Rubin, 1989). The defenders of incrementalism argue that it could be a result of confusing conceptual definition of incrementalism (Berry, 1990) or a mis-specification of the model and problem of size of change (Tucker, 1982). Rubin (1989) in her article “Aaron Wildavsky and the demise of incrementalism” summarizes Wildavsky’s thoughts about application of incrementalism theory to present day budgeting. The author argues that Wildavsky himself acknowledged that the theory is limited and does not explain budgeting realities like entitlements, cutbacks and role of interest groups.

The punctuated equilibrium theory of budgeting came out of the work of Jones, Baumgartner and True (1998). The authors extended the punctuated equilibrium theory, found in policy literature, to apply to federal budgets. The core insight of this theory is that a budget is a policy document governed by the agenda of political actors. The theory does not disregard the existence of incrementalism in budgeting. Instead it argues that over time fairly stable budgets show “punctuations” due to changing *agendas* of political actors. Developing this theory further in their book, Jones and Baumgartner (2005) propose the *disproportionate information processing model* which is the main framework through which they explain the times of stability and punctuations observed in the budgets. This model assumes bounded rationality and institutional friction in decision making (Breunig *et al*, 2010). Stability and punctuations in the model are determined by the *attention* paid by the policy makers to the issues. Their willingness to adjust the agenda to reflect a change in policy priorities results in occasional dramatic budgetary changes. When the decision makers rely on identified serial processing methods and exclude new issues and policy priorities, it results in the period of stability. In this manner

incrementalism is a special case predicted by the model. When there are significant changes made to the policy agenda and the policy makers are paying *attention* to the need for change, the budgeting priorities are redirected (True, 2000) resulting in large fluctuations.

Another interpretation of the mechanism of how incremental and punctuations occur is presented by True (2000). According to him the US political system is highly fragmented and policy making takes place in the larger macro political system as well as within policy subsystems. Incremental decisions in budgetary allocations are a result of times of political stability when decision making occurs comfortably within the subsystems. In the event of a new problem, or policy concern, if the subsystem is incapable of dealing with the political tradeoffs, the decision making takes place at the larger macro political level. When new interest groups and previously disengaged actors participate in the policy process, there is the potential of redirecting the political priorities and setting new agenda for spending. Abrupt changes or punctuations are a result of the shift in spending priorities. They result in extreme changes in spending and trade offs in budget allocations. Green open space referendum acts as punctuation in the expenditure allocations of the local government. It provides an infusion of financial resources .The occurrence of a green open space referendum in a neighboring jurisdiction provides the information and momentum to the interest groups and other policy entrepreneurs. The information forms the basis of challenging the status quo of spending priorities and may lead to a change in the expenditure allocations of neighboring jurisdictions.

The punctuated equilibrium theory assumes that budgeting data follows a partisan probability distribution over time. This distribution is marked with high frequency of values around zero and at the ends of distribution. This results in flat tails of the distribution that are typical for the distribution function. The pattern of the distribution conveys that there is a

tendency for small changes as well as extreme fluctuations in the budgeting data over time. There are few values in the middle of the distribution. This observation has been verified by other scholars who have investigated the punctuated equilibrium theory in budgets (True, 2000; Jordan, 2003; Breunig *et al*, 2010).

As pointed out before, incrementalism can be understood to be a special case of the punctuated equilibrium theory of budgeting. In other words, incrementalism and punctuated equilibrium theory of budgeting can be considered as two complementary theoretical frameworks

Most research on theory of public budgeting is focused on federal budgets (Wildavsky, 1964; Davis *et al*, 1966; Jones and Baumgartner, 2005; Breunig *et al*, 2010). Few studies on local government budget decisions are available (Boyne *et al*, 2000; Kacynzski and Crompton, 2006; Jordan, 2003; Zhao *et al*, 2010). Evidence from studies conducted in the UK (Barnett *et al* 1991; Boyne *et al*, 2000) and Europe (Mortensen, 2005) support both incremental and punctuated equilibrium models of budgeting. In the US empirical studies concerning local governments have favored the punctuated equilibrium model (True, 2000; Jordan, 2003; Robinson, 2004; Breunig and Koski, 2006; Ryu, 2009). There is little or no evidence of incrementalism being applied to local government budgeting (Zhao *et al*, 2010).

#### **4.2.1 Parks and Recreation: An Overview of Annual Allocations**

Local governments expenditures are concentrated in two policy areas namely allocational and developmental<sup>53</sup> (Lowi, 1972; Peterson, 1981). Traditionally parks and recreation spending

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<sup>53</sup> Working with policy typology given by Lowi (1972), Peterson (1981) decomposed government expenditures into *developmental*, *redistributive* and *allocational* categories. Developmental expenditures are incurred on infrastructure; redistributive expenditures involve government sponsored welfare services, and functioning of government comprises allocational expenditures. Peterson predicted that governments would focus on increasing their competitiveness by engaging in developmental expenditure category.

has been viewed as allocational policy (Jordan, 2003). Lately some authors have argued that parks, green space and other amenity factors contribute towards the competitiveness of cities (Rogerson, 1999; Lambiri *et al*, 2007). This argument qualifies parks and recreation as a category within developmental expenditures. It helps to reposition the legitimacy of parks and recreation departments' allocation and brings it in competition with services such as transportation and economic development (Jordan, 2003; Kaczynski and Crompton, 2006). The shift in policy perception of parks and recreation expenditures, from allocational to developmental, warrants a close look at annual expenditure variations for local governments.

There are few studies in the US that which have examined changes in the outlay of local government parks and recreation expenditures. Literature related to fiscal trends among park and recreation agencies (henceforth PRA) is found in the discipline of leisure studies. Schaumleffel *et al* (2003) note a bias in published literature that PRAs experience annual budget decreases, and services like police and transportation are often prioritized over parks and recreation. These assumptions would imply that the PRA budgets cannot be incrementally predicted and experience fluctuations due to the tradeoff in budgeting priorities. According to Schaumleffel *et al* (2003) these assumptions, although predominant in the field, have been challenged by subsequent studies. Later investigations of PRA allocations have found that political cycles have affected parks and recreation spending at the local government level<sup>54</sup>. For example the introduction of 'Reganomics' in the 1980s created an environment of financial setbacks for the PRA personnel (McCarville and Crompton, 1988; Gladwell and Sellers, 1997 cited in Schaumleffel *et al*, 2003). The ratio of parks and recreation expenditure to total expenditures

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<sup>54</sup> Among other factors, local government size has also played an important role in the literature. Small towns have been found to spend more per capita to provide services than large cities. The ratio of personnel per capita is much higher in small towns, yet they struggle to provide similar services because they do not have enough personnel to do the grant writing and development activities.

increased in the 1990s for select group of cities examined by Gladwell and Sellers (1997). This is a complete opposite of the trend observed in the earlier two decades.

A study of select local governments in North Carolina examined operating, capital and per capita spending over a period of 15 years. The study was based on data reported by municipal and county governments. The results found inflation adjusted increases in the annual budgets of the local governments. Overall the government budgets did not show major fluctuation in spending (Gladwell *et al*, 2003). Similar conclusions were drawn from a study of local governments in Ontario. A study of revenues and expenditures, including parks and recreation expenditures, from local governments over a nine year period supported incrementalism (Connolly and Smale, 2001).

A study of parks and recreation expenditures for four years from 30 small Illinois cities by Schaumleffel *et al*, 2003 supported incrementalism. The authors examined annual budgets as well as per capita expenditures over four years which were found to have a positive trend. While Schaumleffel *et al*, 2003 examined a relatively small sample of cities, Kaczynski and Crompton (2006) compared the allocations for parks and recreation with nine other public services for all US local governments. Data from 1989 to 2003 was analyzed for the study. Studying annual changes, over the 14 years, the authors found support for the incremental method of budgeting. More than 80 percent of the cases displayed an annual percentage change of five percent or less in the budget allocations. This finding was common to the nine other public service sectors examined in the data. In the instance where only operating budgets were studied the margin of change in annual spending was further reduced. Most fluctuations were due to capital spending. The authors note that parks and recreation services exhibited an incremental pattern of annual expenditure change.

A shortcoming of Kaczynski and Crompton (2006) is that they study the aggregate allocations for all municipal governments in the US drawn from the Census of Governments. Their study fails to pick upon the changes that individual governments experience. As for other studies that have supported incrementalism, their data either focus on cities of a particular size, for example Schaumleffel *et al*, 2003 solely study small cities. Or the studies use survey data (Gladwell and Sellers, 1997; Gladwell *et al* 2003) for a small number of years (Connolly and Smale, 2001; Gladwell *et al* 2003).

In comparison to studies that support incrementalism, there are examinations of parks and recreation data that support the punctuated equilibrium framework. One of the prominent studies is Jordan (2003) who examined the expenditures for 38 cities with population over 300,000 over a 27 year time period. Data for cities was taken from the City Government Finances from 1962 to 1992. Five functional areas of public spending along with parks and recreation were examined in the study. The functional areas were chosen on the basis of whether they would constitute allocational or non allocational spending. Data were examined for the frequency of punctuations for each spending area. The analysis revealed that the agenda, hence spending, is more stable for the allocational categories of government expenditures. Twenty percent of annual change in parks and recreation expenditures, which is classified as a non allocational spending category in the study, showed punctuations. Comparatively, in the allocation category the average punctuations in annual spending change were three percent. Jordan (2003) systematically presents the leptokurtic distribution of the different expenditure categories. This distribution is characteristic of punctuated fiscal trends (True, 2000) resulting from the disproportionate information processing model. The author argues that the results strongly support the punctuated equilibrium theory for budgeting.

Other studies in US that have examined fiscal trends with the help of punctuated equilibrium theory have used state expenditures (Ryu, 2009), and school expenditures (Robinson, 2004), so their conclusions are not directly applicable to the present discussion.

Based on the preceding discussion I profile the parks and recreation expenditures for six different states chosen for the study. The section comments on the trend and distribution of observed expenditures.

In order to show that cities with referendum register a difference in their expenditure trend, it is important to establish a pattern of parks and recreation expenditures over time. The next section presents an analysis of the parks and recreation expenditure trends for the six states chosen for the study.

#### **4.3 Distribution of Parks and Recreation Expenditures in Select States: An analysis**

For the present study parks and recreation data has been gathered from six states at the municipal level. States are selected on the basis of two criteria namely, the number of city referendum and availability of city level expenditure data over time. The six states selected are California, Colorado, Florida, North Carolina, Pennsylvania and Washington. The collected data spans ten years from 1996 to 2006. For the purpose of the study I make a distinction between municipal governments that have experienced a green open space referendum and those that have not. In this section I present the trend of expenditure data shown by all municipal governments from the six states. I discuss whether the observed expenditure trends fit the pattern predicted by incrementalism and punctuated equilibrium frameworks. It is important to establish the trend of parks and recreation expenditures to discuss the difference made by the occurrence of a green open space referendum.

Table 5 shows a summary of the municipal expenditure data obtained from the six states for years 1996 to 2006.

**Table V: Descriptive Statistics for Municipal Expenditure data 1996-2006**

State	Number of Municipalities(a)	Average Number of Municipalities Reporting expenditures (b)	Average Per Capita Expenditures (\$)	Standard Deviation	Average Minimum	Average Maximum
California	478	439	69.5	75.7	0.1	723.3
Colorado	270	50	227.4	333.8	2.3	1908.6
Florida	411	335	82.2	84.4	0.2	766
North Carolina(*)	548	159	162.6	481.6	0.1	3392.2
Pennsylvania	2562	1862	14.9	46.3	0.1	1373.3
Washington	281	240	41.7	46.1	0.1	436.2

Note: (a) The number of municipalities reported in the Census of Governments, 2007. (b) For Pennsylvania the count represents both municipalities and townships because both report parks and recreation expenditures. (\*) The values for North Carolina are inflated due to an outlier. Without the outlier the average is \$54.2

Column (a) shows the number of cities in the state according to the Census of Governments survey 2007. Column (b) displays the average number of cities reporting parks and recreation expenditures in the ten year period. According to the figures in table five, the average number of cities reporting parks and recreation expenditures is very low for cities from Colorado and North Carolina.

The average per capita expenditures and the standard deviation figures are the highest for municipalities in Colorado. This suggests a greater variability in reported expenditures for cities in Colorado over the ten year period. Cities in Washington are more homogenous in the reported expenditures over the ten year period. A detailed table of yearly average expenditures is presented in the appendix [A4.1].

Following incrementalism I expect a normal distribution of parks and recreation expenditure changes over time. The punctuated equilibrium theory would predict a leptokurtic distribution for the expenditure changes (Jordan, 2003). One way to gauge the non-normality of



the distribution is to measure its skewness and kurtosis. Measures of skewness and kurtosis help approximate the slope and thickness of the distribution tail. A kurtosis value of three and above signals a leptokurtic distribution (Jordan, 2003). Table six displays the kurtosis values for the annual change in per capita expenditures of the six states. Except North Carolina and Pennsylvania the remaining states show large values for kurtosis.

**Table VI: Descriptive Statistics for Annual Change in Per Capita Expenditures 1996-2006**

	Florida	North Carolina	Pennsylvania	Colorado	Washington	California
Mean	0.04	0.09	0.18	0.06	0.05	0.05
Skewness	-0.50	0.31	0.07	0.77	1.58	0.19
Kurtosis	3.92	2.87	2.41	5.32	7.86	3.85
Shapiro-Wilk	0.97***	0.98***	0.98***	0.93***	0.84***	0.96***
Kolmogorov-Smirnov	4.28***	3.25***	2.88***	4.17***	5.59***	3.71***

Note: \*\*\*significant at  $p < 0.05$

Statistically the Shapiro-Wilk statistic (Shapiro and Wilk, 1965) is useful in distinguishing a normal and non-normal distribution. The null hypothesis for the test posits that the sample is derived from a normally distributed population. A p value of less than the alpha level of 0.05 helps to reject the null hypothesis. The Shapiro-Wilk test statistic for each state is shown as significant in table six. According to the statistics the null hypothesis that the sample is drawn from a normal distribution is rejected for the data.

An additional test to check for the normality is performed. A one sample Kolmogorov-Smirnov test evaluates the distribution of the data against a theoretical normal distribution. The null hypothesis is that the distribution is normal. The highly significant coefficients reported in table six help to reject the null hypothesis. Both Shapiro Wilk and Kolmogorov-Smirnov test show that the expenditures data from the states have a non-normal distribution.

In this section table six illustrates the distribution of expenditures data statistically for the ten year period. In the following figure seven I present the expenditure trend of a randomly selected city from each of the six states.

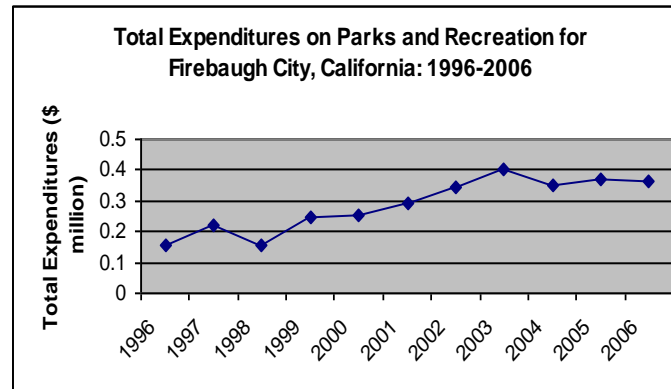
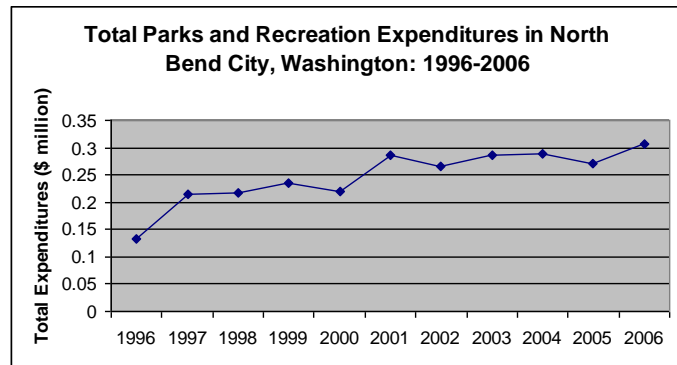
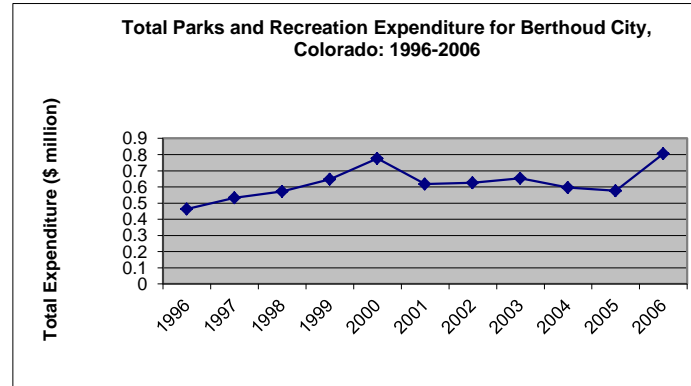
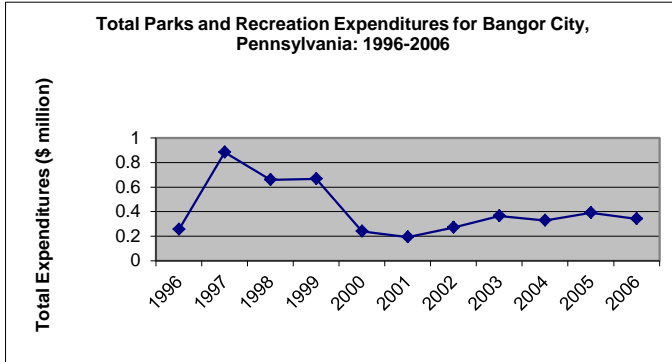
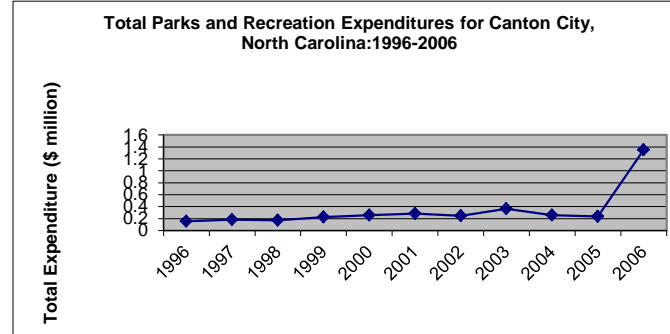
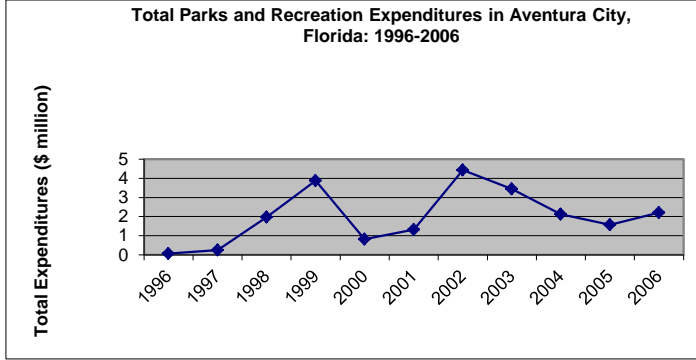


Figure 6: Trend in Expenditures for Sample Cities between 1996 and 2006

Figure six is a table of graphs that shows the trend in expenditures for sample cities. The graphs present a mixed picture. Aventura city in Florida clearly shows a cyclical pattern with highs and lows in the total expenditures. The cyclical pattern would support the re-ordering of priorities suggested by the punctuated equilibrium theory. In North Carolina, Canton city shows a much steadier trend of expenditures, the changes that occur in the spending appear incremental except for the expenditures from 2005-2006. The last year shows the highest increase in total spending for the city and possibly reflects a reordering of priorities by the policy makers or a big capital investment.

The graph for Bangor City, Pennsylvania is full of fluctuations that do not fit the expectation from the incremental model of budgeting. Graphs from cities in Washington, Colorado and California are marked with distinct phases of small changes. These stable small changes over a period of time support the incrementalism view. The cities display some large changes but they are fairly sparse in the distribution.

The analysis so far has shown that parks and recreation spending, being a non-allocational expenditure (Jordan, 2003), is less steady over time and susceptible to large fluctuations. Therefore, conventional statistical assumptions of normal distribution will have to be set aside. Rules of thumb for checking on the robustness of results will require softening for the interpretation of coefficients. I will be paying attention to the sign of the coefficients more than the  $p$  value. There are two main questions which will be answered in this chapter. The next section introduces these questions.

#### **4.4 Research Questions and Hypotheses**

As discussed in the introduction the two questions asked in this chapter provide critical foundation for the research described in chapter five. They are also linked to chapter three which

raises questions about how referendum disseminate in a regional space. In this chapter, I measure change in spending after the green open space referendum. The first question simply asks whether there is a difference in referendum and non-referendum cities before and after the referendum. This is important to establish that referendum cities are no different than other cities before a referendum.

**Research Question 1: Do referendum cities differ in per capita expenditures from control cities before and after the referendum?**

The null hypothesis for this question is that there is no difference in the per capita expenditure on parks and recreation for referendum and non-referendum cities. The referendum cities are considered as the treatment group. A control group of cities that have a similar socio-economic profile as referendum cities is chosen. The two groups of cities, treatment and control, are examined before and after the referendum. The timing of the referendum is indicated with subscript  $r$  and subscript  $t$  is any given time before ( $r-t$ ) or after the referendum ( $r+t$ ). The null hypothesis is represented as follows

$$H_0 : Control\beta_{r+t} = Treatment\beta_{r+t}$$

The alternative hypothesis for this question proposes that there will be a difference in the per capita spending after the referendum.

$$H_1 : Control\beta_{r+t} \neq Treatment\beta_{r+t} \ \& \ Treatment\beta_{r+t} - Control\beta_{r+t} \succ 0$$

I also consider the difference in expenditures for referendum cities before and after a referendum.

**Research Question 2: For the referendum cities, does own expenditure on park and recreation differ after the referendum?**

The null hypothesis for this analysis is that there will be no difference in expenditures on parks and recreation, for the referendum city, before and after the referendum.

$$H_0: \beta_{r-t} = \beta_{r+t}$$

The alternative hypothesis suggests that after referendum there will be a change in the own expenditures of a city government. I expect the coefficient before and after the referendum to be unequal. In addition, I expect that the coefficient after the referendum will be positive showing an increase in the expenditures on parks and recreation.

$$H_2: \beta_{r-t} \neq \beta_{r+t} \ \& \ \beta_{r+t} - \beta_{r-t} \succ 0$$

The two hypotheses will be examined with empirical analyses. Details on the data and methodology are provided in the next two sections.

#### **4.5 Data**

The hypotheses will be tested with city expenditures data on parks and recreation. Annual expenditure data is collected from municipal governments of six different states in US from 1996 to 2006. The primary dependent variable<sup>55</sup> in the analysis is per capita expenditures on parks and recreation. The annual expenditures are converted into real dollars by deflating them with the consumer price index for base year 2000. Referendum data for the states is drawn from the Trust for Public Land *Landvote* database. Referendum observations from 1996 onwards are used following the disclaimer of Trust for Public Land stating that the referendum data prior to 1996 may not be accurate.

Table seven shows the basic characteristics of the states chosen for the study and the frequency of referenda conducted by their city governments. A separate column identifies the financial mechanism that the states have allowed for the local governments when proposing a

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<sup>55</sup> A similar set of estimations was carried out for change in annual expenditures as the dependent variable. The findings are not discussed in the chapter to avoid replication. The detailed tables are provided in Appendix B4.2.

referendum. This information is taken from the *Conservation Almanac* a subsidiary organization of the Trust for Public Land.

There is a large variation among states in allowing local governments to use various financial mechanisms to support local referendum. Florida and North Carolina only permit its local governments to sell general obligation bonds. On the other hand cities in California have the freedom to choose between bonds, and a variety of taxes.

**Table VII: Characteristics of Referenda in Selected States (1988-2010)**

State	Region	Frequency of successful municipal referenda	Financial mechanism
Florida	South East	29	Bond
North Carolina	South East	25	Bond
Pennsylvania	Midwest	134	Bond, property tax & sales tax
Colorado	West	65	Bond, property tax & income tax
Washington	North West	27	Bond, property tax
California	South West	67	Bond, property tax & other taxes (eg utility, parcel tax)

Research on referenda has shown that the mechanism of funding affects the likelihood of its success (McQueen and MacMahon, 2003). Voters prefer referenda that are backed by bonds because bonds tend to affect taxes less visibly than an increase in the property taxes or sales tax (Kelly and Zieper, 2001). The variability of financial mechanism in referenda seen in Table seven will be taken into account in the analysis. A comparison will be made between different finance mechanisms and their effect on the expenditures after the referendum. This step will provide an extra layer of detail in understanding the change in expenditures of referendum cities.

For the estimation, expenditures on green open space goods are operationalized as expenditures on parks and recreation. Theoretically parks and recreation expenditures are not the same as expenditures on green open space goods. However, at the municipal level the parks and

recreation department is responsible for green open space functions. The reported annual financial data at the local level cannot be disaggregated into the specific category of pure green open space goods. Any change in the outlay for green open space goods would be reflected in the total expenditures of the parks and recreation department.

Dependent variables in the study are per capita expenditures on parks and recreation and the annual percentage change in per capita expenditures. The former is a sum total of annual expenditures by city parks and recreation department. Use of this variable is supported by similar studies that have examined other local government expenditures (Lundberg, 2006; Carruthers and Úlfarsson, 2008). The second dependent variable is the annual change in per capita expenditures on parks and recreation (Jordan, 2003). Expenditure data are collected from years 1996 to 2006 for the states except California for which the expenditure series is available till year 2005.

#### **4.6 Methodology**

To study the difference in expenditure data, before and after the referendum I use the interrupted time series research design with a control group (Shadish *et al*, 2002). The interrupted time series research design is commonly used to assess the effect of an exogenous intervention on a time series observations of a variable (McDowall *et al*, 1980). The intervention or change agent in this case is the event of green open space referenda.

The inclusion of a control group adds to the strength of the research design as it protects against threats to internal validity such as history, maturation and instrumentation (Cook *et al*, 2002: 182)

The analysis of post treatment change involves assessing the effect on the level of change and the slope of change. Change in level refers to the change in the value of the variable

following the intervention. Slope change corresponds to the unit of change per unit time following the intervention. Other type of effects on the time series of a variable can be characterized as continuous/discontinuous and immediate/delayed effects (Cook *et al*, 2002: 173). In this study I focus on the level and slope of change in expenditures for treatment (referendum) and control (non- referendum cities) group of cities.

The treatment group is formed of the referendum cities from the six states. A control group of cities is chosen from each state. The control group is similar to referendum cities in their socio-economic profile which is a strong predictor of referendum occurrence (Nelson *et al*, 2007; Banzhaf *et al*, 2010).

In the first stage of the analysis I select a control group of cities from each state to compare with the referendum cities. I do this by estimating a probability score for referendum occurrence among all cities. A logistic model is fitted with referendum occurrence as the dependent variable. Socio-economic factors are included as regressors to derive the predicted probabilities. The dependent variable is categorical and assumes value =1 if there is a referendum occurrence (REF).

The independent variables for states were drawn from literature that predicts the success of green open space referenda. The independent variables differ between individual state equations, but include the per capita income (PCI) and median household income (MHI); percentage population over 65 (PER\_65); percentage population with a bachelor's degree (BACH), land area in square miles (LANDSQML), percentage owner occupied housing (OOHU) and amenity factors (AMENITY) like presence of coast line and surface area in water miles (WATERML).



The relationship of income as a predictor of green open space demand is unclear. Generally, local public goods are found to be income elastic (Borcherding and Deacon, 1972). However, empirical conclusions about the effect of income on green open space demand are mixed. The effect of income was found to be positive in the most empirical analyses (Bates and Santerre, 2001; Schläpfer and Hanley, 2003; Kotchen and Powers, 2006; Howell-Moroney, 2004), but in some cases income has been reported to have a negative or insignificant association (Schmidt, 2008; and Banzhaf *et al*, 2010). Median household income was used as a predictor to estimate referenda success by Thalmann (2004) and Nelson *et al* (2007).

