

# POLITICAL INSTITUTIONS AND CONSERVATION BY LOCAL GOVERNMENTS

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In this article, the authors develop a political market framework to explain the circumstances under which Florida counties will supply environmental public goods in the form of conservation amendments to county general plans. The framework emphasizes the role of local legislative and executive institutions as mediators of local policy change. Using count models and interaction terms, the analysis shows how the strength of real estate interests constrains the ability of professional county managers to pursue conservation policies. The findings reinforce the importance of developing theories of urban politics in which local political institutions are not transparent.

**Keywords:** *political institutions; local government; environmental policy; conservation; growth management; policy change*

**The provision of local public goods** has been a central focus of the urban political economy literature since Tiebout (1956; see also Schneider 1989; Peterson 1981). In this article, we develop a theoretical framework to explain the circumstances under which Florida counties will supply environmental

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public goods in the form of conservation amendments to county general plans. General plans are important because they define what Ostrom (1999) calls the “operational rules” governing land use in a local community. Operational rules define property rights over resources by identifying permitted, required, and prohibited behaviors. It is important to note that the general plans of local governments are not static rule systems. Rather, general plans are amended in response to interactions between political actors in the context of local political institutions. Conceptualizing general plans as products of decision making in local political institutions allows us to bring insights from institutional theory to bear on the broader topic of local government policy change.

The key theoretical advancement in this article is to develop an understanding of the mediating role of local political institutions on the local provision of conservation policies. In the language of empirical models, the structure of local political institutions is the central independent variable we will study. The theoretical underpinning of this role is derived from the study of structural reforms introduced during the Progressive Era and builds upon several decades of institutional scholarship on local governments (Lineberry and Fowler 1967; Ostrom, Bish, and Ostrom 1988; Schneider 1989; Ruhil 2003). Local political institutions determine the rules and procedures for making collective choices. These rules and procedures are embodied in the structure of local legislative and executive institutions, both of which exhibit substantial variance across local governments. Following Clingermayer and Feiock (2001), we hypothesize local political institutions will influence the incidence of conservation amendments to local general plans observed over time. Later in this article, we will describe the dimensions of local political institutions and how different structures will influence the frequency of conservation amendments.

Our focus on the structure of local political institutions is a significant departure from two other major theoretical frameworks that have developed to explain local policy. The “property rights” framework argues environmental policies will emerge in the face of scarcity and the overconsumption of common-pool resources (Libecap 1989; Alchian and Demsetz 1973). This perspective is linked to Tiebout (1956) models, which often that argue local communities have an optimum size for delivery of local public goods. In general, the property rights framework predicts conservation amendments will become more frequent as land becomes scarce, population increases, and infrastructure becomes strained.

The “interest group” framework of local politics provides a second popular explanation of local policy. Interest group models predict that groups that are better able to deliver to political resources to local elected officials are

more likely to receive their preferred policies. The interest group model provides the theoretical basis for “growth machines” ruled by political alliances between local government officials and development interests (Molotch 1976; Logan and Molotch 1987). Development interests have the upper hand in local politics because they receive concentrated benefits for pro-development policies and are better organized than diffuse public interests. Of course, public entrepreneurs can often organize diffuse public interests to effectively participate in local political decisions, and local governments are certainly capable of pro-environmental policies (Elkins 1995; Goetz 1990, 1994; Feiock 2002). Regardless, interest group models have a modern pluralist perspective that views policy change as a result of interest group competition.

In both the property rights and interest group models, political institutions are largely transparent to the underlying economic or political forces driving land-use policy. We believe this is a serious oversight; political institutions are crucial mediators of political and economic forces and will influence policy dynamics. To remedy this situation, we offer a “political market” theory of policy change that combines political economy theories of property rights (Libecap 1989; Eggertsson 1990; Alston 1996; Lubell et al. 2002) with the interest group framework by focusing on how the influences of these factors are conditional on the structure of local government institutions (Clingermeier and Feiock 2001; Ostrom 1990, 1999). The political market framework conceptualizes policy and institutional change as the result of a dynamic contracting process between the suppliers and demanders of change in a community (Alston 1996; Libecap 1989). Generally, the demanders are the private interests in society, and the suppliers are the government authorities (Schneider 1989). Interest group demands are driven by the local economic changes, such as land scarcity, described by the property rights perspective. In return for political resources, elected officials will supply land-use policies that affect the utility of different social interests. Hence, the political market framework encompasses both traditional perspectives.

More importantly, the political market approach assigns a central role to structure of local government institutions as the arena in which political contracting occurs. Political institutions combine with the structure of interest organization and the economics of land-use to determine the outcome of political contracting. Different types of political institutions will favor different types of interests, either enhancing or reducing the ability of interests to influence land-use policy. For example, we argue that district-based elections will favor local environmental interests, which are often organized to resist specific unwanted land uses. In other words, the structure of local political institutions determines the winners and losers in the land-use policy. In

contrast to the property rights model, our perspective heavily emphasizes the distributive consequences of policy change.

