The Conditional Effect of Specialized Governance on Public Policy

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What are the policy consequences of creating functionally specialized venues for decision making? This study directly compares special districts with general purpose local governments to evaluate how specialization influences responsiveness and policy choice. Previous theorizing has assumed that specialization should have the same effect across all policy contexts. The findings presented here show instead that its effect is conditional on the status of public problems. Objective conditions related to a policy issue more strongly influence the responsiveness of multipurpose legislatures than that of special districts; thus the institutional effect of functional specialization varies with the severity of the public problem. The result is that governing structure matters most where problems are least severe. The findings demonstrate the importance of considering policy context when analyzing the effects of political institutions.

What are the policy consequences of creating functionally specialized venues for decision making? This is a question of growing importance in the United States, where local governance is becoming more specialized. The number of limited purpose special districts has tripled over the last 50 years, and now they outnumber any other local government form. The question also arises with respect to Europe, where the weakening of central states has prompted discussion about the best way to organize a decentralized, federalist system (Hooghe and Marks 2003).

This article focuses on American special districts in order to evaluate the effects of functional specialization. The analysis directly compares special districts with cities and counties that perform the same function to assess how specialized governance influences public policy outcomes. Institutional design has long attracted the interest of urban politics scholars. Efforts to find policy effects from city structures have produced mixed results, although the balance of evidence indicates that the organization of city governments has an impact on local policy decisions (Clingermayer and Feiock 2001; Lineberry and Fowler 1967; Morgan and Pelissero 1980; Sharp 1986; Wolfinger and Field 1966). Functional specialization is a more striking institutional departure. Specialization allows decision makers to develop issue expertise and reduces logrolling that might distort policy decisions away from outcomes the majority would prefer. It also increases the number of local policy venues, reducing the visibility of each individual venue. Crosscutting jurisdictional boundaries can divide communities of interest and further inhibit public participation. Taking these competing dynamics into account, it is difficult to predict how special district governance might affect policy outcomes.

Indeed, existing literature on the topic offers conflicting hypotheses, arguing that special districts are either more or less likely than cities and counties to be captured by special interest groups and deliver inefficient policies that depart from the preferences of their constituents. Advocates of specialization predict that decoupling policy issues from one another will provide greater transparency and reduce the costs of communicating with public officials, increasing the likelihood that policy decisions will be

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efficient and congruent with majority opinion (Bish 1971; Ostrom, Bish, and Ostrom 1988). Critics focus on the low political visibility of specialized governments, arguing that it hinders public participation and creates a bias favoring private interests who invest in lobbying special district officials (Bollens 1957; Burns 1994; Jones 1942; Macedo and Karpowitz 2006). These hypotheses have received little empirical testing, leaving us with limited understanding of the impact of specialization on policy outcomes.

Previous theorizing about special district governments has treated all special districts equally by assuming that the effects of specialization are constant across policy contexts. This approach fails to consider variation in the behavior of multipurpose legislatures. In a multidimensional policy space, legislators must be selective about where they allocate attention (Jones and Baumgartner 2005). They set priorities based in large part on perceived electoral rewards (Arnold 1990). Busy city and county officials will seek out opportunities for policy action in areas where they perceive potential costs or benefits at the ballot box; on other issues, attentive groups can use monitoring and lobbying to gain an advantage in general purpose venues. Thus the effect of isolating responsibility for an issue within a single-dimensional space should vary based on the relative salience of that issue. Specifically, the effect should be larger for issues that are perceived as less important to constituents’ voting decisions, because these issues will receive less attention from multipurpose legislators. Specialized officials focus attention solely on the issues they oversee, so they always have an incentive to pursue policies that are popular and efficient, even if the problems these policies address are not severe. Issues that are perceived as salient occupy the attention of all local officials, specialists and generalists alike, reducing the influence of governing structure on policy choice.

This study tests the argument that institutional specialization has conditional effects against theories postulating a universal impact. Local water policy is the empirical testing ground. The severity of water policy problems varies across communities based on actual conditions of water supply. This variation provides an opportunity to test the effects of problem status on the relationship between specialization and policy choice. The results lend support for a conditional theory of specialization’s impact, and further testing suggests that problem severity also conditions the effect of other institutional structures. The findings highlight the importance of considering policy context when analyzing the policy effects of institutional design.

### Theories of Special District Responsiveness

Special districts are commonly perceived as shadow governments operating primarily in rural areas, but in fact they are an integral part of American local governance. Setting aside the major local functions that they do not perform—education, public welfare, police protection, and corrections—independent special districts account for more than 20% of local government spending (U.S. Census Bureau 2005). Special districts are more likely than cities and counties to be located within metropolitan areas, and the majority of special district officials are selected through popular election.

Special districts have received attention as part of a larger debate over the ideal form of metropolitan organization. On one side are polycentrists who favor the fragmentation produced by multiple competing governments operating within a region. Supporters of the reform tradition in local governance prefer a consolidated body to govern the region as a whole. The debate has focused primarily on geographic fragmentation, or the density of municipalities in an area, but scholars on both sides of the debate extend their arguments to the functional division of responsibility among limited purpose governments.

Polycentrists embrace special districts for creating competition among local governments, thereby enhancing efficiency and policy responsiveness. Drawing on Tiebout’s model of local governance in which jurisdictions compete for residents by offering rival packages of public goods (Tiebout 1956), these scholars argue that functional specialization promotes economies of scale and makes available a wider range of tax and service bundles than would be available from a single government (Bish 1971; Hawkins 1976; McGinnis 1999; Ostrom, Bish, and Ostrom 1988; Ostrom, Tiebout, and Warren 1961). They contend that multiple and overlapping service providers allow residents to separate their preferences on parks from those on public safety or land use and evaluate public officials based on the specific functions they oversee. Moreover, the layering of independent governments provides citizens with multiple access points to express grievances, reducing the cost of communicating with government officials. Organized lobbying may be necessary to capture the attention of public officials in general purpose governments, creating a bias that favors those with a concentrated interest in a particular policy issue and resources and experience in communicating with government officials.

