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Do Special Districts Act Alone?:
Exploring the Relationship Between
Flexible Boundaries and
Intergovernmental Cooperation

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ABSTRACT

Special districts have been seen as a formalized institution for promoting regional cooperation. They allow boundary design to the scale of public problems and may produce greater efficiency in the marketplace for local public goods. Many scholars also have highlighted the flexibility of special district boundaries once established, arguing that this flexibility allows for governance that is more adaptable to changing resource constraints and patterns of demand. While flexible boundaries might promote special districts' ability to internalize spillovers while acting alone, it might impede more ad hoc forms of cooperation among localities. This paper presents evidence that boundary change is a substitute strategy to the establishment of intergovernmental agreements for the resolution of interlocal policy challenges. By allowing special districts with slack resources to expand into new territory, state rules that promote boundary flexibility reduce the likelihood that districts will develop contracting relationships to share their surplus capacity with neighboring governments. The results demonstrate the importance of considering the entire package of coordinating institutions that are available in a given region when we examine how local governments develop solutions to collective action problems.

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Do Special Districts Act Alone?: Exploring the Relationship Between Flexible Boundaries and Intergovernmental Cooperation

Local infrastructure development gives rise to important collective action dilemmas: scale economies that may not coincide with the scale of existing local governments, and negative effects from promoting growth that spill over into neighboring jurisdictions. These dilemmas are amplified in the case of infrastructure for the provision and treatment of drinking water.

Securing water supply to meet a community's demands involves competing for access to an increasingly scarce common pool resource. Once supply has been secured, the provision of drinking water is capital intensive, with high fixed costs for the construction of storage, treatment, and distribution facilities. These assets are highly specific and cannot be deployed for other local government functions. Thus local governments can impose substantial costs on their neighbors when making decisions regarding water infrastructure expansion. They also can help their neighbors to achieve growth goals or resolve water scarcity issues by cooperating for drinking water provision.

This paper focuses on the role of special districts in resolving local coordination problems. Special districts often have been seen as a formalized institution for promoting regional cooperation. They allow boundary design to the scale of public problems and may produce greater efficiency in the marketplace for local public goods. Many scholars also have highlighted the flexibility of special district boundaries once established, arguing that this flexibility allows for governance that is more adaptable to changing resource constraints and patterns of demand.

While special districts may be more adaptable in design, they also contribute to fragmentation of local authority and the concomitant challenges of coordinating policy action

across multiple jurisdictions. Moreover, it is possible that the flexibility of special district boundaries might impede more ad hoc forms of cooperation among localities. This paper considers whether the possibility of boundary change is a complement or substitute to the establishment of interlocal policy agreements. In many circumstances, individual contracting will be a more efficient solution to a collective action dilemma than adjustment of a jurisdiction's boundaries; contracting can maximize use of existing infrastructure while avoiding negative externalities that might arise from boundary change. By allowing special districts to bypass negotiating with their neighbors, boundary flexibility may reduce the incidence of cooperative agreements that could help achieve policy efficiencies. Alternatively, it might promote cooperation by allowing more creative solutions to regional conflict.

The following section discusses in greater detail how special district boundary flexibility and intergovernmental contracts each help to resolve interlocal collective action problems. I then offer hypotheses about how boundary flexibility might serve to promote or suppress the development of ad hoc contracting relationships between local governments. The empirical analysis focuses on local water policy to test these hypotheses, along with other explanations for intergovernmental cooperation on the part of special districts. The analysis shows that for special districts with surplus capacity for production or provision of drinking water, the possibility of boundary change that would allow expansion of the district's customer base reduces the likelihood that the district will establish contracting relationships to share its surplus capacity with neighboring governments. The results demonstrate the importance of considering the entire package of coordinating institutions that are available in a given region when we examine how local governments develop solutions to collective action problems.

BOUNDARY FLEXIBILITY AND INTERGOVERNMENTAL AGREEMENTS

Autonomous local governments with much of the power and stability of cities and counties, special districts diversify local public economies by providing goods and services that other local governments cannot or will not take on. They may supplement the efforts of general purpose local governments in meeting demand for local services, or they replace the city or county in providing an essential local function. Special district boundaries frequently crosscut the boundaries of other local governments, creating layers of local authority that vary in their geographic and functional breadth.

Many scholars and local government observers have expressed optimism about the potential for special districts to help overcome interlocal collective action problems and improve efficiency in the delivery of local services. Specialization allows the scope of each governmental unit to be designed appropriately for the policy area it oversees, allowing economies of scale to be captured and the consequences of policy actions to be internalized (Hawkins 1976; Ostrom, Bish, and Ostrom 1988; Ostrom, Tiebout, and Warren 1961). Advocates of regional governance as a means to improve policy coordination view functionally specialized metropolitan bodies as a politically palatable first step toward a broader regionalism (Altshuler et al. 1999; Downs 1994; Pagano 1999).

While many of the perceived benefits of special district governance stem from policy specialization, some analysts suggest that it is the flexibility of special district boundaries that helps reduce spillover effects and heighten responsiveness to changing public preferences. Foster (1997: 97-98) describes special districts as “geographically adaptable,” able to adjust their boundaries in order to accommodate new development or changes in technology or demand. This is in contrast with “geographically rigid” general purpose governments with jurisdictions

that do not overlap. Hooghe and Marks (2003) treat special districts as a form of Type II governance, characterized in part by flexible design that allows fluidity in jurisdictional size. These treatments suggest that special districts produce efficiencies not only at the formation stage, when their geographic territory can be designed to capture economies of scale and minimize negative externalities, but throughout their lifespan, as their boundaries get adjusted to address new spillovers or accommodate changing populations or preferences.