Previous studies have found a positive relationship between the amenity factors and the demand for more green open space (Murdoch *et al*, 1993; Kline and Wichlens, 1994; Schläpfer and Hanley, 2003). In their study of green open space referenda in the US, Banzhaf *et al* (2010) concluded that higher surface area in water miles is associate with referenda success.

Percentage owner occupied housing units is included as a predictor of referendum occurrence according to the rationale of the *homevoter hypothesis*. According to Fischel (2005) homeowners are most interested in improving the property values of their homes hence favor improvement in the quality of life. As green open space is empirically linked with improvement in quality of life and property values (Nicholls and Crompton, 2005), I expect referendum occurrence to be positively associated with percentage owner occupied homes.

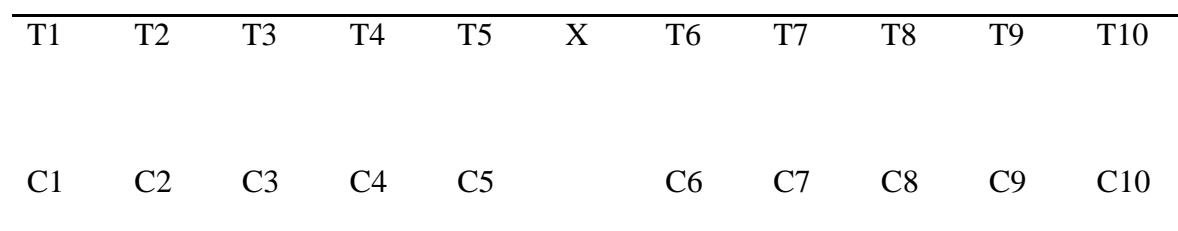
I expect that a government serving a population over a larger surface area will require providing multiple sites of green open space access. The option of green open space referendum provides the required capital for acquiring land to provide access to green open space at multiple sites.

The estimation equation takes the following representative form (equation 4.1).

$$REF_i = \alpha + \beta_1 PCI_i - \beta_2 PER\_65_i + \beta_3 BACH_i + \beta_4 LANDSQML_i + \beta_5 OOHU_i + \beta_6 AMENITY_i + \varepsilon_i \dots\dots\dots(4.1)$$

Among the independent variables the coefficient for percentage population over 65 is expected to be negative as the expected marginal utility of elderly population from green open space is low (Kline and Wichlens, 1998). After the logit model is estimated and probabilities generated, the cities are sorted on the score of predicted probabilities. Non referendum cities closest to the referendum cities in the probability score are designated as the control group. The non random process of selecting the control group may introduce selection bias in the study however it is not a serious threat to the conclusions of the study. At least one control city is selected for every referendum city in each state. However in some states the number of available control cities was less than the referendum cities<sup>56</sup>. The analysis was conducted with a comparable number of referendum and non-referendum cities in the sample.

The second stage of the analysis consists of the panel estimation. A simple diagram of the interrupted time series research design with a control group is shown in the figure seven. In the figure occurrence of X denotes the time of the intervention



**Figure 7 Diagram of Interrupted Time Series Research Design with Control Group**

<sup>56</sup> The pool of non-referendum cities was decreased because either a) they were too far apart from the referendum cities in their probability score or b) the data was missing or not consistent.

For the analysis the cities are arranged in the panel depending on when the referendum occurred (point X). The year of the referendum is treated as year  $r$  and all referendum cities are aligned at year  $r$ . Expenditure data for 10 years from 1996-2006 are used in the study. The years before the referendum are marked as  $r-t$  where  $t$  takes values 1,2,3 ...9. For example the value of  $t$  in  $r-t$  is 9 if the referendum has taken place in 2006. Similarly, the value of  $t$  is 9 for  $r+t$  where the referendum has occurred in 1996.

Figure eight conveys the arrangement of the analysis graphically for a few cities.

Dependent Variable (Per Capita Expenditures on Parks and Recreation or Annual Percentage change in Per Capita Expenditures on Parks and Recreation)												
Cases/Year	Ref	r-5	r-4	r-3	r-2	r-1	$r$	r+1	r+2	r+3	r+4	r+5
City 1	1					4.67	7.86	9.43	9.03	7.34	5.43	2.45
City 2	0		23.4	32.6	22.4	34.6	44.6	45.6	34.5	23.3		
..	1	..	..	..	..	..	..	..	..	..	..	..
..	1	..	..	..	..	..	..	..	..	..	..	..
City 3	1	12.3	16.9	13.5	18.4	20.9	18.5	16.7	19.3			
City 4	0	23.4	24.6	22.4	29.0	32.5	36.8	34.6	23.9			
..	1	..	..	..	..	..	..	..	..	..	..	..
City <sub>n</sub>	1				32.6	36.5	33.8	38.0	34.6	32.6	31.4	39.3

**Figure 8: Design of panel dataset for estimation**

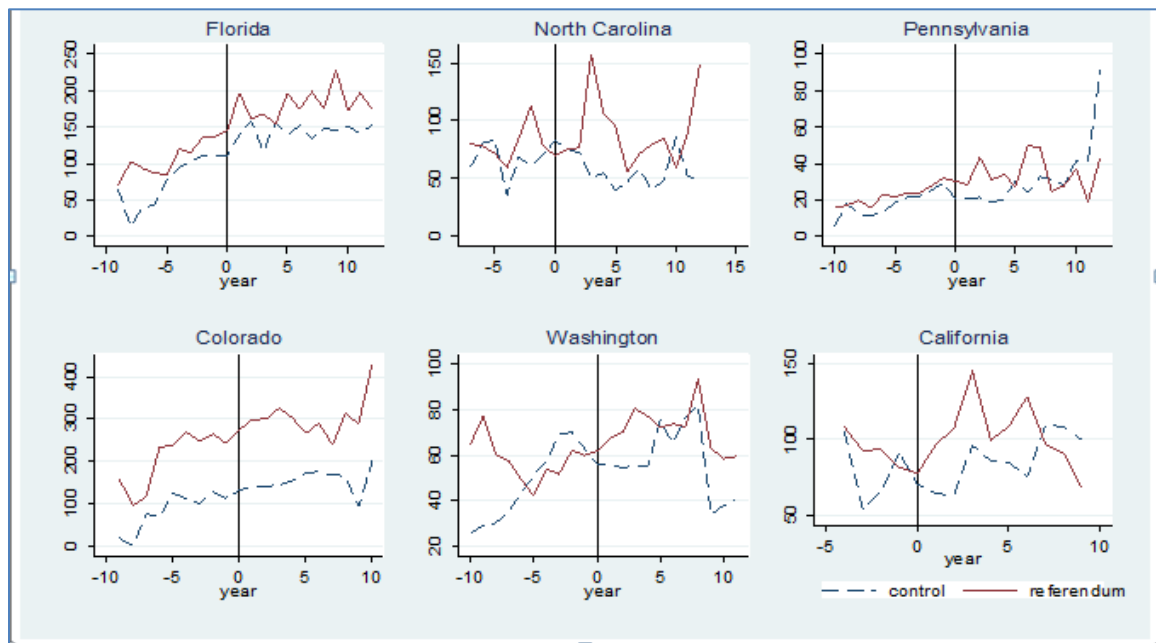
City 3 and City 4 are matched pairs according to the probability score calculated with the logit estimation. City 3 is a referendum city whereas City 4 is a non-referendum city. The arrangement of expenditure data for non-referendum cities in the panel mirrors the arrangement of their matched referendum cities as shown in the example. After the arrangement of the panel data I test it for the hypotheses outlined in the research questions. The analysis and results are summarized in the following section.

#### **4.7 Analysis and Results**

The first step in the analysis is the estimation of logistic regression models for each of the states. The regression yields a probability score of holding a referendum for each city in the state. Table A4.1 in the appendix B 4.1 provides the details on the logistic estimation for each state. Results of the regression summarized in the table match the conclusions found in literature (Kline and Wilchens, 1994, 1998; Kline, 2006; Bates and Santerre, 2001; Halbheer *et al*, 2006; Kotchen and Powers, 2006; Nelson *et al*, 2007; Bornstein and Thalmann, 2008; Bornstein and Lanz, 2008; Banzhalf *et al*, 2010). Communities with a higher percentage of educated and lower percentage of older population are found to be more likely to hold a referendum. The sign on percentage owner occupied housing is inconsistent and does not support the ‘homevoter hypothesis’ (Fischel, 2005). This hypothesis states that homeowners are more politically active to ensure that the actions of the municipal governments increase their quality of life. Accordingly, I expected a positive relationship between percentage homeowners and occurrence of a referendum as green space adds to the quality of life offered in a community. The results show a small and mixed effect. Large cities with more water area show a tendency to hold referenda (Murdoch *et al*, 1993). Presence of amenity factors underscores the efforts to protect green open spaces.

Table A4.2 (1-6) in appendix B4.1 provides details on the goodness of fit for each of the logistic regression estimated on state data. The table contains expected and observed referendum occurrences and non occurrences. The Hosmer-Lemeshow goodness of fit statistic is provided in table A4.1 in appendix B4.1. The null hypothesis being tested in the Hosmer-Lemeshow test is that the model fits the data. The presence of a non significant statistic allows for the conclusion that the model matches the data. The Hosmer-Lemeshow statistic summarized in table A4.1 of the appendix B4.1 show that all six models estimated match the data. I calculated the

predicted probabilities for the cities in each state and sorted them in ascending order. The non referendum cities closest in their score to the referendum cities were designated within the control group. Ideally, for each referendum two cities would be chosen as respective controls, the city just above and just below in the order of predicted probabilities. In some cases, just one control city is found in between two referendum cities when sorted on the predicted probabilities. For such cases, one control city is chosen for each of the two referendum cities. In the presentation of the analysis I first discuss the differences in per capita expenditures between referendum and non-referendum cities. Figure nine graphically shows the difference in trend of expenditures for referendum and non-referendum cities.



**Figure 9: Mean Per Capita Expenditure for Referendum and Control Cities**

The table of graphs (figure nine) presents per capita expenditures for cities in the treatment and control group for each state. Separate lines indicating mean per capita values for control and treatment cities are shown for each year of the data. The X axis shows time (year) in the format of  $t (+/-) t$ . The value '0' on X axis shows the occurrence of the referendum. The RHS

of the graphs shows trend in expenditures after the referendum and LHS before the referendum.

Graphically, it is difficult to ascertain the general trend of per capita expenditures for control and referendum cities. To clarify the trend in expenditures I use regression to compare the groups of referendum and control cities.

Tables eight and nine present the descriptive statistics of the referendum and control group of cities for each of the six states<sup>57</sup>.

**Table VIII: Descriptive Statistics for Per capita Expenditures of Referendum Group**

States	Number of Cities	City Years	Mean Expenditure	Median Expenditure	Maximum	Minimum	Std. deviation
Florida	17	216	156.1	129	634.7	32.5	104.7
North Carolina	15	175	88.6	80.6	884.5	6.8	78
Pennsylvania	63	784	31.	11.1	610.7	0	57.4
Colorado	29	317	280	158	2804.9	2.1	395.5
Washington	9	115	64.2	54.1	169	1.8	44.3
California	10	94	102.2	94	555	15	63.9

**Table IX: Descriptive Statistics for Per capita Expenditures of Control Group**

States	Number of Cities	City Years	Mean Percent Expenditure	Median Expenditure	Maximum	Minimum	Std. deviation
Florida	23	288	128.1	104.8	943.4	4.02	99.9
North Carolina	10	114	63	46.4	405.9	0.12	69
Pennsylvania	61	768	22.6	10.3	439.1	0.01	39.3
Colorado	22	226	147	61.2	885.5	0.4	204.6
Washington	8	104	61	57	192.9	0.06	43.7
California	17	168	82.3	67	330	10	52

In tables eight and nine the city years refer to how many observations of per capita expenditures are present in the sample from each state. The discrepancy in the number of observations for the referendum and control groups can be attributed to the number of cities in each group and the missing expenditure data. The two tables show that the mean and median per capita expenditures of referendum group of cities are higher than the non referendum group. The state of Colorado shows a high variation in per capita expenditures for both referendum and non

<sup>57</sup> Expenditure data with '0' or negative numbers were recoded as missing because the data appeared unreliable. Values greater than \$5000 were recoded as missing. Cases with annual expenditure change value of less than or equal to -80percent were recoded as missing.

referendum cities. The large standard deviation suggests that cities in Colorado are varied in their per capita expenditures on parks and recreation. Among referendum and non referendum cities, Colorado cities are shown to have the largest value of per capita spending. Upon further investigation, I found that the sample of cities from Colorado consists of cities that are ski resorts. As a result, the high per capita spending on parks and recreation as ski facilities is counted within the expenditures. There are a few ski resort cities in Colorado most of which have held a referendum for green open space. Results from Colorado therefore may not directly be comparable to other states.

Table A4.4 and A4.5 present the descriptive statistics for percentage change in per capita expenditures for the treatment and control groups. The standard deviation scores are comparable between the two groups for each state. It is not clear from the tables whether referendum affects annual mean and median change in per capita expenditure values.

**Table X: Expenditures for Referendum Group Before and After the Referenda**

States	Mean Per Capita Expenditures before Referendum	Mean Per Capita Expenditures after Referendum	Median Per Capita Expenditures before Referendum	Median Per Capita Expenditures after Referendum
Florida	123.5	179.5	101.1	155.1
North Carolina	82.2	93.7	79.1	82.3
Pennsylvania	25.5	37.4	8.0	14.1
Colorado	617.1	751.4	160.1	192.8
Washington	56.1	72.5	42.7	68.7
California	91.2	108.6	94	94

Table 10 displays the median and mean per capita expenditures for referendum cities in each state before and after the referendum. The table is an exploratory tool to survey the change in expenditures of referendum cities. The table helps form some early expectations about the trend in expenditures of referendum cities in different states. For example in North Carolina, Pennsylvania and California there is a positive difference between pre and post referendum expenditure levels. However, this difference is much smaller compared to states like Florida,

Colorado and Washington. Both mean and median values of referendum cities in the latter three states show a difference of \$20 per capita.

#### **4.7.1 Difference between Referendum and Non Referendum Cities**

Table 11 is a test of the first hypothesis which posits that there is no difference between in the per capita expenditures of referendum and non referendum cities before and after the referendum. It is important to establish that the referendum cities did not have significantly different expenditures than the control group prior to the referenda. If significant difference is observed in the two groups before the referendum then the difference in expenditures after the referendum cannot be unambiguously attributed to the referendum.

**Table XI: Difference in Per Capita Expenditures for Referendum and Control Group before Referendum**

States	Per Capita	R <sup>2</sup>	City_Years
Pooled	67.5***	0.01	1529
Florida	22.5**	0.01	174
North Carolina	10.9	0.00	110
Pennsylvania	6.3**	0.00	867
Colorado	125.4**	0.06	196
Washington	2.2	0.00	121
California	10.8	0.00	75

The coefficient reported in the table shows that in the pooled sample referendum cities had significantly higher expenditures on parks and recreation than non referendum cities. The sample of referendum cities from Florida, Pennsylvania and Colorado show a significantly higher expenditure per capita before the referendum. Post referendum difference in per capita expenditures for cities from these three states cannot be attributed to the referendum. In the remaining states referendum cities show higher expenditure per capita than the non-referendum group of cities but the difference is not statistically significant.

**Table XII: Difference in Per capita expenditures for Referendum and Control Group after Referendum**

States	B	R <sup>2</sup>	City Years
Pooled	110.1**	0.02	1660
Florida	36.1***	0.02	310



North Carolina	34.2***	0.04	179
Pennsylvania	11.5***	0.00	685
Colorado	140***	0.03	347
Washington	2.7	0.00	98
California	23.7***	0.03	194

Table 12 displays the post referendum difference of expenditure coefficients. According to the alternative hypothesis I expect that, post referendum, the difference in per capita expenditures is positive. Three states, North Carolina, Washington and California, did not show a difference in expenditure before the referendum (Table 11). These three states fulfill the first criteria of the hypothesis. After the referendum treatment group cities in Washington show higher expenditures than control group but the difference is not statistically significant. In North Carolina and California, referendum cities spend an extra \$35 and \$24 per capita respectively.

The pooled sample shows a highly significant coefficient. All the states, except Washington show significantly higher post referendum per capita expenditures. Combining the observations from table 11 and 12 it appears that for data from all six states, referendum cities show higher per capita expenditures on parks and recreation than control group cities. This is a reflection of the priority given to parks and recreation amenity in these cities. It is possible that due to a prioritization of parks and recreation these cities hold a referendum. The treatment and control group of cities in North Carolina and California display the ideal case of the first hypothesis. Before referendum the cities were not statistically different in their per capita expenditures on parks and recreation but after the referendum they were.

Tables A4.6 and A4.7 in the appendix present the difference in the annual change in per capita expenditures for referendum and control groups. The two groups do not show significant difference in the annual change in expenditures. In comparison with the control group, the referendum cities in North Carolina, Colorado, California and Washington show a lower value of

annual change. After the referendum cities in Colorado and California continue to show a lower rate of annual change than control cities (Table A4.7).

**Table XIII: Trend in Per capita expenditures Over Time after the Referendum**

States	Time $\beta_1$	Interaction $B_2$	$R^2$	City Years
Pooled	-3.6**	16.0**	0.00	3189
Florida	3.8**	5.2**	0.06	507
North Carolina	-1.51	4.6**	0.01	289
Pennsylvania	1.2**	1.1	0.01	1552
Colorado	-9.1**	23.3***	0.02	543
Washington	2.7*	-0.4	0.03	219
California	1.7	22.9*	0.04	268

Note: Event time =t after the referendum. For referendum cities the interaction term will be t, others =0. Add p value here

Tables 11 and 12 presented a comparison of expenditure differences before and after the event of a referendum. The slope of expenditures over time after the occurrence of referendum might also be of interest to the analysis. The coefficient for time in Table 13 represents the slope of per capita expenditures for the cities in the sample for each state. To understand the variables reported in the table I refer back to figure eight which provides a visual description of the manner in which the data is arranged for the analysis. In the dataset REF is a dummy variable that shows whether the city has experienced a referendum. The annual expenditure data is divided into the time before ( $r-t$ ) and after the referendum ( $r+t$ ),  $r$  indicates the year of the referendum. All referendum cities are aligned on  $r$ .

For the results presented in table 13 the variable of time is coded to take continuous values ( $r+t$ ) after the event of the referendum. The interaction term ( $REF*r+t$ ) displays the slope of per capita expenditures for the referendum cities.

The coefficient for time reported in table 13 shows a negative slope after the referendum for the pooled sample, North Carolina and Colorado. In the years following the referendum the

average per capita parks and recreation expenditures increase by less than \$4 dollars for cities in Florida, Pennsylvania, California and Washington.

In the years following the referendum, the treatment group cities show an average expenditure increase of \$16 dollars. The highest increase is seen for referendum cities in Colorado for \$23 dollars. Cities in Florida, North Carolina and Pennsylvania show a modest increase of less than \$5 dollars over the years. Cities in Washington present a conundrum. The sample from the state shows an increase of less than \$3 dollars in the years after the referendum. However, the referendum cities display a negative slope coefficient over time. This indicates that per capita expenditures for referendum cities in Washington decrease over time after the referendum.

In the estimations both time and the interaction variables display some statistical significance at a p level of less than 0.10. For this reason the low R square value observed in table 13 is unexpected. Low R square values show that time and the categorical variable referenda are not good explanations for the observed variation in per capita expenditures. However, the low R square value does not interfere with the interpretation of the coefficient for referenda. The purpose of the table is to demonstrate a positive change in expenditures before and after the referenda, and R square is not an important criterion for the evaluation.

#### **4.7.2 Difference in Expenditures after the Referendum**

The second research question asks whether referendum cities experience a change in expenditure levels after the referenda. It is logical to postulate that a referendum city will increase expenditures due to access to finances via bond sales or tax increases. However, this is assumption has not been empirically proven. To test the second hypothesis which states that post

referendum expenditures are higher than pre referendum expenditures I refer to the previously presented tables and figure eight. In Table 10 a comparison of mean and median per capita expenditures before and after the occurrence of a referendum are presented. The table is exploratory and shows that for each sub sample, the mean and median values for post referendum expenditures are higher than before the referendum.

Researchers use both graphical and statistical methods to evaluate the difference made by a policy intervention. In the interrupted time series research design attention is paid to the change in level and slope of the variable after the intervention (McDowall *et al*, 1980). The visual interpretation of time series data with marked point of intervention is an important tool in deducing the change in the level of the variable after the intervention. In this analysis figure nine shows the plot of mean per capita expenditures for referendum cities over time. Mean per capita expenditures for referendum cities in Florida, Colorado, Washington and California show a clear increase in the level after the referendum. Referendum cities in North Carolina and Pennsylvania show an increase in post referendum expenditures but the change in the level appears to be delayed.

Table 14 presents the regression of per capita expenditures for referendum cities over time. The arrangement of data for analysis follows the example shown in figure eight. To compare the level of expenditures before and after the referendum a dummy variable is introduced ( $X_{ref}$ ). A time trend variable captures the trend of per capita expenditure for referendum cities before referendum ( $X_{r-t}$ ). The third variable is an interaction term which accounts for the trend in expenditures after the referendum ( $X_{ref}*(r+t)$ ). The estimation equation takes the following form

$$E(Y)_t = \beta_0 + \beta_1 X_{r-t} + \beta_2 X_{ref} + \beta_3 X_{ref*(r+t)} \dots \dots \dots (4.2)$$

The equation is estimated for the pooled data, as well as the sample data drawn from the six states. The coefficients are presented in table 14.

**Table XIV: Comparison of Per Capita Expenditures for Referendum Cities**

	<b>Pooled</b>	<b>Florida</b>	<b>North Carolina</b>	<b>Pennsylvania</b>	<b>Colorado</b>	<b>Washington</b>	<b>California</b>
Constant	162.4***	146.7**	81.3**	33.0***	276.1***	57.7***	76.5**
Pre Referendum trend	-12.9**	-8.1**	-0.5	-1.7**	-9.7	-0.2	6.9
Referendum Dummy	58.8	24.8	12.2	3.3	22.7	15.2	41.8*
Post Referendum trend	-7.9	2.0	0.2	2.0	-0.4	-0.1	-2.3
R sq.	0.00	0.08	0.00	0.01	0.00	0.03	0.03
City Years	1628	219	175	784	317	115	100

The empirical result suggests that the initial level of per capita expenditures in the overall data was \$162 dollars. Among states, the initial per capita expenditures were highest for cities in Colorado. This is due to the fact that the majority of referendum cities are ski resorts. The second highest per capita expenditure allocations were shown by referendum cities in Florida. It is plausible that location near coastal areas increased the per capita expenditures for Florida referendum cities.

The pre referendum spending trend is negative. A negative slope coefficient for the time before the referendum suggests that allocation to parks and recreation expenditures did not adhere to the incremental method of budgeting and allocation. Referendum cities from California are an exception to this observation. They display an average increase of \$7 dollars in per capita expenditures on parks and recreation before the referendum.

The comparison of expenditures before and after the occurrence of a referendum is provided by the dummy variable. This variable measures the change in the level of expenditures

after the occurrence of the referendum. After the occurrence of referendum, cities in the pooled sample experienced an increase in expenditures of \$58 dollars. The highest increase is seen for referendum cities in California which show an increase of over \$40 dollars. The coefficient for the change in level of per capita expenditures is found to be positive for all the states. The increase varies between \$3 and \$40 dollars for the sample states. However, the coefficient for the variable is only significant for the sample from California. The null hypothesis for the second research question, that referendum does not affect the per capita expenditures, cannot be rejected. However, as mentioned before, the sign of the coefficient is an important criterion. It is important to note that in all of the sub samples the mean per capita expenditures were higher after the referendum.

The trend of per capita expenditures after the referendum is negative in the pooled sample. Among the states, per capita expenditures of referendum cities in Colorado, Washington and California decrease with time after the occurrence of the referendum. In Florida, North Carolina and Pennsylvania the per capita expenditures increase by an average of \$2 dollars over the time period of the study. The difference in the coefficients for the trend in per capita expenditures after the referendum could be due to the differences in the financing mechanisms supporting the referendum. In the next section I present preliminary analysis of per capita expenditures and the differences caused by the use of different financing mechanism.

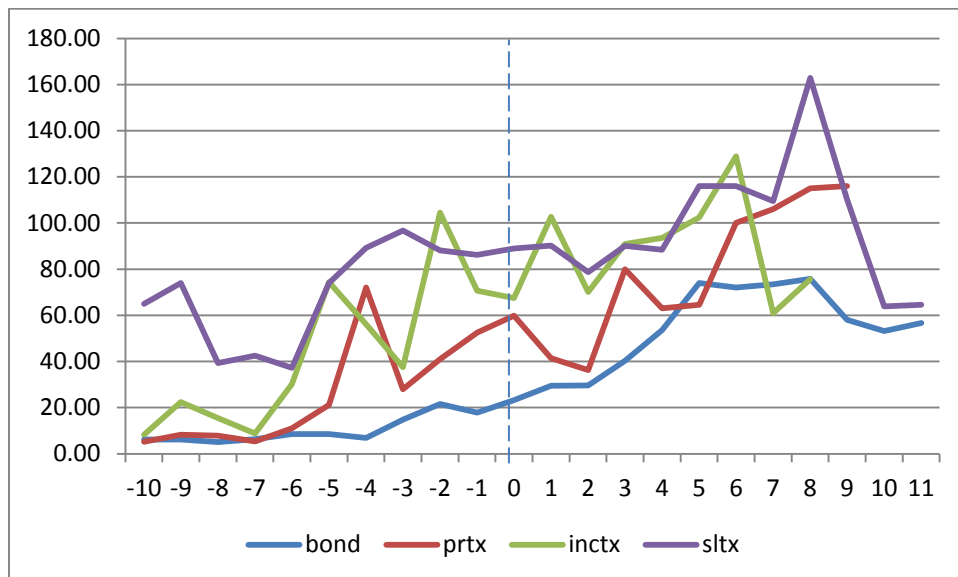
#### **4.7.3 Differences among Finance Mechanism Supporting the Referenda**

Figure 10 shows the trend in per capita expenditure for referendum cities using bonds, property taxes and income taxes to support the referendum. The reason for exploring the differences in financing mechanisms is to form a hypothesis of how cities perform after the

referendum due to the differences in financing mechanisms. In figure 10 mean per capita expenditures for different types of financing mechanisms are graphically represented<sup>58</sup>.

Referendum cities supported by property tax increases show a delayed effect. The expenditures for such cities show an increase after 3 to 5 years of the referendum. This is possibly due to the fact that governments collect the revenue from the tax increase for a few years before investing it in green open space. Income tax and sales tax trend lines display volatility with pronounced peaks and troughs. The income tax cities show an immediate increase in the per capita expenditures following the referendum. The change in level of expenditures for sales tax cities is not very pronounced.

Cities with bond funding show the most stable trend line. The per capita expenditure increases for bond funded cities plateaus after five years of the referendum. It is shown to decrease steadily between years eight and ten after the referendum. Presumably this trend is reflects of the pace of investment made by cities after the general obligation bond is approved.



<sup>58</sup> Of the 144 referendum cities in the pooled sample, 64 cities used general obligation bonds; 14 used property tax increases or surcharges; 39 increased income taxes; 13 increased sales taxes and 14 relied on other forms of tax increases to support the green open space referendum.

**Figure 10: Mean per capita expenditures over time by finance mechanism**

Table 15 compares pre and post referendum per capita expenditures for different financing mechanisms. The reference category in the estimation is bonds. It is also the most popular financing mechanism for cities holding green open space referendum.