Polycentrists offer an optimistic assessment of citizens’ ability to express their demands and governments’
ability to respond to them. This assessment has drawn criticism from scholars and practitioners who call for greater consolidation of governing structures across geographic and functional boundaries (Lyons and Lowery 1989). These analysts argue that fragmentation in local governance actually reduces efficiency due to coordination costs and duplication of service (Committee for Economic Development 1966; Jones 1942). They highlight special districts’ low visibility, pointing to institutional characteristics such as exclusionary voting rules and overlapping jurisdictions, and contend that political obscurity produces a bias in favor of groups with a concentrated interest in the relevant functional area (Bollens 1957). Case studies reinforce perceptions of special districts as invisible and unaccountable to the general public (Foster 1997; Gottlieb and FitzSimmons 1991; Perrenod 1984), and accounts of district formation indicate that developers and private interests play an active role in establishing special districts in order to pursue their own private goals (Burns 1994; Porter, Lin, and Peiser 1987).

Empirical testing has not kept pace with theoretical development, and few studies have directly compared the policy decisions of specialized and general purpose governments. Foster (1997) has shown that special district reliance for a given function tends to produce higher spending on that function, but her results also reveal that the consequences of specialization vary across policy issues. Existing theories offer little insight about that variation, because they assume that specialization will have the same effects regardless of policy content. This study offers an alternative theory of special district responsiveness that challenges that assumption.

\begin{figure}
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\includegraphics[width=0.5\textwidth]{figure1.png}
\caption{The Conditioning Influence of Problem Severity on the Effect of Specialization}
\end{figure}

\section*{The Conditioning Influence of Problem Severity}

A graphic depiction of this alternative theory appears in Figure 1. The theory predicts that the severity of a public problem will condition the effect of specialization on policy outcomes, as a result of variation in the behavior of general purpose legislatures across policy contexts. Objective conditions related to a public problem might influence the relationship between institutional specialization and policy outcomes through two different mechanisms. First, problem conditions should have differential impact on the capacity of governments to search for and enact efficient policy solutions. Assuming that local officials are to some extent policy oriented, they should seek to make optimal use of public resources. Constraints on time and information make this more difficult in a multidimensional issue environment, and problem severity is likely to be a factor in how general purpose legislators allocate their attention. Special district officials do not face the same demands on their attention and therefore should be able to pursue efficient policies regardless of the status of problems within their issue domain.

Problem status also should condition the influence of governing structure through its effects on the electoral incentives facing local officials. Studies of policy responsiveness at the federal level have shown that representatives in multidimensional legislatures are more likely to heed constituent opinion on salient issues, because those issues play a larger role in individuals’ vote choices (Kingdon 1973; Page and Shapiro 1983; Wlezien 2004). Legislators

\footnotesize{\textsuperscript{1}Suggestions from a reviewer substantially improved this figure.}
also will attempt to anticipate constituents’ preferences about policies that are potentially salient on account of worsening objective conditions or costs that are highly visible (Arnold 1990).

Thus for city and county officials, the electoral pay-off for addressing a public problem varies with the seriousness of that problem. General purpose officials have an incentive to respond to the perceived preferences of their constituents on issues that are salient or potentially salient. Where objective conditions provide no reason for public concern, city and county officials perceive that the issue has low salience and follow their private preferences or respond to appeals by vocal minorities and interested groups; they anticipate that the median voter will pay more attention to policy actions in other issue domains. The severity of a problem should have less influence in a specialized policy venue. Functional specialization reduces the voting space to a single dimension, so special district officials have reason to respond to constituent opinion even if the function they oversee has low salience and objective conditions are good. Since voters have no other criteria on which to evaluate the performance of specialized politicians, responsiveness should be high regardless of issue salience.

This argument applies the concept of issue unbundling, developed in papers by Besley and Coate (2002, 2003) on citizens’ initiatives and elected regulators. Besley and Coate ask why majoritarian institutions produce different policies when candidates always have an electoral interest in responding to majority opinion. In a general purpose legislature, the bundling of multiple issues can yield nonmajoritarian policy outcomes on an individual issue. By unbundling an issue from other policy dimensions, ballot initiatives and direct election of regulators change the incentives for policy makers and force greater policy responsiveness. Special districts provide an alternative institutional mechanism for unbundling.

Note in Figure 1 that policy outcomes are predicted to be similar across institutional venues where problem status is more serious, but it is possible that general purpose governments may be the less biased venues under these conditions. This is due to higher visibility of cities and counties and their more effective mechanisms for responsiveness. When governments have the incentive to account for constituent preferences, they may have more success in doing so if there are fewer barriers to public participation.

2Typical public opinion measures of issue salience may in fact be capturing objective conditions in an issue area rather than attitudes about the issue’s importance (Wlezien 2005).

Empirical Test on Water Rate Structures

Water is an ideal case for measuring the effects of functional specialization. First, there is substantial variation in the public institutions that govern local water provision. Nationwide, special districts are responsible for over a quarter of local spending on water supply, and most states contain utilities operated by each type of local government (U.S. Census Bureau 2005). Second, the institutional framework for water governance has received significant scholarly attention, including foundational public choice work on local political economy (Ostrom, Tiebout, and Warren 1961) and several recent studies of collaborative institutions for solving collective action problems (Lubell et al. 2002; Sabatier et al. 2005; Schneider et al. 2003).