Empirical evidence on special district boundary changes is scant. The literature on city boundary changes has identified cost savings in service provision as one motivation for municipal efforts to annex neighboring unincorporated territory, along with other rationale including expansion of the tax base and local preferences to change the racial balance of the city (Austin 1999; Feiock and Carr 1991; Liner 1990; Liner and McGregor 1996). Efficiency and service considerations are likely to predominate in the case of special district boundary changes. Special district boundaries do not shape perceptions of local political community as city boundaries do, and special districts lack the land use authority that would allow them to practice exclusionary politics (Danielson 1972). Moreover, it is uncommon for special districts to manage redistributive functions that create the strongest justification for a large tax base. Some special districts do have the authority to impose property taxes, thus creating an incentive to widen their jurisdiction. But in general, expansion of special district boundaries is likely a response to changing service demands or opportunities to achieve policy efficiencies.

Boundary changes can help to solve a local policy dilemma by shaping a single jurisdiction to the scale of the problem or the service demand. Another strategy is the development of cooperative agreements between two or more governments. These intergovernmental agreements may consist of contracts for the purchase of goods or services by

one government from another, or agreements for a government to provide a good or service outside its jurisdictional boundaries. Cooperative agreements between localities are a form of institutional collective action (Post 2004), and they can help reduce damage from spillovers and otherwise overcome the negative impacts of fragmented governance. They also can increase efficiency by taking advantage of slack in existing infrastructure and capturing economies of scale. Pursuit of cost savings is a dominant reason for contracting by local governments (Morgan and Hirlinger 1991; Stein 1990). In many cases, intergovernmental cooperation will produce more efficient policy solutions than boundary change. Contracts are more adaptable than even the most flexible jurisdictional boundaries, and they can allow separation of the production and the provision of public goods and the development of competitive markets for each (Ostrom, Tiebout, and Warren 1961). Even boundary review commissions, state and county institutions established to guide local government creation and boundary change, over time have begun to promote intergovernmental agreements as an efficient and less controversial alternative to annexation (ACIR 1992: 33).

THE RELATIONSHIP BETWEEN COORDINATING MECHANISMS

Boundary change and intergovernmental agreements are two mechanisms by which special districts might address institutional collective action problems. The model presented here examines whether a relationship exists between these mechanisms. In the case of cities, pursuit of efficiency gains has been shown to be a primary motivation for municipal annexation and the establishment of interlocal agreements. Cities rarely have the opportunity to choose between these tools, however, since city boundaries cannot overlap. Annexation therefore requires some supply of annexable land. Indeed, Stein's (1990) thorough analysis of municipal service

arrangements showed no consistent relationship between a city's annexation authority and its decision to contract for services. Special district boundaries have been perceived as more flexible and able to adapt to changing problem conditions and public demands. There is reason to question the flexibility of special district boundaries in practice—just like cities, some special districts are restricted by their enabling legislation from overlapping districts of the same type, and a few analysts have expressed concern that special districts can be difficult to terminate once demand for their services has disappeared (ACIR 1964; Little Hoover Commission 2000). But if it is indeed more feasible for special districts to change their boundaries, does this affect their incentives for developing interlocal agreements with other governments?

A relationship between institutional mechanisms might operate in either direction. The stronger hypothesis is that boundary flexibility and intergovernmental agreements are substitute strategies. If boundary flexibility increases the opportunity for a special district to expand its jurisdiction, that could reduce the district's incentives to cooperate with neighboring governments. This would apply especially to districts with slack resources. A district with excess capacity in its infrastructure might prefer to provide services to new customers on its own rather than form an agreement to sell that capacity to a nearby jurisdiction. Special districts could seek to internalize spillovers through expansion rather than negotiate an agreement with neighboring communities that suffer costs from the district's operations. With less boundary flexibility, interlocal cooperation may seem a more attractive strategy. Alternatively, boundary flexibility and intergovernmental cooperation might complement one another by increasing the range of possible solutions to policy dilemmas created by local fragmentation. Post (2002) has shown that a larger supply of potential partners increases the incidence of interlocal agreements. Boundary flexibility does not increase the density of governments in a region, but it does allow

territorial change by those governments that may cause them to become more likely partners for an agreement—for example, by creating overlap or a common boundary that facilitates labor sharing or infrastructure extension.

Provision of services by a special district typically has been treated as an alternative to municipal annexation (Carr 2004; Feiock and Carr 2001) or to intergovernmental agreements (LeRoux and Carr 2006). The analysis presented here shifts the focus to the adaptability of special districts after they have been established. Special district formation may be intended to close service gaps or increase efficiency in service delivery, but once created special districts contribute to the fragmentation of authority that can give rise to policy conflicts and collective action problems. Specialized governments are able to employ the same strategies that cities use to address these challenges—they can change boundaries and develop cooperative agreements with their neighbors. Whether expansion or an interlocal agreement is the better solution will depend on the nature and extent of the policy dilemma. This analysis examines whether the availability of boundary change as an alternative strategy affects the decisions that special districts make about entering into interlocal agreements.

