

Intergovernmental Institutions and Local Environmental Policy Choices

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Policy decisions at the local level of government are framed by a set of institutions established at the state and local levels that determine what changes can be accomplished and through what channels. In the study of intergovernmental relations, institutions are important because they shape individuals' actions and preferences, provide stability to collective choices, minimize transaction costs, limit choices, affect policymakers behavior and preferences, and provide incentives for political exchange (Clingermayer and Feiock, 2001). Given this role for institutions, one can argue that any serious analysis of policy choices at the local level requires focusing on the role of intergovernmental relationships.

However, empirical studies conducted at the local level have consistently ignored intergovernmental rules and institutions in the explanations provided. One policy area where neglect of intergovernmental institutions is particularly egregious is empirical analysis of solid waste management. Recent efforts to explain the adoption and success of municipal recycling programs (Folz, 1991; Folz and Hazlett, 1991; Mrozek, 1996) have failed to include intergovernmental factors such as mandated recycling goals, financial assistance, incentives, and the role of state solid waste management comprehensive plans. There are few exceptions. Feiock and West (1993) develop a model of federalism to test the impact of state rules (mandates, financial assistance, reduction goals, incentives, and administration and enforcement) in the adoption of municipal solid waste recycling programs. The same authors (1996) also include state level goals and mandates in a test of the success of municipal recycling programs. Another exception is provided by Khator

(1993) who examines the impact of Florida's state recycling law at the county level of government.

History also provides a compelling reason to explore the nature of intergovernmental institutions. Throughout the 1960s and 1970s, the impacts of local policy became extrajurisdictional, justifying state legislation to deal with negative spillovers, collective action problems, and other assorted market failures. Following the call made by Burns and Gamm (1997) to an exploration of the link between state legislatures and local government, this paper helps to fill this important lacuna in theoretical and empirical analysis of local government policy. Even though state level rules in a given state may apply to all local jurisdictions, local policy choice and implementation varies across localities. Using state level rules as controls, this work also addresses the local/contextual determinants of this variation.

Rationale for Local Policy Instrument Choice: The Tools Approach

The focus of the empirical analysis in this paper is the policy instrument¹ and we contend that local choices are made within the constraints provided by both state and local level rules.

In policy areas where the local government plays an important role such as solid waste, economic development, and growth management, it is possible to identify a number of tools usually available to local officials to help them deal with each of these policy concerns. In addressing local policy choices constrained by state rules we employ

¹ The concepts policy instrument, policy tool, and production technology will be used interchangeably throughout this paper.

the tools approach to highlight economic and political tradeoffs faced by local officials when choosing between competing alternatives. Each policy tool has its political economy, which makes them attractive or undesired by local officials, interest groups, and citizens.

In recent years the public policy and welfare economics literatures have directed attention to the specific policy instruments that governments employ to pursue policy goals (Salamon, 1989; Weimer and Vining, 1999; Peters and van Nispen, 1998; Salamon, forthcoming). The tools paradigm was first proposed and explained as a field of inquiry by Salamon (1981) and Salamon and Lund (1989). As argued by these authors, the tools share a set of essential features and are generally used to accomplish the same goals. In other words, the tools are alternative means of accomplishing similar governmental policy objectives.

While a growing literature explores how context can affect the choice of policy instruments, most attention has been on the comparison of markets with public bureaucracies. Moreover, this work has focused on national level policy to the neglect of instrument choices at the local level. Research on the tools of government action has classified a variety of instruments available to address government and market failures (Hood, 1983; Linder and Peters, 1989; Salamon, 1989; Weimar and Vining, 1999; Feiock Tavares and Stream, 2001). While policy instrument typologies sometimes apply different labels to various strategies, each describes generic policy instruments used to address failures of markets or government to deliver goods or services.

A wide array of policy instruments is available for implementing local environmental goals. At the aggregate level, municipal solid waste programs combine various generic

policy instruments and reflect the interests of multiple constituencies. In the analysis that follows we do not treat waste policy as monolithic. Instead, we identify separate policy instruments as interventions with unique implications resulting from distinct institutional contexts. It is important to analyze the choice of tools in terms of what problem government is trying to address, what the strengths and weaknesses of each tool are in dealing with the problem, and what the consequences or impacts are of their use in specific communities. At the local level, more than any other level of government, the link between policies and goals is, or at least should be, clear. Policy instruments or tools are devices used to achieve a specific goal (Salamon and Lund, 1989).

Policy tools will be distinguished according to both economic and political characteristics. Economically, tools differ on the benefits and costs accrued to the median taxpayer and the choice should reside in the policy instrument or combination of instruments producing the largest marginal benefit. In order to produce the best choice under a Pareto efficiency criterion, benefits and costs of the available tools should be examined.