**Table XV: Difference in Per Capita Expenditures by Finance mechanism**

<b>Per Capita Expenditure</b>	<b>Property Tax</b>	<b>Income Tax</b>	<b>Sales Tax</b>	<b>Other</b>	<b>Adjusted R2</b>
Before Referendum (Event time <0)	53.3	272.7***	56.1	7.6	0.07
After Referendum (Event time >0)	346.5***	332.7***	19.7	2.0	0.09
All event time	180.4***	305.6***	35.6	6.6	0.07

Note: reference category is bonds.

The pre referendum expenditure mean for cities supported by general obligation bonds is lower than any other method of financing. The difference between income tax cities and bond funded cities is the largest and statistically significant. After referendum, cities with income tax and property tax as the chosen method of finance are seen to have significantly higher per capita expenditures than the cities with bond funding.

**Table XVI: Difference due to Finance Mechanisms in the Short Term**

	<b>Per Capita Expenditures</b>	<b>Percentage Change in Expenditures</b>
Property Tax	447.8***	0.04
Income Tax	319.1***	-0.03
Sales Tax	15.4	-0.08
Other	4.8	-0.04
Constant	85.8	0.08
R2	0.10	0.00
City Years	637	546

Note: Bonds is the reference category

Table 16 shows the per capita spending and percentage spending three to five years after the referendum. The reference category is bonds. Property tax and income tax supported cities show higher and statistically significant difference in expenditures per capita compared to the cities supported by bond referendum. The per capita expenditures of referendum cities supported



by sales tax and other financial instruments do not significantly differ from cities supported by bond funds.

Among the annual change in expenditures the income, sales and other tax supported cities show a negative change coefficient. The negative coefficient conveys that the annual rate of change is higher for bond supported cities. Property tax supported cities show a positive annual change. The change is 4 percent higher than the bond supported cities.

#### **4.8 Discussion**

Results obtained from the comparison of referendum and control group expenditures show that in some cases, referendum cities display a difference in expenditures even before the referendum. Higher per capita expenditures of referendum cities after the referendum support the main hypothesis of the study that referendum does affect the parks and recreation expenditures. However the expenditure effects resulting from the referendum are not comparable across states.

Referendum cities from Washington present a conundrum. The post referendum expenditure is not significantly different from the control group in the state sample. A plausible explanation for observing a non difference in post referendum expenditures is Washington's environmental ideology. Washington is recognized for its environmental activism. The state recently was recognized in popular ranking surveys as one of the three 'greenest' states in the country (Forbes, 2007; Greenopia, 2011). It is plausible that due to increased sensitivity of the citizens to environmental goods, including green open spaces, the governments incur comparable per capita parks and recreation expenditures. In this case referendum has little to no impact on the level of expenditures of governments. A measure of local environmental culture in future studies would add to the understanding of how referendum changes expenditures in the local governments across states.

In the second part of the analysis, the coefficients display a lack of statistical significance for the change in the level of expenditures for referendum cities. Although the coefficient is positive, which supports the alternative hypothesis from research question two, the lack of conclusive evidence limits the conclusions that may be drawn.

The role of external economic environment has to be acknowledged as an important concern in the parks and recreation expenditure changes after the referendum. From 1996 till 2006, local governments enjoyed a healthy and predictable national economic environment. Through the interviews for the case study I learned that interest rates and the health of the economy affect the decision of local governments to sell bonds in the open market. Since the majority of green open space referenda are supported by the sale of general obligation bonds, the stability of the economy provided favorable economic environment for the governments to sell the bonds. The sale of the bonds provides the local governments with the financial resources to implement the objectives of the referenda. As a result I notice the expenditure changes. If the economic conditions were not favorable, governments would have waited for an opportune economic environment and delayed the sale of bonds. This delay would have reflected in the lack of difference in per capita expenditures on parks and recreation after the green open space referenda.

The second common fiscal mechanism supporting the green open space referenda is property tax. The housing market witnessed a boom in the early 2000s. As a result green open space referenda supported by property taxes displayed expenditure changes without much delay. The collapse of the housing market in 2007-2008 and the continuing crisis is an adverse economic environment in which the local governments are struggling with the loss of property tax revenue. In such conditions, local governments would not be able to reflect the magnitude of

change in per capita expenditures as shown by the current dataset which reflects a boom period in the housing market.

The present analysis is the first to explore the effect of green open space referenda on parks and recreation expenditures. Previous literature which has examined local government expenditures has been oriented towards verifying the applicability of budgeting theories. After analyzing the data on expenditure change, the present analysis does not find support for the role of incremental theory in predicting parks and recreation expenditures. The non normality of expenditure change values [table 4.1.] supports the view that the expenditures are better predicted by the punctuated equilibrium theory. This finding supports the conclusions of True (2002) and Jordan (2003).

#### **4.9 Conclusion**

The chapter discusses the per capita expenditures of referendum cities on parks and recreation. Differences in expenditure levels and trend have been explored through graphical and empirical analyses. The assumption that green open space referendum affects parks and recreational expenditures has previously not been tested. The chapter produced new insights to fill this gap in research.

The empirical research design is an interrupted time series with a control group. The research design helps to control for threats of history to the internal validity (Shadish *et al*, 2002: 182). The main goal of the analysis was to observe the per capita expenditure variances after the occurrence of a referendum and the differences between referendum cities and a representative group of control cities.

To examine the differences in expenditures after the referendum, annual expenditure data for local governments was gathered from six different states. The graphical analysis shows the

non normal distribution of annual change data for per capita expenditures. Subsequent statistical tests confirmed the presence of non normality in expenditure change data. The conclusion supports the ‘punctuated equilibrium framework’ view of local government expenditures (Jordan, 2003). This result challenges the conventional understanding of incrementalism determining the annual allocations to parks and recreation agencies (Gladwell and Sellers, 1997). The assumption of incrementalism or small changes is important to the analysis in the chapter as it facilitates forming of a hypothesis about expenditures trend in the absence of a referendum. In the presence of a non normal expenditure change data, the adopted research design with a control group protects the internal validity.

The empirical analysis has yielded a mixed picture of per capita expenditures of referendum cities. The sample data shows that treatment group cities had higher per capita expenditures than the control group before the referendum in four states. This conveys a prior commitment by these referendum cities to green open space goods. Referendum in such cases can be viewed as an extension of policy. On the other hand cities/states that show a difference in per capita expenditures after the referendum convey the creation of new policy and its implementation. This observation is important for future research which looks into the institutions that support the policy environment for green open space policy and the role of referendum in promoting the goals of the above policy. Cities that demonstrate a higher per capita expenditure level before the referendum and then undergo another increase in expenditures after the referendum reflect the sustained prioritization of parks and recreational expenditures. For public administration studies this expenditure trajectory displays a shift in city government’s perception of parks and recreation goods from allocational to developmental policy category (Jordan, 2003).

The sample offers weak evidence for the conclusion that per capita expenditure differences observed between referendum and control group is due to the referendum. The case of Washington underscores the importance of including local environmental consciousness variables into the analysis to better predict the trend in expenditures after the referendum.

The empirical analysis finds some support for the hypothesis that referendum cities experience an increase in the per capita expenditures after the referendum. The increase in expenditures is assumed to contribute to addition of green space goods for the referendum government. The creation of additional green space goods contribute to the benefit spillovers exerted by the referendum cities to their neighboring jurisdictions. The effect of these spillovers on neighbors' expenditures will be examined in the next empirical chapter (chapter five).

Through the analysis the use of general obligation bonds appears to be a good choice of financing mechanism. It not only minimizes political repercussions (Kelly and Zieper, 2001) but also yields a stable expenditure trend over time. Referendum backed by property and income taxes did show an impressive difference in expenditures when compared to bonds. However, the effect of the above two financing mechanism was limited to five years after the referendum.

This chapter has provided a preliminary analysis of per capita expenditures of referendum cities over time. Some limitations of the analysis are lack of detailed local expenditure data and limited number of cases of referendum cities.

## **5. GREEN OPEN SPACE REFERENDA AND SPATIAL DEPENDENCE OF EXPENDITURES: AN ANALYSIS OF FLORIDA LOCAL GOVERNMENT REFERENDA**

### **5.1 Introduction**

Green open space referenda are a convenient tool for land preservation by local governments (McQueen and McMahon, 2003). Public support of such referendum favors the land protection agenda. This makes long term support of land preservation sustainable in such jurisdictions.

Green open space referenda have fiscal implications. They either propose to raise taxes or issue general obligation bonds to collect the funds required for land preservation. The public finance literature shows that governments are influenced by neighbors' tax and expenditure decisions. Each successful referendum has the potential to affect neighbors' fiscal decisions. Change in neighboring government spending may result due to benefit spillovers received from green open space. The presence of spillovers is the cause of horizontal fiscal dependency in a regional space. Expenditures of county and state governments influence fiscal decision making at the local level. As a result vertical fiscal dependency is induced among hierarchically arranged governments (Revelli, 2005; Wu and Hendrick, 2009). In the context of interjurisdictional competition, the observation of horizontal fiscal decision dependency is well examined in the context of tax competition. There are a few studies on expenditure competition as well. Since green open space *referendum* is a fiscal policy tool, I expect it to affect the expenditure decisions of neighboring governments.

Public choice theory provides one framework to examine spatial dependence in public goods provision in the presence of benefit spillovers (Case *et al*, 1993). Another theoretical frame that supports such an inquiry is the theory of *yardstick competition* used in the disciplines

of political science as well as public finance (Besley and Case, 1995; Bordonon *et al*, 2003; Rincke, 2007). The yardstick competition model operates on the basis of *information* about amenity and tax bundles being made available to neighboring citizens. The availability of information leads to a comparison of amenities by citizens and as a result pressurizes the local government to provide a similar tax and amenity bundle. The occurrence of green open space referendum and the process of campaigning provide the information on the availability and need for green space in the local government and the region. This information helps the citizens to compare the amenity of green open space across the governments and start a yardstick competition mechanism.

In addition, the information supplied through the referendum promotes action from elected officials and bureaucrats on green open space. Elected officials are motivated by self interest (legacy concerns) which has been discussed in the qualitative chapter. The bureaucrats are motivated by various reasons prime among them is the action of their neighboring local governments (Walker, 1969). The local governments observe their neighbors and learn or emulate their policy decisions and as a result display policy interdependence. These pathways of policy diffusion mechanisms were discussed in the qualitative chapter (chapter three). The policy dependence resulting from policy diffusion and yardstick competition model impacts the fiscal relationship among neighboring local governments (Brueckner, 1998). As a result many local governments exhibit spatial dependence in their local government expenditures and taxes.

Research on green open space referendum in the US is dominated by the determination of factors that predict the success of a proposed referenda (Bates and Santerre, 2001; Nelson *et al*, 2007; Banzhaf *et al*, 2010). Although the instances of green open space referendum are amenable to the application of fiscal interdependency theories, there has been no previous inquiry. This

chapter is the first attempt to examine the spatial dependence of expenditures on parks and recreation, in the context of green open space referendum. Useful in forming the research question are the conclusions of a handful of previous studies. The conclusions of Murdoch *et al* (1993) are especially relevant for this study, as they have examined the spatial dependence in parks and recreational spending among governments in the larger Los Angeles metropolitan area. It is the only US based study which has examined parks and recreational spending among neighboring cities. The authors found a positive spatial dependence in expenditures across cities. It means that an increase in a city's own expenditure caused an increase in its neighbors' expenditures.

Studies reviewed from Europe reveal opposing conclusions. The findings point to an incentive for the neighbors to 'free ride' on the benefits generated by increased expenditures by the local government on parks (Solé-Ollé, 2006; Lundberg, 2006).

Existing literature on green open space referendum in the US does not branch into the issues of implementation of referendum objectives and associated expenditure changes. Therefore, there is very little understanding of how local governments allocate resources, approved through citizen vote, for the creation of green open space goods. In this chapter the main assumption is that local governments that experience a referendum increase their spending on parks and recreation. More investigation is required with respect to expenditures on parks and recreation following a referendum.

This chapter focuses on analyzing the expenditure data from the state of Florida spanning the time period of 1996 through 2006. I examine the following issues:

1. Spatial dependence within regional parks and recreation expenditures in the presence of multiple green open space referenda.



2. Spatial dependence of *change* in expenditures on parks and recreation following referenda within select metropolitan areas.

These two issues are relevant for public administration studies because they provide evidence for understanding the fiscal consequences that green open space referendum have on neighboring governments. The effect of a green open space referendum on regional expenditures can be gauged by establishing the direction of neighbors' response. If the neighbors are found to free ride, then it signals an under provision of public goods in a geographical region. On the other hand, if the neighbors' response is positive, it suggests that referenda can serve as a policy instrument to stimulate regional spending on parks and recreation, without intervention by state or county governments.

The remainder of this chapter is organized in the following manner. The next section presents a conceptual model of change in spillovers resulting from a referendum, and the neighbors' response to it. Section three through five summarizes the land protection policies of the state of Florida; the associated research design; methodology and data. Data analysis and conclusions are reported in section six through eight. Inferences gathered from the analysis are reported in section nine.

## **5.2 Conceptual framework**

Governments' watch what their neighboring governments are doing while making fiscal and policy decisions (Parks and Oakerson, 1989; Fredricksson and Millimet, 2002). This results in a spatial pattern of government fiscal and policy choices. This tendency has been observed among states (Besley and Case, 1993) and local governments (Brueckner, 2003). This behavior of governments has led to an extensive literature on *fiscal interdependence* which explores strategic fiscal interaction among local governments (Brueckner, 2003, 2005). Spatial regression

methods provide the tools to identify spatial patterns and draw conclusions regarding the behavior of governments (Anselin, 1988). Therefore, the literature on fiscal interaction is linked with the literature on spatial methods.

The most recognizable form of strategic fiscal interaction examined in the literature is tax competition. Studies have found that municipal governments maintain comparable tax rates in order to attract business and residents to their jurisdictions (Boskin, 1973; Brueckner and Saavendra, 1999; Nicholson-Crotty, 2008). Moreover, the fiscal interaction is not only manifested in exchanges with governments in the same tier, but also visible with vertical and overlapping governments. In the study of property tax competition among Florida municipal governments, Wu and Hendrick (2009) found that municipal property tax rates were also affected by policies set by county and school districts, which are overlapping governments. Similar conclusions are drawn by Revelli (2005) while examining the tax rates of UK local governments.

Studies of spatial correlation in public expenditures of local governments exist, although the literature is not as extensive as tax competition (Case *et al*, 1993; Murdoch *et al*, 1993; Brueckner, 1998, Baicker, 2005).

Studies have shown how spatial interaction varies by expenditure category (Gregor and Gregorova, 2007), and different hierarchies of government (Revelli, 2005; Park, 1997; Wu and Hendrick, 2009); however, there is no investigation on the change in the measure of spatial dependence over time. Moreover, there is no scholarship on how the spatial dependence in taxes or expenditures reacts to a change in the system induced by an event like a referendum or an intergovernmental grant (Birkelöf, 2009).

As noted earlier, the disciplines of public finance and policy sciences acknowledge the presence of interdependence among local governments (Brueckner, 2003; Franzese and Hays, 2007). I build hypotheses about neighbors' reaction to a referendum, with the help of theories from both disciplines.

The first theory that I draw from is *yardstick competition*. It refers to the tendency among voters to evaluate their governments' performance by comparing them to other local governments. Voters compare governments to ensure that they are getting the right package of tax and services (Breton, 1998; Kenyon, 1997).

If the voters find that their government is underperforming, then the elected officials are voted out in the next elections. In this way the residents 'voice' their preferences (Hirschmann, 1970).

In the event of a green open space referendum, the campaigning process of the referendum alters the information set available to neighboring voters in the following way. During the campaign process, issue advocates use symbols and statistics to highlight an issue. In this way they elevate an issue to the status of a problem, warranting the attention of the elected officials (Stone, 1997). Media is a critical actor<sup>59</sup> in the referendum process and serves as a channel of information on the issue. It builds consensus by relaying proposed benefits through special stories, interviews, and op-ed pieces. Media sources like newspapers and local television channels usually serve an entire region, rather than one jurisdiction. It makes it easier for information about green space referendum, its benefits and the need for action, to spill over to the citizens of the neighboring jurisdictions. Such information is supplied in the months before a referendum. The supply and diffusion of information through media and people in the referendum campaigning process creates the context for a yardstick style comparison of public

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<sup>59</sup> McCann (2004) explores the link between urban competitiveness and popular media.

goods provision among citizens of neighboring jurisdictions. This increases the potential for dependency in fiscal and policy choices in the issue of green open space protection. On the basis of the above theory, I propose the following

*Proposition 1: Green open space referendum will cause the neighbors to increase their allocation on green open space goods.*

The theory of public goods is the second theory that I use to propose the effect of referendum on neighbors' expenditures. Public goods are characterized by non rivalry and non excludability in consumption, which makes it difficult to allocate them through a market mechanism. It is difficult to put a price on individual consumption of public goods. For this reason, government intervention is required in the provision and management of public goods. A central dilemma in public goods theory is the management of spillovers or externalities<sup>60</sup> resulting from public goods. In case of environmental goods, the problem of spillovers<sup>61</sup> may be addressed through the definition of property rights (Coase, 1970) which translates into the adoption of polluter pays principle when the externality is negative. In other cases, where the externality is positive, its protection is ensured by property rights like copyright, trademarks and patents.

In the case of green open space, which is an open access public good, the externalities generated are positive in the form of improved public health benefits and intangible ecosystem benefits (De Groot, 1994; Stanners and Bourdeau, 1995; Wolf, 2008; Tzoulas *et al*, 2007). The implementation of property rights, although possible, is difficult because of enforcement costs.

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<sup>60</sup> Externalities are defined as un-intended benefits or harm caused by an economic activity.

<sup>61</sup> Illustrated through the example of a leather factory situated by a river bank, which is releasing its wastewater into the river stream. The pollutants from factory travel in the river water, and affect the health of people consuming the water. This is a case of pollution externality which is negative. Other examples include acid rain and smog where air pollutants are transferred to locations other than the place of origin through air currents and affect the air quality at other locations.

Green open space goods have been found to attract users from areas beyond the neighborhood. In a study of local greenway use, Furseth and Altmann (1991) found 21 percent of users were non residents. They came from a distance of over five miles. I found evidence of similar behavior in the case study of North Carolina cities (chapter three), where the citizens from town of Apex were using facilities made available by the adjoining town of Cary. The use of green space by neighboring citizens points to benefit spillovers. Similarly, following a successful referendum when the parks and recreation facilities are developed, they provide benefits to the neighbors. These benefit spillovers are expected to interfere with the expenditure levels of neighboring jurisdictions causing an increase or decrease in their spending. This is called a reaction function (Brueckner, 1998), and it is the characteristic of spatial relationship between two governments. In other words a reaction function, as the name suggests captures the reaction of the neighboring municipalities to the information and benefit spillovers.

According to public choice theory, in the presence of these spillovers there is less incentive for neighboring governments to provide similar facilities. Green open space created with the help of referendum would give the neighboring governments the incentive to free ride and absorb the benefit spillovers. On the basis of this theory I propose a competing proposition

*Proposition II: The neighboring governments will free ride on the benefits generated by green space goods created after the referendum.*

Propositions one and two will help identify the trend observed in the spatial dependence of expenditures before and after the green open space referendum. As mentioned earlier, studies have examined neighbors' reaction to parks and recreation spending (Murdoch *et al*, 1993; Lundberg, 2006; Solé-Ollé, 2006; Choumert and Cormier, 2011). However, none of the studies have examined how neighboring governments react when there is information about an increase

in the pool of public goods. I explore this question with the help of data from Florida. In the next section I provide background information about the state policies and programs for land protection.

### **5.3 Florida: General context of Green Open Space protection in Florida**

The efforts for green space protection in the state of Florida began as early as 1972, with the creation of *Environmentally Endangered Lands* program, which provided \$240 million from the sale of general obligation bonds. In 1979, this program was rolled over into the *Conservation and Recreational Lands* program which continued the acquisition of endangered lands. A separate program, *Save our Coast*, targeting coastal lands was started in 1981, with initial funding of \$275 million (Florida State Parks, 2011). These state programs, once initiated with bond funding, were subsequently supported by recurring revenue sources from real estate transactions, documentary stamp sales and excise taxes on minerals (Conservation Almanac, 2010).

Florida was the second state in the US to introduce an integrated plan for growth management at both the county and municipal levels. Its Growth Management Act (1985) was the first land use plan adopted by the state to ensure that development occurred away from protected natural areas. (Ben-Zadok, 2005).

Florida has involved its local governments in the growth management plan by providing them with financial incentives to design land use plans. Included in the financial incentive is the condition of *concurrency*. This requirement ensures that local government plans are designed to integrate state growth management priorities and mechanisms. In this manner state growth management goals are reflected in choices made by local governments (Boarnet *et al*, 2006).

In 1990, the Florida state legislature approved *Preservation 2000*, a land preservation program that acquired ‘unspoiled lands’ in the state with the objective of maintaining the quality of life for Florida citizens (NW Florida Water Management District, 2005). The ten year program was supported by the sale of general obligation bonds and provided annual funding of \$300 million to the local governments for land acquisition.

*Preservation 2000* was folded into a new initiative titled *Florida Forever*, in 2001 which is still in operation. It is the largest public land acquisition program in the US. Through the program, public lands are acquired for the purposes of active and passive recreation by state and local governments. Through these two flagship initiatives, a total of 3.8 million acres of conservation land has been purchased in Florida (FCT, 2010).

Local governments access *Florida Forever* funding through a matching grant program administered by the Florida Communities Trust. The department allocates funding of \$63 million annually. Until August 2010, a total investment of \$678 million by the local governments had leveraged \$800 million in matching grants from the *Florida Forever* program (FCT, 2010) resulting in preservation of 667,832 acres of land.

Florida’s proactive growth management policy and presence of abundant natural resources like the Everglades create the backdrop in which to examine municipal referenda for protection of green open space. In Florida, both state and local governments have brought 96 referenda for public vote. Florida municipal governments have received public approval to spend \$2.6 billion dollars towards green open space in the last two decades (Trust for Public Land, 2011).

### **5.3.1 Florida Land Preservation: Florida Forever**

In 2000, the state of Florida transitioned into a new policy environment with its *Florida Forever* program. There were two versions of the bill up for a vote in the state legislature as a replacement for the Preservation 2000 program. The feature common to both was more opportunity for municipal governments to access funding towards the purposes of improving land protection and recreation (Tribble, 2005). This reflects the growing consensus among decision makers that more resources were required by municipal governments.

The *Florida Forever* Act was passed by the state legislature in 1999 (Section 259.105, F.S.) This program came on the heels of a successful statewide referendum in 1998 to revise the constitution of Florida. The referendum indefinitely extended the state's authority to pursue protection of land through its various initiatives that are supported by the sale of revenue bonds. The success of referendum to increase the state's authority to continue its land protection initiatives, and the creation of *Florida Forever* program in two consecutive years, demonstrate the public support for land preservation policy in Florida in the late 1990s and early 2000s.

The *Florida Forever* Act was different from the existing Preservation 2000 program because it expanded the scope of the program objectives. The new program allocated funding for increasing opportunities for environmental education (4e), historical preservation (4f) and increase in the amount of open space accessible by residents of urban areas (4h). The policy makers realized that land acquisition was not the only method of ensuring land protection, therefore the new program set to increase conservation easements and joint ownership projects (17b). Other priorities included protection of water resources and environmental restoration.

The Florida Forever Act also changed funding allocations to various state agencies responsible for grant making to local governments (Perspectives, 2005). The act increased the annual allocation for the Florida Communities Trust (FCT), from 30 million to 63 million. FCT



is the main agency that provides matching grants (25 percent match required) to local governments for land protection.

In addition, funds were diverted to the Office of Greenways and Trails. FCT was required to spend at least five percent of the funds to promote the development of publicly accessible green open spaces, namely trails. The act also required that 30 percent of the funding was to be spent in metropolitan areas. This was done in recognition of Florida's growing urban population that was not well served by existing green open spaces.

*Florida Forever* widened the scope of related objectives that could be covered through the program and made the program attractive to local governments and non profit groups. Due to the wide applicability of the new *Florida Forever* for local governments in urban areas it is likely to notice a change in the expenditures and referendum frequency of local governments in the 2000s. I will be using data from mid 1990s to late 2000s to observe change in spatial dependence of expenditures. The analysis will allow me to contrast the referenda frequency among local governments in the two decades as they relate to the difference in policy frameworks.

#### **5.4 Research Question and Hypotheses**

As previously highlighted, there is a gap in current research on green open space referendum literature. It does not address the question of effect on neighbors' expenditures. Growing public demand for green space, as visible in the number of successful nationwide referenda in the last two decades, has been widely noted. Its relevance to the public administration literature, particularly fiscal policy and incentive design has not been explored. The theme central to my inquiry in this chapter is *whether referendum makes a difference to neighbors' expenditures*.

I have divided my inquiry into the following two questions. The first question is motivated by the literature on local government expenditure dependence. Although previous studies have produced evidence that local governments exist in a spatially dependent fiscal environment (Besley and Case, 1993; Lundberg, 2006; Wu and Hendrick, 2009 ), there is no guidance from the theory on how the measure of spatial dependence reacts to external shocks like grants or referendum. In my literature reviews, Birkelöf(2009) is the only author who has investigated the effect of external shocks on spatial dependence in expenditures.

In her analysis, Birkelöf (2009) demonstrates that spatial dependence among local governments is altered in the presence of a grant that reduces information asymmetry and removes the incentive among municipal governments to ‘mimick’ each other’s expenditure levels. The primary variable of interest in her study was physical health expenditures before and after an intergovernmental grant was introduced by the Federal government. Birkelöf (2009) is the closest in concept to what I study. The main difference from Birkelöf (2009) is that unlike grants, referendum does not guarantee a steady supply of resources. Unlike grants that come with a series of requirements from the grant making body, referendum does not impose any conditions on the expenditures made by local governments.

Similar to Birkelöf’s study (2009) where the information generated by the grant process affected mimicking behavior among cities, I expect that in the course of the referendum, the ‘information set’ of neighboring communities is altered, causing a change in their expenditure and consequently in the spatial dependence.

I propose the first question

*Research question 1: Does spatial dependence in parks and recreation expenditure change in the event of referenda.*

The main assumption is that there is a spatial dependence in parks and recreation expenditures among neighboring municipal governments. This assumption is drawn from previous literature (Murdoch *et al*, 1993) in the US context. I propose that a referendum acts as an external shock to the existing spatial dynamic and has the ability to rearrange the spatial relationship among local governments, consequently affecting the magnitude of the spatial dependency. The data will allow observation of change in spatial dependence with successive referenda in a region.

The null hypothesis is that in the event of a referendum there will be no change in the spatial dependence of the expenditures among cities. The alternative hypothesis is that the effect of a referendum will result in the rearrangement of spatial dependence patterns.

*H1: Spatial dependence of expenditures across municipal governments will change in the event of a referendum.*

There is no consensus on how spatial dependence manifests itself in parks and recreational spending in Florida. The expectation from yardstick competition is that the spatial dependence will be positive, i.e. the neighboring jurisdictions will increase their expenditures following the example of the referendum jurisdiction. Whereas, the expectation from public choice theory is that neighboring jurisdictions will free ride on the benefit spillovers.

The second question examines the spatial dependence in the *change* in neighbors spending after a referendum.

*Research Question 2: Is there a spatial dependence in the change in neighbors' spending on parks and recreation following a referendum?*

The null hypothesis for this question is that following a referendum, *change* in spending for neighboring jurisdictions will not be spatially dependent. The alternative hypothesis is that

the change in expenditures for neighboring governments following a referendum will be spatially dependent. If the change is spatially clustered in space, then the coefficient will be positive. It means that neighbors with similar values of expenditure change are geographically clustered. If the coefficient is negative, then it indicates that neighbors with dissimilar expenditure change after the referendum are clustered together in space.

Using data from the state of Florida I examine the research questions stated above. The first question which checks for the spatial dependence in expenditures is examined at a regional level. For this purpose the state of Florida has been divided into five distinct regions. The second question which examines spatial dependence of change in spending on parks and recreation is undertaken at a metropolitan level. The next section introduces the research design adopted for these research questions.