Empirical Analysis of Local Water Policy

The empirical analysis tests the relationship between boundary flexibility and interlocal cooperation in the domain of local water policy. The provision of drinking water is one of the most important services that American local governments oversee, and the nature of the good makes it particularly vulnerable to coordination problems and policy inefficiencies.¹ The typical policy challenge begins with new demand for water service. This new demand might result from

¹ The Environmental Protection Agency (EPA) estimates that 57 percent of community water systems are privately owned, but they serve only 14 percent of the population (U.S. EPA 1997, 7-8).

residential or commercial development in a growing community, but it also arises in aging communities where declining productivity of individual wells brings about demand for connection to a community water system. Whether or not the new demand is located within the existing service area of a public water utility, delivering drinking water to satisfy the increased demand may pose a difficult policy challenge. A utility with a monopoly on service to the territory may need to acquire new supply in order to avoid jeopardizing water service to its existing customers.² As common pool resources, groundwater aquifers and clean rivers are vulnerable to overexploitation; utilities have more incentive to secure a plentiful water supply for their own customers than to protect the source for other communities or for ecosystem health. Moreover, the capital-intensive nature of water storage and treatment facilities create scale economies that can make it particularly costly for small utilities to expand service.

Intergovernmental coordination is even more difficult if the new demand falls outside the existing service area of any utility. On top of the supply questions described above, local governments must coordinate in order to ensure water provision to the new territory without duplicating effort. Frequently the policy solution in these situations is for a nearby utility to expand its service area to include the territory where the new demand is located. If a city or county operates the utility, this typically involves extending the utility's service area outside the jurisdiction of the responsible government. Many states permit extralocal service provision, especially by utilities. A city's decision to annex new territory typically would involve more considerations than water service alone. For water districts, extending service would more likely entail a boundary change. Changing the district's boundaries includes residents of the new territory as constituents of the district, subject to fees and taxes imposed by the district and able

² Approval of new development by general purpose governments without assurance of adequate water supply is itself an important coordination problem. See Hanak (2005) for a discussion of this issue in the California context.

to vote for district officials and bond measures. Since special district boundary change does not affect citizens' definitions of their local political community, it is not likely to encounter any more resistance than would be the case for a simple extension of service. Indeed, existing residents of the water district might insist on boundary change in order to extend the district's revenue base.

An alternative solution to this policy challenge would be the establishment of interlocal cooperative agreements. Cooperative agreements allow separation of responsibility for water supply and water service. The utility with the most proximate water mains usually will be the most cost-effective service provider, but in some cases it will not have sufficient water supply for new customers. Neighboring utilities may have slack resources for water production after building in excess capacity in anticipation of future demand.³ In other cases, the best solution might involve utilizing infrastructure owned by multiple utilities. Boundary change creates a permanent commitment for a utility to serve the new territory, while interlocal agreements promote ad hoc policy solutions that may supplement or replace that commitment.

Data

The analysis estimates the effect of water district boundary flexibility on incidence of intergovernmental agreements. Observations are individual water districts. Data on intergovernmental agreements come from the finance phase of the 2002 Census of Governments. The models estimate effects for two different dependent variables: local intergovernmental expenditures and local intergovernmental revenues. Both are coded as dichotomous variables; an intergovernmental agreement is seen to exist when a water district reports any local

³ Seasonal variation in demand for water is another important source of slack resources. In climates susceptible to drought, seasonal variation also is an important source of uncertainty about water demand.

intergovernmental spending or revenue.⁴ Across all functions, special districts are less likely than their general-purpose counterparts to establish intergovernmental agreements: 32 percent of special districts report some local intergovernmental spending or revenue, compared to 54 percent of cities and towns. As Stein (1990) has shown, the nature of a good can influence the likelihood of alternative service provision. Interlocal cooperation is rarer for water, with only 12 percent of water districts participating in interlocal agreements related to water.

The key independent variable, boundary flexibility, refers to the stringency of state rules guiding the process of special district boundary change. When crafting legislation that enables formation of new special districts, states define the process for boundary expansion and change. These rules then become part of the package of constraints and opportunities that district officials face when considering strategies for addressing policy challenges related to water service. Previous research has demonstrated the importance of state policy for stimulating special district formation and reliance (Austin 1998; Bollens 1986; Burns 1994; Foster 1997; MacManus 1981; McCabe 2000; but see Carr 2006), but we know little about the impact of state rules governing special district boundaries on the organization and behavior of local governments.

Findings about the effect of state boundary change rules on city annexations have been mixed (Carr and Feiock 2001; Dye 1964; Galloway and Landis 1986; Liner 1990; Liner and McGregor 1996; MacManus and Thomas 1979). Data are not available for special district boundary changes as they are for city annexations; thus we cannot measure the effect of rules on district expansions. But for the current purpose, it is rules rather than actual boundary changes that are of interest. Regardless of the frequency with which special districts alter their territorial reach, it is the obstacles they face in doing so that define the flexibility of their boundaries. State

⁴ Included in the analysis are independent special districts that report water supply as their primary function. The dependent variable measures only intergovernmental agreements related to water functions.

rules make it more or less difficult for special districts to absorb new territory.⁵ If a relationship exists between boundary flexibility and intergovernmental cooperation, district officials will consider the relative ease of both strategies in deciding what mechanisms to employ. Rules grant or withhold voice for residents of the district and the new territory, and they set procedural requirements for hearings and county review of a boundary change proposal. Restrictive rules will make boundary change a less attractive option for district officials. If cooperation is a complementary strategy, restrictive rules also should suppress interlocal agreements. If the strategies are substitutes, agreements should replace boundary changes where rules are stringent.