Policy instrument choice, however, cannot be reduced to an economic criterion. In fact, political and distributive interests are involved so that policy makers choose the policy tool or combination of tools which minimizes political transaction costs.

The relevance of the tools approach to local government choices should by now be apparent. At the local level, the link between goals, choices, and outcomes is much more clear than at upper levels of governments. First, contrary to state level choices, which are much more general and usually address regional or statewide issues and are targeted to

achieve state level goals and objectives, local policy choices deal with the inherently local problems.

Second, local level policy makers are able to assess the benefits and costs of each tool much more accurately and choose according to an economic efficiency criterion. More specifically, a policy instrument entails economic benefits because its adoption can produce savings, if the instrument is a less costly way of achieving the same goal, or economic costs if the reverse occurs.

Third, the local choice is determined by local officials, interests, and constituencies who are much more closer to decision makers and, hence, can more easily influence them. Not incidentally, this also allows local officials to have a better sense of the political transaction costs they face in making the choice. In other words, policy instruments are not neutral means of accomplishing the same objectives.

Fourth, and most significantly, state officials direct, constrain, and limit local choice but do not choose local policy tools. Ultimately, this decision belongs to the local community and this fact justifies the emphasis placed upon the relevance of local context in the remaining pages.

Contrary to previous attempts to enumerate comprehensive classifications or taxonomies of instruments applicable to governments as a whole (Phidd and Doern, 1978; Salamon, 1981; McDonnell and Elmore, 1986; Salamon and Lund, 1989; Linder and Peters, 1989), here we focus in the notion of tools available to deal with a specific problem in a given policy area.

When thinking of the solid waste problem, four policy tools are considered: landfilling, incineration, recycling, and source reduction. Tool choice has to be placed in

a context, considering three essential features (Linder and Peters, 1989): the institutional framework within which local officials operate, the problem situation at hand which demands the tool choice, and the temporal context at which the choice is made. However, equally important for the examination of the policy choice, it is to consider the characteristics of the tools available and the trade-offs inherent to their adoption.

The analysis of policy choices at the local level is then centered in the policy tool and on what factors determine the choice of these policy instruments. The next section discusses the intergovernmental factors that influence local level choice. Then, we proceed by highlighting the local setting where these choices take place, namely by mentioning the role of local institutions and rules in framing choices, the local context where economic trade-offs in policy instrument choice take place, and the political transaction costs faced by local officials when deciding between competing alternatives.

Intergovernmental Rules and Local Policy Instrument Choice

State level rules function as intergovernmental institutions that communicate state level preferences, define local roles, and establish the upper limits of local choices (McCabe and Feiock, 2000). In this sense local governments are agents of the state. By defining legitimate actions, state rules structure how local actors approach policy decisions in general and shape the path of future policy choices. The direct effect of state level rules is mitigated by information asymmetries and political incentives. Local actors, but not state policy makers know their true motivations, abilities, and propensity to behave opportunistically. Local actors realize that they must comply with the rules of

the intergovernmental contract, and recognize where it constrains the pursuit of local political objectives. This, in turn can lead to a shift of policy strategies as local actors attempt to achieve political goals under state rules.

The essential question presiding this kind of research is: “How do local governments respond to environmental policy shaped at the state level?” State laws affect the behavior of local actors by forcing them to comply or by making them adjust their behavior in order to circumvent those upper level rules. The success of state laws is largely dependent upon the incentives embedded in the legislation usually intended to raise costs of noncompliance, reduce information asymmetries, and diminish time-consistency of action problems (Dixit, 1996). Local policy is generated within an intergovernmental framework and hence partly shaped by federal and state limitations.

Local governments are dependent upon the states for financial support, regulation, and in other ways. Examples of this type of impact are state level mandates that force local governments to comply. A mandate can be best seen as a change in policy venue in the sense that it denies the local government the authority to decide over a certain issue obliging it to comply. At the same time, the rules established at the state level constitute constraints that induce stability in local government performance. From the point of view of local governments, these upper level rules can be extremely difficult to modify for several reasons.

First, rules are difficult to change because they confer advantages to certain individuals or groups that will oppose efforts to changes in rules detrimental to their own projects (Goodin, 1996). Moe (1990) contended that institutions are not only a way to solve problems of collective action, but also instruments of coercion and redistribution.

Thus, institutions are not neutral; they create winners and losers and induce equilibrium in the political system (Shepsle, 1979).