We use general plan amendments in Florida counties as a laboratory for testing our hypotheses about local political institutions and conservation. Florida is an excellent research setting because the 1985 State Growth Management Act (GMA) requires comprehensive plans that are relatively easy to compare between local communities and that have well-defined moments in time to observe change (Feiock 1994). The GMA required every city and county to create a comprehensive growth management plan to guide land-use decisions. The plan provides a legally binding constraint on development decisions because local zoning codes, land development regulations, and permit decisions must conform to the provisions and designations of the plan. The plans must contain certain elements, most importantly for this article, conservation elements that represent the provision of environmental public goods. Each local community has the opportunity to amend the plan twice per year, and the city or county commission in each community may propose some number of amendments in each cycle. The amendment cycles are the units of analysis in our study. The number of conservation amendments during each cycle constitutes the primary dependent variable in our analysis.

In the next section, we discuss the property rights and interest group perspectives on local land-use politics because both perspectives identify important components of the political market. We then discuss how local political institutions may have a direct effect on the number of environmental amendments and also possible interactions between political institutions and other components of the political market. We then test out hypotheses using regression count models that estimate the rate of conservation amendments per cycle.

### **INTEGRATING THE PROPERTY RIGHTS AND INTEREST GROUP FRAMEWORKS**

Our political market approach will focus not only on how the structure of local institutions directly influences land-use decisions but also on how forces and interests identified in property rights and interest group frameworks are mediated by local institutions. Our empirical models will incorporate several variables from these other models. At the very least, these variables must be controlled for to isolate the influence of local political institutions. By including the relevant variables in the model, we may also be able to identify which model does a better job of explaining local land-use policy change.

### PROPERTY RIGHTS FRAMEWORK

The property rights literature provides one of the clearest applications of economic theory to land-use policy. The demand for property rights is generated by the potential efficiency gains of internalizing externalities (Alchian and Demsetz 1973). This line of argument is most frequently used for the case of common-pool resources, where the lack of property rights leads to overexploitation and conflict. Land is a common-pool resource for local communities, and as land becomes scarce, there are Pareto-benefits to creating conservation rules that protect environmental values. Eggertsson (1990) calls these early approaches to institutions the “naïve theories of property rights” because they only consider only the economic demand for property rights and do not address distributional conflict between interest groups.

The benefits of environmental public goods are related primarily to the extent to which existing growth patterns increase the scarcity of local land and infrastructure resources. Extant research on local development and growth management typically refers to these as “need-based” explanations (Steinacker 1998; Lewis and Neiman 2002). As growth pressures intensify, many citizens will begin to demand policies that preserve environmental resources. Thus, we expect measures of population pressure and urbanization to be positively related to environmental amendments. Sentiment for growth management often becomes louder when population density strains public infrastructure, so we hypothesize larger mean travel times to work will increase the number of environmental amendments.

### INTEREST GROUP FRAMEWORK

More recent scholarship has stressed the fact that some interests are better at organizing for collective action and therefore better able to articulate policy preferences and participate in political decision making. Hence, the relative political powers of the demanders and the willingness of government authorities to supply favorable policies to various interests are both important parts of the process. Eggertsson (1990) uses the term “interest group theories of property rights” to describe these more recent accounts of institutional change because they explicitly take into account the efforts of private interests to secure favorable outcomes in the political arena. Extant studies of local economic development and growth management focus directly on the role of private interests in shaping land use and development decision making. Much of this work concludes that land-based development interests either dominate the local agenda or are able to build governing coalitions to overcome opposition to development (Molotch 1976; Stone, 1989; Lewis

and Neiman 2002). We argue that the interest group framework encompasses existing urban politics theories of land-use politics such as the growth machine literature.

Our primary method for integrating the interest group framework is to measure characteristics of communities that reflect certain types of interests. These community characteristics then serve as proxies for interest group participation in the political process. This approach is justified by Gray and Lowery (1996), who show that the density of interest groups is a positive function of the size of the latent constituency. Lubell et al. (2002) also use community characteristics as proxies for interest group constituencies.

We expect community characteristics such as wealth, education, and race to influence the demand for conservation amendments. Previous work suggests high socioeconomic status (income/education) communities will favor restricting growth so as to isolate themselves from lower-income individuals and therefore increase their property values and lower the cost of supplying local public goods (Maser, Riker, and Rosett 1977; Navarro and Carson 1991; Donovan and Neiman 1992). The same groups have also tended to place higher value on protection of the natural environment and are more likely to join environmental groups (Dunlap and Mertig 1992). Thus, we expect more conservation amendments in communities with a higher per capita personal income and educational attainment levels.