Third, water revenue policies have important distributional consequences. As Berry noted regarding electricity rates, “the setting of rate structures is inherently redistributive; its study, therefore, can extend our understanding of policy making which reflects a conflict for benefits between ‘haves’ and ‘have-nots’” (1979, 263). Water rate structures differentially affect customers according to water uses and patterns of residential development, and they reflect trade-offs among equity, revenue stability, efficiency, and administrative practicality. Water prices must protect universal access for essential uses, but at the same time they can send signals about preferred levels of consumption and be used to coordinate a collective aim such as water conservation. Policy choices regarding water service can reflect important trade-offs among competing priorities, and they have consequences for who pays for and who benefits from local services. Finally, the choice of a water rate structure almost always occurs at the level of the utility governing board—for the cases in this analysis, the water district board or the city or county council—allowing direct measurement of the effects of governing structure.

The primary challenge in measuring policy responsiveness at the subnational level lies in estimating the distribution of policy preferences within a constituency. To overcome that challenge, this study examines rate structures set by public water systems, a policy choice on which the distribution of constituent preferences can be assumed. Rate structures have a direct relationship with household water bills; this analysis begins with the conservative assumption that citizens always prefer policies that allow them to pay less for water.

Water rate structures vary in how they distribute the costs of water consumption. There are four primary water
rate systems: a flat fee system that charges the same sum to all customers, regardless of consumption; a uniform rate with the same marginal price for water at all levels of use; a declining block rate in which the per-unit price for water declines with higher use; and an increasing block rate structure in which water costs more per unit as consumption rises. Increasing block structures have only been in use since the late 1970s, but they are a policy innovation that has spread rapidly among water utilities. Panel data are not available to track utility rate structures reliably over time, but a compilation of rate surveys for utilities in major metropolitan areas reveals that between 1982 and 2000, application of increasing block rate structures spread from just 4% to approximately a third of all water systems (Olmstead, Hanemann, and Stavins 2005).

Like other rate structures, increasing block pricing can be designed to generate any level of income. One drawback is that revenue will be more variable under an increasing block plan; when the marginal units of water consumed are those whose prices are highest, reduced consumption due to weather or conservation investments creates larger fluctuations in overall revenue. However, careful consideration to the number of blocks in a rate structure, the levels of block switch points, and price differentials between blocks can increase revenue stability. Moreover, increasing block prices offer a number of public good benefits that are absent in alternative pricing schemes: economic efficiency, demand management, and redistribution.

Economists have long promoted increasing block rates as a means to enhance efficiency, arguing that consumers need price signals that indicate the increasing marginal cost of providing water service. In markets where costs are rising over the long run, rate structures based on historical average costs contribute to excessive demand and inefficient investment in new supply. True marginal cost pricing is neither technically nor politically feasible in the public drinking water sector, but increasing block rates represent an efficiency gain over uniform or decreasing block prices by signaling the increasing incremental costs of water provision. By providing a price incentive to discourage wasteful consumption, increasing block rates also can be used to encourage water conservation.

Finally, progressive rates can promote vertical equity and income redistribution. With a given set of climatic conditions, income is the strongest determinant of household water demand. As income rises, households use more water to operate appliances, fill swimming pools, and maintain larger lawns. The highest price tiers of an increasing block structure affect only those households that consume the most water. Every household’s basic needs are subsidized under an increasing block plan, and low-income consumers whose demand is largely restricted to indoor use pay the lowest price for water.

While utilities can use lifeline plans and other methods to relieve the burden of water rates for low-income customers, an increasing block schedule builds equity considerations directly into the rate structure by reducing the difference across income groups in the proportion of household expenditures dedicated to water. Market-based pricing tools are often more politically feasible than direct subsidies for promoting affordability, and Timmins (2002) has shown that local politicians have an incentive to manipulate water prices in order to pursue income redistribution. For residential customers, increasing block rates favor essential over nonessential consumption, subsidizing customers with the least disposable income. By shifting the burden of water costs to large users, however, progressive prices are likely to attract opposition from the most politically active members of the community. Their adoption has met with controversy in many communities, and rate-setting manuals now dedicate considerable attention to advising water systems on how to build public support for a progressive rate proposal (AWWA 2000; Chestnutt et al. 1997).

Hypotheses on Adoption of Progressive Water Rate Structures

The high correlation between household income and water consumption makes it possible to predict the distribution of water costs across households for different rate structures and therefore to assume the preferences of the median resident. Increasing block rates imposes a concentrated cost on a small number of heavy consumers who subsidize the water use of a larger number of consumers. With a strong link between water use and income, the highest rates fall on the jurisdiction’s wealthiest residents. The distribution of household water demand has a strong right skew—the majority of households fall into a category of minimal consumption, and frequencies decline at higher consumption levels (Chestnutt et al. 1997). Since

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Outside the United States, increasing block water rates are often called “social tariffs” because of their strong implications for equity (OECD 2003).
the median household tends to fall into a category of low consumption, that household’s water use will be subsidized by high-income households with greater demand. Given the typical distribution of residential water use, the median household will pay less under an increasing block rate system than under uniform or declining block rates designed to generate the same revenue. The median voter consequently should support the adoption of increasing block rates, which offer the public good benefits of economic efficiency, water conservation, and vertical equity in addition to a smaller water bill for the median household. Opposition to these rates typically comes from high-income residents and developers who profit from building expensive housing units.

The polycentrist and metropolitan reform theories described above produce competing hypotheses about how specialized governance might affect the decision to adopt progressive pricing. If critics are correct in their contention that limited purpose governments have a bias in responsiveness that favors developers and wealthy private interests, then special districts should be less likely than city and county utilities to adopt progressive pricing. Alternatively, if special districts are more likely to employ increasing block rates, this would lend support to the argument made by polycentrists that special district governance is more efficient and more likely to respond to majority opinion.