Second, because institutions shape preferences of individuals and groups, they also favor the preservation of the status quo by introducing stability in social interaction. The first and the second argument are linked by the fact that, with a structurally induced equilibrium changes in the rules of the game become difficult to accomplish.

Finally, because rules represent power differentials between individuals and groups, policy and institutional change happens when shifts in the distribution of bargaining power among individuals or groups occur. Knight (1992) argues that collective action costs and uncertainty costs are the obstacles facing policy and institutional emergence. The former type of costs refers to the difficulty in getting individuals and/or groups to support proposed changes, whereas the later type of costs concern the degree of difficulty in predicting the consequences of the intended change. When the benefits of supporting and enacting a given institutional or policy change exceed the costs the change is more likely to occur. For these three reasons we expect that local actors will face strong obstacles when attempting to change rules or policies defined at the state level. Does this mean that change in local level policies is a rare phenomenon and a hostage of federal and state level institutions?

Based on the arguments presented we expect intergovernmental institutions – federal and state regulations, fiscal policies, and mandates – to affect political action and behavior at the local level. However, even if state level rules act as constraints to local behavior one can also expect that local governments will exhibit adaptive behavior in

order to pursue their self-interest engaging in what Sbragia (1996) called the politics of circumvention.

Sbragia (1996) argued that throughout the twentieth century local governments became increasingly immersed in "...a complex framework of limitations constructed by state governments, state courts, and the Supreme Court." (p. 102). To address these limitations, localities promoted legal, financial, and organizational strategies of circumvention that allowed them to pursue their own goals without violating the rules established by their principals.

In the case of local borrowing, Sbragia suggests that two complementary mechanisms were adopted as strategies to circumvent general-obligation bond restrictions imposed by state governments²: the issuance of revenue bonds and the creation of public authorities. The two instruments are interrelated because one of the distinguishing features of a public authority is the ability to use revenue bonds as its major method of finance.

In a similar vein, Burns (1994) highlighted the important role of state legislatures in the formation of local governments. Diverse state legislation affects the ability of cities to zone, prevents them from taxing neighbors, restricts annexations, constricts voting rights in special districts elections to property owners, and imposes diverse tax limitations.

Empirical work has addressed the politics of circumvention by local governments. Principal-agent theory has been applied to interpret the adoption of state level limits on local taxes and expenditures (TELS) and their implications for local finances. This work suggests that while TELS have reduced property tax dependence they have created incentives to increase revenue from fees and charges (McCabe and Feiock, 2000).

² Restrictions imposed by state governments may include debt limits, and referenda requirements, among others.

Empirical work by Carr and Feiock (2000; 2001) concludes that smaller, but more frequent, annexations are an integral part of the adaptive behavior displayed by local governments facing state level constraints on annexations. From this perspective it seems clear that change at the local level can be hindered or at least slowed down by the stability of state level institutions.

The fact that local governments are embedded (nested) in the intergovernmental system affects the time and scope of policy change at the local level. On one hand, when change takes place within the institutional constraints imposed by upper levels of government it is slow and incremental. On the other hand, when rules change in national or state level the repercussions at the local level may be dramatic and non-incremental.

Local Institutions, Contextual Factors, and Policy Instrument Choice

An examination of the literature focusing on policy choice at the local level reveals a primary concern with local contextual variables such as quasi-market competition, local interest groups, socio-demographic factors, and the local institutions adopted, among others. I begin this discussion by examining the part played by local institutions in local policy outcomes.

The Role of Local Institutions in Policy Instrument Choice

The form of government allowed by the municipal charter, the form and frequency of elections, the power of eminent domain, and the authority to incorporate as a

municipality are just a few examples of the formal institutions and rules of government that can influence policy outcomes at the local level (Clingermayer and Feiock, 2001).

Fleischman (1985) pointed to the way private interests are affected by local boundary change. This author recommends that, besides focusing on collective action costs involved in bringing about local boundary change, one should also consider private benefits and costs that accrue to local actors. In other words, changing boundaries at the local level involves distributional issues that have to be examined when analyzing the motivations for collective action (Burns, 1994).

A similar argument is considered by Maser (1985) when discussing the adoption and change of municipal charters. The author argues that changes in municipal charters are a consequence of citizens' demands for political outcomes. First, local actors with policy preferences shape institutional rules to further those preferences (Miller, 1985). Second, because distributive consequences arise from the adoption or change in local level institutions, it is certain that local policies will be affected by these institutional factors (Maser, 1998).