We also expect race may be an important predictor of conservation amendments. The environmental justice literature suggests minority populations are subjected to a disproportionate share of environmental harms. We suspect this phenomenon relates to land-use policy as well; minority populations are unlikely to generate support for conservation amendments. However, this is not because minority populations do not prefer environmental policies. Rather, it is because minority populations often lack political resources to articulate political demand, and thus, their interests are overwhelmed by better-financed and organized development interests (Lubell et al. 2002).

Economic and development interests have a substantial interest in land-use decisions because land-use policy has consequences for the private risk and return on their investments and production activities. Like other business interests, development interests are often organized and well financed, making them strong candidates to become powerful articulators of political demand. These characteristics give development interests an advantage in translating their preferences into policy. Another advantage that business interests possess is their perceived importance to local economies (Schneider 1989). A number of studies suggest a substantial degree of cooperation between business and public officials (Fleischmann 1986; Stone 1989). The

growth machine perspective often portrays local policy regimes as an alliance between government officials and interest groups from the development and real estate/finance industries.

Development and construction interests would be particularly influenced by conservation amendments that reduce available development space or increase the costs of development. Thus, we expect counties with stronger construction interests to be less likely to generate conservation amendments. Real estate interests are more complex. Although they are often outspoken opponents to environmental restrictions, they may benefit from these rules if the amenity values of environmental goods such as open space can be capitalized into housing prices and passed on to consumers. The sign of the coefficient estimating the influence of real-estate interests on the incidence of conservation amendments will distinguish between these two possibilities.

Pro-development and environmental interests feature important differences in their geographic basis of organization. The typical political science analysis portrays environmental interests as a diffuse, unorganized constituency that favors some general form of environmental protection. Some local environmental interests, for example, unorganized citizens who worry about runaway growth, do have this type of structure. However, many local environmental interests are what Clarke and Gaile (1989) call "territorial groups" with links to a specific geographical location. These groups are often main players in not-in-my-backyard politics and include neighborhood organizations, homeowners associations, and citizen activists located within geographically defined constituencies. These geographic groups often dominate the politics of land use, as they resist locally unwanted land uses like major roads or clamor for improved environmental amenities like parks and conservation areas.

Development interests, on the other hand, have less clear-cut connections to geographic interests. These groups may instead be defined along functional or occupational lines. Such groups might include developers, realtors, contractors, construction trade unions, and financial institutions. Occupationally organized interests will generally look for economic opportunities all over the local community and are less concerned with a particular location. Evidence suggests that geographically diffuse environmental interests cannot compete in the political market with well-organized development interests, unless a strong political entrepreneur helps environmental interests organize at the broader community level (Clingermayer and Feiock 2001). These differences in the structure of interest organization have important consequences for the influence of local political institutions, as discussed in the next section.

## LOCAL POLITICAL INSTITUTIONS AND CONSERVATION AMENDMENTS

The central argument of our research is that the structure of local political institutions will facilitate or impede the influence of specific demands and community interests on land-use decisions. Recent work reveals that when local policies, such as urban growth boundaries, are made through direct democracy institutions, it advantages anti-growth interests (Gerber and Phillips 2004a, 2004b). Local political institutions also have implications for development and the influence of development interests on land use policy. Local political institutions vary in terms of both their legislative and executive structures. We argue the structure of political institutions interacts with the structure of interest organization, in that particular types of institutions are more likely to produce conservation amendments. In other words, political institutions affect the ability of interests to articulate their demand in the political market and the willingness of elected officials and bureaucrats to supply preferred policies.

The effects of local institutions may be additive and direct, as in a basic linear model. However, we are also hypothesizing interaction effects between political institution variables and property rights and interest group variables. Lubell (2003) demonstrates the usefulness of assessing interaction effects in comparative institutional analysis. Instead of assuming the political process operates identically across different settings, we can think in terms of how the political process will change as a function of different institutional arrangements. In the next sections, we develop hypotheses about both the direct and interactive effects of legislative and executive institutions.

### THE STRUCTURE OF LOCAL LEGISLATIVE INSTITUTIONS

Both legislative and executive institutions can shape the responsiveness of land-use policy to territorial or occupationally organized interests. Land use is the quintessential targeted policy that can direct benefits to particular constituencies (Denzau and Weingast 1982; Maser, Riker, and Rosett 1977; Hinds and Ordway 1986). The most important characteristic of legislative institutions is the extent to which they feature district-based, rather than at-large, elections. District elections increase the likelihood of shared development preferences and reduce transaction costs for representation. Because a district representative's electoral success is likely to depend upon support from geographic constituencies (Clingermyer and Feiock 1993), he or she may be sensitive to environmental concerns about growth and development.