The source for data on boundary change rules is state enabling legislation. Starting with a sample of 21 states, I compiled a list of all water district types in each state using information from the Individual State Descriptions volume of the 2002 Census of Governments (U.S. Census Bureau 2005). I then consulted state statutes enabling each special district type to code procedural rules for changing district boundaries subsequent to district establishment. The procedural rules parallel requirements for municipal annexation identified and coded by the Advisory Commission on Intergovernmental Relations (ACIR): majority approval of the boundary change by residents of the district, majority approval by residents and/or landowners of the territory to be added to the district, organization of a public hearing, and approval of a county governing authority (ACIR 1992).⁶ These rules are combined into an index scored 1-4

⁵ The recent contribution to this literature by Carr and Feiock (2001) reported the surprising finding that more restrictive annexation rules actually increase the frequency of municipal annexation. In estimating the relationship between rules and actual annexations, this and other studies in effect are measuring the degree to which annexation opponents are able to exploit those rules. Indeed, Carr and Feiock suggest that their result may be attributable to annexation supporters pursuing smaller proposals that encounter less resistance. Because special district boundary changes do not directly affect residents' perceptions of their political community, they are not as likely to spark controversy and attract opposition. Therefore I assume that a larger number of procedural hurdles serves as a disincentive for district officials to pursue boundary change.

⁶ In some cases, referendum or majority approval is required only upon request. Since local actors always must consider the possibility that someone will request the referendum, these cases are coded as requiring majority approval.

measuring the stringency of rules for special district boundary change. In addition, I measured whether a requirement exists for new territory to be contiguous with a special district's existing jurisdiction: the rule is scored 1 if there is a contiguity requirement, and 0 if not. After coding boundary change rules, I assigned values to individual water districts. Some states have common boundary change rules that apply to all special districts. In other states, I scored each district's type using information contained in district names and state and individual district Web sites. The analysis omits districts formed under specific enabling legislation and districts with boundaries that must be contiguous with a city or county. These omissions removed four states from the sample, producing a dataset containing 1,383 water districts in 17 states.

Careful examination of procedural requirements for special district boundary change reveals that districts are not as adaptable as some analysts have suggested. Once a special district has been established, district officials and other local actors may face important hurdles to expanding the district's jurisdiction. Table 1 shows boundary change rules for the states included in this analysis. The first column indicates the state's score on the four-point index for municipal annexation rules, using data collected by the ACIR. The second column includes the parallel score for water district boundary change rules, averaged across water districts in the state.⁷ The number of procedural requirements ranges from one in Alabama to all four in California, demonstrating the special district boundaries are not equally flexible in all contexts. Moreover, in the majority of states, procedures for water district boundary change are more restrictive than procedures for municipal annexation. Expectations for contiguity are relatively rare among special districts, however. These appear in the table's final column. The majority of water districts in 11 of the 17 states may add territory that is not adjacent to the current district.

⁷ If the boundary change rules vary across district type in the state, more common district types receive more weight in the state index score shown in Table 1.

[TABLE 1 HERE]

Measuring boundary flexibility by the number of rules restricting boundary change, a more flexible special district is one with a lower score on the boundary rules index. If boundary flexibility is a substitute to intergovernmental cooperation, then, we should expect a positive relationship between boundary rules and incidence of an interlocal agreement. A negative effect would suggest a complementary relationship in which restrictions on boundary change reduce agreements by suppressing opportunities for creative interlocal collaboration.

Control Variables

Other variables in the model control for fiscal, intergovernmental, institutional, and problem severity conditions that also could affect the likelihood of water districts engaging in interlocal cooperation. Missing from the model are demographic characteristics of special districts that might influence local demand for cooperative agreements. Very few states make available geographic data on special district boundaries that would allow calculation of the size, wealth, or homogeneity of a district's population. Consequently, the analysis focuses on economic factors, the supply of potential cooperative partners, district governing structure, and the local policy context. Except where noted otherwise, the data source is the 2002 Census of Governments.

Fiscal Variables: Fiscal variables measure the capacity of a special district to fund its own water supply functions and offer production resources to its neighbors, as well as the tax burden on area residents. Larger districts should have more opportunity to build and operate their own water storage and treatment facilities. *Current expenditures* is an indicator of district size; it

measures general expenditures for current water operations. *Debt finance* is a dichotomous variable indicating whether the water district reported to the Census of Governments that its operations include financing public facilities or services by issuing public debt. A positive response suggests that the district perceives the construction of capital facilities as one of its primary functions, suggesting that it may have extra capacity to share with neighboring jurisdictions. *Long-term debt* is another indicator of capacity, measuring the actual level of outstanding long-term debt held by the district. I expect all three of these fiscal capacity variables to have a positive effect on incidence of revenue-generating intergovernmental agreements and a negative effect on agreements involving interlocal expenditures. In addition, I include a variable for *Property taxes per capita* imposed by the state and all local governments located within the district's home county. A heavy tax burden on the local population will make boundary change less attractive to special districts, and they may be more likely to cooperate rather than build and operate their own expensive facilities.

Intergovernmental Variables: Post (2002) has shown that interlocal cooperation is more likely to occur where local governments have access to a larger number of potential partners. *County local governments* measures the number of local governments located within the special district's home county. *Multicounty* districts reach across county lines and therefore should be more likely to find opportunities for collaboration. Districts with *Common boundaries* have boundaries that correspond to a single city or county, possibly encouraging a long-term cooperative relationship between these governments with a shared jurisdiction. The degree to which a special district focuses on a single function also might influence its opportunities for collaboration. *Proportion spending on water* indicates the proportion of the district's total current general expenditures that

are dedicated to water. Finally, I included two variables to control for the use of other possible coordinating mechanisms in the face of interlocal policy challenges. *City annexation rules* is a four-point index measuring the stringency of procedural requirements for municipal annexation, compiled by the ACIR (ACIR 1992). As with special districts, municipal boundary change may be a complement or a substitute to intergovernmental cooperation. This variable captures the impact of city boundary flexibility. Local actors also might choose to address service gaps or policy inefficiencies by creating a new special district. *District formations* is the change in the number of special districts located in the county between 1992 and 2002, per 10,000 county residents.