Because past options are the result of a certain distribution of power resources, information, and preferences at a given point in time, they tend to operate as institutions. In the same tone, Dixit (1996) argued that policy acts have long-term consequences because they create constituencies that benefit from the policy and will resist alternatives that challenge the status quo. Hence, local policy change is very much determined not only by local institutions but also by shifts in the balance of the power distribution. In order to identify changes in this distribution it is necessary to focus on the relevance of

contextual factors in determining local policy outcomes. This is the topic of the next section.

The Role of Local Contextual Factors in Policy Tool Choice

Contextual factors – political, economic, social, and demographic – mold local policies. A large body of literature based on the ideas of Tiebout (1956) has developed over the last forty years guided by the idea of the existence of a quasi-market for local public goods. The extremely restrictive assumptions of the Tiebout model include consumers interest maximizers making rational decisions about where to live, that is, citizens make “buying” decisions with their feet by moving from one local government to another that provides them better bundles of services.

While other studies confirm the existence of local markets for public goods (Teske, Schneider, Mintrom, and Best, 1993; Schneider, Teske, Marschall, and Roch; Stein and Post, 1998), the criticisms of this model are intense. Lowery and Lyons (1989) concluded that voice and contracting are more important than the exit mechanism embodied in the Tiebout model. For this reason the authors argue that the choice between consolidated and fragmented structures does not affect the political participation at the local level.

Whatever the side of this debate one might choose to take, it is clear that the local environment and market matter when dealing with policy choices. The context in which these decisions are made includes institutional factors, discussed in the previous subsection, and non-institutional factors such as business interest groups, citizen interest groups, race and class divisions, fiscal conditions (property tax base, rates, fees, etc.), and demographic variables. One last factor remains to be discussed.

Every time a policy decision is made, it influences future options and future decisions to be made by elected and appointed officials. The concept of path dependency is relevant for the analysis of local policy outputs because it focus on the role of history in determining current policies. Woodlief (1998) explained the importance of path dependence theory by arguing that early choices decisively affect later policy options by locking in preferences. For example, early choices regarding urban development and expansion influenced the alternatives available in later periods regarding urban mass transportation.

Once following a given policy path it is extremely costly for a local government to revert it. These sunk costs are not only economic, but also political. If a city enacts a set of curbside recycling programs or implements a city pension plan it gets locked-in a self-reinforcing policy path that is politically costly to revert. Even more difficult to correct are structural lock-ins such as road design or tax and regulatory policies that affect local retail and residential areas (Woodlief, 1998). The reason why structural lock-ins may be more enduring is because they involve physical modifications in the landscape that are much more difficult to revert. The pattern of policy change when the lock-in is structural will be mainly incremental since it involves infrastructures – roads, bridges, railways among others – already in place that might be extremely difficult, if not impossible to alter. As a consequence policy change is locked in a constraining path and choices are severely limited.

Solid Waste Policy Instrument Choice at the Local Level

We contend that intergovernmental institutions are critical to understand local solid waste management. Most policy decisions are concentrated at the state and local level. McClain (1995) argues for an integrated approach to solid waste management at the local level that should rely on a combination of production technologies tailored for each community. This freedom in defining the appropriate combination of policy instruments is, as we have seen, somewhat limited by federal and state solid waste legislation. For example, the U.S. Environmental Protection Agency only provides major guidelines regarding national recycling goals, allowing the states large discretion in the design of recycling policies, establishment of goals and comprehensive planning. In turn, recycling programs are carried out by county and city governments that are responsible for their design, implementation and, ultimately, success or failure.

Both state and local government solid waste management practices have been described as a “highly fragmented patchwork of legislation” (Powelson and Powelson, 1992). If it is possible to find some consistency or pattern across state level legislation, the same cannot be said for the local level, where solid waste choices are very much related to the local context, including cost of solid waste policy tools, industry interests, environmental leadership, and political commitment.

The theoretical framework described in the preceding pages is now applied to solid waste management practices in the 67 Florida counties. The data set for this analysis is provided by Florida’s Department of Environmental Protection (www.dep.state.fl.us/dwm/). The description of hypotheses, variables and their indicators

follows next, divided in two subsections dealing with economic effects and political-distributive effects upon local policy choices. Throughout both subsections the hypotheses pertaining to the intergovernmental aspects of local policy choices are highlighted.

It is possible to focus this analysis upon several features of policy instrument choice, such as the number of recycling programs per capita, the total tons per capita landfilled, recycled, or incinerated. Current limitations of data prevent us from engaging in such an ambitious task. Therefore, we concentrate the empirical analysis upon the size of recycling programs measured as the percentage of households covered in 1998 as an indicator of effort to supply this specific policy tool.