At-large elections force local legislators to respond to a much broader set of political interests than are typically found in a single district. At-large representatives serve a citywide constituency, and hence, they are more likely to think in terms of aggregate welfare. At-large representatives are often part-time politicians, and would have less incentive to devote the energies necessary to organize diffuse environmental interests. For this reason, they have greater incentive to favor well organized, occupational interests that can provide instrumental political resources over territorial-based environmental interests. To summarize, the district-based (DB) election hypothesis predicts:

*DB1 (Direct):* The proportion of district-based county commissioners will increase the rate of conservation amendments.

*DB2 (Interactive):* As the proportion of district-based commissioners increases, the ability of pro-development interests to negatively influence the rate of conservation amendments will decrease.

#### THE STRUCTURE OF EXECUTIVE BRANCH INSTITUTIONS

The structure of the executive branch also shapes incentives to supply different land-use outcomes. Form of government is generally defined in a county charter, or in counties without charters, by state constitutional rules or special state legislative provision. County forms of government are typically classified as commission-manager or mayor-commission and commission-only forms.

The traditional form of county government specified in constitutions of many states (particularly in the South) is the commission-only form. County commission governments have at times been depicted as incompetent or corrupt political machines (Morgan and Kickham 1999; DeSantis and Renner 1994). The progressive reform movement followed a different path for counties than did cities. Municipal reformers attempted to weaken mayoral power within city politics. At the county level, reformers emphasized the separation of power from the traditional commission form of county government and thus the strengthening of executive powers (Benton 2002). Reform has been constituted by the shift from county commission form to so-called modernized county government in the form of commission-administrator and commission-elected executive forms (Feiock and Taveras 2002; Benton 2002; Schneider and Park 1989).

The main thrust of the commission-administrator form is that there is a centralized professional executive who is in charge of daily county administration. Professional norms or standards of administration underscore the significance of the role of planning in local land use (Renner 2001). Executive

leadership can lower coordination costs among diverse interests in conservation and land use. Strong local executives may function as growth management entrepreneurs (Schneider and Teske 1995; Feiock and Taveras 2002; Feiock 2003).

In Florida, the only two county-commission/strong-mayor forms of government occur in the consolidated city-counties of Miami-Dade and Jacksonville. Of the Florida counties, 45 have some form of county manager, and 20 have commission only. Given the small number of mayor-commission forms of government, we limit our theoretical discussion to the implications of an appointed county manager.

The literature suggests two possible hypotheses about the role of appointed managers. We will refer to these as the “insulation hypothesis” and the “planning hypothesis”. The insulation hypothesis portrays county and city managers as insulated from interest demands and community pressures (Lineberry and Fowler 1967; Marando and Thomas 1977). Moreover, county managers’ professional advancement has been linked to success in promoting efficiency and economic development (Stein 1990; Teske and Schneider 1994; Ruhil et al. 1999). This insulation of county managers increases participation costs for community- and territorial-based interests. It is less costly for functional interests represented by existing trade associations or labor unions to influence policy than for more diffuse interests that rely on public entrepreneurs. Counties in which business groups are already active and organized may have an advantage in articulating their preferences to professional managers and place constraints on the policy choices of county managers. The insulation (I) hypothesis predicts:

*I1 (Direct):* Counties with an appointed manager will have a lower rate of conservation amendments than commission-only forms of government.

*I2 (Interactive):* The magnitude of the negative difference in rates between appointed manager- and commission-only forms of government will increase as the strength of construction and real-estate interests increases.

The planning hypothesis argues that the professional technocratic training and socialization of county managers make them responsive to demand for comprehensive planning and growth management. About 60% of city managers hold master’s degrees in such fields as public or business administration or public policy (Renner 2001). Professionally trained administrators are typically granted a certain degree of discretion in the exercise of public trust (Miller 2000). The preferences of many managers are shaped by the modern norms of professional planning associations and public administration schools, which stress ideas like sustainable development and smart

growth as ways to reconcile conflicts between economic and environmental values (Nalbandian 1989).

This does not mean that government with an appointed administrator is neutral, just that it has a different set of biases than governments operating under alternative forms. To the extent professional managers provide an opportunity for the exercise of modern planning ideas, we expect counties with appointed managers will be more likely to have conservation amendments. The planning (P) hypothesis predicts:

*P1 (direct):* Counties with an appointed manager will have a higher rate of conservation amendments than commission-only counties.

*P2 (interactive):* Construction and real-estate interests will have weaker negative relationships with the rate of conservation amendments in counties with an appointed manager

## RESEARCH DESIGN AND ANALYSIS

We collected information on all comprehensive plan amendments between 1994 and 2000 for all 67 Florida counties in Florida. Because the Growth Management Act provides for two amendment cycles per year, this translates into 12 government-amendment cycles per jurisdiction. Hence, we will analyze a total of 938 amendment-cycle observations. During this time period, counties offered amendment packages in 415 (44%) of the cycles. As will be seen below, our analysis takes into account both the choice to offer an amendment package and whether that package contains any conservation amendments. Below, we discuss the measurement of dependent and independent variables; Table 1 reports descriptive statistics.