Institutional Variable: Drawing on analyses demonstrating the importance of local government structure as a factor influencing interlocal cooperation (Morgan and Hirlinger 1991) and other local policies (Clingermayer and Feiock 2001), the model includes a variable measuring the proportion of the special district's governing board that is elected rather than appointed to office. Data for *Proportion elected* come from the 1992 Census of Governments, the last time the Census collected data on popularly elected officials. Elected boards should have a stronger incentive to seek out policy efficiencies in order to lower the tax and fee burden on district constituents. However, appointed boards could have a broader geographic scope and may even include representatives from other local governments that could be potential partners.

Problem Severity Variables: The final set of control variables addresses the seriousness of local water policy problems. Lubell et al. (2002) have shown that cooperation is more likely to emerge where objective conditions related to a public problem are more severe. For this

analysis, communities are most likely to confront water supply challenges where the local climate is hot and dry and where population growth has strained existing infrastructure and supply sources. These conditions may give rise to the kind of collective action problems described earlier and the need for a coordinated policy response. Climate variables come from maps produced by the National Climatic Data Center (NCDC) showing annual data on mean total precipitation and mean daily maximum temperature, computed for the period 1961-1990. The NCDC integrates point measurements collected at thousands of weather stations nationwide with other spatial datasets to generate these climate maps. To assign values to the water districts, I plotted each district as point data in the center of the district's home county. Merging the point data with the climate maps produced values for the utilities on *Precipitation* and daily maximum *Temperature*, each variable scored as an index. *Population growth* indicates the percentage change in population of the water district's home county between 1990 and 2000. The model also includes interactions between each problem severity variable and the four-point index of boundary change rules. Problem severity can heighten the salience of a policy issue and increase the costs for inaction, thereby affecting the incentives local officials face when they make policy choices (Mullin 2005). Resource scarcity may serve to intensify interjurisdictional cooperation or promote create cooperative policy solutions. As a result, it may influence the relationship between boundary flexibility and intergovernmental coordination.

To estimate the effects of these variables on the likelihood that a water district engages in interlocal cooperation, I use a probit model with observations clustered according to the state laws that set rules for boundary change. In some cases, the cluster is defined by the statute enabling the specific type of water district; in other cases, all of a state's water districts belong to

the same cluster because a single law governs boundary change for all district types. The dataset includes 23 clusters of water districts in 17 states.

[TABLE 2 HERE]

Results

Results from the probit analysis appear in Table 2. The first column shows estimates for the effect of each independent variable on a water district's entry into an intergovernmental agreement in which the district makes expenditures. In the second column, the dependent variable is existence of revenue-generating interlocal cooperation. The table presents the estimates as first differences, or differences in the predicted probability of engaging in an intergovernmental agreement associated with a shift from the minimum to the maximum value of each independent variable, holding all other variables constant at their mean values.⁸ The model's fit is better for explaining a water district's decision to purchase supply or services from another local government than for explaining the provision of water services, with the pseudo-r² for each model at .15 and .09, respectively.

The distinction between expenditure and revenue contracts is an important one. Among the sampled water districts, revenue contracts are somewhat more prevalent than expenditure contracts: six percent of water districts participated in the former, and four percent the latter. Only two utilities in the sample reported both expenditures and revenues from interlocal cooperation, however, and the models reveal a number of differences in the determinants of the two contract types.

⁸ Predicted probabilities are based on a probit model estimated using the Clarify routine in STATA (King et al. 2000; Tomz et al. 2001).

The analysis reveals a positive relationship between the stringency of boundary change rules and a special district's likelihood of receiving interlocal revenue. Increasing the number of procedural hurdles for district boundary change from one to four boosts the likelihood of a district participating in a revenue-generating contract by 9 percentage points. This finding supports the hypothesis that boundary flexibility and intergovernmental cooperation are substitute strategies for addressing local coordination problems. When a water district has surplus supply or other resources, it could put those resources to use by expanding its own boundaries to enlarge its customer base, or it could establish a cooperative agreement that allows other local governments to take advantage of the district's excess capacity. Depending on the nature of the specific policy problem, either of these strategies might be the more efficient and durable policy solution. But the analysis suggests that the two are in fact alternative solutions—where boundary change is a more feasible strategy, the incidence of interlocal cooperation declines. The same does not hold true for special district spending on interlocal cooperation. When a district requires supply or services, the flexibility of its boundaries and the boundaries of surrounding districts does not appear to influence its choice to enter into a contract with another local government. Requirements that additional territory be contiguous to a water district's existing jurisdiction do not affect districts' decisions to enter into either type of agreement.