Production Technology Choice at the Local Level

Local officials policy instrument choices can be framed as a set of management technologies from which they choose the appropriate combination. The choice depends upon the relative costs of each of the alternatives and addresses some of the factors that might affect these costs such as costs of disposal, economies of scale, levels of participation in recycling initiatives, and state level grants to local governments.

In considering the economic trade-offs between alternative production technologies, officials choose the combination of policy tools which maximizes the benefits of waste disposal at the least cost for the median taxpayer. *Ceteris paribus*, as the cost of one alternative increases, officials are expected to substitute that alternative for another of lower cost.

The choice between the three policy tools available to manage solid waste is determined in large part by the relative cost of the options. It can be expected that jurisdictions will compare landfill and incinerator tipping fees and the administrative costs of recycling programs.

Kinnaman and Fullerton (1997) found that a \$1 increase from the average in the landfill tipping fee leads to a .78% increase in the likelihood of adopting a recycling program. Even though the substitution effect between the reliance on landfilling and recycling has been supported empirically there are a few caveats. Several authors have found evidence that the costs of operating curbside recycling programs exceed those of landfill disposal (Franklin Associates, 1994; Solid Waste Association of North America, 1995 – both cited by Kinnaman and Fullerton, 1999). Palmer et al. (1997) reach similar conclusions by arguing that recycling more than 7.5% of the total amount of waste is an inefficient choice given that landfill disposal becomes a less costly option.

The capacity of local landfills affects the choice of production technology. Peretz (1990) argued that communities facing lack of landfill capacity face pressures to look for alternatives to solve the solid waste management problem. The availability of suitable land for future landfilling also influences the choice of production technology. Overall, low landfill capacity will tend to increase negative externalities. Furthermore, the health and contamination safeguards involved in each choice will also affect the presence of negative externalities. In jurisdictions where there is a shortage of landfill capacity, the costs and possibly the negative externalities associated with landfilling are high, leading to increases in the scope of recycling programs.

Similarly, incineration involves costs and negative externalities that are pondered when deciding the production technology to be employed. In general, we expect that as the costs of recycling decrease relative to incineration costs, the larger in scope the municipal recycling programs will be. In accordance, Everett (1989) shows with the New Jersey case that, lower costs of other available options can also contribute to smaller programs. On the other hand, the enactment of air pollution controls on incinerators is likely to increase the cost of adoption of this production technology and, by that, decrease the relative cost of other solid waste management options.

In order to measure economic trade-offs between solid waste policy instruments, we employ three variables measuring landfill, incineration, and recycling costs. Landfill and incineration costs are measured as the average landfill tipping fee and waste-to-energy tipping fee³ in each county respectively. Recycling costs are measured as the average cost per capita of the county's recycling programs⁴.

The choice of production technology is also a function of population density. On one hand, low densities are likely to indicate more available space and an option for the landfilling solution. On the other hand, higher densities produce economies of scale so that production technologies which achieve cost savings through higher density such as recycling and source reduction programs are more likely to be adopted.

Some authors have argued that the average costs of recycling decrease with the amount collected confirming the argument of economies of scale (Bohm et al., 1999). Kinnaman and Fullerton (1997) show that a community with 100 more people per square

³ The waste-to-energy variable was dropped due to the small number of these facilities in Florida.

⁴ This variable is lagged one year to allow for readjustments in program size/coverage as a result of program cost.

mile is 4.2% more likely to adopt a recycling program. In our analysis, density is measured as the 1998 county population per square mile.

A similar mechanism is thought to occur when the population of a municipality increases. The size of the population has been analyzed under the rationale that, as the population increases, the amount and diversity of recyclable materials also increases creating the need for solid waste programs larger in scope. Again, according to our waste management explanation, the costs of recycling programs will go down as the population gets larger, which allows for recycling programs larger in scope (Paehlke, 1993). In their 1993 study, Feiock and West also found population to be a positively significant predictor of the adoption of municipal solid waste recycling programs, both in the need/responsive model and in the final model. Population is included in the analysis using the 1998 official estimates from the Florida Governor's Office.

Intergovernmental financial assistance to finance recycling programs alters the benefit/cost ratio of recycling relative to other alternatives. Grants are likely to reduce the relative cost of recycling when compared to other available alternatives and, for this reason, encourage broader recycling programs. Local governments receiving more money to stimulate recycling are also more likely to display higher rates in the use of this solid waste policy tool. Feiock and West (1993) found that state level mandates and intergovernmental financial assistance were significant predictors of the adoption of residential curbside programs. The Recycling & Education Grants provided by the state of Florida to its local governments for the fiscal year of 1996-97 is used to test this hypothesis. In addition, county solid waste expenditures per capita lagged one year is included to test the effect of spending upon the size of recycling programs.