### MEASURING THE FREQUENCY OF CONSERVATION AMENDMENTS

Measurement of the dependent variables is based on quantifying the information contained in each set of amendment documents. The Florida Growth Management Act requires that each comprehensive plan contain certain elements. We are mainly concerned with the conservation elements, because the policies included in that element typically represent policies that will provide local environmental goods. The Florida statutes prescribe a conservation element as follows:

- (d) A conservation element for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands,

**TABLE 1: Descriptive Statistics**

	M	SD	<i>Minimum</i>	<i>Maximum</i>
Dependent variable				
Number of conservation amendments	1.01	9.03	0	200
Interest group variable				
% construction	11.51	2.89	1.16	21.67
% real estate	4.05	1.25	0.64	8.87
% Black	13.90	9.76	2.10	57.10
% college	16.74	8.03	6.80	41.70
Median income (\$1000)	35.32	6.20	25.64	50.10
Institutional variables				
Mayor-commission	0.03	0.17	0	1
Manager-commission	0.67	0.47	0	1
% district commissioners	45.20	9.76	0	100
Number of cities	5.85	7.02	1	38
Property rights variable				
Population	222,000	369,749	6,024	2,253,362
County miles squared	805.37	385.95	240	2,025
Mean travel time (minutes)	26.54	3.65	18.4	35.5

waterwells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources (s. 163.3177(6)(d)).

The language of the Florida statutes supports the face validity of using conservation amendments as an indicator of the supply of local environmental goods. However, it is possible that a small subset of conservation amendments release land for more development and reduce the supply of local environmental goods. To guard against this possibility, we qualitatively examined 433 individual conservation amendments and found all but 5 (98.85%) were clearly pro-environment in their content. For example, Martin County added additional protection for native upland habitat that is endangered, unique, and rare in 1999. In 2003, Indian River County amended the conservation and open space element of their comprehensive plan to recognize and promote greenways. Even if some of the conservation amendments do reduce the supply of local environmental goods, that measurement error would bias our statistical tests toward accepting the null hypotheses of zero effects. Hence, we do not think the possibility of measurement error risks overstating our significant findings (i.e., the risk of Type I error).

Another advantage of the GMA is that the Florida Department of Community Affairs is required to review all general plan amendments, and thus, all

the amendment documents are stored in a central document library in Tallahassee. We construct the dependent variable by simply counting the number conservation amendments during each cycle. There is some variance across counties in terms of how narrowly they define an amendment. For example, some counties might offer a large package of one-sentence amendments, whereas another county might offer a single amendment that encompasses a large number of statements. In our database, the number of conservation amendments ranges from 0 to 200, with 99.63% of the counts less than 50. We exclude the four county-amendment cycles with conservation amendment counts greater than 80 because these influential outliers tended to artificially increase our standard errors.

#### MEASURING INDEPENDENT VARIABLES: ARCHIVAL DATA

Measurements of independent variables for the property rights and interest groups models are available from U.S. Census Bureau products, primarily the 1990 Population Census and the annual County Business Patterns. After 1997, the County Business Patterns classification structure changed from the Standard Industrial Classification (SIC) to the North American Industrial Classification System (NAICS). Because the NAICS system is more precise, we translated all SIC data into NAICS classifications. One problem with this is that the Census Bureau bridge between the two data sets was not very precise in many categories; hence, the translation process increases the amount of random measurement error in our data. Although this article reports results from the entire time period, we checked the robustness of the results using just post-1997 data, and found them to be largely consistent. Note that any data from the 1990 Population Census are applied for the entire decade, and thus, these measures are spread over multiple units of analysis.

The measures of the economic variables from the property rights framework include annual county population for each year (combines Census data and annual estimates from the Florida Bureau of Economic Business research), mean travel time to work in 1990, and county size. We enter the natural log of population and county size into the analysis, under the assumption of decreasing marginal effects. These variables are all entered into the first stage of the analysis, which assumes they generated the initial economic demand for conservation amendments.

For the interest group framework, we use the annual County Business patterns data to measure the percentage of county establishments categorized as construction or real estate businesses. From the 1990 Population Census, we measure the proportion of the county population that is Black, the proportion with at least some college education, and the median income. We assume that

counties with higher socioeconomic status are both more likely to express environmental preferences and also better able to absorb the transaction costs of political participation.