The conditional theory of specialized governance predicts that institutional effects will vary based on objective conditions of water supply. The politics of water take on a different character across American communities depending on water availability. Throughout much of the Northeast and Midwest, water provision is a low-profile function of local governments. It is in these communities that governing structure should matter most in shaping water policy. Water issues will be low on the agenda of city and county officials, allowing attentive groups to bias rate policy away from the preferences of the majority. In hotter, drier climates, where securing a reliable water supply has long been a central concern for governments at all levels, water consistently has a place on the public agenda. Public officials in all institutional settings recognize that citizens and interest groups may monitor decision making on water issues and incorporate water policy decisions into their vote calculations. Here we should see little difference between policies delivered by special districts and general purpose governments, and special districts may be less responsive due to their low public visibility.

The theory also produces hypotheses about the effects of problem severity on each institutional type. For general purpose governments, water scarcity should have a strong positive effect on responsiveness, by shifting water issues to the top of the policy agenda. Objective conditions should have a weak effect on the policy choices of special districts.

Model and Data

The model uses data from the 1999 Financial and Revenue Survey conducted by the American Water Works Association (AWWA) to estimate the influence of special district governance on the adoption of increasing block rate structures for residential users. The close correlation between household income and water use attaches clear distributional consequences to a residential pricing strategy. The same is not true for commercial and industrial users, whose water use varies across industries. Moreover, among nonresidential users the distinction between public and private benefits is more complex, because economic development might compete with redistribution and conservation as a public good. In short, it is impossible to assume preference distributions or the imposition of costs for nonresidential customer classes, and therefore they are not treated in this analysis.

The dependent variable is a dichotomous measure of whether a utility has adopted an increasing block plan as part of its package of residential rate structures. This decision about functional form is motivated by theoretical and measurement considerations. Theories about the relationship between specialization and responsiveness produce clear hypotheses about progressive rate adoption; the implications are less clear for decisions between other rate structure alternatives. In addition, use of increasing block rates reflects a relatively recent policy decision. Where the use of declining block rather than uniform rates might reflect a policy decision made many decades earlier, use of increasing block prices indicates a contemporary policy choice by a utility to abandon its existing revenue policy. This allows better measurement of the effects of institutional variables and minimizes the problem of using cross-sectional data.

Omitted from the analysis are privately owned water systems, utilities operated by state or federal government,

5Time-series data on rate structures for a national sample of utilities are not available. Cross-sectional analysis cannot measure the influence of regional diffusion or highly variable factors contributing to policy adoption (Berry and Berry 1990), but it can evaluate the impact of more enduring institutional forces. Given the temporal stability of the explanatory variables and the relative novelty of the rate policy, time order should not affect the validity of these findings.

6A small percentage of utilities employ multiple rate structures for residential customers, typically to account for customers who do not have metered connections.
ancillary systems, and utilities that only sell water wholesale.\(^7\) In addition, only utilities that report using uniform, increasing block, or declining block rate systems for residential users are included, leaving out water systems that do not meter water use and those that employ only seasonal or peak rates.\(^8\) After narrowing the sample with these omissions and cases with missing data, the remaining sample includes 427 utilities, 322 operated by a city or county and 105 by a special district.

The key explanatory variable is Special district, a dummy variable measuring whether the utility is managed by a special district or a general purpose local government.\(^9\) Control variables account for system and financial characteristics of the sampled utilities. Dummy variables indicate whether the utility’s dominant source of water supply is from Purchased water or Surface water, rather than from groundwater sources. Surface water sources typically are more expensive to develop and maintain than groundwater, and the cost of purchased water depends on its original source and the availability of alternative supplies. Because increasing block structures create more revenue variability, utilities with greater water supply costs might be less likely to adopt these rate plans. Operating ratio is an accounting measure that appraises whether a utility’s operating revenues are sufficient to cover operating costs. As a general rule, a higher operating ratio suggests better financial health, although there are reasons why a financially sound utility might operate at a low ratio in a given year.\(^10\)

It is not possible to measure features of a utility’s customer base such as its income distribution and partisan composition, because few states make available geographic data on special district boundaries that would allow calculation of demographic and political characteristics. To help account for variation in the distributions of water demand across jurisdictions, the variable Urban indicates whether the observed city or water district is located in a metropolitan statistical area. Differences in residential water use patterns between urban and rural areas might have an impact on rate structure preferences. The model also includes dummy variables indicating utilities’ regional location, to control for aspects of political culture and historic water allocations that might affect a utility’s likelihood of adopting redistributive rates. Proportion retail sales measures a utility’s retail customer population as a proportion of the total population served. Utilities should dedicate more attention to retail rate structures when retail rather than wholesale water sales make up a greater proportion of their enterprise.

Measures of local climate capture objective conditions related to water in a community. Precipitation and temperature are important predictors of water supply and use (Water Science and Technology Board 2002). In hot, arid climates, water resources are under stress due to limitations on supply and high per capita consumption. Water rates tend to be higher in these climates, and local officials face the real and recurring possibility of drinking water shortages. Water supply is less problematic in wetter, cooler climates, where groundwater and surface water resources typically are adequate to meet the demands of the local population. These climate measures are not direct indicators of issue salience, but because they play a critical role in establishing the local supply of water resources and shaping patterns of demand, they should capture much of the cross-sectional variation in severity of water scarcity as a public problem. The vulnerability of a local climate to drought conditions should be an apt proxy for the potential salience of water issues. Climate data come from maps produced by the National Climatic Data Center (NCDC) showing annual mean total precipitation and mean daily maximum temperature, computed for the period 1961–90. Merging the climate maps with point data on utility location produced index values for Precipitation and daily maximum Temperature.