Policy Tools as Consumption Goods at the Local Level

The choice of policy tools at the local level is also shaped by local contexts and institutions. Next, we address the relevance of these factors in the choice of solid waste policy instruments by local level government officials.

Policy Instrument Choice and Political Benefits: Citizens, Interest Groups, and Entrepreneurs

At the local level, the role of interest groups involved in environmental policy is particularly salient given that the proximity to decision makers and local officials is higher hence increasing the ability to have their claims attended. Better than at the state level, government officials are able to choose the combination of policy alternatives or tools that maximizes electoral benefits and minimizes ideological costs. In order to accomplish these goals, the consideration of the socio-economic make up and context of the local community is crucial in determining the combination of policy tools.

Neighborhood associations and environmental interest groups are likely to be more active in opposing the presence of a landfill in the jurisdiction because of potential for decreased property values (Kinnaman and Fullerton, 1999; Nelson et al. 1992).

On the other hand, local commitment to the environment is expected to increase the likelihood of the adoption of curbside recycling. Tawil (1995 – cited in Kinnaman and Fullerton, 1999) found that the probability of adoption increases by 4% with a 1-percentage point increase in the number of households belonging to an environmental

interest group. Using county data, Mrozek (1996) concluded that pro-environmental voting was a statistically significant variable in predicting curbside pick-up adoption.

Other empirical studies confirm the expectation that the presence and influence of environmental support in a given municipality associated with recycling programs larger in scope and the performance of recycling programs (Feiock and West, 1993; 1996).

A similar argument can be made for landfills and waste-to-energy plants (WEP) operated either by private entities or the government of the jurisdiction. If, in a given jurisdiction, the percentage of solid waste diverted to a landfill or WEP is large, it is probable that the owners and operators of these businesses will oppose recycling. Clearly, owners and operators of landfills and waste-to-energy plants are likely to resist the adoption and expansion in size of recycling programs because these will negatively affect their income and survival. To measure the opposition to recycling we employ the number of private landfills per capita in each county.

One can expect that the socio-demographic make up of a jurisdiction will have a role to play in the mix of policy tools adopted by that community. Previous findings indicate that wealthier, more educated, and more liberal communities recycle more.

Two arguments indicate a positive relationship between income and solid waste management prevention strategies such as recycling and source reduction. On one hand, wealthier citizens are more likely to support local government prevention strategies because they associate these options with an increased quality of life. On the other hand, wealthier citizens wish to avoid the harmful consequences of the presence of a landfill or incinerator in their community that may depress property values. These individuals, who are more likely to be property owners, will also have more space required by recycling

activities. Several empirical pieces confirm the positive association between income and recycling (Feiock and West, 1993, 1996; Berger, 1997; Kalan and Feiock, 2000; Tavares, 1999; 2001). To test this hypothesis we employ the county per capita personal income as reported by the Florida Statistical Abstract for the year of 1998.

The association between education and prevention strategies is also generally thought to be positive, not only because more educated citizens and communities are expected to be more environmentally conscientious hence favoring recycling and source reduction over other alternatives, but also because they will more easily recognize the environmental costs entailed by landfills and waste-to-energy plants. Using nation-wide data of 909 communities, Kinnaman and Fullerton (1997) find that the likelihood of a jurisdiction adopting curbside recycling increases by 0.86% with a one-percentage point increase from the average in the percentage of individuals with a bachelor degree. The effect of education attainment on the size of recycling programs is measured as the percentage of county's population with high school diploma in 1998 with the data being retrieved from the Florida Statistical Abstract.

In order to test the positive association between citizen liberalism and the size of recycling programs we employ the percentage of county population voting for the Democratic Party in the 1996 presidential election.

Administrative and Decision Making Costs

At the local level, the equivalent to state legislative opportunity costs are administrative costs. Recycling programs require large amounts of both financial and human resources (Wiseman, 1992). Their size will therefore increase as the amount of

resources devoted also increases. The county solid waste expenditures per capita is used as an indicator of administrative costs incurred by the county in managing solid waste. As spending increases, the coverage of recycling programs is also expected to increase.

Commitment Costs, Sunk Costs, and Path Dependency

The minimization of political transaction costs by local officials is largely determined by local contexts. The presence and predominance of interest groups favoring one or several of the policy instruments will affect the degree to which elected officials can commit to a given choice. The minimization of commitment costs forces officials in communities with a large number of recycling establishments to adopt preventive strategies rather than relying on landfilling and incineration. In our analysis we use the number of recycling centers and facilities per capita operating in a county as an indicator of environmental interest group strength.