For the purposes of this article, the measures of institutional characteristics are the most important. To code county government institutions we started with data collected by the International City/County Management Association in its 1992 and 1997 County Form of Government Surveys. Where observations were missing, they were filled in based on data reported in the *Municipal Yearbook* and county government homepages. This classification on county institutions was verified with the *Almanac of Florida Politics* (Fiedler and De-Haven Smith 2000). Discrepancies in reported forms of government among these sources were found for several counties. In these instances, calls were made to the county clerks to verify the specific executive and legislative institutions that were in place.

The measure of legislative institutions is the percentage of county commission seats that are selected with district-based elections. We include two dummy variables for executive institution structure, one for mayor-commission forms of government and one for commission-manager forms of government. The excluded baseline category in the model is the commission-only form of government. To reiterate, we are primarily interested in the manager-commission form of government because the mayor-commission form is rare in Florida and is confined to the consolidated governments of Jacksonville-Dual and Miami-Dade. We also include the number of municipal government units in the county as a control variable because counties with a high level of possible intergovernmental conflict may be less likely to supply conservation amendments.

## ANALYSIS

The logic of analysis is to estimate the incident rate of conservation amendments per cycle based on a political market framework that integrates the property rights and interest group approaches and includes the central institutional variables. However, we noted earlier that not every county offers amendments at a given cycle, and even if they do offer amendments, they may not offer conservation amendments. Hence, zeros are large proportion (93%) of counts in the data. We argue that counties must cross some type of demand threshold for institutional change before they decide to implement the amendment process. We will use zero-inflated Poisson regression models to handle the problem of the zero counts, where the zeros can occur for these two different reasons. The standard model for count data is a Poisson regression model, which estimates the expected count at each unit of analysis (the

incident rate, denoted  $\mu_i$ ) as a function of hypothesized independent variables (Greene 1994, 2000; Long 1997). Specifically,

$$Pr(y_i|x_i) = \frac{\exp(-\mu_i)\mu_i^{y_i}}{y_i!}, \text{ where } \mu_i = \exp(x_i) \quad (1)$$

To handle the excess zeros in the data, the zero-inflated Poisson model (ZIP) assumes zeros can arise from a Poisson process but are also generated with probability  $\psi_i$  that is determined by a logistic model:

$$\psi_i = F(z_i\gamma) \quad (2)$$

where  $F$  is a logistic cumulative density function.

Hence, the full probability function for the ZIP model combines Equations 1 and 2:

$$Pr(y_i=0) = \psi_i + (1 - \psi_i)\exp(-\mu_i) \quad (3.1) \text{ and}$$

$$Pr(y_i|x_i) = (1 - \psi_i) \frac{\exp(-\mu_i)\mu_i^{y_i}}{y_i!}, \text{ for } y_i > 0 \quad (3.2)$$

Intuitively speaking, equation 3.1 combines the logit probability of observing zero with the Poisson probability of observing zero, conditional on the fact that a Poisson process is operating. Equation 3.2 shows the probability of observing a count greater than zero when only the Poisson process is operating.

Combining the two models ultimately allows estimation of the incident rate conditional on the probability of observing the Poisson process, where the incident rate (same as expected count) is the following expression:  $EV(y_i|x_i, z_i) = m_i - \mu_i\psi_i$ . The logit model determines the demand threshold for observing a county that enters the amendment process; once that threshold is crossed, then the factors determining the Poisson count of conservation amendments begin. Independent variables enter at two places in the model,  $x_i$  (the Poisson model) and  $z_i$  (the logit model). In this case, we assume the property rights variables belong in the logit model, whereas institutional characteristics and interest group variables determine the count. Interaction terms between interest group variables and institutional characteristics will test whether the influence of interest groups is conditional on types of political institutions. The substantive interpretation of this structure is that property rights variables have largely drive the initial demand for changing the

comprehensive plan, and the institutional and interest group characteristics determine the outcome of the amendment process in terms of the conservation amendments.

The data is also a pooled, cross-section time series, which creates the potential for heteroskedasticity within each county and within each year. Thus, we estimate panel-robust standard errors clustered by county, which provides correct standard errors in the presence of both heteroskedasticity and autocorrelation (StataCorp 2003; C. Cameron, pers. comm.). Panel-robust standard errors make the minimum assumption that the error terms are uncorrelated across counties. We control for exposure by entering the natural log of county size directly into the log-link function of the Poisson model (Long 1997).

## RESULTS

ZIP models are non-linear and non-additive, making direct interpretation of the regression coefficients difficult. Thus, Table 2 reports the results of the analysis by showing the discrete change in the incident rate for each of the independent variables, where statistical significance is judged according to the ZIP coefficients. The ZIP coefficients from the full models are reported in the appendix. The discrete change is calculated by subtracting the predicted incident rate (using the expected value formula stated above) at the minimum value of the independent variable in the sample from the incident rate at the maximum value of the sample, holding the other independent variables at their mean levels. For the model with the interaction term, all variables are held at their mean values except those involved in the interaction. We tested the interaction terms specified by our theory and found only the interaction term between percent real estate establishments and commission-manager form of government to be significantly greater than zero. Table 2, column two, reports the model without the interaction term, and Table 2, column three, reports the model with the interaction term. Unless otherwise indicated, the discussion is limited to the model with the interaction term.