## **5.5 Research Design**

### **5.5.1 Florida: Distribution of referenda**

Situated in the southeast, Florida is divided into 67 counties and 403 incorporated municipalities. According to referendum data collected by the *Trust for Public Land*, between 1988 and 2008, Florida experienced 99 referenda of which 80 were successful (Trust for Public Land, 2011). In that period a total of 75 local government referenda were voted on, of which 26 were municipal and 49 were county referenda.

The frequency of referenda among local governments and their spread across the last two decades is shown in Table 17. The table shows the popularity of referenda in the counties compared to the municipal governments. There are more county referenda but the rate of success for municipal referenda is higher (84 percent) than county (77 percent).

**Table XVII: Frequency of Referenda on Parks and Green Space in Florida (1996-2008).**

<b>Referenda</b>	<b>State</b>	<b>County</b>	<b>Successful County Referenda</b>	<b>Municipality</b>	<b>Successful Municipal Referenda</b>
1996-99	2	14	10	5	5
2000-03	0	11	10	13	10
2004-07	0	20	15	6	6
2008	0	4	3	2	1
Total	2	49	38	26	22

*Source: Landvote Database, Trust for Public Land*

Table 17 shows frequent referenda for counties and municipality from 2000 onwards.

The frequent use of referenda from 2000s reflects the change in the policy environment. The new *Florida Forever* land protection grant program emphasized funding for municipal and non governmental agencies. This funding was available as matching grants. In my interviews with North Carolina cities, I found that cities sometimes use referendum to gather funds for accessing such matching grants.

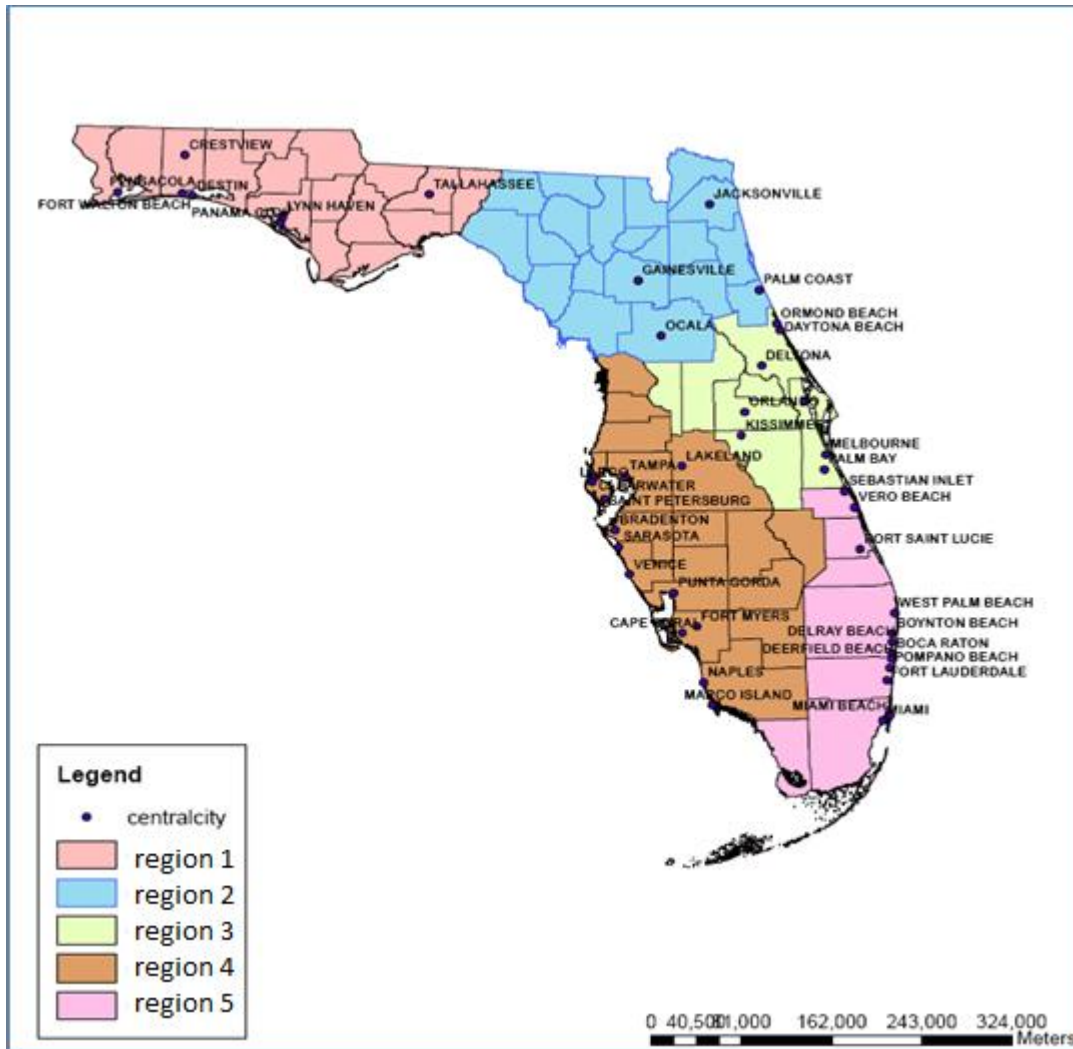
In table 17 there are instances of local governments that have held multiple referenda. Most county referenda are recorded in Miami-Dade and Sarasota counties with five referenda each. Comparatively, three cities- Boca Raton, Davie and Oviedo have experienced two referenda in the last two decades.

Another way to visualize the occurrence of referenda is to examine their distribution at a regional level. Table 18 provides a regional distribution of referenda. The regions are identified on the basis of a map of economic development zones obtained from the Florida State Department of Economic Development. The map divides the state into eight regions. These are indicated in the table in column one. A reformulated map is shown in figure 11. For the analysis, the state is divided into five regions.

Table 18 shows that referenda occurring between 1996 and 2006 are not evenly spread across all geographical regions. They range from no referenda in region one to ten referenda in region five. County referenda show a similar pattern and are concentrated in regions four and five. Many counties in these two regions have repeatedly gone to the voters to get funding for additional green open space protection.

Table 19 provides a breakdown of referenda frequency by metropolitan area. The table confirms the previously observed regional distribution. Most referenda are clustered in the Miami Fort Lauderdale-Pompano Beach metro area (henceforth South Florida metro), followed by the Orlando-Kissimmee and Deltona-Daytona metro area (henceforth Orlando metro).

The table provides select socio economic indicators like building permits, population density and income. This supports earlier conclusions that the demand for



**Figure 11: Florida: Five regions of analysis**

**Table XVIII: Regional Distribution of Local Governments and Referenda in Florida**

Revised Region	State Designated Region (s)	Cities (n)	Counties	Number of successful county referenda	Successful County Referenda	Number of successful Municipal referenda
1	Northwest (1)	63	Escambia, Santa Rosa, Okaloosa, Walton, Holmes, Washington, Jackson, Bay, Calhoun, Gadsden, Leon, Wakulla, Liberty, Gulf, Franklin, Jefferson	1	Leon (2000)-Sales Tax	
2	North central (2)	45	Hamilton, Madison, Taylor, Suwannee, Columbia, Union, Lafayette, Dixie, Gilchrist, Alachua, Bradford, Levy, Marion	1	Alachua (2000)	
2	Northeast (3)	26	Nassau, Duval, Baker, Clay, St. Johns, Putnam, Flagler	1	Flagler (2002)	2 <b>Duval County</b> Jacksonville (2000) <b>Nassau County</b> Fernandina Beach (2001)
3	East central (4)	73	Volusia, Lake, Seminole, Sumter, Orange, Osceola, Brevard	6	Volusia (2000) Seminole (2000) Brevard (2004) Osceola (2004) Lake (2001,2004)	6 <b>Volusia County</b> Ormond Beach (1997) <b>Orange County</b> Winter Park (1996) <b>Seminole County</b> Winter Springs (2001) Ovideo (2001 & 2003) <b>Brevard County</b> Titusville (2004)
4	Tampa Bay (5)	63	Citrus, Hernando, Pasco, Hillsborough, Pinellas, Polk, Manatee, Sarasota	7	Pinellas (1997) Pasco (2004) Sarasota (1997)-Sales Tax Sarasota (1999,1999,2005,2005)	1 <b>Sarasota County</b> Venice (2003)
4	Southwest (6)	9	Charlotte, Lee, Collier	5	Lee (1996) Collier (2002, 2004, 2006) Charlotte (2006)	1 <b>Collier County</b> Naples (2000)
4	South central (7)	11	Hardee, DeSoto, Okeechobee, Highlands, Glades, Hendry,			
5	Southeast (8)	113	Indian River, St. Lucie, Martin, Palm Beach, Broward, Dade, Monroe	14	Indian River (2004) St Lucie (2002) Martin (1996,1996,1998,2006) Palm Beach (1999,2002, 2004) Broward (2000) Dade (1996,2004,2004,2004)	10 <b>Broward County</b> Davie (1998,2005) Wilton Manors (1998) Fort Lauderdale (2000) Pembroke Pines (2005)  <b>Palm Beach County</b> Boca Raton (2000) West Palm Beach (2000) Delray Beach (2004) Jupiter (2004) <b>Dade County</b> Miami Beach (1999)

Source: State of Florida, Department of Economic Development; Landvote database Trust for Public Land



**Table XIX : Distribution of Municipal Referenda by metropolitan areas (1996-2006)**

S.No.	Metropolitan Code	Cities (n)	Metropolitan Area	Referenda voted (n)	Year (s) of referenda	Building Permits (2000-06)	Population Change (1990-2000)	Households with Income \$75,000 or more	Bachelors Education or Higher
1	14600	9	Bradenton-Sarasota-Venice	1	2003	72,181	16.5	27.1	26.5
2	15980	5	Cape Coral Fort Meyers	1	2003	115,371	31.6	28.1	24.1
3	19660	16	Deltona –Daytona Beach-Ormond Beach	1	1997	36,594	19.6	21.3	20.3
4	23020	9	Fort Walton Beach-Crestview-Destin	0		14,834	18.6	31.7	28.4
5	23540	12	Gainesville	0		14,643	21.5	23.3	36.3
6	27260	16	Jacksonville	1	2001	114,995	21.4	30.0	25.2
7	29460	16	Lakeland-Winter Haven	0		53,806	19.4	20.9	17.3
8	33100	85	South Florida Metropolitan Area	10	1998,1999, 2000, 2004, 2005	276,426	23.4	29.3	28.1
9	34940	3	Naples Marco Island	1	2000	47,561	65.3	36.6	29.0
10	36100	5	Ocala	0		38,103	32.9	17.3	15.9
11	36740	36	Orlando –Kissimmee	4	1996, 2001, 2003	203,797	34.3	28.3	27.9
12	37340	15	Palm Bay-Melbourne- Titusville	1	2004	44,875	19.4	27.4	26.2
13	37380	4	Palm coast	0		-	-	-	-
14	37460	8	Panama city-Lynn Haven	0		20,273	16.7	24.3	19.8
15	37860	5	Pensacola-Ferry Pass –Brent	0		25,109	19.7	24.0	23.9
16	38940	5	Port St. Lucie	0		50,941	27.2	27.3	22.5
17	39460	1	Punta Gorda	0		20,991	27.6	21.7	21.1
18	42680	5	Sebastian Vero Beach	0		72,181	25.2	26.0	26.4
19	45220	10	Tallahassee	0		23,178	23.6	24.8	32.2
20	45300	35	Tampa- St Petersburg- Clearwater	0		180,252	15.9	25.2	25.0

Source: State of Florida, Department of Economic Development; Landvote database Trust for Public Land (2011); State and Metropolitan Area Databook (2006) US Census Bureau.

green open space is associated with higher socio-economic characteristics (Halbheer *et al*, 2006; Kotchen and Powers, 2006; Nelson *et al*, 2006) and the rapid loss of land through development activities (Romero and Liserio, 2002; Schmidt, 2008).

Florida and its polarized referenda distribution are not atypical. Referendum distribution across the country show clusters of referenda. Therefore, the insights from analyzing local governments' data from Florida may be generalized to other local governments in the country.

### **5.5.2 Study Design**

This chapter uses data obtained from the State Department of Financial Services for years between 1996 and 2006. Year 1996 was chosen as the starting year because reliable referendum information is not available before then (Trust for Public Land, 2011).

Two questions are identified with the review of existing literature. The first question asks whether spatial dependence of expenditures among cities changes in the event of referenda. To answer this question, I compare the spatial dependence in parks and recreation expenditures in the five regions identified in table 18 for years 1996 and 2006. Table 18 shows the number of cities and the distribution of referendum in each region. The regional distribution of referendum provides an opportunity to compare the spatial dependence in expenditures over time, in the presence of growing frequency of referenda.

From tables 17 and 18 it is evident that referenda are frequent after 2000. The increase in referendum frequency coincides with the change in state policy by the adoption of the *Florida Forever* program. The occurrence of policy change sets up a natural experiment in which to

compare spatial dependence across different regions of Florida in the past two decades. The research design for this question is set up as a pre and post comparative study.

The second question asks whether there is spatial dependence in the change in expenditure of municipalities after the referendum. To answer this question I study the interaction of cities within a metropolitan area. This geographical boundary for the analysis, is similar to the study conducted by Murdoch *et al* (1993) who analyzed cities within the Los Angeles metropolitan area.

Table 19 presents the metropolitan areas in Florida as defined by the Office of Management and Budget (OMB). From the table it is seen that there are two metropolitan areas that offer enough number of cases ( $n < 25$ ) for a statistical analysis. The South Florida metropolitan area has the maximum number of cities and referenda, followed by St. Petersburg-Orlando metro. Both metropolitan areas have experienced successful municipal referenda and have a sufficient number of cities for the analysis.

### **5.5.3 Data and Methodology**

The study uses four different categories of data to answer the research questions. These are:

*Expenditure Data:* Expenditure data for the study were obtained through correspondence with the Department of Financial Services, Florida. Annual expenditure and Revenue data for county and municipal governments in Florida was provided from 1996 to 2008. The data series has been deflated using the consumer price index with year 2000 as the base year.

*Socio-Economic Data:* Demographic information for the study was drawn from the decennial census files for census years 1990 and 2000. Other sources of data include U.S. Gazetteer files

for 1990 and 2000; Florida Department of Coastal Management, and Florida Office of Demographic and Economic research.

*Green Open Space Referendum Data:* Data is available in the public domain through the *Landvote* database supported by the Trust for Public Land. The data prior to 1996 is not verifiable according to a disclaimer by the organization. Therefore a decision was made to use referendum data from 1996 onwards. Table 20 provides details of the referenda that occurred between 1996 and 2006.

**Table XX: Distribution of Municipal Referenda in FL data (1996-2006) by Year**

Year	Jurisdiction	Total referenda funds voted (million)	Conservation funds (million)	Elections	Purpose
1996	Winter Park	\$5.1	\$5.1	General Elections	Open space
1997				Local Government elections	
	Ormond Beach	\$3.7	\$3.7		Watershed protection, wildlife habitat, parks
1998				Local Government elections	
	Davie Wilton Manors	\$12 \$3	\$7 \$3		Recreation, open space, parks Recreation
1999				Local Government elections	
	Miami Beach	\$24.8	\$24.8		Parks, watershed protection
2000				General elections	
	Jacksonville	\$2200	\$50		Parks and open space
	Naples	\$9	\$9		Open space, wildlife habitat
	Boca Raton	\$30	\$30		Open space, recreation
	Fort Lauderdale	\$8	\$8		Parks and open space
	West Palm Beach	\$20	\$20		Parks and open space
2001				Local	

				Government elections	
	Fernandina Beach	\$6	\$6		Watershed protection, parks
	Oviedo	\$3	\$1.3		Parks, recreation
	Winter Springs	\$3.4	\$3.4		Parks
2003				Local Government elections	
	Oviedo	\$9	\$4.5		Parks
	Venice	\$10	\$5		Parks and Recreation
2004				General Elections	
	Delray Beach	\$9	\$9		Recreation, parks, open space
	Jupiter	\$17	\$17		Open space
	Titusville	\$10.3	\$10.3		Open space, parks, recreation
2005				Local Government elections	
	Pembroke Pines	\$100	\$13		Parks and open space
	Davie	\$25	\$25		Open space, trails, parks, wildlife habitat, watershed protection

Note: County elections take place in even number years, municipal elections in odd number years. All local elected officials appointed for a term of four years

*Geographical Data:* Geographic Information Systems (GIS) shape files were used in the analysis in order to calculate spatial dependence in expenditures among local governments. The shape files were obtained from the Florida Department of Environmental Protection and the Florida Natural Areas Inventory hosted by the Florida State University.

#### **5.5.4 Selection of Dependent Variables**

The expenditure on green space goods is operationalized as expenditures on parks and recreation goods. The expenditure reporting at the local level in Florida does not differentiate between pure green open space goods and others. At the city level one department, usually the parks and recreation, is responsible for green open space acquisition, park development and management. The annual expenditure of the parks and recreation department for each city is the key variable in the analysis. The primary dependent variable is per capita expenditures on parks

and recreation. It is the sum total of expenditures by city parks and recreation department. Use of this variable is supported by studies that have examined spatial dependence in other local government expenditures (Murdoch *et al*, 1993; Lundberg, 2006; Carruthers, 2007; Choumert and Cormier, 2011).

I use the change in per capita expenditure as the dependent variable for the second question. The use of expenditure change as a dependent variable is unprecedented in a spatial analysis to study fiscal interdependence.

In estimation of spatial dependence, a critical element is the method used to define “neighbors”. It is the backbone of the analysis to gauge spatial interactions with neighbors (Anselin, 1988) and summarizes the spatial relationship in the data (Dubin, 1992). There are a number of ways in which previous studies have defined neighbors. A common method to define neighbors is the use of geographical contiguity, in which cities that share a geographical boundary are designated as neighbors (Revelli, 2003; Bordignon *et al*, 2003; Werck *et al*, 2008). Often in cases of crime data dependence, contiguity measures are very useful as offenders work across geographically neighboring towns. Other criteria for determining neighbors include measure of threshold distance, i.e. cities which are in a distance radius of  $x$  miles (Choumert and Salanie, 2008); travel time i.e. cities (Lundberg, 2006) which are in a time traveled radius of  $x$  minutes are classified as neighbors. Still other methods considered are inverse distance- where cities which are closer are considered more important neighbors than those that are further away (Murdoch *et al*, 1993); nearest neighbors-in which cities with  $n$  number of nearby cities are chosen to be neighbors. Some studies have used socio-economic variables to construct the spatial weight matrix (Case *et al*, 1993; Revelli, 2003; Baicker, 2005; Deverue *et al*, 2007). Ultimately it is the theory behind the question that determines the definition of neighbors (Anselin, 2002).

The classification of neighbors in this analysis is informed by observations during the case study in North Carolina. I found residents from neighboring communities accessing each others green space facilities. However, such use is determined by the ease of access. In the case of green space goods, neighbors are defined by a threshold distance beyond which the cost of accessing a green space in neighboring community becomes more than the net benefit received. The method of threshold distance best fits the criterion to define neighbors<sup>62</sup> according to the observation. The three distance matrices that I have constructed in Florida data to measure the effect on neighboring communities is respectively 10, 15 and 20 mile in radius.

### **5.5.5 Selection of Estimation Equation**

For the analysis, I adopt the model from Murdoch *et al* (1993) to estimate spatial dependence in parks and recreation expenditures. Refer to Murdoch *et al* (1993) and Choumert and Cormier (2011) for a description of the theoretical derivation. The resulting equation (i) is a median voter demand model, where parks and recreation spending is predicted by a set of socio demographic demand and amenity factors. The equation takes the following functional form:

$$PCExp_i = \alpha + \beta_1 X_i + \beta_2 TXPC_i + \beta_3 AMENITY_i + \varepsilon_i \dots \dots \dots (5.1)$$

Where

PCExp<sub>i</sub>=Per capita expenditures on parks and recreation

X<sub>i</sub> = socio demographic need factors of the city *i*

TXPC<sub>i</sub>=Tax price for parks and recreation goods provided in city *i*

AMENITY<sub>i</sub>= amenity factors which complement the need for green space.

To estimate spatial dependence of expenditures among neighbors, a weighted average of neighbors' per capita expenditures is introduced on the right hand side of the equation. This is the typical spatial lag model outlined by Anselin (1988). As previously noted, neighbors are defined by the criterion of threshold distance. I constructed three matrices with distances radius

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<sup>62</sup> Contiguity is an alternative measure to define neighbors, however Florida consists of large areas of un incorporated territory. This makes it is difficult to rationalize contiguity as a factor in determining spatial dependence.

of 10, 15 and 20 miles respectively. It means that all cities that were at a distance of 10, 15 and 20 miles were included in the calculation of weighted per capita expenditure average. All matrices are row standardized, which allows for comparison of coefficients across the estimations. Multiple matrices were used to evaluate the sensitivity of spatial dependence coefficient to the distance and number of neighbors included in the estimation.

The predictors of parks and recreation spending in the literature are a set of socioeconomic variables following the median voter demand model. Lifestyle variables like income, age and education have been found to be associated with public goods expenditures (Kahn and Matsusaka, 1997; Bates and Santerre, 2001; Nelson *et al*, 2007). In their estimation Kotchen and Powers (2006) concluded that the proportion of population under 18 years correlates negatively with green open space referenda success. I include the variable of percentage population over 65 and expect a positive association with per capita expenditures on parks and recreation.

The unit cost of public good provision is measured by the increase in the tax share of the median voter. In the model this is captured by the use of a variable representing the tax price (Murdoch *et al*, 1993). I calculate tax price (TXPC) as the proportion of median value of owner occupied house and total property tax base of the city (Bergstrom and Goodman, 1973).

In addition to the above variables I add a variable measuring the intergovernmental grants available to the municipal government for parks and recreation (LGR) as a predictor of its expenditure (Birkelöf, 2009). I expect that parks and recreation grants will be positively associated with the per capita expenditures on parks and recreation.

Amenity factors like presence of a coast line and ozone levels have been found associated with a higher per capita spending on parks (Murdoch *et al*, 1993; Banzhaf *et al*, 2010). I add a



dummy variable that captures the location of the city on the coast (COASTAL). I expect that cities with public beaches incur more parks and recreational spending.

A locational variable that identifies central cities<sup>63</sup> (CCITY) in the dataset is introduced. In literature central cities have been found to have higher per capita spending than suburban cities (Choumert and Cormier, 2011). I expect that per capita expenditures will be positively associated with the designation of the city as a central city. Finally, the area of a city in landmiles (LLDML) is added as a control variable. I expect larger cities to have higher per capita spending.

In the analysis<sup>64</sup> income and age were dropped as predictors of per capita expenditures on parks and recreation as they did not contribute to the explanatory power of the estimation. In literature the relationship of income as a predictor of green open space was found mixed (Bates and Santerre, 2001; Schlöpfer and Hanley, 2003; Kotchen and Powers, 2006; Howell-Moroney, 2004; Schmidt, 2008; and Banzhaf *et al*, 2010). Scholars have pointed that the ambiguous relationship of public demand for green space and income is due to the impure public goods nature of green space.

Green open space goods are prone to congestion due to non-rivalry. At higher levels of income, environmental goods (Kahn and Matsusaka, 1997) and green open space goods were seen as inferior goods (Kline, 2006). Nelson *et al* (2007) found that the support for green open space referenda was positively associated with median household income till \$100,000, but declined at higher levels of median income.

After the elimination of income and age from the estimation the revised version of equation (i) is written as

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<sup>63</sup> Ferreira, 2002 cited in Ferreira *et al* (2005) reported that suburban cities surrounding Rio de Janeiro spent less on public health services, due to the benefit spillovers realized from the provision through the central city.

<sup>64</sup> Also refer to section 4.6 for a discussion of income as a predictor. Separate estimations with income and age variables are reported in appendix tables A5.1.1 to A. 5.6.1

$$PCExp_i = \alpha + \rho W * Exp_{i...k} + \beta_1 TXPC_i + \beta_2 LGR_i + \beta_3 LLDML_i + \beta_4 COASTAL_i + \beta_5 CCITY_i + \varepsilon_i \dots \dots \dots (5.2)$$

In the estimation, the coefficient for the weighted average expenditure of neighbors ( $\rho$ ) denotes the direction and magnitude of the spatial reaction function (Brueckner, 1998). If the coefficient bears a positive sign, it indicates that neighboring governments are engaged in a ‘mimicking’ relationship. If city A increases its expenditures, then city B will follow suit. Such observation would fit the results from yardstick competition theory. A positive spatial reaction function would support previous conclusions drawn by Murdoch *et al* (1993) in the US context.

On the other hand, if the coefficient on neighbors’ expenditures ( $\rho$ ) is negative then it would show a ‘free riding’ behavior among neighboring cities. This conclusion will support the findings drawn by studies done in Europe.

Equation (5.2) has so far dealt with horizontal spatial dependence. In their study on Florida tax competition, Wu and Hendrick (2009) reported that the measure of horizontal spatial dependence decreased in the presence of county tax variables. Similar results were reported by Revelli (2005) from a study in UK. I add county spending per capita as a regressor to the equation to estimate the effect of the vertical spatial dependence. These estimates will be reported separately. This analysis will help understand the impact of horizontal interdependence after accounting for the influence of vertical overlapping governments.

Two additional control variables are introduced along with the county expenditures. Presence of a land preservation program in the county (LPRESV) is included to account for the differential in spending by 23 counties that have established a land preservation program<sup>65</sup>. Another dummy variable for counties with green open space referendum (REF) is included in the

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<sup>65</sup> This information is from a source dated 2003, therefore the dummy variable will not be included in estimation from the year 1996.

analysis. I expect that, expenditures in cities that belong to such counties will be different from those in other counties.

The modified version of the estimation equation for the effect of county spending is as follows

$$PCExp_i = \alpha + \rho W * Exp_{i...k} + \beta_1 TXPC_i + \beta_2 LGR_i + \beta_3 LLDML_i + \beta_4 COASTAL_i + \beta_5 CCITY_i + ExpCounty_i + LPRESV_i + REF_i + \varepsilon_i \dots\dots\dots(5.3)$$

The second part of the chapter deals with spatial dependence in the *change* in expenditures for cities in select metropolitan areas in Florida. I estimate a spatially weighted expenditure equation for the two metropolitan areas. Two differences from previous equations (5.1-5.3) are notable. First the dependent variable is the change in expenditures for cities between a pre referendum and post referendum year. Secondly, the estimation equation exclusively uses financial regressor. Compared to socio-economic variables, drawn from the census, which are stable over a 10 year period the financial variables are advantageous as they are well measured each year.

There are three variables that are used for predicting change in expenditures over time. These variables are change in intergovernmental grants for parks and recreation (GRANTS), change in the departmental revenues (REV) and change in the debt affordability of the city (DEBT). The latter is measured as the total city debt service as a fraction of the equalized assessed value of the city.

The estimation equation for question two is

$$\delta PCExp_i = \alpha + \rho W * \delta PCExp_{i...k} + \beta_1 \delta GRANT_i + \beta_2 \delta REV_i + \beta_3 \delta DEBT_i + \varepsilon_i \dots\dots\dots(5.4)$$

The above equation is estimated for cities belonging to two metropolitan areas that have experienced frequent referenda.

In the next section I report and summarize conclusions for the first question (equation 5.2 and 5.3) which assess spatial dependence in two different decades. The subsequent section presents the analysis and discussion for the second question (equation iv).

### **5.6 Effect on Spatial Dependence: Regional Analysis**

Descriptive statistics for independent and dependent variables are given in tables 21 and 22. A comparison of per capita expenditure values on parks and recreation shows that average spending has increased among the cities over the decade. An increase in per capita grant values is observable. The minimum value for grants tripled from 1990s to 2000s. The last column in the tables summarizes the expected sign on the independent variables. Except for the variable of tax price, the remaining variables are expected to have a positive coefficient.