Among fiscal considerations, debt affects the incidence of both types of cooperation. Districts that report debt financing as a primary function are more likely to cooperate by providing services to other localities. Levels of debt do not matter for revenue contracts but they do for expenditure agreements; high levels of outstanding debt increase the probability that a water district will purchase supply or services from another local government. It may be that

highly indebted districts cannot secure the capital needed to develop their own infrastructure due to state-imposed debt limits or poor bond ratings.⁹

Intergovernmental variables have a larger impact on revenue than expenditure agreements. The number of local governments in the county has no effect on cooperation for drinking water, but multicounty districts and districts with boundaries that correspond to a city or county are more likely to provide supply or services to another local government. Recent special district formations in the county have a large negative effect on the likelihood of revenue contracting, supporting the treatment of special district formation as another substitute to contracting for the provision of local services. Special districts that dedicate more of their attention to water are more likely to cooperate for both sales and purchases. It is possible that specialization allows district officials to concentrate their attention on maximizing policy efficiencies.

Election of special district officials has a small and weakly significant positive effect on cooperation for districts requiring services, but no effect for districts that have slack resources to share with other governments. Electoral incentives seem to have the most influence when district officials are trying to avoid supply shortages; this analysis provides no evidence that they make a difference for revenue-generating policy activities.

Finally, conditions that affect the severity of water supply issues in a community do not have a clear and consistent relationship with cooperative behavior. None of the problem severity variables has a significant impact on the probability of water districts to contract out their own services through revenue-generating agreements. A hot climate and population growth both demonstrate some influence on the likelihood of contracting to obtain services, but the estimates

⁹ The very large effect size reported in Table 2 for long-term debt on incidence of revenue agreements is attributable to outlying observations. Calculating the first difference associated with a shift from the 10th to the 90th percentile values of long-term debt produces an increase in probability of cooperation of less than .01.

operate in opposite directions. Population growth has a sizeable positive effect on cooperation as predicted, but water districts in hotter regions appear to be somewhat less likely to establish interlocal agreements to cope with mismatch between water supply and patterns of demand. Since this latter estimate is small and weakly significant, the analysis is not conclusive regarding the effects of climate on interlocal coordination for water service.

[FIGURE 1 HERE]

Table 2 shows the first differences for problem severity variables with the number of boundary rules set at its mean value of 2.8 rules. I also was interested in the interaction between boundary rules and problem status—specifically, whether the relationship between boundary flexibility and intergovernmental cooperation varies with the severity of objective conditions related to water. Figure 1 shows first differences in the probability of cooperation across the range of values for each measure of problem severity. Again, results vary for the different elements of problem severity, making it difficult to draw firm conclusions from the analysis. For revenue agreements, the temperature and population change interactions show that increased demand resulting from hot climates and population growth serve to intensify the substitutability of boundary flexibility and interlocal cooperation. This could be evidence of coordinated regional resource planning where water is scarce. In areas that have experienced drought conditions or rapid growth, water becomes an important consideration in land use planning. Local land use officials should be more likely to plan for water service prior to approving new development. Boundary change rules may determine whether the policy solution consists of expanding a local water district or establishing intergovernmental supply and service contracts. Where water resources are under less pressure, land use officials may be less likely to plan ahead for water service, and boundary constraints may have less influence over policy decisions when

coordination challenges do arise. The result for precipitation runs in the opposite direction, however. All else held constant, as severity of water as a policy problem declines with increased rainfall, we also see boundary rules develop a stronger relationship of substitutability with interlocal cooperation. For expenditure contracts, precipitation is the only element of problem status that has a conditioning effect on the relationship among coordination strategies. Taken as a whole, it is difficult to discern a consistent pattern to these findings, and the role of problem severity in modifying the relationship between coordinating mechanisms will require further development in future research.

DISCUSSION AND IMPLICATIONS

The analysis presented here sheds light on the complex institutional environment within which local actors select strategies for addressing policy challenges that cross jurisdictional lines. Interlocal agreements are a flexible policy tool that can help local governments close service gaps, overcome mismatch in the distribution of resources and resource demand, and improve efficiency in service delivery. At the same time, the transaction costs for developing an agreement may be high, and the possibility of renegotiation or exit heightens uncertainty for governments entering into an agreement and creates challenges for long-term planning. This paper has explored whether the attractiveness of intergovernmental policy coordination is contingent on the ease with which local governments can act alone. The findings indicate that a relationship does exist between solo and joint policy strategies. When a government has excess capacity for public good production or service provision, it faces a choice between boundary change to expand its jurisdiction and secure a permanent market for its goods, or the establishment of interlocal agreements that allow neighboring governments to utilize that surplus

capacity. This analysis has shown that the procedural hurdles a government faces in changing its boundaries affect its likelihood of cooperating with neighbors through formal contracts.

While boundary change and interlocal contracting appear to be substitute strategies for water districts with excess capacity, it is important to note that districts pursuing boundary change might still be engaging in an informal form of intergovernmental cooperation. Faced with a policy challenge related to water supply, it may be the case that localities in a region reach agreement that expanding the boundaries of an existing water district is the best mechanism for internalizing spillovers or achieving efficiency gains. Acting alone does not necessarily mean acting without consultation. The data analyzed here do not allow inferences about the process of policy choice in these scenarios of fragmented authority.

To the extent that water districts are acting unilaterally, however, they may be contributing to the development of further collective action problems down the road. Nationwide, water supply is becoming a more important consideration in planning and zoning for growth. Coordinated planning for water and land use is necessary to ensure adequate water supply for all essential uses while protecting the environment and economic productivity. Understanding boundary change as a substitute strategy to cooperative agreements has important implications for the possibility that coordinated planning will emerge. Flexible boundaries may create an incentive for water districts to preserve slack resources in order to expand into new territory. This could drive land use policy, as city and county planners increasingly respond to availability of water supply. The end result may be the creation of new spillover effects in other policy areas, if growth gets misplaced due to water districts' management of their surplus capacity. If boundary flexibility creates a disincentive for interlocal cooperation, states that seek to promote coordinated planning might consider locking in special district boundaries.