The analysis uses a Heckman probit model to account for the AWWA survey’s nonrandom sample selection process. This survey was designed to describe the membership of the AWWA and thus does not constitute a representative sample of retail water utilities. The AWWA sent questionnaires to approximately 3,400 of its 4,400 members, and it tended to drop its smallest member utilities from the sample. Response rate for the survey was 21%. As a consequence of this selection process, the AWWA sample is heavily skewed towards the largest utilities, as compared to estimates of the population of retail water systems (U.S. Environmental Protection Agency 1997). The sample also overrepresents utilities that rely on surface sources.

The Heckman model addresses the possibility that the factors underlying sample selection also influence the

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\(^7\)The majority of U.S. water systems are privately owned, but they serve only 14% of the population (U.S. Environmental Protection Agency 1997). In an ancillary water system such as a mobile home park, water is ancillary to the primary business.

\(^8\)Seasonal or peak pricing can refer to a wide variety of rate structures. The number of utilities relying on peak pricing structures is small enough that including them in the analysis does not change the substantive results, regardless of how they are coded.

\(^9\)The only economic analysis that has examined water rate structure as an endogenous choice found no significant difference between private and public water systems in the probability of adopting increasing block rates (Hewitt 2000). The study did not address the diversity among public governing structures.

\(^10\)The largest source of missing data was for utility financial data. Removing Operating ratio from the model increased the sample to 452 utilities and did not change the substantive results.
Results and Discussion

Results from the Heckman probit model appear in Table 1, along with estimates from a probit model that does not account for selection effects. Comparing the two sets of results, it is evident that the estimates are not conditional on modeling the sample selection process. Coefficients in the outcome equation of the Heckman model closely resemble those in the conventional probit model, and the small and insignificant coefficient for $p$ indicates that selection bias does not substantially affect the parameter estimates. As expected, population served strongly predicts selection into the AWWA sample; reliance on surface sources and location in the West or Midwest, rather than the Northeast, also have an important effect. Utilities in the AWWA dataset are not a random sample of public water utilities nationwide, but unmeasured aspects of the selection process appear not to influence the dependent variable in the rate choice model.

Results from these models offer support for the conditional theory of specialized governance. Local temperature conditions influence the effect of governing structure on adoption of progressive water rates. Special district governance increases progressive rate use at low values on the temperature index, but that relationship weakens for utilities in hotter climates. Figure 2 shows the marginal effect of special district governance on increasing block rate adoption under different temperature conditions, setting control variables at their mean values. At the median temperature of 60 degrees, the marginal effect of specialization is .20, meaning that special districts are 20 percent more likely than cities and counties to employ residential rate structures that promote public good provision. The difference is greater where temperatures are low. In higher temperature categories, however, the institutional effect on policy choice diminishes. Where temperature is at the 75th percentile level of 70 degrees, there is no difference across governance types in the likelihood of adopting conservation rates. The findings lend only weak support for the possibility of greater responsiveness among general purpose governments when objective conditions are most severe. The marginal effect of specialization is predicted to be negative for communities in the hottest climates, but the effect is not significant at a 95% confidence level, as indicated by the gray band.

The conditioning effect of temperature operates by changing the policy choices of general purpose governments. Shifting from the 25th to 75th percentile temperature categories produces a 26-point increase in the likelihood of increasing block rate use among utilities operated by a city or county, supporting the hypothesis that problem severity has a strong positive effect on policy responsiveness in multidimensional legislatures. The policy choices of water districts remain unchanged, however; the same shift produces a 0.2-point difference in predicted likelihood of adoption among water districts. This latter result refutes the prediction that all institutional types become more responsive when objective conditions worsen.

The impact of problem severity is evident only in using maximum daily temperature as an indicator of climatic conditions. Total annual precipitation has no direct effect on increasing block rate use, and nonlinear and interactive relationships for precipitation also failed to pass standard hypothesis tests. The absence of interaction between precipitation and governance type counters expectation. Given the strong findings for temperature, however, there is reason to interpret this null result as weakness of the precipitation indicator for measuring problem severity rather than as a refutation of the theory. Results in the water demand literature reveal that on the whole, temperature has a more powerful influence than precipitation on water consumption. Moreover, there is greater variation in how that literature measures precipitation. Indicators include precipitation frequency, seasonality, and excess over evapotranspiration in addition to aggregate annual measures such as the one used here.
These indicators imply different mechanisms for the relationship between precipitation and problem severity, and some even suggest that precipitation’s effects are conditional on temperature. Finally, temperature has a high degree of face validity as a measure of objective conditions regarding water. The scarcity of water supplies in the arid West is well known, but water has become an important issue throughout the Sunbelt. Groundwater depletion has produced subsidence in Houston and saltwater intrusion in Florida, prompting heightened attention to water issues even in these regions of abundant rainfall. Georgia’s pursuit of new water storage to address growing resource scarcity has prompted a “water war” with neighboring states. In sum, the link between temperature and water scarcity is more evident on its face and has been established with more certainty in the literature, and we may see evidence of that stronger linkage in these results.

Control variables in the model contribute little to explaining water rate policy choice. The one exception is the proportion of a utility’s customer base that purchases
water retail directly from the utility. This result is consistent with expectation, because utilities that serve primarily retail customers should be more likely to invest time and resources to seek out efficient policies for retail users. Retail rates would be a lower priority for officials operating a primarily wholesale business.