**Table: XXI: Descriptive statistics 1996**

Variable	Year	N	Minimum	Maximum	Mean	St. Dev	Source	Expected Sign
Per capita Expenditure on Parks and Recreation 1996	1996	400	0	579.7	51.0	57.6	Florida State	
Percentage 65 years plus	1990	386	0	82.3	21.5	12.7	Census 1990	Negative
Per capita income	1990	387	0	159306	15749.7	14302	Census 1990	Positive
Per capita Grants	1996	398	0	320.1	6.8	22.53	Florida State	Positive
Tax price	1996	400	0	131.3	1.2	7.55	Florida State	Negative
Land sq. miles	1990	400	64	1964950	23510.3	102790.3	U.S. Gazetteer	Positive
Coastal	1990	400	0	1	0.3	0.5	Florida State	Positive
Central city	1990	399	0	1	0.1	0.3	Florida State	Positive

**Table XXII: Descriptive Statistics 2006**

Variable	Year	N	Minimum	Maximum	Mean	St. Dev	Source	Expected Sign
Per capita Expenditure on Parks and Recreation 1996	2006	403	0.2	852.8	107.9	106.9	Florida State	
Percentage 65 years plus	2000	403	0	79.1	20.35	11.6	Census	Negative

							1990	
Per capita income	2000	403	0	200087	24263.3	20436.9	Census 1990	Positive
Per capita Grants	2006	402	0	618.8	25.3	52.4	Florida State	Positive
Tax price	2006	375	0	25.47	0.6	2.6	Florida State	Negative
Land sq. miles	2006	403	0.0	757.4	10.3	40.0	U.S. Gazetteer	Positive
Coastal	2000	403	0	1	0.3	0.5	Florida State	Positive
Central city	2000	403	0	1	0.1	0.3	Florida State	Positive

Regressions were carried out using the method of Maximum Likelihood estimation, because weighted dependent variable on the right hand side (RHS) of the spatial lag model makes the OLS estimates biased (Anselin, 1988). The software tool GeoDA was used for this purpose. Lagrange Multiplier test (LM test) statistics were used to check for the presence of spatial autocorrelation in the data (Anselin, 1988; Baltagi, 2003). Two values for LM test signal the presence of autocorrelation in data. A positive and significant value for LM lag indicates that the data shows spatial dependence. In order to accommodate this spatial autocorrelation, a spatial lag model is then fitted on the data and the subsequent results are reported. The second LM statistic is the LM error value which shows the presence of serial correlation (spatial error) in the data.

As previously discussed, the state of Florida is divided into five regions for the analysis to answer the first question. Tables A5.1 through A5.6, in the appendix I, show the cross sectional estimation results for year 1996 and 2006 using three different weight matrices. The dependent variable is city per capita expenditure on parks and recreation. The tables report regression coefficients for six different estimations. The first column provides estimates for the entire state followed by the five regions into which the state is divided. Each instance where the

presence of spatial dependence is detected by the LM statistic is modeled separately and the column appropriately marked (SPATIAL).

The empirical results suggest that, for the statewide model, cities demonstrate the presence of spatial dependence in parks and recreation expenditures in both 1996 and 2006. The coefficient is positive and significant for all three weight matrices. This finding supports the conclusion drawn by Murdoch *et al* (1993), who found a similar pattern of positive spatial dependence in parks and recreation expenditure among cities within Los Angeles metropolitan area. Regional spatial dependence is detected in two instances. It is positive and significant in region three for year 1996 and region five for year 2006. At the regional level, the coefficient of spatial dependence is shown to be sensitive to the criterion of threshold distance. At larger radius of 15 and 20 miles, regional spatial dependence is absent in the data (Tables A5.2 and A5.3 in appendix I). The absence of spatial dependence indicates a threshold effect for public goods like green open space. The spillovers do not matter for cities that are at a distance of 10 miles or more.

Table A5.7 in the appendix I shows that region 3 neighbors, in year 1996, in the ten mile radius spent 60 cents more for every one dollar increase in spending. This coefficient is much larger than the statewide model which shows an average of 20 cents increase in neighbors spending. The results support the proposition that complementary public goods among neighboring cities are responsible for this increase. This was proposed by Murdoch *et al* (1993).

Estimations for year 2006 (Tables A5.4 to A5.6 in appendix I) show that the magnitude of spatial dependence for the state model is small compared to the 1996 estimate<sup>66</sup>. Spatial

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<sup>66</sup> Murdoch *et al* (1993) report a value of 0.012 from the model estimating spatial dependence in parks and recreation expenditures for Los Angeles metropolitan area from 1987 Census of Governments dataset. The value of spatial coefficient for 2006, is closer to this value than the one reported for 1996.

dependence in region three is not detected as seen in the 1996 results. Region five shows interdependence in parks and recreation expenditures. Consistent with the threshold effect discussed earlier, regional spatial dependence is not visible in region five at distance of 15 and 20 miles for year 2006.

A summary of the results of spatial dependence coefficient is found in table 23. A positive spatial coefficient suggests complementarity in the parks and expenditures of neighboring cities. This finding supports the hypothesis supported by the yardstick model of interjurisdictional dynamic. The yardstick model predicts a similarity in expenditure behavior among neighbors.

**Table XXIII: Horizontal Regional Spatial Dependence**

	1996			2006		
	10 miles	15 miles	20 miles	10 miles	15 miles	20 miles
STATE	0.12***	0.22**	0.22**	0.08**	0.14	0.18***
Region 1						
Region 2						
Region 3	0.59***					
Region 4						
Region 5				0.16**		

Among other variables per capita grants and land miles are a steady predictor of parks and recreation expenditures. Due to log transformation of the dependent variable and grant variable, the coefficient for grants per capita can be interpreted as the elasticity of expenditures with per capita grants available for parks and recreational spending. Intergovernmental grants are positive and elastic to the expenditures. The elasticity is less than one, which suggests that a one per cent increase in grants results in a less than one per cent increase in per capita spending. Coastal cities have a higher spending on parks and recreation as expected. Variable for tax price and central city do not yield consistent and significant coefficients in both sets of estimations.

In Florida, a change in land protection policy in 2000s provided an opportunity for the local governments to access funding for green space. The increase in funding opportunity corresponds with an increase in referenda occurrence. The hypothesis for question one is that referenda concentration alters the coefficient for spatial dependence. The rationale being that the information set of the neighboring municipalities is altered in the process of referenda. They either engage in yardstick competition or free ride on benefit spillovers. Data from *Landvote* shows that in 1996 only one municipal referendum had occurred in region three. Results revealed that region three had a positive spatial dependence as shown by a positive spatial coefficient. A positive coefficient is hypothesized when the yardstick model is operating.

In 2006, when the concentration of referenda had increased, region three does not show any spatial dependence. This is consistent with the expectation from Birkelöf (2009) who found that the introduction of an intergovernmental grant reduced spatial dependence in her data. Birkelöf (2009) argues that it is due to a reduction in the information asymmetry about the funding agency among the governments. In the case of Florida, increase in referenda contribute to more information about successful examples of municipalities which availed *Florida Forever* funding. This sets up a similar effect of information asymmetry reduction as described by Birkelöf (2009)

Region five which did not show spatial dependence in 1996 shows positive spatial dependence in 2006. It also records the the highest number of referenda in the early 2000s (9 referenda) most of which were held in the early 2000s. According to the mechanism identified in Birkelöf (2009) no spatial dependence in expenditures should be expected. To form a plausible explanation for this observation I argue that along with frequency of referenda it is useful to consider the time of referenda closest to the *point of evaluation*, the *referendum amount* and the



*interconnectedness of the city* holding the referendum. In region five two cities conducted a referendum in 2005. Pembroke Pines voted on a referendum of \$100 million dollars and Davie voted on a referendum of \$25 million dollars. In region three the closest referendum to year 2006 was conducted by Titusville in the year 2004 for an amount of \$10 million dollar. The reported average annual expenditures for the parks and recreation departments for region three cities in the year 2006 was \$28 million. It is possible that Titusville's referendum for \$10 million dollars was an insignificant amount to the other cities in the region and therefore did not make an impact.

Geographical contiguity of a city is an important concern when studying the effects of a referendum. In region five the two cities that experienced referendum have 10 and 14 neighbors respectively in the 10 mile radius. In region three, Titusville, the city which experienced a referendum, was not geographically contiguous to any other city. In 1996, the city of Winter Park experienced a referendum in region three and it was connected to nine other cities in a 10 mile radius. It is plausible that in the absence of neighbors who will experience a benefit spillover, and the low amount of the Titusville referendum, region three did not display spatial dependence in 2006.

Scholars have argued that looking at horizontal spatial relationships is looking at one side of the coin. Municipal governments in any given time interact not only with their peers but also with governments that are above and / or below them in the federalism hierarchy. In the next section I explore how the inclusion of county level expenditures alters the results gathered from the horizontal level regressions. Possibly, results from including the county variables will help explain some of the effect observed in the municipal regressions.

### **5.6.1 Effect of County Spending**

The second set of estimations conducted with regional data (equation iii) integrated the variable of county spending per capita (COUNTY). Previous studies have concluded that measures of horizontal spatial dependence are inflated as a result of not including the vertical effects from county spending (Revelli, 2005; Wu and Hendrick, 2009). The expectation from the inclusion of county expenditure variable is that it would decrease the magnitude of spatial dependence coefficient. Two categorical variables were also included in the analysis for the year 2006. These variables control for the occurrence of a prior referendum in the county (REF) and the presence of a county land preservation program (LPRESERV). A variable for prior referendum is derived from Nelson *et al* (2007) who did not find any effect of a prior county referendum on the likelihood of a city referendum. I check the association of prior referendum with municipal expenditure levels. The variables take a value of one if the county has experienced a prior referendum or has a land preservation program. This information is not available for counties for the year 1996.

Tables A5.7 to A5.12 in the appendix I show the results of estimation for statewide as well as regional models after the inclusion of county spending. In tables for year 2006 (Tables A5.10 to A5.12 in the appendix I) the dummy variables for land preservation and referendum are included in separate models. Tables are arranged according to the three weight matrices used to check the sensitivity of the spatial dependence coefficient to the distance radius.

Table 24 summarizes results for the spatial dependence coefficient derived from the data. Inclusion of county expenditures (COUNTY) decreased the measure of spatial dependence in expenditures for the statewide models. The statewide model for 10 and 20 miles in the 1996 and 20 miles in the 2006 no longer show the presence of spatial dependence. Whereas the spatial dependence measure for 15 miles in the year 1996 fell from 0.22 to 0.17. A modest reduction is

observed in the 10 and 15 miles models for 2006 as well. The observation of reduction the in spatial dependence measure is similar to the previous findings in literature.

Inclusion of county expenditures did not decrease the spatial dependence in the regional data. It resulted in a new observation of spatial dependence for the 15 mile radius in 1996.

Overall the regional pattern of spatial dependence in the data remains unchanged.

**Table XXIV: Regional Summary of Spatial Dependence in Parks and Recreation including County Expenditures**

	1996			2006		
	10 miles	15 miles	20 miles	10 miles	15 miles	20 miles
STATE		0.17***		0.07**	0.12**	
Region 1						
Region 2						
Region 3	0.59***	0.37**				
Region 4						
Region 5				0.16**		

The tables in the appendix display a positive coefficient for county expenditure variables in the state models for both 1996 and 2006. However, in the regional models county spending bears a negative sign except for region five. Similar to the previous set of equations variables of intergovernmental grants, land miles and coastal cities are consistent predictors of parks and recreation expenditures. Coefficient for central cities bears a sign that is the opposite of what is expected (Lundberg, 2006; Choumert and Cormier, 2011). In the data central cities do not spend as much on parks and recreation as other cities. The conclusions about central cities' spending more comes from studies done in the European setting, which is markedly different than the US. Tax price is not found to be a statistically significant predictor although it bears the expected sign on the coefficient.

Tables A5.10 to A5.12 in appendix I present the analysis for 2006 including the variables for land preservation and prior referendum. A county land preservation program, according to a report dated 2003, was operational in 23 counties in Florida. This county land preservation program is shown to have a positive association with city parks and recreation expenditures in the state models. Inclusion of land preservation and prior referendum in addition to the county expenditures removes the spatial dependence in the statewide regressions.

In the regional models, region five is the only case that demonstrates the presence of spatial dependence. County land preservation program data show that all counties in regional five had such a program. As a result the categorical variable to net the effect of such a program could not be included in the regression. The coefficient of spatial dependence was increased by the inclusion of the variable for prior referendum in the county. In the model which considers neighbors within the 10 mile radius, the coefficient of spatial dependence increases from 0.16 to 0.18 after the inclusion of a prior referendum variable. Spatial dependence observed in region five can be explained in terms of the common resources effect derived from the county land preservation program. It is one of the several reasons for fiscal and policy interdependence identified in the literature (Elkins and Simmons, 2005).

### **5.7 Spatial dependence in Expenditure Change: Metropolitan Analysis**

The second part of this chapter examines the spatial dependence in the *change* in parks and recreation expenditures after a referendum. A positive coefficient will indicate that the change in the neighboring municipalities' expenditures was in the same direction, whether it was an increase or a decrease. A negative coefficient can be inferred as opposite trends of

expenditure observable among neighboring municipalities in the 10, 15 or 20 mile radius in the period of observation.

The South Florida and Orlando metropolitan areas, which had multiple referenda, are chosen for this analysis. The precedent for using metropolitan areas as a geographical unit to study spatial dependence is found in Murdoch *et al* (1993). The authors used Los Angeles metropolitan area to study spatial dependence in parks and recreation expenditures. Their study was one of the first to examine spatial dependence in local government expenditures in the US.

### **5.7.1 Background of Metropolitan Areas**

#### **5.7.1.1 South Florida Metropolitan Area**

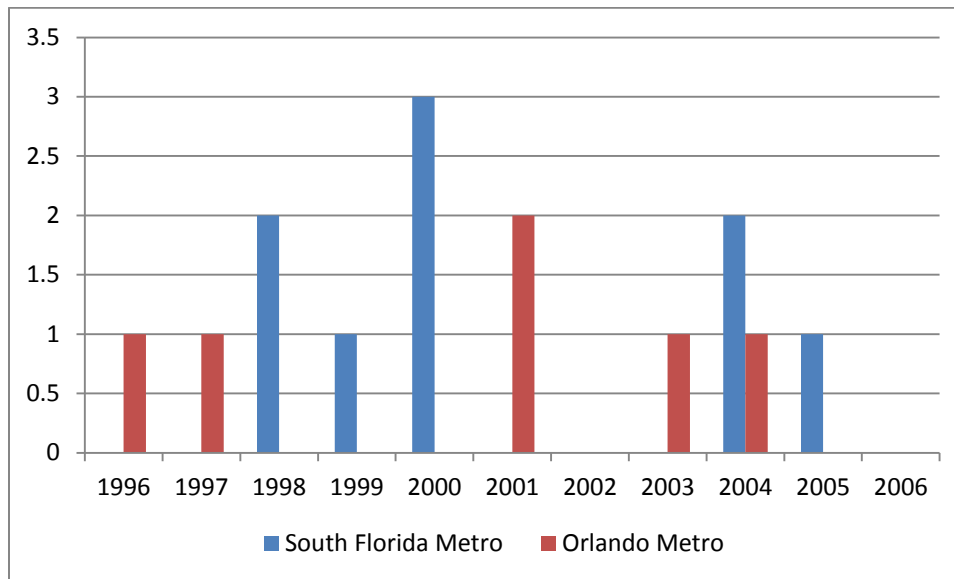
The South Florida Metropolitan Area consists of Miami-Dade, Broward and Palm Beach counties. It occupies the south eastern side of the state with an extensive coastline. The metropolitan area consists of eight primary cities with population over 100,000 residents. According to the *Landvote* database, South Florida metro experienced 9 referenda between year 1996 and 2006.

All three counties in the South Florida metropolitan area have a bond funded land acquisition program. Among the three counties, Broward County started a matching grants program in the year 2008. The grant program provides funding for local governments who own green space and open space sites for further improvement. Miami Dade County initiated a program in year 2008 to connect municipal governments through green space, but there is no provision for grant funding (Miami Dade County, 2011). Palm Beach County co-manages green space with its cities. It does not have a matching grants program.

### **5.7.1.2 Orlando Metropolitan Area**

Metropolitan Orlando consists of Lake, Orange, Osceola and Seminole counties.

Seminole County (1000 friends of Florida, 2011) , Osceola County (Osceola County, 2011) and Lake County (Lake County, 2011) have a land protection program which was financed by public referenda. Orange County started its Environmental Land Stewardship Program in 2010. Even though the county has not voted on



**Figure 12: Municipal referenda in metropolitan areas 1996-2006**

any referendum, one of its cities, Winter Park was among the first in the state to hold a green open space referendum (Orange County, 2011). Orlando metropolitan area has three central cities, Orlando, Kissimmee and Sanford. Neither of these cities has voted on a green open space referendum.

### **5.7.2 Data Preparation**

Both metropolitan areas have experienced multiple referenda over the period of 1996 to 2006 (Figure 12). In order to arrange the analysis, I deal with multiple referenda in the metropolitan areas by clustering them. The South Florida metropolitan area has nine referenda

that have occurred in the years 1998, 1999, 2000, 2004 and 2005 respectively. I calculate the dependent variable, change in per capita expenditures, over two time intervals. The first is at the interval of five years between 1997-2001 and 2002-2007. The second is the interval of ten years for the study, from 1996 to 2006. Metro Orlando has experienced seven referenda in the same time period. I calculate the five year time lag between 1996-2000 and 2002 -2004. The second time interval between 1996 and 2006 is the same as for South Florida metro. The two metropolitan areas differed on the basis of the number of incorporated municipalities. The south Florida metropolitan area has 77 cities whereas the Orlando metropolitan area has 35 cities. Considering the difference in the number of observations a limited number of independent variables are introduced in the analysis to preserve the degrees of freedom.

### **5.7.3 Results**

Table A5.13 and Table A5.14 in appendix C show the results from regression using equation (iv) for South Florida Metropolitan area and Orlando metropolitan area. The diagnostics and spatial lag models were estimated using three weight matrices constructed with the threshold radius of five miles, ten miles and 15 miles respectively. This set of estimations considers the five mile radius as the starting threshold. This is done because compared to regions metropolitan areas tend to have more dense incorporated urban spaces.

In the South Florida metropolitan area, results show a negative spatial lag coefficient for the five year time period of year 1997-2001 (Table A5.13 in appendix C). In other words, neighbors within the five mile radius showed negative spatial dependence in the change of expenditures on parks and recreation between the years of 1997 and 2001.

A negative spatial dependence coefficient means that neighboring cities within the five mile radius displayed opposite expenditure trends. Subsequent estimations with the ten mile and

15 mile radius weight matrices do not show the presence of any spatial dependence in expenditure change. This observation suggests that, similar to regional results, there is a threshold effect in spatial dependence that is not observed beyond five mile radius.

The second five year time period, from year 2002 to 2007, does not show the presence of spatial dependence in the dependent variable for any of the three weight matrices. The lack of spatial dependence in the change in expenditures is concurrent with the higher number of referenda observed in the metropolitan area beyond year 2001. No spatial dependence is observed for the dependent variable constructed for the ten year time period.

Results from analysis of the Orlando metropolitan area show no spatial dependence in per capita expenditure for any time frame (Table A5.14 in appendix I), irrespective of the weight matrices. The lack of spatial dependence in expenditure change for cities in metropolitan Orlando suggest that cities were not affected by the occurrence of referendum in either the five year or ten years of frequent referenda.

## **5.8 Discussion**

Results from the first part of the analysis, the statewide models for years 1996 and 2006, were in agreement with other published cross sectional estimations (Murdoch *et al*, 1993; Wu and Hendrick, 2009; Choumert and Cormier, 2011). The positive coefficient for spatial dependence is presumably induced by the creation of complementary public goods in neighboring cities. For this chapter, a positive coefficient points to the creation of complementary parks and recreational goods among neighboring cities in the ten mile radius. The magnitude of the spatial coefficient declined between 1996 and 2006, with the largest reduction among neighbors of 10 mile radius. The reduction in the coefficient is counter intuitive. According to the theory of the yardstick model, the increase in referenda and the



facilitation of information would result in neighboring citizens demanding similar action by their local governments. Consequently this will increase neighbors expenditures. The spatial dependence coefficient would also increase in this scenario.

However, I find that the spatial dependence from 1996 to 2006 actually decreases. Similar decrease in spatial dependence was observed by Birkelöf (2009) after a grant providing more information was made available to the local governments in Sweden. Birkelöf (2009) argues that the result is explained by a reduced reliance of local governments on mimicking to set their expenditures. Instead the governments are armed with information due to the grant and become more autonomous in setting their expenditure levels.

Florida experienced a policy change in year 2000 which made green open space protection grants more accessible to the local governments and non-governmental actors. As most local governments hold referenda to gather the finances required for a match for the grant, the increase in the number of referenda helped to disseminate the information about grants. Similar to Birkelöf (2009) I reason that the increase in information availability through referenda motivates the local governments to be assertive in deciding the expenditures on green open space. A reduction in the spatial dependence points to a reduced effect of neighbors' spending on the expenditure decisions of city governments with time.

The two theories considered in this empirical investigation predicted neighbors reaction to an increase in expenditures on parks and recreation. The yardstick theory predicted a positive reaction from neighboring local governments. The results from the analysis show that over time, with the increase in information availability (increase in the number of referenda) the spatial dependence declines. The magnitude of neighbors increase in expenditures declines. In literature the majority of empirical evidence supporting yardstick competition model is drawn from studies

of tax policy setting. In an empirical examination of yardstick competition model in the context of environmental policy diffusion Perez (2010) found that if the local government held a large majority in previous election, they were less prone to being affected by neighbors decisions. The reduced spatial dependence in Florida from 1996 to 2006 demonstrates that the theory of yardstick competition model is limited in the explanation it offers in this context. There are two ways in which the empirical analysis could be improved. First, on the basis of the conclusion drawn by Perez (2010) it is plausible that inclusion of local government election variables would provide more insight. Second, it is possible to hypothesize a different government reaction to continued provision of information in the regional system.

Results from the regional models for years 1996 and 2006 presented new insights. The first is that the coefficient for the spatial lag varies over time. It was detected in region three in year 1996 but not in year 2006. Similarly it was induced in region five in 2006. This observation speaks to the dynamic nature of the spatial dependence coefficient resulting from the ever changing fiscal relationship between municipal actors. The second insight gained from these models is that the spatial dependence coefficient is distance dependent. It has a threshold effect, which in some cases does not extend beyond a 10 mile radius. This observation is theoretically fitting as the expectation is that influence decreases with distance. This is derived from Tobler's first law of Geography (Tobler, 1970).

The inclusion of county expenditures altered the spatial dependence coefficient for the state models. It does not affect the regional spatial dependence coefficients. The inclusion of county land preservation program provides important information to understand the observed spatial dependence in the statewide estimates as well as in region five. Inclusion of prior county

referenda and county land preservation program eliminates the spatial dependence observed in the statewide estimations for 2006.

With the increase in referenda and access to public funding for green open space I expected that spatial dependence in the data would decrease (Birkelöf, 2009). The statewide models showed this trend with the decrease in the spatial coefficients, as does region three for the estimates of 2006. However, the spatial dependence observed in region five in 2006 does not fit the trend and can be explained with the county preservation program that causes an increase in expenditures for all municipalities in region five.

The results from the regional analysis are preliminary and require replication to form a conclusion about the characteristic of the spatial dependence coefficient over time. More information about how the timeframe of evaluation affects the coefficient is a worthwhile inquiry for the scholars of local government.

Results from the metropolitan level weakly suggest the presence of spatial dependence in expenditure change after the referendum. The south Florida metropolitan area displayed spatial dependence in one time period between 1997 and 2001. The negative coefficient suggested that neighboring municipalities were involved in opposing trends of expenditure change. I explore this further by looking at spatial dependence at the disaggregated level in the metropolitan area. Methodologically the details of municipal actors behavior in the metropolitan area can be studied by using local indicator of spatial dependence (LISA). This metric was proposed by Anselin (1988) and is generated by the GeoDA software. A LISA map for change in expenditures between the time period of 1997 and 2001 for the South Florida metropolitan area is presented in figure A5.1. The figure shows pockets of high-low spending. Even though these

pockets are not as pervasive in the metropolitan area, as shown in the figure A5.1, their effect is picked up by the spatial coefficient.

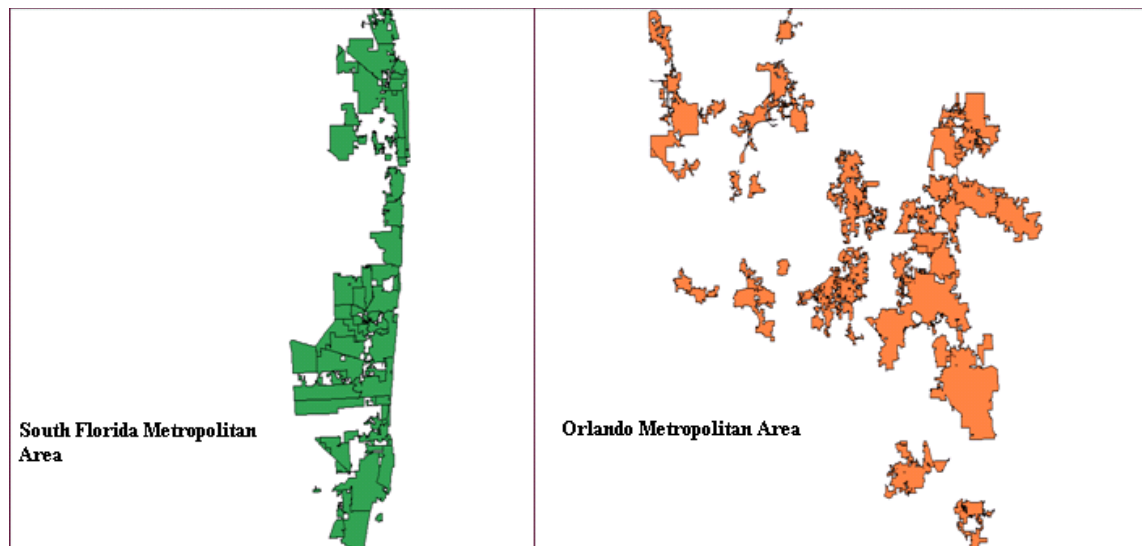
The negative spatial dependence in expenditure change, in the years before *Florida Forever* was adopted shows that neighboring cities were affected by the referendum. As funding for green open space conservation became more accessible through the new policy framework, cities in the metro area adjusted their expenditures according to the grants and funding available to them. They became less reactive and more assertive in determining their green open space expenditures. This is an explanation for the lack of spatial dependence in the second five year time period between 2002 and 2007.

As an explanation for the lack of spatial dependence in expenditure change in the Orlando metropolitan area I revisit the logic of geographical contiguity and amount of referendum. These are influences determining the spatial dependence coefficient.

Amount of the referenda: In the Orlando metropolitan area, the referendum held by Winter Park in 1996 was for \$ 5.12 million dollars and completely dedicated to open space. From year 1996 to 2006, the metropolitan area experienced four referenda- 1996 (Winter Park- \$5 million), 2001 (Oveido -\$ 3 million and Winter Springs- \$ 3.4 million) and 2003 (Oveido- \$9 million). The metropolitan area had additional spending of \$16 million in a 10 year period through referenda. Compared with the South Florida metropolitan area, the amount of spending in metropolitan Orlando is very small. This could possibly be a reason that the two metropolitan areas differ in their spatial dependence for per capita expenditures.

Geographical Contiguity: Figure 14 shows the geographical spread of incorporated municipalities in both metropolitan areas. A small portion of metropolitan Orlando is covered by incorporated municipalities. Comparatively the South Florida metropolitan area is a more

contiguous group of cities, albeit horizontally constricted. There is not much unincorporated territory within the South Florida metropolitan area. Calculating spatial dependence in both metropolitan areas was a challenge because theoretically, both yardstick and spillover hypothesis are better understood in the landscape of contiguous neighbors. The lack of horizontal and vertical contiguous space, which is ideal for calculating the weight matrix, made the software calculations more tedious. However, because the South Florida metropolitan area was more vertically contiguous it was possible to see the spatial dependence in the metropolitan area. I am skeptical about whether spatial dependence was not manifested in metropolitan Orlando because of the spatial gaps in its incorporated municipal territory.