Consistent with the prediction of the property rights framework, moving from the minimum to maximum county population increases the incident rate by 6.02. Although the county size coefficient is not significant, the sign is also consistent with our predictions. Conservation amendments appear to be more frequent in developed counties, where environmental public goods are becoming scarce. The mean travel time coefficient is insignificant. One possible explanation is that mean travel time does not adequately measure pressure on local infrastructure, because people could be traveling long distances

**TABLE 2: Expected Change in Incident Rate of Conservation Amendments**

	<i>Without Interaction</i>	<i>With Interaction</i>
Interest group variable		
% Construction	-4.15*	-14.35*
% real estate	-0.93	See Table 3
% Black	-2.45*	-6.41*
% College	3.55**	6.21**
Median income (\$1000)	-0.64**	-1.19**
Institutional variable		
Mayor-commission	-0.06	0.11
Manager-commission	-0.89*	See Table 3
% district commissioners	-0.39^	-0.55
Number of cities	-0.20	-0.40
Property rights variable		
Natural log population	6.02*	9.23*
Natural log county miles squared	1.57	3.41
Mean travel time	0.01	0.01

NOTE: Cell entries are the discrete change in the expected incident rate moving from the minimum to the maximum of the independent variable. For the model without the interaction term, all other variables are held at their mean values. For the model with the interaction term, the mayor-commission, manager-commission, and percentage real estate are all held at zero, with the interaction terms manipulated as appropriate for Table 3. Estimates are derived from zero-inflated Poisson models presented in the appendix. Null hypothesis tests (of the zero-inflated Poisson model coefficient = 0) are copied from the appendix.

\* $p < .05$ . \*\* $p < .10$ .

on uncrowded roads. Hence, future research will need to incorporate more diverse measures of local infrastructure capacity.

The predictions of the interest group model are largely confirmed. Regardless of institutional structure, development interests appear to resist conservation amendments, reducing the incident rate by 14.35. Moving from the minimum to maximum of college-educated population increases the incident rate by 6.21, whereas the same discrete change for proportion Black decreases the incident rate by 6.41. The only inconsistent finding is that higher median income appears to decrease the incident rate. However, percentage with a college education (hereinafter, percentage college) and median income are highly correlated ( $r = .73$ ), which suggests the possibility of multicollinearity. If percentage college is dropped from the model, then the median income coefficient is insignificant. The results for the interest group variables suggest that conservation amendments are more likely in communities with higher levels of education and less likely in minority communities—counties in which the costs of political participation are lower.

Because of the significant interaction term, the results are more complex for the institutional variables. The non-interactive model in Table 2 supports the insulation hypothesis: Manager-commission counties have a 0.89 lower incident rate than commission-only counties. However, once the interaction variable is included, the dynamics of the political market appear to be very different, conditional on both the strength of real estate interests and the structure of executive institutions. Table 3 summarizes the effects of the interaction by reporting the estimated incident rate under four different combinations of interest group and institutional characteristics.

For example, the top left cell of the table reports the expected incident rate equals 0.64 in commission-only counties when the percentage real estate establishments is at the minimum level in the sample. The top right cell shows that the incident rate equals 3.63 in county-manager governments when real estate establishments are low. When real estate is weak, the difference in the incident rate between manager and commission-only institutions is positive 2.99. This is directly counter to the negative coefficient in the non-interactive model and supports the planning hypothesis. At least when real estate interests are weak, county managers have some discretion to push for the type of conservation policies that are often stressed in modern planning education. On the other hand, when real estate interests are at the maximum, the difference between manager- and commission-only counties is  $-2.51$ . A strong real estate sector appears to constrain the discretion of county managers and reduce their ability to pursue conservation amendments.

We view the interaction effect as demonstrating a fact of central theoretical importance. The dynamics of the political market in local governments is not uniform across institutional structures. Rather, the dynamics of the political market is *conditional* on the structure of local political institutions. One cannot conclude that either the planning hypothesis or the insulation hypothesis is correct; they are not mutually exclusive. Both phenomena are possible, depending on which political institutions are in place and how those institutions shape the incentives of local actors.