These results suggest that the relationship between functional specialization and policy choice may be more complex than anticipated by both advocates and critics of special districts. Governing structure has an important influence on how public water utilities distribute the costs of service, but this influence varies with the severity of water scarcity as a public problem. Throughout most of the United States, water is in adequate supply, and special districts are more likely than cities and counties to pursue a water pricing policy that promotes efficiency and offers benefits to the median resident. Among utilities facing supply constraints and higher demand for water, we do not see the same difference across institutional structures. The organization of government seems to matter less.

**Testing Responsiveness as a Causal Mechanism**

The results above demonstrate the conditional nature of the relationship between functional specialization and policy adoption, but further analysis is required to determine whether the policy outcomes can be attributed to the effect of issue unbundling on policy responsiveness. Differences among special districts in the rules governing selection of district officials provide some leverage for testing responsiveness as a causal mechanism. Structural arrangements that establish participation in the selection of district officials define the political community and focus the attention of officeholders on some interests over others. If a bias in responsiveness accounts for the divergence in policy choice between specialized and general purpose governments, there should be a similar divergence when specific structural aspects of special district governance vary in their capacity for responsiveness. Election practices that minimize the bias in translating constituents’ preferences into votes and seats—selection of district officials by election rather than appointment and elections at large rather than by ward—should produce policies that are more consistent with public preferences. If utility rate policies respond to local officials’ perceptions of constituent preferences, then selection rules that define a politician’s constituency should have an influence on likelihood of progressive rate adoption.

**Hypotheses on the Effects of Election Arrangements**

The analysis focuses first on the presence of special district elections. Nearly 70% of water district officials nationwide
are selected by a vote of district constituents. Others are appointed to their positions by elected officials representing overlapping cities, counties, or the state. Appointed officials should have less incentive to respond to the preferences of their constituents than do elected officials. Although the appointing authority for a district board is a set of elected officials who themselves should respond to electoral incentives in making water district appointments, the absence of elections is likely to introduce some distortion in the translation of constituent preferences into policy in several respects.

First, the officials who make special district appointments often represent constituencies that differ from the special district’s population. The electoral incentives for these appointing officials will not necessarily correspond to the district’s constituency. Moreover, with an appointed board, constituents’ preferences on the selection of water district officials are bundled with their preferences on other issues overseen by the appointing authority (Besley and Coate 2000). Voters will cast a ballot for the appointing official based on issues that are more salient than water policy. When water district officials are directly elected, candidates’ positions on water rates might well be the most salient issue in the election. The incentives to respond to residents’ preferences are much stronger for elected officials. Finally, the transmission of constituent preferences to a special district board is simply more direct with an elected board; adding an appointing authority introduces friction that may produce bias in outcomes.

The other institutional characteristic examined here is whether local government elections are organized by ward or at large. The formation of ward boundaries introduces the possibility of bias in aggregate representation, even when individual officials are purely responsive to their constituencies. In a jurisdiction that has been divided into wards, the median resident’s position on increasing block rates will vary across wards based on patterns of wealth distribution and residential development. Ward boundaries are critical in aggregating constituent preferences, and their existence makes it more likely that a purely responsive legislature will produce a decision about the cross-subsidization of water costs that differs from the aggregate median resident’s preference. Indeed, the adoption of at-large election structures at the local level was intended to promote politics that responded to majority preferences (Meier et al. 2005). Numerous studies have shown that ward elections benefit the interests of minorities (Engstrom and McDonald 1981; Meier et al. 2005; Welch 1990). In the case of water rate policy, wealthy homeowners whose rates would increase under progressive pricing make up the minority that stands to benefit from a biased system. At-large elections should allow for more direct translation of the median resident’s preference on water rates. With an at-large system, all public officials represent the same constituency. If the governing board is truly responsive to the preferences of residents, it will adopt a policy that satisfies the jurisdiction’s median resident. This hypothesis provides a strong test of responsiveness as the causal mechanism. Since previous work has shown that ward elections tend to produce more low-income city council members (Welch and Blessoe 1988), governments elected by ward should be more likely to adopt progressive rates that promote income redistribution. Evidence that ward elections reduce the likelihood of these rates would lend particularly strong support for demonstrating that responsiveness accounts for policy differences shown above.

As in the earlier analysis, the hypotheses here predict that institutional effects will vary with problem severity. Election of district officials and elections by ward will have their greatest effect where objective conditions are good and water has low potential salience.

Results and Discussion

Data on procedures for selecting local government officials come from the 1987 Census of Governments. The first hypothesis predicts that an elected board, rather than appointed special district officials, would be more likely to adopt progressive rates where problem severity is low. The results shown in Figure 3 demonstrate support for the hypothesis. Where mean maximum temperature is 60 degrees, there is a 25-point difference between elected and appointed special district boards in likelihood of policy adoption. With the small sample of water districts in the analysis, this difference is not significant, but the institutional effect is larger and significant in climates colder than the median. In warm climates, the selection process for district officials has no effect on policy choice. Unbundling water from other dimensions of local policy by providing for direct election of water district officials seems to have the greatest effect where water might not factor into voting decisions otherwise.

Testing the hypotheses about ward elections involves two models: one for cities and counties that operate water utilities, and one for water districts with elected board members. Both models produce sizeable effect estimates

14Also included in the model for general purpose governments are dummy variables to control for the jurisdiction’s form of government. These controls isolate the effect of electoral incentives from the effect of reform city management, which exercises its own independent positive impact on the adoption of redistributive rates. Probit estimates from all election models are available from the author upon request.
for ward elections. Figure 4 shows that utility governing boards with a greater proportion of members elected by ward are significantly less likely to adopt progressive rates where water supply is plentiful. At the median temperature, the marginal effect of electing city and county council members by ward is to reduce progressive rate use by 11 percentage points. Among the small sample of elected water districts, the probabilities of progressive rate use

**FIGURE 3 Marginal Effect of Elections on Increasing Block Rate Adoption**

![Diagram showing marginal effect of elections on increasing block rate adoption.](image)

Gray band shows 90% confidence interval. N = 95.