**Figure 13: Maps of the Two Metropolitan Areas**

## **5.9 Conclusion**

This chapter examines spatial dependence in parks and recreation per capita expenditures. Dimensions of fiscal spatial dependence are explored geographically and temporally.

Geographically, the analyses examine spatial dependence at a regional and metropolitan level. These analyses are conducted on a cross section of data as well as over time.

The main subject of the chapter is the estimation of spatial dependence of public expenditures among municipal governments. The novelty of the chapter is in the calculation of spatial dependence in the context of a referendum for a public good, in this case green open space. This extends the current literature about fiscal interactions and the implications of a green space referendum on expenditures of own and neighbors' expenditures.

The main goal of the analysis was to see how referenda altered the spatial dependence of expenditures among municipal actors. The empirical results gathered by the statewide inquiry shows that referenda reduce the spatial dependence in expenditures between neighbors. Between 1996 and 2006, the state witnessed 40 plus referenda including state and local government referenda. The spatial dependence among municipal actors decreased between the two years by a maximum of 8 points and a minimum of 4 points. The yardstick competition model would predict that with increased information availability the spatial dependence in expenditures would show an increase and not a decrease. In the analysis, the results show a decrease in spatial dependence of expenditures with sustained information availability. The results point to the limitation of yardstick competition model to explain local government behavior. The decrease in spatial dependence is explained as a result of increased independent decision making by neighboring local governments (Birkelöf, 2009).

The regional and metropolitan level inquiries were weakly supportive of the role of referendum in altering fiscal choices of local governments. The present analysis is best viewed as exploratory. It requires replication in other states to form conclusions about the effect of referenda on municipal spending.

In the analysis, I have discovered that county land preservation programs play an important role in explaining the fiscal interactions of municipal actors. The county expenditures may not directly affect municipal spending because both county and municipal governments have a different orientation towards land preservation. County actors are more inclined towards preservation while municipal actors are more interested in creating recreational green space. Yet, the presence and absence of county preservation programs makes a difference in how a municipal actor associates with their neighbors.

The role of county governments in providing institutional support, leadership and technical support was highlighted through the case study. In the study of collaboration on green open space policy area Smith (2009) demonstrated that if the county has a dedicated department to green open space, it promotes collaboration with other governments. The importance of county leadership and county programs cannot be overemphasized in commenting on the local government initiatives like referenda to protect green open space.

Parks and recreation is one functional area which has low salience to voters when compared to public safety or public health expenditures. It would be important to acknowledge the tendency among municipal actors to be affected by the actions of other horizontal and vertical level government actors among different functional areas. I propose that the field of public administration and public finance would benefit from further inquiry into the spatial dependence of municipal actors in different expenditure categories. Such knowledge will be helpful in explaining regional patterns of expenditures.

The second area of inquiry that I have identified is the response of spatial dependence to external shocks. From the research in this chapter I know that spatial dependence is a dynamic concept. It reacts and responds to changes in the general economic environment. In the literature

review for this chapter Birkelöf (2009) was the only study that addressed the issue of how municipal fiscal spatial dependence responds to grants. I have added to this literature by studying how municipalities respond to public referendum and how that affects the spatial dependence of expenditures. More inquiry in this area will increase knowledge about the sensitivity of municipal actors to external and internal economic shocks.



## **CONCLUSION**

This dissertation has adopted a new approach in examining the research questions on green open space referenda. The dissertation considers green open space referenda not only as policy tools but also as information and fiscal instruments. This is a departure from earlier literature that is focused on the event of referendum occurrence but does not provide insight into policy and expenditures effects caused by such referenda. The sustained activity of local governments in creating additional green open space using referenda makes an inquiry into the policy and expenditure consequences relevant to the scholarship in public administration.

The dissertation articulates three questions on the policy and expenditure effects of green open space referenda. The spatial distribution of successful referenda (figure 1, pg.3) serves as a starting point for the first question. The analysis combines theoretical elements from the literature on public policy diffusion to explain the mechanism(s) responsible for clustering of multiple green open space referenda.

The third research question also is motivated by clustering of the referenda (figure 1, pg.3). There is empirical evidence to suspect a strategic expenditure response among neighboring governments, particularly in parks and recreation expenditures (Murdoch *et al*, 1993; Choumert and Cormier, 2011). However this literature has not been applied to the occurrence of green open space referenda. Green open space referenda are specific to the US and provide a unique opportunity to observe interjurisdictional strategic responses to public goods provision through referendum.

The second research question serves as a bridge between the first and the third question. The assumption in literature is that referendum affects own expenditures on green open space

goods. However there is no empirical proof of this assumption. The second research question tests the assumption that expenditures increase after the occurrence of a green open space referendum.

The dissertation adds to the literature on green open space referendum in the US by applying theories of public policy and public finance. It expands the scope of research inquiries into questions of policy and expenditure effects as a result of implementation of referendum objectives.

This chapter summarizes the conclusions gathered from the analyses. The findings are evaluated and the chapter concludes with future directions for research.

### **6.1 Expenditure Effects of Green Open Space Referendum**

The inquiry on expenditure effects was divided into examining the effects of green open space referendum on own expenditures and neighbors' expenditures. The proposed hypothesis for own expenditures is that expenditures increase after the referendum. The analysis shows support for this hypothesis in the data. Post referendum expenditures increase in the data, although the range of increase per capita varied among the states (\$2 to \$140 per capita).

The analysis shows that the method of referendum finance affects the expenditures trend over time. Referendum cities using general obligation bonds show a marked increase in the level of expenditures. Referendum cities supported by bonds show a positive slope of average expenditures till eight years after the referendum. Referendum cities using property taxes show a lagged increase in expenditures. For these cities the average per capita expenditure reflects an increase in the level and slope after a period of three years post referendum.

The conclusion that expenditures increase is important for advocacy organizations and other government institutions that promote the use of green open space referendum. The study is

the first to provide empirical evidence that there is a difference in per capita expenditures between referendum and non-referendum cities with a similar socio-economic profile. This finding is important because earlier studies have shown an association between median voter demand factors and the successful occurrence of green open space referendum (Nelson *et al*, 2007). Median voter demand factors are approximated by socio-economic factors like age, income and education levels. Following the rationale one might expect that a non-referendum city with similar socio-economic profile will have comparable per capita expenditures on green open space. Instead this study finds that the non-referendum cities of similar socio-economic profile have significantly lower expenditures and a negative slope of expenditures over time. The occurrence of green open space referendum makes a positive difference to the per capita expenditures, given similar demand factors.

A secondary finding in the analysis is that the use of bonds and property tax to support green open space referendum results in different outcomes compared to other tools. They yield a more stable and predictable trajectory of expenditures. This finding is relevant for advocacy organizations, policy entrepreneurs and bureaucrats who are considering financing tools for a green open space referendum. The use of bonds is not only politically favorable (Kelly and Zieper, 2001) but it also results in a more visible sustained investment in green open space over time.

The second question in the dissertation on the effect of referendum on expenditures, concerned neighbors' expenditures on green open space. Neighbors' strategic reaction to expenditures on public goods is well documented in literature. The novel approach taken by this analysis is that it views green open space referenda as a stimulus that readjusts the strategic expenditures dynamic among neighbors. The analysis proceeds with a two tailed alternative

hypothesis. Yardstick theory predicts a complementary response from neighboring governments, whereas the public choice theory predicts that neighbors will free ride on the benefit spillovers created after the green open space referendum.

The statewide analysis of Florida local governments yields results consistent with yardstick theory. Following a green open space referendum, neighbors' within a 10 mile radius increase their per capita expenditures on green space goods. The increase in expenditures following a green space referendum is associated with an increase in neighbors spending. This is a significant finding of the study. The empirical evidence promotes a policy role for green open space referendum. Following the empirical evidence, it is possible to increase regional expenditures on green open space goods by the introduction of a green open space referendum within a specific radius in the region.

However over time, with an increase in the number of referenda (availability of information) the magnitude of spatial dependence coefficient declined in the study area. This change is explained by the tendency of local governments to get more autonomous in their decision making in the presence of information availability (Birkelöf, 2009). The findings from case study (chapter three) show that decision making in local governments is contingent on their local political environment. Therefore, the neighboring governments may not always react in away predicted by theory (yardstick model). The case study interviews revealed that in a fragmented urban space where local governments are in competition with each other, with the continued availability of information, governments try to choose a course of action that will be politically viable while maintain their identity in the regional space. As a result their reaction to repeated information and expenditure increases cannot be predicted by the yardstick theory alone.

The analysis showed that county variables interact with the spatial dependence of expenditures among municipal actors. In Florida the presence of county expenditures, conservation programs and prior county referenda explained the observed changes in neighbors' reaction over time. This is an important finding that confirms the conclusions of Revelli (2005) and Wu and Hendrick (2009) that both the horizontal and vertical fiscal interactions are important, when examining spatial dependence among municipal governments.

An important data limitation of the analysis requires acknowledgement. Data pertaining to existing green space like existing parks, greenways and trails is a key variable missing from the analysis. Existing green open space would be an important predictor of the expenditures on green open space and the demand for green open space and the green open space referenda. However this data is not available at the municipal level for any state in the US.

The lack of existing green open space data in the analysis results in biased coefficient estimates. The understanding of neighbors response to referenda and increase in expenditures is limited due to the lack of information on pre existing green open space within neighbors boundaries.

The dissertation has demonstrated that green open space referendum affect own expenditures on green open space. It has also shown that that referendum may serve as an information shock (Birkelöf, 2009) and readjust the expenditures dynamic among local governments in a region. More research on the role of referendum will be helpful in casting green open space referendum as stimulus to influence regional expenditures on green open space.

## **6.2 Regional Spread of Green Open Space Referenda**

Motivated by the observed spatial clustering of green open space referendum, the qualitative analysis provided useful insights. An important finding is that the process of green

open space referendum diffusion in a region is nonlinear and not explained by policy diffusion mechanisms alone. The explanation includes a mixed bag of factors. These include the four diffusion mechanisms derived from theory. The analysis discovered that county governments, policy networks, elected officials and the local context play an important role.

The theoretical expectation in the analysis was that the diffusion mechanism of economic competition will motivate the governments to adopt a green open space referendum. The analysis conducted in the two metropolitan areas of North Carolina demonstrated that policy learning and incentives in the form of matching grants and technical support were the most compelling policy diffusion mechanisms. Economic competition was not the motivation for adoption of green open space initiatives in any local government. The empirical evidence on green open space and increase in property values and the quality of life is not sufficient to motivate elected officials to behave proactively in creating green open space.

A number of actors served as policy entrepreneurs in the area. Interestingly actors within the government were more entrepreneurial than citizen organizations.

Through the analysis county leadership surfaced as an important determinant of municipal green open space policy and outcomes. County leadership and the capacity to form internal policy networks promotes the creation of linked green open space among municipal actors. The analysis revealed that county governments engaged municipal actors in a green open space policy dialogue and in the decision to pursue a green open space referendum. They provided leadership through county referenda, designed a set of fiscal incentives, and created a shared interlinked green space vision for its municipal actors. This finding is important for actors working towards creating holistic co-operative green open space policy and implementation

programs. Advocacy associations should encourage counties to become more involved in green open space efforts.

The case study shows that elected officials view green open space policy as an issue area where their administration can make a lasting and visible difference. Such concerns about administrative legacy can be effectively channeled by bureaucrats and advocacy organizations when lobbying for a green space policy or a referendum.

### **6.3 Policy and Theory Applications**

The results from the analysis translate into specific applications for public administration practitioners. Some applications for theory development can be derived from the results. The most relevant finding for practitioners such as local government bureaucrats, metropolitan planning organizations and national advocacy organizations is the role of county governments in setting up the basic framework of green open space policy in a region. The empirical analysis has shown that county programs significantly affect expenditure interactions among municipal actors. Further evidence on the importance of county initiatives was visible in the referenda occurrence within the case study. Both qualitative and quantitative findings form the basis for an increased involvement of county governments in the design and initiative of a green open space regional policy.

State and regional governments could consider empowering the county governments to serve as facilitators of political, institutional and technical leadership to their municipal governments. They serve as important organizational bodies to envision and implement an interconnected green space policy for the governments in the county. County referenda could serve as good tools for policy sensitization and initiating a regional agenda on green open space.

Select findings from the study are useful for practitioners who are involved in green open space referenda planning. These include NGOs that are targeting a particular city for green open space referendum. The study has also shown that irrespective of socio-economic similarities, referendum governments prioritize expenditures on green open space. This empirical finding can be used to advocate for a referendum.

Centrality of a target referendum city may be an important consideration for those who want to influence the regional spending through referenda. The results have shown that more neighbors around the referenda city will result in more information and expenditure spillover effects.

The results have also demonstrated that use of bond and property taxes is not only politically more feasible but empirically they are better than income and sales taxes. The study provides empirical proof that bonds and property tax provide a steady supply of funding than sales and income taxes. This information is helpful while deciding on the specifics of a green open space referendum proposal. The study has shown that incentives are effective. The political will is readily granted when financial help is given. The result is relevant in lobbying for more federal, state and foundation grants into green open space efforts.

The dissertation uses many theoretical frameworks to examine the policy and expenditure effects resulting from the occurrence of green open space referenda. Spatial proximity of green open space referenda prompted the query into the diffusion of policies. Interjurisdictional economic competition was investigated as one of the mechanisms responsible for the occurrence of referenda. The empirical analyses presented in the dissertation extend the theme of interjurisdictional interactions into explaining the expenditures observed in referendum cities and its neighboring governments. Specifically, the empirical analyses considered the theories of



benefit spillovers and yardstick competition model to formulate hypotheses about expenditures after the referendum. Analysis of post referendum expenditures show support for the creation of benefit spillovers resulting from the additional provision of green open space. Upon analyzing the behavior of neighboring governments to the repeated occurrence of referenda, no evidence of free riding behavior was detected. The other theory, the yardstick competition model, was inadequate in explaining the behavior of neighbors over a period of time in the context of sustained information exposure through the green open space referenda.

The empirical results have provided evidence for more research on the theories that predict local government expenditure allocation and expenditure dependence. The two empirical questions have resulted in applications for theory development for own expenditures and neighbors expenditures. Chapter four, which examined the effect of referendum on own expenditures, demonstrated that there is a need for research on how direct democracy initiatives like referendum affect local government allocation decisions. The analysis in chapter five pointed to the limitation of yardstick theory in explaining the behavior of neighboring local governments. The results demonstrate the need for theory development on how external shocks like grants and referendum affect the spatial dependence in fiscal policy among neighboring governments. Exposure to information generating mechanism like referendum has the potential to set up a yardstick like mechanism, which will result in an increase in the regional expenditures on a particular public good. More research on this hypothesis is required to profile how local governments respond to frequent information shocks.

## **6.4 Directions for Future Research**

In this section I propose a set of research inquiries that will add to the literature on green open space referenda.

### **6.4.1 County Green Space Referenda**

The dissertation has exclusively focused on municipal actors. Landvote database shows that county governments are equally active in preserving land through green open space referenda. There is limited research on the predictors of county green open space referendum success. Further, there is no evidence regarding other fiscal and policy effects generated through a county green open space referendum. Some of the questions that can be answered by empirical inquiry include: what are the expenditure differences among counties that have experienced green open space referenda and those that have not? Does state policy on green open space have a bearing on the frequency of county referenda? What is the effect of a county green open space referendum on its neighboring counties? Are municipal expenditures of counties with referendum different from those without a referendum? Is there a spatial correlation in the past referenda adoptions within a metropolitan area? Does county green open space policy affect the number of municipal green open space referendum?

These are some of the questions that can be examined to expand the literature on green open space referendum from municipal actors to county actors.

### **6.4.2 Distribution of Green Open Space**

Environmental resources like air and water are amenable to standard setting which allows for an advantageous resource management framework. Land, unlike the above resources is not subject to standard setting. The clustering of referenda in a regional space indicates that the public distribution of green space is not uniform in that region (Wu and Plantinga, 2003). Like

any other public good, equitable distribution of green space is warranted because it provides more opportunities to remain healthy by ensuring easy access to spaces of active recreation. The National Recreation and Park Association (NRPA), a national non profit agency has prescribed a level of service guideline for green open space. This guideline was prepared in 1997 and has not been updated. Secondly the methodology has not been researched or endorsed by either the federal or any state government. More research is required to fill in the gap of a universally acceptable standard (federal or state) for green open space.

#### **6.4.3 Effects of a Failed Referendum**

There is a literature on the predictors of successful green open space referendum. This study also considers the effects of successful referenda. However, a failed referendum has the potential to create information externalities similar to a successful referendum. The information externalities could potentially empower a yardstick like comparison among neighboring governments. Alternatively, a failed referendum might result in a review and change of expenditures allocated to green open space by the communities. The literature is silent on the topic of failed referendum. Some of the questions that can be answered include: Do own expenditures on green open space change after the occurrence of a failed referendum? How many governments with failed referenda attempt to bring another green open space referendum to the ballot box? What kind of changes made to a previously failed referendum proposal result in a success?

The dissertation has discussed three questions related to green open space referenda and presented some initial findings.

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## **APPENDICES**

## APPENDIX A

### A3.1 Interview Guide

#### Interview Guide

##### Agenda Setting

1. How did the issue of conserving green space first get discussed in the city and why?
2. Why did the city consider green space conservation instead of using land for development?
3. Did the city evaluate the need for additional green space?  
[Aid to recall:]
  - Government report on open space needs assessments
  - Open space white papers published by non profit/government agencies
  - Green space plans
  - Research reports from Metropolitan Planning Organization
  - Discussions with other officials in the area about what they are doing on this issue?
  - A benefit cost analysis comparing all available financial tools for conserving open space?
  - Others
4. Did the city consider how a green space policy would affect its competitiveness-for business and/or residents?
5. How did the option of conserving green space through referendum come about? [Aid to recall]
  - Information from nearby cities on green space referendum
  - Approached by non profit group or consultants
  - Others
6. Was there any incentive offered by the county, state or federal government for green space conservation?

##### Policy Process

7. Was there opposition to the referendum proposal? If so, what was the rationale?  
[Aid to recall:]
  - Opposing campaigns  
Was opposition expressed through -
  - Newspaper reports
  - Policy briefs or white papers published by other agencies
  - Public discussion forums
  - City council meetings
  - Blogs, websites etc.
8. Who were the main actors in the referendum campaigning process (for and against)?  
[Aid to recall:]
  - Newspaper and media reports
  - Campaign literature and other promotional items
  - Public opinion reports
  - Others?

## Appendix A continued

9. How was the campaign for referendum funded? And how much did it cost?

### **Policy Outcome**

10. Does the city plan on future referenda for land conservation?

11. Has conservation of land through referendum influenced city's competitiveness in the region?

12. Something that you would like to add. Any other observations or comments which recreate the policy making and decision process in the city at that time?

## A3.2 Subject Information Sheet

### **University of Illinois at Chicago**

#### **Subject Information Sheet**

**Title: Interjurisdictional Competition, Information and Provision of public goods: The case of public urban green space.**

You are being asked to participate in a research study. Researchers are required to provide a consent form such as this one to tell you about the research, to explain that taking part is voluntary, to describe the risks and benefits of participation, and to help you to make an informed decision. You should feel free to ask the researchers any questions you may have.

Principal Investigator Name and Title: Kamna Lal, PhD candidate

Department and Institution: Department of Public Administration

Address and Contact Information: 411 Plank Bridge Way Morrisville, NC 27560

Phone: 919-461-0689; email: klal2@uic.edu

### **Why am I being asked?**

You are being asked to be a subject in a research study about the use of public referendum to conserve additional green space in a municipality. The study will explore why local jurisdictions are motivated to conserve green spaces through referendum.

You have been asked to participate in the research because you may be eligible to participate in this study by the virtue of your association with the government agency involved in the process of planning and financing urban green spaces through referendum in your municipality.

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future dealings with the University of Illinois at Chicago. **If you decide to participate, you are free to withdraw at any time without affecting that relationship.**

Approximately 25 subjects may be involved in this research.

### **What is the purpose of this research?**

Researcher is trying to learn more about the processes involved in the decision of a local government to conserve additional green space. Particularly the research is interested in exploring the rationale for conservation of additional

## Appendix A continued

green space **through referendum**. In this context, influence of other neighboring governments, knowledge of neighboring jurisdiction's referendum and county government's decisions regarding green space are being explored.

### **What procedures are involved?**

If you consent to participate in this research, you will be asked questions related to the green space conservation policy of your city. A total of 12 questions will be asked which would cover your role in green space policy of the city, the process of referendum for green space where applicable, and your view about the benefits that green space conservation has yielded to the city or not. The researcher may aid recollection of past events via newspaper reports, government documents and white papers etc.

The researcher would like to use the tape recorder for the session. If you are not comfortable with the recording of the session, you may refuse to be recorded, and the researcher will take notes instead.

### **What are the potential risks and discomforts?**

The usual risk presented in this research is a breach of confidentiality (i.e. information given by you could be accidentally disclosed); otherwise risks are similar to those presented in everyday life.

### **Are there benefits to taking part in the research?**

Taking part in this research will not benefit you personally.

### **What other options are there?**

You have the option to not participate in this study.

### **What about privacy and confidentiality?**

The person who will know that you are a research subject is the principal researcher. Otherwise information about you will only be disclosed to others with your written permission, or if necessary to protect your rights or welfare or if required by law

### **Can I withdraw or be removed from the study?**

If you decide to participate, you are free to withdraw consent and discontinue participation at any time without any penalty.

### **Who should I contact if I have questions?**

If you have any questions about this study or your part in it and if you have any questions concerns or complaints about the research contact the researchers a) Kamna Lal at 919-461-0689 or email address:klal2@uic.edu and b) Prof. David Merriman at 312- 413-2368 or email address: dmerrim@uic.edu

### **What are my rights as a research subject?**

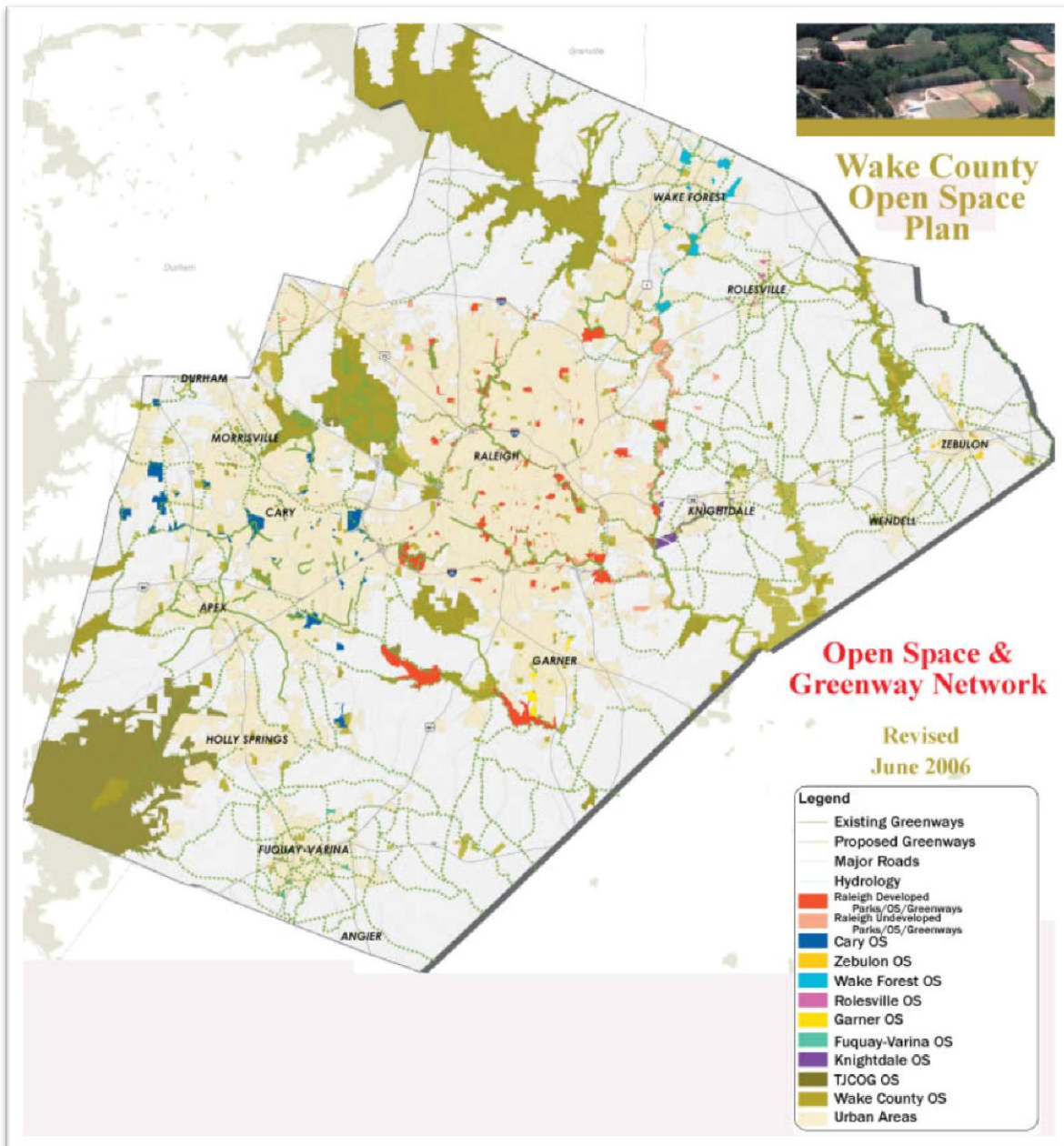
If you feel you have not been treated according to the descriptions in this form, or if you have any questions about your rights as a research subject, including questions, concerns, complaints, or to offer input, you may call the Office for the Protection of Research Subjects (OPRS) at 312-996-1711 or 1-866-789-6215 (toll-free) or e-mail OPRS at uicirb@uic.edu.

## Appendix A continued

**Remember:**

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

## A3.3 Wake County Consolidated Green Open Space Plan Map





## Appendix A continued

## A3.4 Frequently Asked Questions

**PARKS, RECREATION, AND CULTURAL RESOURCES  
BOND REFERENDUM QUESTIONS AND ANSWERS  
November 2, 2004**

**DEMOGRAPHICS AND STATISTICS**

**Q:** What is the current population of the Town of Apex?

**A:** As part of the 2003 Year End Report issued by the Planning Department, the population of Apex was estimated at 28,139 (a 39.2% increase since the 2000 Census). This reflects a 4.5% increase for 2003.

**Q:** What are the current demographics of the Town?

**A:** According to information supplied by the 2000 Census, the median age in Apex is 33.3 years; the median income is \$53,382, and the average household income is \$65, 917. Apex is a very young and vibrant community. An astounding 26.0% of those living in Apex are under age 15, 50% are between 15 and 44, 18.6% are ages 45-64, and 5.4% are over age 65.

**Q:** What is the estimated participation in programs sponsored and co-sponsored by the Town over the past 3 years covering periods from July 1 through June 30<sup>th</sup>?

**A:**

<u>Year</u>	<u>Programs Offered</u>	<u>Estimated Participation</u>
2003-2004	700	83,000
2002-2003	483	65,000
2001-2002	148	61,424

**Q:** How does participation by residents compare with the participation by non-residents?

**A:** Participation in Town sponsored programs continues to accelerate and the department now estimates that on the average, approximately 80% of those participating in organized programs reside within the corporate limits. Residents enjoy designated registration periods and receive priority on waiting lists. In addition, non-residents continue to pay an additional “non-resident” fee for all programs.

**POTENTIAL PARK BOND PROJECTS**

**Q:** What potential projects are included in the park bond?

**A:** There are 6 major potential projects currently identified. They include:

- The completion of the Beaver Creek Greenway, connecting downtown Apex to the American Tobacco Trail
- Completion / retrofitting of Greenways in Haddon Hall and Beckett Crossing
- The construction of a 100+acre Nature Park and Environmental Education area
- The expansion of the current Community Center;
- Funds for land acquisition for a future athletic complex
- Funds to help complete the renovation of the Town’s original Town Hall into a Cultural and Performing Arts Center.