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Table 1. State Boundary Change Rules

	Municipal Annexation Index (ACIR)	Water District Boundary Change Index	Water District Contiguity Requirement
Alabama	1	1	1
California	1	4	1
Colorado	3	2	0
Idaho	0	2	0
Kansas	1	3	1
Kentucky	3	2	0
Missouri	0	2	1
Montana	3	3	0
Nebraska	0	2	0
New Hampshire	0	3	0
Oregon	2	3	0
Tennessee	3	2	0
Texas	2	3	0
Utah	1	2	0
Vermont	0	2	1
Washington	3	3	1
West Virginia	2	2	0

Table 2. Establishment of Interlocal Agreements on Water: First Differences

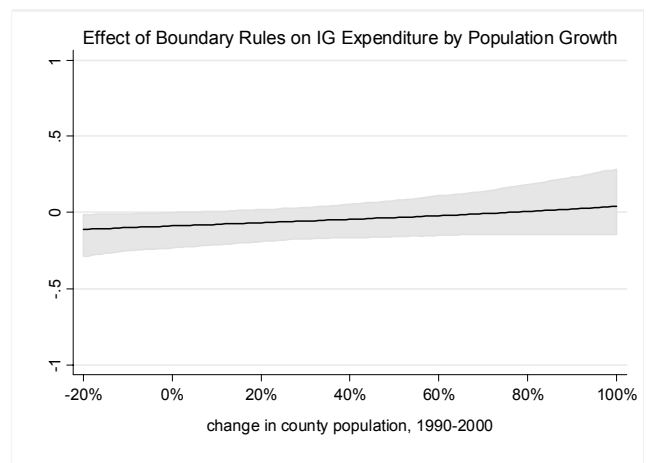
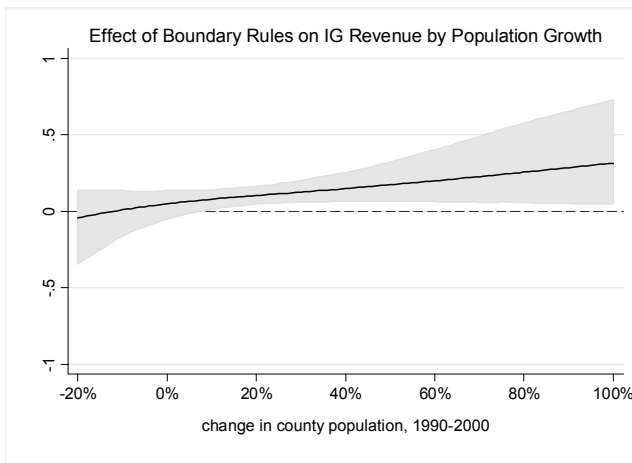
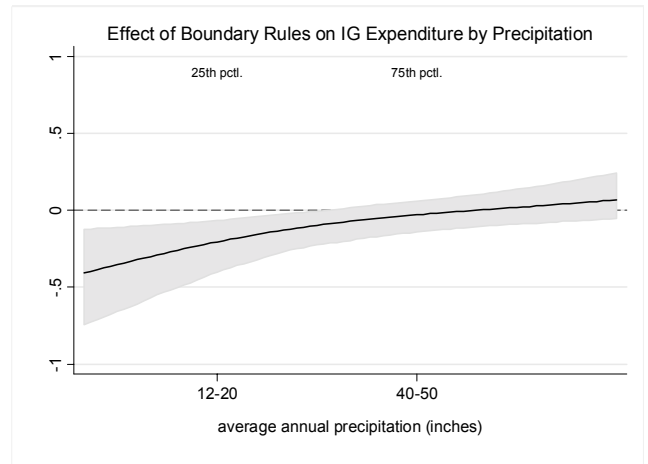
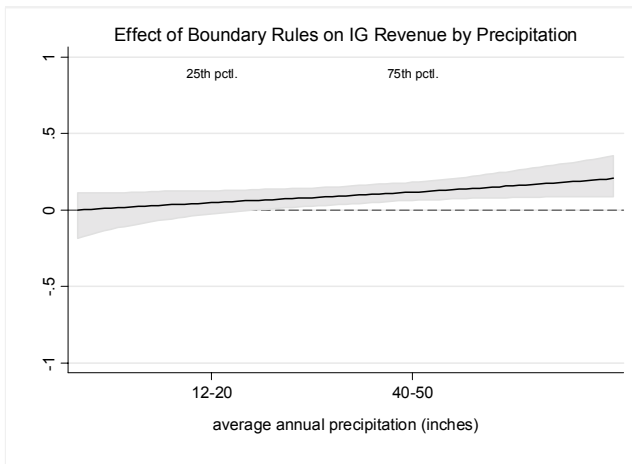
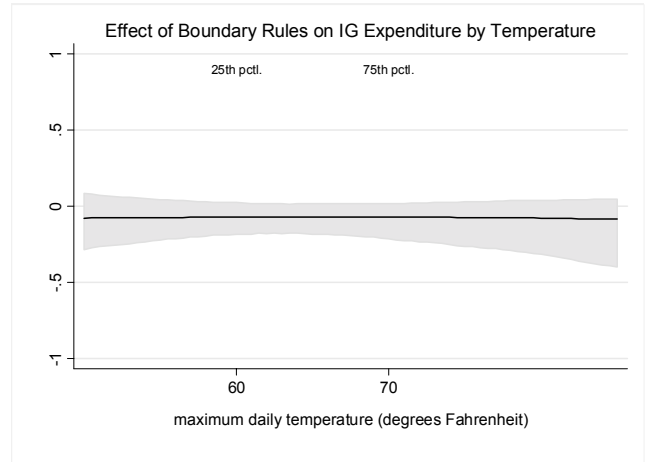
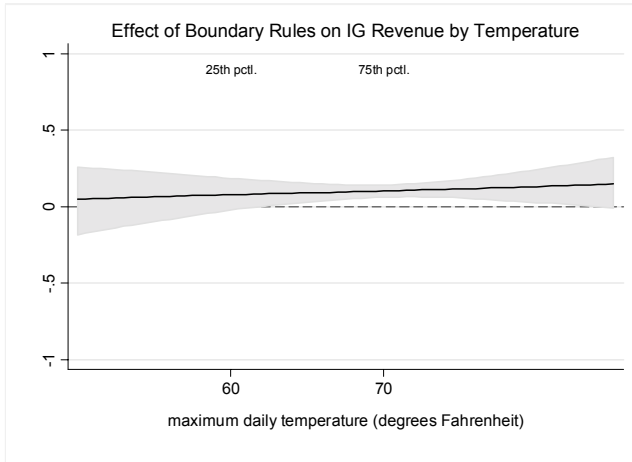
	Revenue Agreements	Expenditure Agreements
Boundary change rule index	.09 ***	-.07
Contiguity requirement	-.03	-.01
<i>Fiscal Variables:</i>		
Current expenditures	.18	.02
Debt finance	.05 ***	.01
Long-term debt	.74	.98 ***
Property taxes per capita	.11	.08
<i>Intergovernmental Variables:</i>		
County local governments	.01	-.00
Multicounty	.02 *	.01
Common boundaries	.04 ***	-.01
Proportion spending on water	.04 **	.02 **
City annexation rules	-.01	.02
District formations	-.25 ***	.09
<i>Institutional Variable:</i>		
Proportion elected	-.04	.02 *
<i>Problem Severity Variables:</i>		
Precipitation	.02	.00
Temperature	.01	-.03 *
Population growth	-.05	.08 **
N	1393	1393
Pseudo R ²	.09	.15