Commitment to a given mix of policy tools inevitably generates sunk costs because resources are invested in programs, facilities, and equipment and cannot easily be retrieved. For this reason, larger reliance on a single strategy will make it more difficult for government officials to switch to other strategies.

Finally, the earlier the commitment to a strategy, the more difficult it will be to change tools. As an example, local governments that relied earlier on recycling are also likely to have higher recycling rates being that age and size of the program should be good predictors of these rates. Here, we employ state recycling and education grants per capita lagged up to seven years to test the link between past practices and current size of recycling programs.

The Effect of Local Institutions: Form of Municipal Government and System of Elections

The form of government is also included in this analysis under the contention that political preferences for expanded recycling will be most influential under mayor-council governments.

Mayor council (unreformed) governments are more likely to adopt recycling programs larger in scope due to the political attractiveness of this option. It is our contention that, in local governments with unreformed governments, the programs will be larger in scope because politicians will have incentives to pursue allocative efficiency and be more responsive to political demands.

On the other hand, counties with reformed governments are less likely to adopt recycling programs with a broad scope of materials. Council-manager governments have less of an incentive to adopt recycling programs for political reasons. In the council-manager type of government, high-powered incentives are not as pervasive as in the mayor-council type. Managers may only choose to adopt programs large in scope if the benefit-cost ratio of this option exceeds those of other alternatives. In other words, city managers are more concerned with efficient waste disposal. Hence, the decision concerning the size of programs is not related with citizens' demands or lobbying activities but with professional considerations of managers and their perceptions of the public interest. These incentives are described as low-powered and result from the appointment of a manager as chief executive.

The council manager variable is a dummy, which takes the value of "1" for counties using this form of government and "0" otherwise (Commission and Council Elected Executive forms of government). An interaction term is included to capture the combined

effect of the council manager form of government and the cost of landfilling upon the size of recycling programs.

The system of election is commonly thought to affect the pattern of policy instrument choice among local governments. District based elections are frequently associated with the distribution of benefits to local constituencies by local officials that are able to target these benefits to specific groups. Our analysis includes a dummy variable (“1”=District election and “0”=Otherwise) to account for the impact of the electoral system upon recycling program size. The coefficient should be positive. Table I summarizes the independent variables included in the empirical analysis.

(Table I about here)

Estimation Procedures

The number of observations in the analysis is 66. Duval County was dropped from the estimation due to missing data. The interaction term described in the previous section was dropped due to crippling multicollinearity problems. The inclusion of a variable addressing the form of election was compromised due to lack of reliable data for the Florida counties. An attempt was made to estimate the model with data available for 24 counties, but the coefficients become unstable and the variable was dropped.

We proceed by estimating an ordinary least squares model with robust standard errors correcting for heteroscedasticity. Next, we estimated seven other models where the only variable changed was recycling and education grants. The variable was lagged one

additional year in each estimation. The results of these estimations are reported in Table II and discussed next.

Empirical findings

The overall model performs reasonably well by explaining 49 percent of the variation in the dependent variable. The results confirm the impact of institutions upon the size of recycling programs. The form of government variable is statistically significant at the 90% confidence level. In counties where the council manager form of government is adopted the percentage of households covered by recycling programs is, on average, higher by approximately 20 percentage points, holding the other variables constant and controlling for the effect of recycling program cost⁵.

(Table II about here)

Equally important result is provided by the recycling and education grants variable. State grants contribute to an expansion in size of recycling programs. Each additional dollar per capita distributed by the state of Florida to its counties increases the percentage of households covered by 8 percentage points. As previously stated, this variable uses data of the recycling and education grants for the 1997-98 fiscal year. In order to test the idea of path dependency, we lagged this variable as many years as data was available for the Florida counties. The results are presented in table III.

⁵ An alternative estimation of the same model employing the interaction term (council manager * landfill tipping fees) results in a positive but non-significant coefficient, indicating that the hypothesis that, managers will prefer recycling when landfilling is an expensive option does not receive empirical support.

(Table III about here)

The results are remarkable in that all the lags are statistically significant at least at the 90 percent confidence level, even when one looks at grants provided seven years before. In terms of path dependency and distributive consequences this means that counties receiving more financial support seven years before present recycling programs with larger coverage in 1998. In other words, the impact of early choices lingers for years in terms of solid waste options.