**FIGURE 4 Marginal Effect of Ward Elections on Increasing Block Rate Adoption**

![Diagram showing marginal effect of ward elections on increasing block rate adoption.](image)

Gray bands show 90% confidence intervals. N = 318 cities and counties; 66 water districts.
start much higher, and the effect of election type is even greater: predicted probabilities for ward-elected and at-large boards are .40 and .76, respectively, so the marginal effect of at-large elections is to nearly double the likelihood of progressive rate use. These differences across election types in median-temperature communities are both significant at the 90% confidence level. Here again, as hotter weather makes water supply a more severe public problem, institutions have less influence on policy choice, although the relationship may reverse at the very highest temperatures.

These results lend support to the hypothesis that variation in responsiveness accounts for the difference between special districts and general purpose governments in their reliance on progressive rates. If responsiveness produces the outcome of policy adoption, then selection rules that promote responsiveness also should have an influence on adoption. Where residents have the opportunity to vote for officials who set water prices, and where votes are aggregated without the interference of politically driven ward boundaries that might distort the transmission of majority opinion on water pricing, officials are more likely to choose rate structures that promote efficiency and redistribution. The findings suggest that such is the case. Moreover, the results support the larger argument about the importance of policy context in conditioning the effects of institutional choice. When objective conditions in a policy area pose an important public problem, all politicians have an incentive to respond and the organization of government matters less in determining policy outcomes.

**Conclusion**

Specialization is a common response to the growing size and complexity of political systems. Legislative districts allow public officials to specialize territorially, and governments establish bureaucracies, legislative committee systems, and independent commissions to organize their work and promote issue expertise. Special districts represent the next step in specialization, the formation of autonomous governments with jurisdictions defined functionally as well as geographically. American communities are growing more reliant on special districts for the provision of goods and services, yet we know remarkably little about the consequences of isolating responsibility for a public function within an independent, specialized government.

Results presented here reveal that the policy effects of functional specialization are contingent on problem status in a policy area. Where objective conditions are normal, institutions play an important role in channeling the demands of constituents and interested stakeholders. Specialized venues create stronger incentives for public officials to respond to the preferences of their median constituent, especially when those venues employ electoral rules that promote majority outcomes. Institutional effects are less evident where objective conditions indicate a severe policy problem. There, politicians in all institutional settings perceive that the issue might become salient for constituents’ vote calculations and thus are likely to respond to public preferences and to the policy problem. General purpose governments managing multiple policy dimensions need to satisfy constituents on the most important policy questions, but they can bargain, logroll, and respond to interest groups on other issues. The policy responsiveness of specialized governments does not have the same conditional nature.

These findings highlight the importance of considering attributes of specific policies when analyzing the effects of political institutions. Institutional effects may be complex and contingent, making institutional design a risky endeavor for political actors seeking to craft institutions that will favor their policy goals. In the immediate case, we might expect specialization to be most appropriate for those issues and programs that have high public salience, so they can receive dedicated attention. This analysis suggests the reverse: that functional specialization has the biggest payoffs for responsiveness on less severe problems that might otherwise get ignored in a multidimensional issue environment. If responsiveness were the only criterion for evaluating institutional choices, these results would lend support for the creation of specialized governments for issues that matter the least. But policy responsiveness at the special district level might impede intergovernmental cooperation or exacerbate socioeconomic segregation and inequality across jurisdictions. This analysis indicates that the impacts of specialization are neither simple nor universal. It is necessary to understand the political context for specialization in order to predict its effects.
## Appendix A: Variable Descriptions and Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing block rate&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Use of rate for residential customers: 1 if yes, 0 if no</td>
<td>.34</td>
<td>.47</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Special district&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Governance: 1 if special district, 0 if city/county</td>
<td>.25</td>
<td>.43</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Temperature&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Mean daily maximum temperature, 1961–90: index scored 1 (lowest) to 8 (highest)</td>
<td>3.70</td>
<td>1.63</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Precipitation&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Mean annual total precipitation, 1961–90: index scored 1 (lowest) to 9 (highest)</td>
<td>4.92</td>
<td>1.49</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Operating ratio&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Total operating revenues divided by operations and maintenance expenses</td>
<td>1.50</td>
<td>.65</td>
<td>0</td>
<td>6.81</td>
</tr>
<tr>
<td>Surface water&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Surface storage as dominant source of water supply: 1 if yes, 0 if no</td>
<td>.48</td>
<td>.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Purchased water&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Purchased water as dominant source of water supply: 1 if yes, 0 if no</td>
<td>.18</td>
<td>.38</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Proportion retail sales&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Proportion of total population served that purchases water through retail sales</td>
<td>.90</td>
<td>.19</td>
<td>.03</td>
<td>1</td>
</tr>
<tr>
<td>Urban&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Location in a metropolitan statistical area: 1 if yes, 0 if no</td>
<td>.70</td>
<td>.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>West&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Location in western Census region: 1 if yes, 0 if no</td>
<td>.29</td>
<td>.45</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Midwest&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Location in midwestern Census region: 1 if yes, 0 if no</td>
<td>.27</td>
<td>.45</td>
<td>0</td>
<td>1</td>
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<tr>
<td>South&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Location in southern Census region: 1 if yes, 0 if no</td>
<td>.29</td>
<td>.45</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Population&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Log of population served (full universe of local government-owned water utilities)</td>
<td>7.24</td>
<td>1.84</td>
<td>0</td>
<td>15.90</td>
</tr>
<tr>
<td>Elected board&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Selection of district officials by election: 1 if yes, 0 if no</td>
<td>.69</td>
<td>.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Proportion elected by ward&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Proportion of special district and general purpose officials elected by ward</td>
<td>.21 sd</td>
<td>.40 sd</td>
<td>0 sd</td>
<td>0 sd</td>
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<tr>
<td>Council-manager system&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Council-manager form of governance: 1 if yes, 0 if no</td>
<td>.40 gp</td>
<td>.49 gp</td>
<td>0 gp</td>
<td>0 gp</td>
</tr>
<tr>
<td>Executive-council system&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Executive-council form of governance: 1 if yes, 0 if no</td>
<td>.49</td>
<td>.50</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*Data Sources:*  
<sup>a</sup> Constructed by author based on American Water Works Association (AWWA), 1999 Financial and Revenue Survey.  
<sup>b</sup> Constructed by author based on AWWA survey and information on water utility Web sites.  
<sup>c</sup> Index scores obtained from climate maps produced by the National Climatic Data Center; assigned to individual utilities by author using ArcGIS and city geographic coordinates from U.S. Census Bureau, 2000 U.S. Gazetteer.  
<sup>d</sup> U.S. Environmental Protection Agency, Public Water System Inventory.  
<sup>e</sup> U.S. Census Bureau, 1987 Census of Governments.  
<sup>f</sup> U.S. Census Bureau.