## Appendix A continued

**Q:** How was the inclusion of these projects determined?

**A:** The Park components / priorities were determined by the current Parks, Recreation, Greenways, and Open Space Master Plan and by the Town's current plan for Downtown Revitalization.

**Q:** What flexibility does the Town have regarding potential projects once the bond referendum is passed?

**A:** The intent of the bond referendum will be to allow the current and future Town Boards as much flexibility as possible so that they can react to changing needs and priorities. Although the Board currently intends to complete the projects as presented to the public, there will be enough flexibility so that the Board can move projects around and designate other priorities if conditions change and the desires and priorities of the citizenry change.

**Q:** If approved, what is the time frame for beginning and completing the projects?

**A:** The Town is currently in the process of completing design and construction documents for the majority of the park projects and if the bond referendum is approved, construction could start as early as February, 2005. Under the current phasing plans, all of the proposed projects should be completed sometime by 2011.

**Q:** Where may I obtain or view a copy of the Town's adopted Parks, Recreation, Greenway, and Open Space Master Plan?

**A:** A copy of the current Master plan may be purchased at the Parks, Recreation, and Cultural Resources Administrative Offices, 237 N. Salem Street, for \$26.50 per copy.

**Q:** When was the Master Plan adopted?

**A:** The current Master Plan was officially adopted by the Town Board of Commissioners in 2001 after approximately 12 months of discussion and input from the Apex community and the Parks, Recreation, and Cultural Resources Advisory Commission. It was also part of a County wide effort to develop community specific plans that fit together as part of a regional effort, especially regarding greenway and open space connection and preservation.

**Q:** What success has the Town had in implementing past Master Plans?

**A:** The Town was very successful in implementing its initial Master Plan which was adopted in 1995. As part of the 1995 bond referendum, the Town completed each of the priorities including renovation of Jaycee Park, construction of the Apex Community Center, the completion of Apex Community Park, the completion of Kelly Road Park, and miscellaneous renovations to various neighborhood parks and school campuses.

## FINANCES

**Q:** What is the Town's current indebtedness?

**A:** \$9,680,183

**Q:** Is this level of debt considered excessive for a Town our size?

**A:** No, the Town's debt per capita is currently one of the lowest in Wake County.

**Q:** What potential projects were listed in the projected 5-year Capital needs for the Town of Apex presented to the Town Board of Commissioners at their Annual Planning Retreats in 2003 and 2004?

**A:** The Parks, Recreation, Greenways and Open Space Master Plan, the Parks Recreation, and Cultural Resources Advisory Commission and Town Board of Commissioners identified the following as priorities and potential bond projects in 2003 and 2004: The completion of the Beaver Creek , Beckett Crossing, and Haddon Hall Greenways; the construction of a Nature Park; the identification / acquisition of land for future park development; the expansion of the Apex Community Center to include an additional gymnasium, administrative and administrative offices; and the renovation of the original Town Hall into a Cultural Arts and Performing Center.

**Q:** If approved, what effect would the proposed park bond referendum have on my property taxes?

**A:** The Town's Finance Department does not anticipate a property tax increase will be needed as a result of the bond referendum. From a historical perspective, no tax increase

## Appendix A continued

resulted as a result of the Town's last park bond referendum in 1996.

**Q:** What revenue assumptions were made by the Town Board with regards to the effect on my taxes?

**A:** A minimum 4.5% annual average growth in revenue

**Q:** What is the term of the payback for the proposed park bonds?

**A:** 20 years

**Q:** What type of public input was used to arrive at the proposed priorities for the proposed park bond?

**A:** Public input occurred over a 12 month period as the Town developed its current Parks, Recreation, Greenways, and Open Space Master Plan, which was adopted in 2001. There were 4 specific public meetings for input and 6-8 meetings with the Parks, Recreation, and Cultural Resources Advisory Commission. In addition, periodic updates were made the Town Board of Commissioners as part of their regular monthly meetings, which were open to the public.

**Q:** If approved, how will the bonds be issued?

**A:** There will be three bond sales. Approximately 7.5 million will be sold in 2005, 2008, and 2010. Potential park projects will encompass approximately 13 million. The remaining balances each year will be for transportation improvement projects.

**Q:** If approved, how will the issuance of approximately \$22.5 million in park and transportation bonds affect the Town's ability to pay for future capital improvements and projects?

**A:** The Town's ability to pay for future projects and needs will be impacted by the issuance of this amount of debt and the obligation to pay back the bonds, but this issuance will also allow the Town to finance and complete most of the anticipated major projects in a more timely fashion.

**Q:** How has the Town financed Capital Park projects in the past and what other mechanisms are available for funding if the proposed park bond is rejected?

**A:** In addition to bond funding, in the past the Town has used a combination of lease purchase, general fund tax revenue, and development fees to finance park projects. If the referendum fails, the Town will consider using funding sources other than bonds but the projects will be broken into smaller phases. Past experience suggests that the projects will cost more due to inflation and will take significantly more time to complete.



[www.Apexnc.org](http://www.Apexnc.org)

**APPENDIX B**

Table A4.1 Descriptive Statistics for Expenditure Data from Six Sample States

Florida					
	Average	N	min	max	sd
1996	64.3	315	0.1	636.5	67.3
1997	70.5	314	0.0	657.4	78.4
1998	66.7	324	0.2	483.2	59.0
1999	76.7	334	0.3	964.7	79.4
2000	85.5	338	0.1	1044.5	93.4
2001	84.4	338	0.1	656.6	85.0
2002	87.4	345	0.6	732.1	84.7
2003	90.0	347	0.0	692.2	89.9
2004	90.9	344	0.0	943.4	102.5
2005	90.4	341	0.3	887.1	92.3
2006	97.6	341	0.2	728.5	96.5
North Carolina					
	mean	N	min	max	Sd
1996	39.8	49	0.7	252.1	48.1
1997	41.7	160	-0.5	387.0	50.6
1998	48.3	165	0.1	388.0	57.5
1999	52.1	168	0.0	412.7	63.2
2000	52.7	166	0.0	371.7	63.4
2001	62.7	178	0.0	470.7	81.0
2002	60.4	173	0.0	728.0	96.8
2003	58.4	174	0.2	554.0	84.9
2004	61.9	175	0.2	545.3	87.0
2005	64.0	171	0.2	665.4	88.1
2006	1247.0	169	0.0	32539.4	4577.2
Colorado					
	mean	N	min	max	Sd
1996	221.8	47.0	7.7	1998.8	330.3
1997	246.1	48.0	2.2	2429.5	395.0
1998	242.3	49.0	1.0	2595.1	408.6
1999	288.5	50.0	0.4	2804.9	441.2
2000	200.1	50.0	1.0	1806.9	303.4
2001	199.7	52.0	1.6	1407.7	272.0
2002	214.4	52.0	1.9	1481.0	280.1
2003	217.4	52.0	3.4	1644.0	309.1
2004	221.3	52.0	1.5	1736.5	314.9
2005	217.8	51.0	3.8	1530.4	300.1
2006	231.6	50.0	1.3	1559.5	317.3
Pennsylvania					
	mean	N	min	max	Sd
1996	10.9	1795	0.0	480.4	25.8

1997	12.4	1820	0.0	556.2	26.5
1998	13.9	1841	0.0	823.7	34.8
1999	14.5	1861	0.0	829.7	34.7
2000	15.1	1843	-14.2	413.8	30.8
2001	13.9	1857	0.0	394.7	27.5
2002	14.9	1872	-0.3	394.0	28.5
2003	15.9	1897	0.0	1987.6	54.1
2004	16.2	1885	0.0	801.5	39.4
2005	17.9	1902	0.0	2612.0	71.1
2006	18.8	1906	0.0	5813.2	136.0
Washington					
	mean	N	min	max	Sd
1996	39.7	237	0.0	442.3	44.7
1997	41.9	242	0.0	440.1	43.9
1998	43.6	240	0.2	452.6	47.2
1999	44.0	240	0.1	473.1	47.7
2000	40.2	238	0.0	468.0	48.3
2001	42.1	237	0.2	453.2	47.9
2002	42.2	236	0.3	423.9	47.3
2003	40.3	239	0.0	423.7	42.7
2004	40.3	245	0.0	408.1	43.3
2005	42.6	241	0.4	402.2	49.8
2006	42.2	241	0.1	411.6	44.5
California					
1996	mean	N	min	max	Sd
1997	57.0	434	0.0	551.0	56.1
1998	59.5	439	0.0	628.0	65.3
1999	59.1	434	0.0	666.0	63.6
2000	64.8	437	0.0	772.0	75.0
2001	66.3	434	0.0	801.0	80.0
2002	70.0	444	0.0	966.0	82.6
2003	73.0	442	0.0	604.0	73.9
2004	81.4	437	0.0	758.0	84.8
2005	79.7	443	1.0	703.0	84.8
2006	84.1	444	0.3	784.5	91.5

## Appendix B continued

Table A4.1.1 Logistic Regression to Predict Probability of Referendum Occurrence

	Florida	North Carolina	Pennsylvania	Colorado	Washington	California
PCI		-0.00	0.00**		-0.00**	-0.00*
per65	-0.02	-0.15***	-0.18**	-0.13***	0.11*	0.00
MHI	-0.00*					
Bach	0.17***	0.08***	0.03**	0.06***	0.23**	0.19***
Landsqml		0.01**		0.03	0.07**	0.01*
Occho	-0.20		0.03**	0.01		-0.06**
Lat	0.13					
Lon	0.89**					
Coastal	0.82					
Wtml	0.02***					0.02**
Constant	66.65**	-2.92**	-4.74***	-3.35***	-8.32***	-2.39**
N	364	245	2480	269	279	474
Wald chi	37.77***	48.03***	154.7***	51.10***	24.04**	32.48**
Probability of Hosmer-Lemenshow	0.9	0.9	0.4	0.5	0.9	0.8

Table A4.2.1 Table collapsed on quantiles of estimated probabilities: Florida

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0000	0	0.0	37	37.0	37
2	0.0000	0	0.0	36	36.0	36
3	0.0003	0	0.0	37	37.0	37
4	0.0019	0	0.0	36	36.0	36
5	0.0058	0	0.1	36	35.9	36
6	0.0175	0	0.4	37	36.6	37
7	0.0320	1	0.9	35	35.1	36
8	0.0752	1	1.9	36	35.1	37
9	0.1543	6	4.2	30	31.8	36
10	1.0000	10	10.5	26	25.5	36

Table A4.2.2 Table collapsed on quantiles of estimated probabilities: North Carolina

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0030	0	0.1	25	24.9	25
2	0.0045	0	0.1	24	23.9	24
3	0.0065	0	0.1	25	24.9	25
4	0.0083	0	0.2	24	23.8	24
5	0.0116	0	0.2	25	24.8	25
6	0.0166	1	0.3	23	23.7	24
7	0.0290	0	0.6	25	24.4	25
8	0.0554	1	1.0	23	23.0	24
9	0.1847	3	2.6	22	22.4	25
10	0.8906	11	10.8	13	13.2	24

## Appendix B continued

Table A4.2.3 Table collapsed on quantiles of estimated probabilities: Pennsylvania

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0023	0	0.4	248	247.6	248
2	0.0038	0	0.8	248	247.2	248
3	0.0052	1	1.1	247	246.9	248
4	0.0069	1	1.5	247	246.5	248
5	0.0089	0	1.9	248	246.1	248
6	0.0119	1	2.6	247	245.4	248
7	0.0166	1	3.5	247	244.5	248
8	0.0250	8	5.0	240	243.0	248
9	0.0490	8	8.5	240	239.5	248
10	0.8391	47	41.7	201	206.3	248

Table A4.2.4 Table collapsed on quantiles of estimated probabilities: Colorado

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0042	0	0.1	27	26.9	27
2	0.0086	0	0.2	27	26.8	27
3	0.0127	0	0.3	27	26.7	27
4	0.0167	0	0.4	27	26.6	27
5	0.0272	0	0.6	27	26.4	27
6	0.0480	0	1.0	27	26.0	27
7	0.0850	2	1.7	25	25.3	27
8	0.1740	7	3.5	20	23.5	27
9	0.3817	6	6.9	21	20.1	27
10	0.9893	15	15.4	11	10.6	26

Table A4.2.5 Table collapsed on quantiles of estimated probabilities: Washington

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0009	0	0.0	28	28.0	28
2	0.0014	0	0.0	28	28.0	28
3	0.0025	0	0.1	28	27.9	28
4	0.0037	0	0.1	28	27.9	28
5	0.0058	0	0.1	28	27.9	28
6	0.0097	0	0.2	28	27.8	28
7	0.0143	1	0.3	27	27.7	28
8	0.0300	0	0.5	28	27.5	28
9	0.0705	1	1.3	28	26.7	28
10	0.9697	7	6.2	20	20.8	27

Table A4.2.6 Table collapsed on quantiles of estimated probabilities: California

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0019	0	0.1	48	47.9	48
2	0.0029	0	0.1	47	46.9	47
3	0.0040	0	0.2	48	47.8	48
4	0.0060	1	0.2	46	46.8	47
5	0.0085	0	0.3	47	46.7	47
6	0.0124	1	0.5	47	47.5	48
7	0.0176	0	0.7	47	46.3	47
8	0.0245	1	1.0	47	47.0	48
9	0.0557	2	1.8	45	45.2	47
10	0.9576	8	8.1	39	38.9	47

## Appendix B continued

Table A4.3: Descriptive Statistics of Annual Change in Expenditures- Referendum Group

States	City_years	Mean Expenditure Change	Median Expenditure Change	Maximum	Minimum	Std. deviation
Florida	190	0.04	0.02	0.73	-0.79	0.29
North Carolina	135	0.07	0.05	0.95	-0.78	0.36
Pennsylvania	579	0.17	0.16	0.99	-0.79	0.36
Colorado	213	0.02	0.03	0.89	-0.74	0.23
Washington	103	0.05	0.04	0.79	-0.41	0.17
California	87	0.02	0.00	0.87	-0.73	0.30

Table A4.4: Descriptive Statistics of Annual Change in Expenditures-Control Group

States	City_years	Mean Percent Expenditure Change	Median Expenditure Change	Maximum	Minimum	Std. deviation
Florida	174	0.01	0.03	0.83	-0.76	0.27
North Carolina	80	0.08	0.02	0.99	-0.78	0.41
Pennsylvania	570	0.14	0.10	0.99	-0.79	0.40
Colorado	142	0.08	0.05	0.93	-0.72	0.30
Washington	100	0.05	0.01	0.97	-0.42	0.22
California	137	0.07	0.05	0.89	-0.79	0.30

Table A4.5: Change in Expenditures for Referendum Group before and after the referendum

States	Mean Change in Per Capita Expenditures before Referendum	Median Change in Per Capita Expenditures before Referendum	Mean Change in Per Capita Expenditures after Referendum	Median Percent Change in Per Capita Expenditures after Referendum
Florida	0.06	0.04	0.04	0.02
North Carolina	0.01	0.03	0.12	0.10
Pennsylvania	0.20	0.17	0.15	0.12
Colorado	0.03	0.06	0.01	0.01
Washington	0.06	0.05	0.04	0.02
California	-0.03	0.02	0.03	0.09

Table A4.6: Difference in Change in Expenditures for Control and Referendum Group before Referenda

States	$\beta$	p-value	R <sup>2</sup>	City_Years
Florida	0.06	0.25	0.01	105
North Carolina	-0.13	0.18	0.02	61
Pennsylvania	0.05	0.15	0.00	516
Colorado	-0.04	0.48	0.00	86
Washington	-0.01	0.76	0.00	81
California	-0.09		0.01	45

Table A4.7: Difference in Change in Expenditures for Control and Referendum Group after Referenda

States	$\beta$	R <sup>2</sup>	City_Years
Florida	0.02	0.00	228



## Appendix B continued

North Carolina	0.07	0.00	138
Pennsylvania	0.01	0.00	544
Colorado	-0.06	0.01	237
Washington	0.01	0.00	105
California	-0.03	0.00	178

Table A4.8: Percent Change in Expenditure for Interaction Variable between Referendum Cities and years after the Referendum.

States	(Event_time) $\beta_1$	p-value	(interaction ref x event_time) $\beta_2$	p-value	R <sup>2</sup>	City_Years
Pooled	-0.00		-0.00			
Florida	-0.00	0.26	-0.00	0.80	0.00	381
North Carolina	-0.00	0.82	0.01	0.24	0.01	215
Pennsylvania	-0.00	0.72	-0.00	0.88	0.00	1144
Colorado	0.00	0.62	-0.01**	0.19	0.01	451
Washington	-0.00	0.38	0.002	0.93	0.00	194
California	-0.00	0.75	-0.02	0.51	0.00	224

## APPENDIX C

Table A5.1: Spatial Dependence of Per Capita Expenditures in 1996 (W1: 10 miles)

	State		Region 1	Region 2	Region 3		Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	Spatial	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.12***				0.59***		
Tax price	0.00	0.00	-0.05	0.00	-0.28**	-0.24**	0.15	0.03
Grants	0.27***	0.27***	0.58***	0.53***	0.17	0.23**	0.26**	0.08
Coastal	0.55***	0.49***	0.77*	1.21**	-0.02	-0.05	-0.12	0.42
Land miles	0.31***	0.31***	0.32*	0.20	0.11	0.12**	0.31**	0.43***
Central city	-0.19	-0.20	0.02	-0.34	-0.60	-0.17	0.18	-0.25
intercept	-0.62		-1.06	0.14	2.38**	0.19	0.50	-0.59
Log likelihood		-688.37				-101.79		
Log likelihood ratio		4.87**				11.15***		
R2	0.17		0.36	0.34	0.13		0.18	0.21
F stat	12.87***		6.55**	6.83***	1.95**		3.52**	5.70***
AIC	1397.63	1394.76	227.08	244.02	226.90	217.59	280.99	385.48
LM lag	4.25**		1.52	0.24	7.38***		0.34	0.17
LM error	1.41		0.87	1.52	0.08		0.60	0.02
Robust LM (lag)	2.86**		0.66	0.18	14.08***		0.04	0.74
Robust LM (error)	0.03		0.01	1.46	6.70***		0.30	0.59
N	400		63	71	73	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.1.1: Spatial Dependence of Per Capita Expenditures in 1996 (W1: 10 miles)

	State		Region 1	Region 2	Region 3		Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	Spatial	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.08**				0.35***		
Per Capita Income	0.09	0.07	0.01	0.20	0.13	0.11	0.20	0.00
Population 65 plus	-0.07	-0.04	-0.00	-0.29	0.08	0.11	-0.26	0.08
Tax price	0.00	0.00	-0.05	0.00	-0.20	-0.18*	0.14	0.04*
Grants	0.27***	0.27***	0.58***	0.51***	0.17	0.20**	0.24**	0.08
Coastal	0.55***	0.49***	0.77	1.22**	-0.14	-0.15	-0.08	0.39
Land miles	0.31***	0.31***	0.32*	0.18	0.23*	0.23**	0.35**	0.43***
Central city	-0.19	-0.20	0.02	-0.44	-0.87	-0.57	0.01	-0.29
intercept	-0.62		-1.18	-0.71	-0.16	-1.2	-0.92	-1.00
Log likelihood		-688.37				-99.70		
Log likelihood ratio		3.99**				8.60***		
R2	0.18		0.36	0.36	0.20		0.21	0.22
F stat	12.87***		4.52**	5.10***	2.40**		2.87**	4.2***
AIC	1397.63	1395.64	231.07	246.09	224.01	217.40	282.38	388.07
LM lag	4.25**		1.73	0.32	7.43***		0.84	0.13
LM error	1.41		0.94	1.92	0.01		2.14	0.22
Robust LM (lag)	2.86**		0.79	0.19	15.05***		0.03	0.36
Robust LM (error)	0.03		0.00	1.79	7.64***		1.33	0.22
N	400		63	71	73	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed.

## Appendix C continued

TableA 5.2: Spatial Dependence of Per Capita Expenditures in 1996 (W: 15 miles)

	All		Region 1	Region 2	Region 3	Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.22**					
Tax price	0.00	0.00	-0.05	0.00	-0.28**	0.15	0.03
Grants	0.28***	0.28***	0.58***	0.53***	0.17	0.26**	0.08
Coastal	0.55***	0.48**	0.77*	1.21**	-0.02	-0.12	0.42
Land miles	0.30***	0.31**	0.32*	0.20	0.11	0.31**	0.43***
Central city	-0.14	-0.22	0.02	-0.34	-0.60	0.18	-0.25
Intercept	0.03	-0.67	-1.06	0.14	2.38**	0.50	-0.59
Log likelihood		-688.51					
Log likelihood ratio		9.60**					
R2	0.17		0.36	0.34	0.13	0.18	0.21
F stat	16.91***		6.55***	6.83***	1.95	3.52**	5.70***
AIC	1398.64	1391.03	227.08	244.02	226.90	280.99	385.48
LM lag	8.34**		0.00	0.04	2.14	0.42	0.05
LM error	13.22**		0.10	1.81	0.00	1.35	0.00
Robust LM (lag)	0.06		0.04	2.23	5.33*	0.01	0.10
Robust LM (error)	4.94**		0.14	4.00*	3.19*	0.94	0.05
N	400	400	63	71	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 15 miles as neighbors. The independent variables per capita grants, and land miles are in log transformed.

## Appendix C continued

Table A5.2.1: Spatial Dependence of Per Capita Expenditures in 1996 (W: 15 miles)

	State		Region 1	Region 2	Region 3		Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS		OLS	OLS
<i>Spatial coefficient (rho)</i>		0.13**						
Per Capita Income	0.09	0.07	0.01	0.20	0.13		0.20	0.00
Population 65 plus	-0.07	-0.04	-0.00	-0.29	0.08		-0.26	0.08
Tax price	0.00	0.00	-0.05	0.00	-0.20		0.14	0.04*
Grants	0.27***	0.27***	0.58***	0.51***	0.17		0.24**	0.08
Coastal	0.55***	0.49***	0.77*	1.22**	-0.14		-0.08	0.39
Land miles	0.31***	0.31***	0.32*	0.18	0.23*		0.35**	0.43***
Central city	-0.19	-0.23	0.02	-0.44	-0.87		0.01	-0.29
Intercept	-0.62	-0.96	-1.18	-0.71	-0.16		-0.92	-1.00
Log likelihood		-688.60						
Log likelihood ratio		6.41**						
R2	0.18		0.36	0.36	0.20		0.21	0.22
F stat	12.87***		4.52**	5.10***	2.40**		2.87**	4.2***
AIC	1397.63	1393.22	231.07	246.09	224.01		282.38	388.07
LM lag	7.17**		0.00	0.04	2.16		0.18	0.01
LM error	12.46**		0.17	1.92	0.03		1.62	0.01
Robust LM (lag)	0.00		0.05	2.27	6.44**		0.21	0.00
Robust LM (error)	5.28**		0.17	4.14	4.31***		1.65	0.00
N	400		63	71	73		83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.3: Spatial Dependence of Per Capita Expenditures in 1996 (W: 20 miles)

	All		Region 1	Region 2	Region 3	Region 4	Region 5
	OLS	Spatial Lag	OLS	OLS	OLS	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.22**					
Tax price	0.00	0.00	-0.05	0.00	-0.28**	0.15	0.03
Grants	0.28***	0.28***	0.58***	0.53***	0.17	0.26**	0.08
Coastal	0.55***	0.48**	0.77*	1.21**	-0.02	-0.12	0.42
Land miles	0.30***	0.30**	0.32*	0.20	0.11	0.31**	0.43***
Central city	-0.14	-0.16	0.02	-0.34	-0.60	0.18	-0.25
Intercept	0.03	-0.63	-1.06	0.14	2.38**	0.50	-0.59
Log likelihood		-690.64					
Log likelihood ratio		5.35**					
R2	0.17		0.36	0.34	0.13	0.18	0.21
F stat	16.91***		6.55***	6.83***	1.95*	3.52**	5.70***
AIC	1398.64		227.08	244.02	226.90	280.99	385.48
LM lag	4.82**		0.00	0.01	0.90	2.20	1.00
LM error	11.12***		0.70	1.10	0.45	0.79	1.81
Robust LM (lag)	0.94		1.07	2.74	1.35	1.48	0.03
Robust LM (error)	7.24**		1.76	3.83**	0.91	0.07	0.84
N	400	400	63	71	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 20 miles as neighbors. The independent variables per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.3.1: Spatial Dependence of Per Capita Expenditures in 1996 (W: 20 miles)

	State		Region 1	Region 2	Region 3		Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	Spatial	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.13*						
Per Capita Income	0.09	0.08	0.01	0.20	0.13		0.20	0.00
Population 65 plus	-0.07	-0.05	-0.00	-0.29	0.08		-0.26	0.08
Tax price	0.00	0.00	-0.05	0.00	-0.20		0.14	0.04*
Grants	0.27***	0.27***	0.58***	0.51***	0.17		0.24**	0.08
Coastal	0.55***	0.49***	0.77*	1.22**	-0.14		-0.08	0.39
Land miles	0.31***	0.31***	0.32*	0.18	0.23*		0.35**	0.43***
Central city	-0.19	-0.23	0.02	-0.44	-0.87		0.01	-0.29
intercept	-0.62	-0.96	-1.18	-0.71	-0.16		-0.92	-1.00
Log likelihood		-688.60						
Log likelihood ratio		3.99**						
R2	0.18		0.36	0.36	0.20		0.21	0.22
F stat	12.87***		4.52**	5.10***	2.40**		2.87**	4.2***
AIC	1397.63	1395.64	231.07	246.09	224.01		282.38	388.07
LM lag	4.81**		1.52	0.01	0.55		1.61	0.88
LM error	11.90**		0.01	0.96	0.03		0.36	1.72
Robust LM (lag)	1.20		1.81	2.44	2.93*		1.45	0.00
Robust LM (error)	8.29**		1.09	3.39*	2.41		0.20	0.89
N	400		63	71	73		83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.4: Spatial Dependence of Per Capita Expenditures in 2006 (W: 10 miles)

	All		Region 1	Region 2	Region 3	Region 4	Region 5	
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS	Spatial
<i>Spatial coefficient (rho)</i>		0.08**						0.16**
Tax price	-0.03*	-0.03*	0.03	-0.01	-1.48*	-0.00	0.00	0.00
Grants	0.08**	0.10**	0.26**	0.18**	0.23**	0.07	0.03	0.02
Coastal	0.58**	0.54**	0.78**	0.83**	-0.35	0.61**	0.28**	0.32**
Land miles	0.22**	0.22***	0.22	0.38**	0.24*	0.41***	0.12**	0.12**
Central city	-0.17	-0.15	0.66	-1.11	-0.31	-0.59*	0.00	-0.05
intercept	3.56***	3.22**	2.34***	2.78***	3.57***	3.50***	4.32***	3.57**
Log likelihood		-595.85						-108.51
Log likelihood ratio		6.03**						5.50**
R2	0.15		0.23	0.21	0.18	0.35	0.13	
F stat	14.33**		3.56**	3.47**	2.96**	8.25**	3.21***	
AIC	1209.75	1205.72	209.66	234.93	233.72	212.87	234.53	231.03
LM lag	5.41*		0.34	0.07	0.07	1.75	4.98**	
LM error	2.12		0.51	0.20	1.41	0.02	0.06	
Robust LM (lag)	3.47*		0.04	0.34	2.01	2.13	5.37	
Robust LM (error)	0.18		0.20	0.47	3.35	0.40	0.45	
N	403	403	63	71	73	82	113	

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variables per capita grants, and land miles are log transformed.