Other results are worth mentioning. Counties with a one-percentage point higher educational attainment have, on average, recycling programs covering two percentage points more households. Population is positive and significant but the substantive impact is very small. In counties with ten thousand more inhabitants, recycling programs cover, on average, 0.3 percentage points more households. This should come as no surprise, given the expectation of economies of scale present in these programs. The density variable is also significant but with a negative sign. This is a surprising result and difficult to justify because it contradicts our expectations indicating the presence of diseconomies of scale⁶.

Another unexpected result is the negative effect of recycling centers and facilities on the coverage of recycling programs. One reason may account for this fact. Since we are attempting to measure the effect of environmental interests upon recycling choices, it is reasonable to argue that quantity of establishments does not equate to strength of

⁶ Due to the strong correlation between the population and density variables, we re-estimated the model dropping the population variable, but density is still negative, barely missing statistical significance.

recycling interests. In fact, the opposite effect may be occurring. The smaller the number of establishments the better they may organize to make their interests prevail. At this point, data to measure the size of these establishments is not available since our data presents an aggregate number that includes drop-off centers, materials recovery facilities, buy back centers, and recovered materials processing facilities. However, in the presence of a large quantity of establishments one can expect that some positive impact will occur in the size of recycling programs. To account for this possibility, we included a squared term of the environmental interest group variable and, as expected, the sign of this coefficient is positive and statistically significant at the 90 percent confidence level.

Of the remaining variables, income, partisanship, local solid waste expenditures, and landfill tipping fees have positive, albeit non-significant, effects upon recycling program size that partially confirms our expectations.

Conclusions

The empirical analysis of recycling programs in the Florida counties provides moderate support for our theory. The assertion that past choices regarding solid waste management influence, if not determine, present options is largely confirmed. More importantly, the use of state government grants to stimulate recycling seems to produce the desired result, at least in terms of recycling program coverage.

The results also confirm the relevance of local institutions in policy instrument choice. However, the unequivocal finding that council-manager governments are characterized by higher rates of recycling coverage is surprising and denies commonly

accepted ideas that electoral incentives drive mayor-council governments' policy choices. Future attempts to determine the impact of the form of government upon local policy choices should focus on the important interaction effects that may be occurring between this variable and the relative cost of policy instruments. Because our efforts to do so result inconclusive, one can think of this as an additional reason to push for further research.

Table I

Variable Measurement and Predicted Coefficients

Variable	Description	Predicted Coefficients
Economic Effects		
Population	Office of the Governor 1998 estimates	+
Density	Population per square mile	+
Solid waste amount	Tons per capita	+
Landfill Costs	Landfill tipping fees	+
Recycling Costs (t-1)	Recycling program cost per capita	-
Local Solid Waste Expenditures (t-1)	Local solid waste expenditures per capita	+
Electoral Benefits		
Income	Personal income per capita	+
Education	Percent population with high school or above	+
Partisanship	Percent Democrat (1996 Presidential election)	+
Environmental interest groups	Recycling centers and facilities per capita	-
Environmental interest groups (^2)	Squared term	+
Landfill interests	Landfills per capita	-
Institutional Variables		
Form of Government	Dummy variable (1=Council Manager 0=Other)	+/-
Form of Election	Dummy variable (District =1 At Large =0)	+
State Recycling Grants	State recycling and education grants per capita	+

Table II

Local Solid Waste Management Analysis

Dependent Variable: Percent of Households Covered by Recycling

Variable	Coefficients	Robust Std. Err.	t-statistics
Economic Effects			
Population	.000	.000	2.50
Density	-.019	.005	-3.80
Solid waste amount	-.565	12.3	-.046
Landfill Costs	.178	.336	.528
Recycling Costs (t-1)	-.117	.250	-.468
Local Solid Waste Expenditures (t-1)	.138	.163	.847
Electoral Benefits			
Income	.001	.001	.489
Education	2.30	.945	2.43
Partisanship	.725	.665	1.09
Environmental interest groups	-.551	.251	-2.20
Environmental interest groups (^2)	.002	.001	1.87
Landfill interests	.940	1.12	.842
Institutional Variables			
Form of Government	20.4	11.8	1.73
State Recycling Grants	8.15	3.20	2.55
N=66			
F=7.45 (Prob. >F = 0.000)			
R^2= 0.49			
Constant	-192.3	76.23	-2.52

Table III

Lag	Coefficient	t-statistic
R&E Grants (t-7)	4.22	1.73
R&E Grants (t-6)	4.45	1.84
R&E Grants (t-5)	5.02	2.02
R&E Grants (t-4)	4.81	1.75
R&E Grants (t-3)	5.26	1.64
R&E Grants (t-2)	6.06	2.00
R&E Grants (t-1)	6.62	1.94
R&E Grants (t)	8.15	2.55

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