## Appendix B: Robustness Considerations

The main text of the article addresses a number of ways in which the results are robust to changes in the model’s specification and functional form and to the exclusion of observations based on various criteria. This appendix introduces data from two other utility surveys in order to address weaknesses in the AWWA sample. The first check addresses the possibility of biased results arising from the lack of special district boundary data, which makes it impossible to measure
characteristics of a district’s customer base. The strongest hypothesis for a potentially confounding variable among constituency characteristics is income homogeneity. If special districts are more likely to be located in a region with fragmented governance, they may have more homogeneous constituencies due to Tiebout sorting. With less variability across households in income and water use, the median resident might not enjoy the same immediate benefit from progressive rates. The rates still would balance public good gains against private costs on residents who consume the most water, but price benefits to the median resident could be small.

To explore this possibility, I used data from a 1999 survey of California water utilities conducted by the consulting firm Black & Veatch. California is one of the few states that maintains geographic data on water district boundaries, allowing aggregation of demographic data to the district level. Data from a single state cannot be used to test the complete policy adoption model, because they do not contain enough variation on the problem severity variables. In the Black & Veatch sample, 41% of the 301 utilities fall into the same temperature category, and 82% of cases fall above the median temperature score in the national dataset. We should not expect the interactive relationship to hold within this limited range of problem status, but the data can be used to test relationships among income homogeneity, governing structure, and rate policy. Indeed, they provide support for the hypothesis that special districts have more homogeneous constituencies than their general purpose counterparts, at least within California. Among sampled utilities, the coefficient of variation in household income (measured as the Census block group median) was .28 among special districts and .33 among general purpose governments. This measure of income homogeneity does not have a significant relationship with rate structure choice, however, either alone or in interaction with governing structure or temperature.

The Black & Veatch data also provide some confidence that demand for environmental policy does not account for the findings reported above. To measure policy demand, I obtained data from the California Statewide Database on precinct-level voting in the 1998 gubernatorial election. Aggregating the vote returns to the boundaries of the water district or general purpose jurisdiction produced an indicator of Democratic support. By this measure, the constituencies of water districts in California exhibit less demand for environmental policy than those of municipal and county utilities, with special district electorates casting a significantly smaller percentage of votes for the Democratic candidate in a statewide election. This alone should cast doubt on the possibility of environmental preference as a potential confound, since we should expect higher demand for increasing block rates among a more liberal population. In fact, Democratic support has no direct or conditioning effect on rate adoption. Thus on the whole, while the policy adoption models may be underspecified due to the lack of demographic data on district constituencies, there is little reason to believe that this creates bias in the main results.

The final test is a more general check on the robustness of the findings. As noted in the main text, the AWWA sample is not designed to represent the universe of public water utilities. The Heckman model helps account for the overrepresentation of large utilities and those that rely on surface sources, but there may remain unspecified sources of bias in sample selection. To confirm that the results would hold with a more representative sample of water utilities, I tested a reduced form of the model using data from the 1995 Community Water System (CWS) survey conducted by the EPA. The EPA periodically gathers data from a national stratified random sample of water utilities. Response rate for the 1995 survey was 54%, and the agency generated sampling weights to allow estimation of population characteristics.

Unfortunately for the current purpose, responding utilities were guaranteed anonymity, making it impossible to introduce variables from outside the dataset and carry out the entire analysis. Instead, I tested a reduced form of the equation that used EPA region as a proxy for climate data. Using the AWWA data, I determined that utilities in EPA regions 4, 6, and 9—an area that encompasses the Sunbelt states—scored substantially higher on the temperature variable than utilities in other regions. The reduced model includes this regional proxy, governance type, and the interaction between them, as well as control variables measuring water supply source, operating ratio, and proportion retail sales. Marginal effects generated from the two models differ in magnitude, but the direction and substantive interpretation are the same. In the original AWWA data, the effect of water district governance in non-Sunbelt states is .33, compared to .19 in the EPA data. Both of these effects are significant with 95% confidence. Neither of the datasets produces a significant effect for governance type in Sunbelt states where water is a more severe public problem. Although the regional proxy is a blunt instrument for measuring problem severity, these results increase certainty that the findings reported in the main text persist using a more representative sample of public water utilities.
References


Bish, Robert L. 1971. The Public Economy of Metropolitan Areas. Chicago: Markham.