Cells show the difference in predicted probability of intergovernmental cooperation associated with a shift from the minimum to maximum value of each independent variable, holding all other variables constant at their mean values. First differences are based on probit models with observations are clustered by special district types sharing the same boundary rules. Estimates are significant at * p < .01, ** p < .05, * p < .10.

Figure 1. Problem Status and the Relationship between Boundary Rules and Cooperation

Revenue Agreements:

Expenditure Agreements:



Gray bands indicate 95% confidence intervals.

Appendix A. Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.
<i>Dependent Variables:</i>				
Revenue agreements	.06	.24	0	1
Expenditure agreements	.04	.21	0	1
<i>Water District Boundary Rules:</i>				
Boundary change rule index	2.78	.84	1	4
Contiguity requirement	.47	.50	0	1
<i>Fiscal Variables:</i>				
Current expenditures (\$1 million)	2.43	20.49	0	673.87
Debt finance	.26	.44	0	1
Long-term debt (\$1 million)	9.78	101.55	0	3512.77
Property taxes per capita (\$1000)	.79	.44	0	5.09
<i>Intergovernmental Variables:</i>				
County local governments	57.78	73.75	2	462
Multicounty	.23	.42	0	1
Common boundaries	.12	.33	0	1
Proportion spending on water	.91	.21	0	1
City annexation rules	1.64	1.01	0	3
District formations (per 10,000 people)	.34	1.36	-6.86	14.49
<i>Institutional Variable:</i>				
Proportion elected	.74	.44	0	1
<i>Problem Severity Variables:</i>				
Precipitation	4.98	1.77	1	9
Temperature	5.08	1.46	2	9
Population growth	.16	.18	-.23	1.85

Appendix B. Establishment of Interlocal Agreements on Water: Probit Coefficients

	Revenue Agreements	Expenditure Agreements
Boundary change rule index	-.42	-1.10 **
Contiguity requirement	-.32	-.22
<i>Fiscal Variables:</i>		
Current expenditures	.00	-.07
Debt finance	.38 ***	.16
Long-term debt	.00	.01 ***
Property taxes per capita	.07	.13
<i>Intergovernmental Variables:</i>		
County local governments	.00	-.00
Multicounty	.20 *	.22
Common boundaries	.31 ***	-.21
Proportion spending on water	.55 **	.89 **
City annexation rules	-.02	.14
District formations	-.13 ***	.04
<i>Institutional Variable:</i>		
Proportion elected	-.34	.43 *
<i>Problem Severity Variables:</i>		
Precipitation	-.19	-.46 ***
Temperature	-.10	-.02
Population growth	-3.54 *	-.94
<i>Interactions:</i>		
Precipitation * Boundary rules	.07 *	.47 ***
Temperature * Boundary rules	.04	-.02
Population growth * Boundary rules	1.10 *	.17 **
N	1393	1393
Pseudo R ²	.09	.15
Wald χ^2	2668.49	5594.89
Log pseudolikelihood	-297.61	-216.52

Cells show coefficients and standard errors from a probit estimation with observations clustered by special district types sharing the same boundary rules. Estimates are significant at * p < .01, ** p < .05, * p < .10.