## Appendix C continued

Table A5.4.1: Spatial Dependence of Per Capita Expenditures in 2006 (W: 10 miles)

	All		Region 1	Region 2	Region 3	Region 4	Region 5	
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS	Spatial
<i>Spatial coefficient (rho)</i>		0.08**						0.16**
Per Capita Income								
Age 65 plus								
Tax price	-0.03*	-0.03*	0.03	-0.01	-1.48*	-0.00	0.00	0.00
Grants	0.08**	0.10**	0.26**	0.18**	0.23**	0.07	0.03	0.02
Coastal	0.58**	0.54**	0.78**	0.83**	-0.35	0.61**	0.28**	0.32**
Land miles	0.22**	0.22***	0.22	0.38**	0.24*	0.41***	0.12**	0.12**
Central city	-0.17	-0.15	0.66	-1.11	-0.31	-0.59*	0.00	-0.05
intercept	3.56***	3.22**	2.34***	2.78***	3.57***	3.50***	2.47**	3.57**
Log likelihood		-595.85						-108.51
Log likelihood ratio		6.03**						5.50**
R2	0.15		0.23	0.21	0.18	0.35	0.13	
F stat	14.33**		3.56**	3.47**	2.96**	8.25**	3.21***	
AIC	1209.75	1205.72	209.66	234.93	233.72	212.87	234.53	231.03
LM lag	5.41*		0.34	0.07	0.07	1.75	4.98**	
LM error	2.12		0.51	0.20	1.41	0.02	0.06	
Robust LM (lag)	3.47*		0.04	0.34	2.01	2.13	5.37	
Robust LM (error)	0.18		0.20	0.47	3.35	0.40	0.45	
N	403	403	63	71	73	82	113	

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.5: Spatial Dependence of Per Capita Expenditures in 2006 (W1: 15 miles radius)	All		Region 1	Region 2	Region 3	Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.14***					
Tax price	-0.04**	-0.03**	0.03	-0.01	-1.48*	-0.00	0.00
Grants	0.08**	0.10**	0.26*	0.18**	0.23**	0.07	0.03
Coastal	0.58***	0.53***	0.78***	0.83**	-0.35	0.61**	0.28**
Land miles	0.22***	0.22***	0.22	0.38**	0.24*	0.41***	0.12**
Central city	-0.17	-0.16	0.66	-1.11	-0.31	-0.59*	0.00
intercept	3.56***	2.95***	2.34***	2.78***	3.57***	3.50***	4.32***
Log likelihood		-594.83					
Log likelihood ratio		8.07***					
R2	0.15		0.23	0.21	0.18	0.35	0.13
F stat	14.33***		3.56***	3.47***	2.96*	8.25**	3.21**
AIC	1209.75	1203.67	209.66	234.93	233.72	212.87	234.53
LM lag	7.38**		1.47	0.54	0.49	0.14	0.12
LM error	12.27***		0.03	0.00	0.27	0.10	0.34
Robust LM (lag)	0.67		2.62*	1.20	2.69*	2.53	0.00
Robust LM (error)	5.56**		1.18	0.66	2.46	2.49	0.23
N	403	403	63	71	73	82	113

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 15 miles as neighbors. The independent variables per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.5.1: Spatial Dependence of Per Capita Expenditures in 2006 (W1: 15 miles radius)

	All		1	2	3	4	5
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.09**					
Per Capita Income	0.30**	0.28**	1.72**	0.33	0.57	0.15	0.20*
Age 65 plus	-0.00	-0.00	0.02	-0.00	0.00	-0.01	0.00
Tax price	-0.06**	-0.06***	0.04	-0.05	-1.49*	-0.05	0.00
Grants	0.09**	0.10**	0.26**	0.18**	0.28**	0.13	0.03
Coastal	0.34**	0.32*	0.08**	0.66	-0.57*	0.49**	0.13
Land miles	0.00	0.00	0.21	0.38**	0.01	0.007	0.14**
Central city	0.35*	0.33*	0.43	0.17	-0.32	0.11	0.05
intercept	0.88	0.69	-14.31**	0.14	-2.08	2.75**	2.19*
Log likelihood		-601.59					
Log likelihood ratio		4.68**					
R2	0.13		0.33	0.12	0.19		0.16
F stat	8.68**		4.02**	1.55	2.19**	2.84**	3.03***
AIC	1222.95	1221.35	204.76	244.05	236.87	232.88	233.51
LM lag	5.01**			0.51	0.29	0.00	0.07
LM error	5.41**			0.24	0.12	0.06	0.59
Robust LM (lag)	1.13			0.27	1.55	0.00	0.53
Robust LM (error)	1.53			0.00	1.38	0.06	0.56
N	403	403	63	71	73	82	113

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.6: Spatial Dependence of Per Capita Expenditures in 2006 (W1: 20 miles radius)

	All		Region 1	Region 2	Region 3	Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.18***					
Tax price	-0.03*	-0.03*	0.03	-0.01	-1.48*	-0.00	0.00
Grants	0.08**	0.09**	0.26**	0.18*	0.23**	0.07	0.03
Coastal	0.58***	0.40**	0.78**	0.83**	-0.35	0.61***	0.28**
Land miles	0.22***	0.20***	0.22	0.38**	0.24*	0.41***	0.12**
Central city	-0.17	-0.20	0.66	-1.11	-0.31	-0.59	0.00
intercept	3.56***	2.76***	2.34***	2.78***	3.57***	3.50***	4.32***
Log likelihood		-595.85					
Log likelihood ratio		6.04**					
R2	0.15		0.23	0.21	0.18	0.35	0.13
F stat	14.33***		3.56***	3.47***	2.96**	8.25***	3.21**
AIC	1209.75	1205.7	209.66	234.93	233.72	212.87	234.53
LM lag	7.38**		1.23	0.01	0.84	0.02	0.02
LM error	0.67		1.30	2.32	0.74	0.40	0.12
Robust LM (lag)	12.27**		0.09	2.97*	0.10	0.32	0.14
Robust LM (error)	5.56**		0.16	5.28*	0.00	0.40	0.24
N	403	403	63	71	73	82	113

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 20 miles as neighbors. The independent variable per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.6.1: Spatial Dependence of Per Capita Expenditures in 2006 (W1: 20 miles radius)

All			1	2	3	4	5
OLS		Spatial	OLS	OLS	OLS	OLS	OLS
	<i>Spatial coefficient (rho)</i>	<i>0.09</i>					
0.30**	Per Capita Income	0.29***	1.72**	0.33	0.57	0.15	0.20*
-0.00	Age 65 plus	-0.00	0.02	-0.00	0.00	-0.01	0.00
-0.06**	Tax price	-0.04**	0.04	-0.05	-1.49*	-0.05	0.00
0.09**	Grants	0.10**	0.26**	0.18**	0.28**	0.13	0.03
0.34**	Coastal	0.32**	0.08**	0.66	-0.57*	0.49**	0.13
0.00	Land miles	0.00	0.21	0.38**	0.01	0.007	0.14**
0.35*	Central city	0.33*	0.43	0.17	-0.32	0.11	0.05
0.88	intercept	0.62	-14.31**	0.14	-2.08	2.75**	2.19*
	Log likelihood	-602.17					
	Log likelihood ratio	2.59*					
0.13	R2		0.33	0.12	0.19		0.16
8.68**	F stat		4.02**	1.55	2.19**	2.84**	3.03***
1222.95	AIC	1222.35	204.76	244.05	236.87	232.88	233.51
3.01*	LM lag		0.69	0.18	0.59	0.01	0.05
9.17**	LM error		0.00	0.98	0.61	0.05	0.45
0.36	Robust LM (lag)		1.80	2.98*	0.00	0.09	0.45
6.53*	Robust LM (error)		1.11	3.78*	0.03	0.13	0.84
403	N	403	63	71	73	82	113

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.7: Spatial Dependence of Per Capita Expenditures including County Expenditures in 1996 (W1: 10 miles radius)

	All	Region 1	Region 2	Region 3		Region 4	Region 5
	OLS	OLS	OLS	OLS	Spatial	OLS	OLS
<i>Spatial coefficient (rho)</i>					0.59***		
Tax price	0.00	-0.05	0.00	-0.30**	-0.25**	0.16*	0.03*
Grants	0.29***	0.57***	0.52***	0.17*	0.24**	0.27***	0.09
Coastal	0.38**	0.75*	1.31**	0.01	-0.01	0.11	0.40
Land miles	0.29***	0.32*	0.21	0.11	0.12	0.36**	0.44***
Central city	-0.11	0.04	-0.32	-0.61	-0.16	0.17	-0.23
County	0.19**	0.05	-0.08	-0.09	-0.09	-0.28	0.38
intercept	-0.33	-1.11	0.21	2.74**	0.54	0.71	-2.10
Log likelihood					-101.56		
Log likelihood ratio					11.37***		
R2	0.19	0.36	0.34	0.13		0.20	0.22
F stat	16.13**	5.40***	5.68**	1.67		3.27***	4.88***
AIC	1390.35	228.95	245.68	228.49		281.01	386.60
LM lag	2.10	1.50	0.23	7.45**		0.76	0.13
LM error	0.35	0.91	1.53	0.01		0.64	0.06
Robust LM (lag)	1.94	0.61	0.19	14.14***		0.28	0.75
Robust LM (error)	0.20	0.02	1.49	6.69*		0.16	0.68
N	400	63	71	73	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variables per capita grants, and land miles are log transformed.

## Appendix C continued

Table A5.8: Spatial Dependence of Per Capita Expenditures including County Expenditures in 1996 (W1: 15 miles radius)

	All		Region 1	Region 2	Region 3		Region 4	Region 5
	OLS	Spatial	OLS	OLS	OLS	Spatial	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.17***				0.37**		
Tax price	0.00	0.00	-0.05	0.00	-0.30**	-0.29**	0.16*	0.03*
Grants	0.29***	0.28***	0.57***	0.52***	0.17*	0.20**	0.27***	0.09
Coastal	0.38**	0.37**	0.75*	1.31**	0.01	-0.11	0.11	0.40
Land miles	0.29***	0.30***	0.32*	0.21	0.11	0.11	0.36**	0.44***
Central city	-0.11	-0.18	0.04	-0.32	-0.61	-0.58	0.17	-0.23
County	0.19**	0.14*	0.05	-0.08	-0.09	-0.09	-0.28	0.38
intercept	-0.33	-0.77	-1.11	0.21	2.74**	1.42	0.71	-2.10
Log likelihood		-685.57				-105.84		
Log likelihood ratio		5.19**				2.81**		
R2	0.19		0.36	0.34	0.13		0.20	0.22
F stat	16.13**		5.40***	5.68**	1.67		3.27***	4.88***
AIC	1390.35	1387.16	228.95	245.68	228.49		281.01	386.60
LM lag	4.30**			0.02	2.17		0.32	0.04
LM error	6.88**			1.88	0.01		1.23	0.00
Robust LM (lag)	0.02			2.93*	5.12**		0.02	0.09
Robust LM (error)	2.60			4.79*	2.97*		0.93	0.05
N	400	400	63	71	73	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 15 miles as neighbors. The independent variables per capita grants, and land miles are log transformed.

## Appendix C continued

Table 5.9: Spatial Dependence of Per Capita Expenditures including County Expenditures in 1996 (W1: 20 miles radius)

	All	Region 1	Region 2	Region 3	Region 4	Region 5
	OLS	OLS	OLS	OLS	OLS	OLS
Tax price	0.00	-0.05	0.00	-0.30**	0.16*	0.03*
Grants	0.29***	0.57***	0.52***	0.17*	0.27***	0.09
Coastal	0.38**	0.75*	1.31**	0.01	0.11	0.40
Land miles	0.29***	0.32*	0.21	0.11	0.36**	0.44***
Central city	-0.11	0.04	-0.32	-0.61	0.17	-0.23
County	0.19**	0.05	-0.08	-0.09	-0.28	0.38
intercept	-0.33	-1.11	0.21	2.74**	0.71	-2.10
R2	0.19	0.36	0.34	0.13	0.20	0.22
F stat	16.13**	5.40***	5.68**	1.67	3.27***	4.88***
AIC	1390.35	228.95	245.68	228.49	281.01	386.60
LM lag	1.32	0.01	0.04	0.75	2.38	0.79
LM error	3.75	0.69	1.03	0.27	0.75	1.59
Robust LM (lag)	0.59	1.01	3.39*	2.08	1.77	0.06
Robust LM (error)	3.02	1.69	4.38*	1.60	0.14	0.86
N	400	63	71	73	83	110

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 20 miles as neighbors. The independent variables per capita grants, and land miles are log transformed.



## Appendix C continued

Table A5.10 Spatial Dependence of Per Capita Expenditures with County Variables in 2006 (W1: 10 miles)

	All			Region 1	Region 2		Region 3		Region 4		Region 5			
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	Spatial	OLS	Spatial
<i>Spatial coefficient (rho)</i>		0.07**										0.16**		0.18**
Tax price	-0.01	-0.02	-0.01	0.02	-0.03	-0.02	-1.52*	-1.73*	-0.00	0.00	0.00	0.00	0.00	0.00
Grants	0.08**	0.10**	0.13**	0.26**	0.21**	0.31**	0.23**	0.23**	0.08	0.06	0.04	0.02	0.04	0.02
Coastal	0.42***	0.39**	0.41**	0.80**	1.04**	1.05**	-0.12	-0.07	0.63**	0.59**	0.28**	0.32**	0.31**	0.30**
Land miles	0.22***	0.22**	0.21**	0.22	0.39**	0.39**	0.24*	0.25*	0.41***	0.43***	0.12**	0.12***	0.12**	0.13**
Central city	-0.20	-0.17	-0.19	0.66	-1.12		-0.27	-0.29	-0.58*	-0.54	-0.02	-0.04	-0.03	-0.04
County	0.19**	0.17**	0.06	-0.02	-0.14	-0.18	-0.16	-0.15	-0.02	-0.08	0.14	-0.01	0.05	0.04
LPRESV			0.34**			0.56		-0.29		-0.35			NA	NA
REF			0.21			0.01		-0.15		0.20			0.24	-0.22
Intercept	2.89***	2.68**	2.93**	2.41**	3.10	2.85***	4.14***	4.47***	3.59**	4.02**	3.69***	3.64***	3.82**	3.51**
Log likelihood		-591.82										-108.51		-108.42
Log likelihood ratio		4.05**										4.81**		4.61**
R2	0.17		0.20	0.23	0.21	0.24	0.19	0.19	0.35	0.36	0.13		0.13	
F stat	13.88***		12.63**	2.92**	3.00**	2.50**	2.61**	1.99**	6.79***	5.20***	2.77**		2.41**	
AIC	1201.7	1199.64	1190.6	211.65	236.13	237.87	234.76	238.07	214.83	217.45	235.84		237.47	
LM lag	3.62**		0.29	0.39	0.07	0.01	0.01	0.00	2.01	1.60	4.66**		4.64**	
LM error	0.99		0.07	0.55	0.26	0.29	1.51	1.95	0.03	0.00	0.26		0.36	
Robust LM (lag)	2.64*		0.21	0.05	0.39	0.03	1.64*	1.74	2.49	1.80	4.61**		4.55**	
Robust LM (error)	0.01		0.00	0.21	0.57	0.31	3.14*	3.69*	0.51	0.19	0.21		0.27	
N	403	403		63	71	71	73	73	82	82	113	113	113	113

Note: 1. The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 10 miles as neighbors. The independent variables per capita grants, and land miles are log transformed. 2. There is no variation in land preservation programs and referenda occurrence among counties in region one. There is no variation in land preservation programs among counties in region five.

## Appendix C continued

Table A5.11 Spatial Dependence of Per Capita Expenditures with County variables in 2006 (W1: 15 miles)

	All			Region 1	Region 2		Region 3		Region 4		Region 5	
	OLS	Spatial	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
<i>Spatial coefficient (rho)</i>		0.12**										
Tax price	-0.01	-0.01	-0.01	0.02	-0.03	-0.02	-1.52*	-1.73*	-0.00	0.00	0.00	0.00
Grants	0.08**	0.10**	0.13**	0.26**	0.21**	0.31**	0.23**	0.23**	0.08	0.06	0.04	0.04
Coastal	0.42***	0.40**	0.41**	0.80**	1.04**	1.05**	-0.12	-0.07	0.63**	0.59**	0.28**	0.31**
Land miles	0.22***	0.22**	0.20**	0.22	0.39**	0.39**	0.24*	0.25*	0.41***	0.43***	0.12**	0.12**
Central city	-0.20	-0.19	-0.19	0.66	-1.12		-0.27	-0.29	-0.58*	-0.54	-0.02	-0.03
County	0.19**	0.17**	0.06	-0.02	-0.14	-0.18	-0.16	-0.15	-0.02	-0.08	0.14	0.05
LPRESV			0.34*			0.56		-0.29		-0.35		NA
REF			0.21			0.01		-0.15		0.20		0.24
intercept	2.89***	2.47**	2.93**	2.41**	3.10	2.85***	4.14***	4.47***	3.59**	4.02**	3.69***	3.82**
Log likelihood		-591.04										
Log likelihood ratio		5.61**										
R2	0.17		0.20	0.23	0.21	0.24	0.19	0.19	0.35	0.36	0.13	0.14
F stat	13.88**		12.63**	2.92**	3.00**	2.50**	2.61**	1.99**	6.79***	5.20***	2.77**	2.41**
AIC	1201.7	1198.08	1190.6	211.65	236.13	237.87	234.76	238.07	214.83	217.45	235.84	237.47
LM lag	5.06**		1.23	1.50	0.39	1.05	0.27	0.16	0.13	0.26	0.03	0.00
LM error	8.94**		4.30**	0.04	0.01	0.31	0.30	0.48	2.47	1.09	0.29	0.19
Robust LM (lag)	0.39		0.02	2.86*	0.66	0.81	2.03	2.02	0.10	0.00	0.00	0.04
Robust LM (error)	4.27**		3.08*	2.91	0.27	0.07	2.05	2.34	2.45	0.83	0.27	0.23
N	403	403	403	63	71	71	73	73	82	82	113	113

Note: 1. The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 15 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed. 2. There is no variation in land preservation programs and referenda occurrence among counties in region 1. There is no variation in land preservation programs among counties in region 5.

## Appendix C continued

Table A5.12 Spatial Dependence of Per Capita Expenditures with County Expenditures in 2006 (W1: 20 miles)

	All		Region 1	Region 2		Region 3		Region 4		Region 5	
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Tax price	-0.01	-0.01	0.02	-0.03	-0.02	-1.52*	-1.73*	-0.00	0.00	0.00	0.00
Grants	0.08**	0.13***	0.26**	0.21**	0.31**	0.23**	0.23**	0.08	0.06	0.04	0.04
Coastal	0.42***	0.41**	0.80**	1.04**	1.05**	-0.12	-0.07	0.63**	0.59**	0.28**	0.31**
Land miles	0.22***	0.20***	0.22	0.39**	0.39**	0.24*	0.25*	0.41***	0.43***	0.12**	0.12**
Central city	-0.20	-0.19	0.66	-1.12		-0.27	-0.29	-0.58*	-0.54	-0.02	-0.03
County	0.19**	0.06	-0.02	-0.14	-0.18	-0.16	-0.15	-0.02	-0.08	0.14	0.05
LPRESRV		0.34**			0.56		-0.29		-0.35		NA
REF		0.21			0.01		-0.15		0.20		0.24
intercept	2.89***	2.93***	2.41**	3.10	2.85***	4.14***	4.47***	3.59**	4.02**	3.69***	3.82**
R2	0.17	0.20	0.23	0.21	0.24	0.19	0.19	0.35	0.36	0.13	0.14
F stat	13.88**	12.63***	2.92**	3.00**	2.50**	2.61**	1.99**	6.79***	5.20***	2.77**	2.41**
AIC	1201.7	1190.6	211.65	236.13	237.87	234.76	238.07	214.83	217.45	235.84	237.47
LM lag	2.32	0.25	1.23	0.00	0.30	0.87	0.93	0.02	0.01	0.17	0.50
LM error	11.31***	5.27**	1.34	2.15	0.95	0.69	0.83	0.43	0.00	0.06	0.00
Robust LM (lag)	1.38	2.55	0.07	2.61*	3.25*	0.18	0.11	0.32	0.04	0.42	0.83
Robust LM (error)	10.37	7.57**	0.19	4.76*	3.90*	0.00	0.00	0.72	0.03	0.32	0.32
N	403	403	63	71	71	73	73	82	82	113	113

Note: 1. The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 20 miles as neighbors. The independent variable per capita income, per capita grants, and land miles are log transformed. 2. There is no variation in land preservation programs and referenda occurrence among counties in region 1. There is no variation in land preservation programs among counties in region 5.

## Appendix C continued

Table A5.13: South Florida Metropolitan Area: Change per Capita Expenditure on Parks and Recreation

	5 MILES WEIGHT MATRIX				10 MILES WEIGHT MATRIX			15 MILES WEIGHT MATRIX		
	1997-2001		2002-2007	1996-2006	1997-2001	2002-2007	1996-2006	1997-2001	2002-2007	1996-2006
	OLS	SLM	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
<i>Spatial Coefficient t Rho(<math>\rho</math>)</i>		-0.68** *								
$\Delta$ Grants	1.38** *	1.31** *	0.43*	0.19	1.38** *	0.43*	0.19	1.38** *	0.43*	0.19
$\Delta$ Revenue	-0.36**	-0.53**	-0.46*	0.56** *	-0.36**	-0.46*	0.56** *	-0.36**	-0.46*	0.56** *
$\Delta$ Debt/EAV	13.35	13.86	70.82*	17.00	13.35	70.82*	17.00	13.35	70.82*	17.00
Constant	14.22* *	20.02* *	42.05* *	34.24* *	14.22* *	42.05* *	34.24* *	14.22* *	42.05* *	34.24* *
$R^2$	0.23		0.09	0.09	0.23	0.09	0.09	0.23	0.09	0.09
Adj. $R^2$	0.20		0.05	0.05	0.20	0.05	0.05	0.20	0.05	0.05
F stat	7.55**		2.48*	2.48*	7.55**	2.48*	2.48*	7.55**	2.48*	2.48*
White test	28.07* *				28.07* *			28.07* *		
AIC	793	787	948	874.67	793	948	874.67	793	948	874.67
Schwartz	802	798	957	883.9	802	957	883.9	802	957	883.9
LM (lag)	4.23**		0.28	0.28	0.56	0.06	0.40	0.28	0.00	0.61
LM (error)	2.51		0.06	0.09	0.12	0.07	0.24	0.09	0.00	0.66
Log Likelihood		-388.66								
Likelihood ratio		8.28**								

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 5, 10, and 15 miles as neighbors.

## Appendix C continued

Table A5.14: Orlando Metropolitan Area: Change per Capita Expenditure on Parks and Recreation

	5 MILES WEIGHT MATRIX			10 MILES WEIGHT MATRIX			15 MILES WEIGHT MATRIX		
	1996-2000	2000-2004	1996-2006	1996-2000	2000-2004	1996-2006	1996-2000	2000-2004	1996-2006
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
$\Delta$ Grants	-0.09	0.83***	0.35	-0.09	0.83***	0.35	-0.09	0.83***	0.35
$\Delta$ Revenue	0.10	0.03	0.49***	0.10	0.03	0.49***	0.10	0.03	0.49***
$\Delta$ Debt/EAV	7.7	-15.28	-51.06**	7.7	-15.28	-51.06**	7.7	-15.28	-51.06**
Constant	13.11	9.18	-25.68**	13.11	9.18	-25.68**	13.11	9.18	-25.68**
$R^2$	0.03	0.55	0.65	0.03	0.55	0.65	0.03	0.55	0.65
Adj. $R^2$	-0.06	0.50	0.61	-0.06	0.50	0.61	-0.06	0.50	0.61
F stat	0.34	12.02***	18.03***	0.34	12.02***	18.03***	0.34	12.02***	18.03***
White test	8.43	16.64**		8.43	16.64**		8.43	16.64**	
AIC	328	344	361.42	328	344	361.42	328	344	361.42
Schwartz	334	350	367.40	334	350	367.40	334	350	367.40
LM (lag)	1.62		0.33			0.10			0.10
LM (error)	2.05		0.63			0.75			0.79

Note: The weight matrix is based on threshold distance, and considers all cities which are within a distance radius of 5, 10, and 15 miles as neighbors.

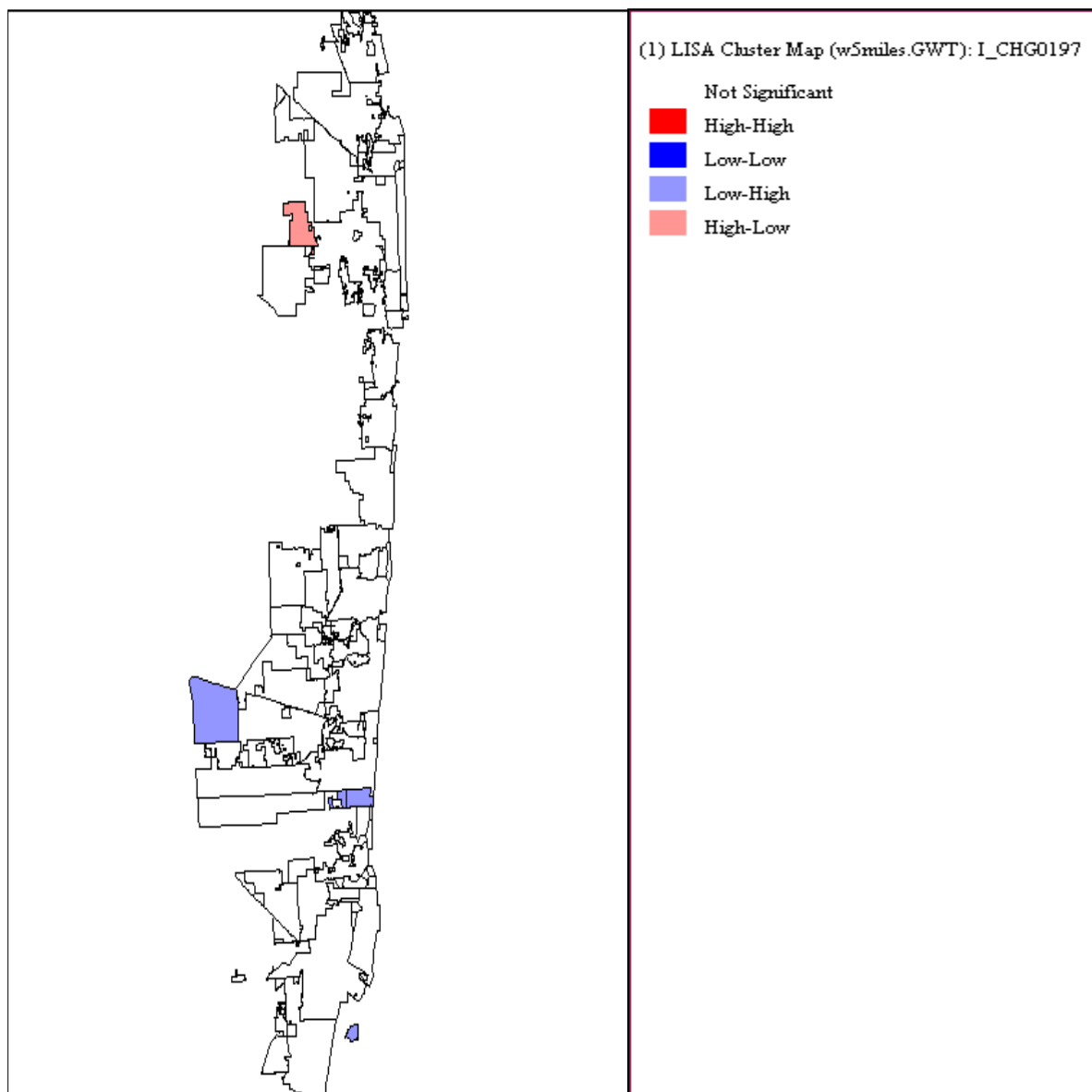
**South Florida Metropolitan Area**

Figure A5.1: LISA map for Per Capita Change in Expenditure 1997-2001

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Hendrick, R., Jiminez, B. and Lal, K.: Does Local Government Fragmentation Affect Local Spending?, *Urban Affairs Review*, 2010.