## CONCLUSIONS

Our analysis demonstrates the usefulness of a political market approach to local policy that integrates the property rights and interest group framework with the structure local political institutions. The most important finding is that local political institutions matter by shaping the dynamics of the political market. In the absence of political constraints that come from a strong real estate sector, county managers appear to encourage conservation land-use

**TABLE 3: Interaction Between Form of Government and Real Estate Interests**

	<i>Commission Only</i>	<i>County Manager</i>	<i>Discrete Change in Expected Rate</i>
Minimum real estate	0.64	3.63	2.99
Maximum real estate	2.52	0.01	-2.51
Discrete change in expected rate	1.88	-3.62	

policies. But as the real estate sector grows, they put more restraints on the discretion of county administrators and push them away from pro-environmental policies. The county-manager form of government is clearly vulnerable to the politics of the growth machine, because managers tend to respond to development interests. However, managers are also capable of more sustainable growth policies when they are not influenced by a strong development sector.

Clearly, these findings have some limits. First, we are only measuring Florida counties. In future research, we plan on moving this basic research design to Florida municipalities. There are more municipalities, they have more variance in institutional structures, and the urban politics literature has developed a better understanding of city politics as opposed to county politics (Benton 2002). Furthermore, local governments make many more types of decisions than just conservation amendments. For example, they make specific zoning decisions in terms of housing densities and types of structures. Future research will classify these decisions in terms of whether they support or restrict urban growth. Increasing the diversity and precision of policy output measures will allow more in-depth understanding of institutional effects. This basic approach to understanding local institutions should also be expanded to other regions of the United States.

Second, we consider local political institutions as a purely exogenous factor. This is partly an artifact of the time period we study; there were not substantial changes in the structure of the Florida county institutions in the 1990s. Only three counties—Clay, Gulf, and Wakula—modified their form of government between 1994 and 2000. From a theoretical perspective, examining political processes holding institutional structures constant facilitates analytic understanding. However, political scientists like Ruhil (2003) have shown that institutional structures are political choices and may reflect or stabilize a particular configuration of political interests and power. In our context, development interests may help create a manager form of government precisely because they believe they are better able to achieve their

policy goals with that type of institutional structure. Research designs that take into account the endogeneity of political institutions will bring a clearer understanding of the causal mechanisms.

Third, although we claim our main contribution to the literature is using interaction terms to understand the mediating effects of political institutions, we find only one significant interaction term between county managers and real estate interests. Hence, not all of our institutional hypotheses receive direct support in this analysis. Although it would be great if the data supported all of our conjectures, at this point, we feel it is more important just to demonstrate that institutional interactions exist. Perhaps an (admittedly grandiose) analogy is the search for life on other planets—it would be a major scientific achievement to find one living organism; we do not expect to find entire families of species to start with. We believe this analysis demonstrates the importance of looking for these institutional effects, and we expect our understanding of institutional dynamics will improve with more data and refined measurements.

Overall, we view the findings and methodologies in this article as the initial step in establishing a research agenda on local political institutions. Urban politics theories should be revised to account for institutional settings, with an eye toward identifying how political dynamics are conditional on institutional structure. Statistical models should use interaction effects to engage in comparative institutional analysis, rather than be satisfied with direct effects. We predict that as the number of empirical settings expands and data gathering protocols improve, researchers will discover many other interesting interaction effects. Although a priori theory should be used to guide inquiry, as the findings accumulate, there will be opportunities for meta-analysis and theoretical synthesis.

## APPENDIX

TABLE A1: Zero-Inflated Poisson Models for Conservation Amendments

	<i>Without Interaction</i>		<i>With Interaction</i>	
	<i>Coefficient</i>	<i>SE</i>	<i>Coefficient</i>	<i>SE</i>
Interest group variable (Poisson model)				
% construction	-0.22	0.07**	-0.30	0.09**
% real estate	-0.28	0.28	0.15	0.21
% Black	-0.15	0.04**	-0.19	0.06**
% college	0.09	0.05*	0.09	0.05)*
Median income (\$1000)	-0.07	0.04*	-0.08	0.04*
Institutional variable (Poisson model)				
Mayor-commission	-0.18	0.63	0.16	0.77
Manager-commission	-1.56	0.56	1.74	1.72
% district commissioners	-0.01	0.004**	-0.009	0.005
Number of cities	-0.02	0.03	-0.02	0.03
Manager-Commission × Real Estate interaction	N/A	N/A	-0.81	0.35**
Property rights variable (Logit model)				
Natural log population	-0.42	0.10**	0-.42	0.10**
Natural log county miles <sup>a</sup>	0.37	0.28	0.37	0.28
Mean travel time	-0.03	0.04	-0.03	0.04
Model Parameters				
Natural log county square miles (exposure variable)	0.93	0.62	1.09	0.68
Wald $\chi^2$	290.30 ( <i>df</i> = 10)**		351.58 ( <i>df</i> = 11)*	
McFadden's $R^2$	.20		.24	

NOTE: Cell entries are unstandardized zero-inflated Poisson regression coefficients.  $N = 931$  for both models, representing two amendment cycles per year for years 1994–2000. Null hypothesis test of coefficient = 0.

\* $p < .10$ . \*\* $p < .05$ .

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