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Guy L. Holburn
University of Western Ontario

Pablo T. Spiller
University of California, Berkeley

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UC Energy Institute
2539 Channing Way, # 5180
Berkeley, California 94720-5180
www.ucei.org

Interest Group Representation in Administrative Institutions: The Impact of Consumer Advocates and Elected Commissioners on Regulatory Policy in the United States

Guy L. F. Holburn[1]
Richard Ivey School of Business
University of Western Ontario
London, Ontario. N6A 3K7. Canada.
Tel: (519) 661 4247
Fax: (519) 661 3485
Email: gholburn@ivey.uwo.ca

Pablo T. Spiller
Walter A. Haas School of Business
University of California
Berkeley, CA 94720-1900
Tel: (510) 642 1502
Fax: (510) 642 4769
Email: spiller@haas.berkeley.edu

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Abstract

We use a panel database of rate reviews conducted for U.S. electric utilities to assess how consumer advocates and elected Public Utility Commission heads affect regulatory policy and utility strategy. We find first that utilities postpone rate reviews in states with consumer advocates and elected commissioners. Second, we find that, after controlling for observed and unobserved state characteristics, states with consumer advocates and elected commissioners tend to grant lower returns on equity. Third, these institutions have differential impacts on different types of consumer: consumer advocates are associated with higher residential-industrial rate ratios while elected commissioners are associated with lower residential-industrial rate ratios.

I. Introduction

In recent years, a steady stream of research has argued that legislatures use the design of administrative procedures as a means of controlling agency policy decisions in regulated industries (de Figueiredo, Spiller and Urbiztondo, 1999; Epstein and O'Halloran, 1994, 1996; McCubbins, Noll and Weingast, 1987, 1989). Attention has focused especially on how legislatures control the degree of representation of certain interest groups in administrative processes to accord influence in a non-random fashion. Enabling favored interest groups to organize and to participate in agency proceedings is argued to affect policy rulings by changing the informational environment upon which agencies base their decisions (McCubbins and Schwartz, 1984); organized interest groups may publicly reveal new information about policy alternatives and consequences that agencies must respond to and incorporate in their final rulings. They also act as monitors of agency behavior on behalf of the legislature, potentially triggering legislative committee investigations or sanctions aimed at preventing agency drift.[2] Thus, by requiring agencies to admit selected interest groups to their decision-making arenas, legislatures can "stack the deck" in favor of important constituents and ensure that policy responds to these groups' preferences yet without the need for continuous monitoring of the agency by the legislature.

While much of this research has established at a theoretical level the mechanisms by which interest group representation influences agency decisions, there is scant empirical support for the hypothesized impact on actual policies. Here we present statistical evidence which supports the proposition that stacked administrative procedures and institutions do indeed shape agency decisions in the predicted manner. Our empirical setting is the utilities sector in the United States. We examine the impact of two institutional features of the regulatory environment that are claimed to stack the deck in favor of consumer interests: the participation of consumer advocates in rate reviews and the election, rather than

appointment, by voter-consumers of Public Utility Commission (PUC) commissioners. While scholars have considered the impact of elected PUC commissioners (but finding mixed results – see Costello, 1984 and Besley and Coate, 2002)[3], this is the first study to analyze, both theoretically and empirically, the effect of consumer advocates. We argue below that, due to differences in selection mechanisms, these two institutions redistribute rents between utilities and different consumer groups in quite different manners.

We use data on over 700 rate reviews conducted for U.S. electric utilities between 1980 and 1989 to determine how consumer advocacy institutions and the method of commissioner selection affect PUC decisions on two aspects of policy, the allowed return on equity (ROE) and the rate structure.[4] Since legislative acts and judicial precedent do not specify particular methodologies for calculating the allowed ROE or the rate structure, PUC commissioners have some discretion to select their preferred policies.[5] After controlling for various factors, including the utility's decision to initiate a rate review, therefore, it is possible to use the allowed ROE and the rate structure to test for the influence of consumer advocates and commissioner election on regulatory policy. In contrast to prior analyses of PUC allowed ROE decisions, which have utilized almost exclusively cross-sectional data, our usage of time series data allows us to control additionally for unobserved state characteristics that may be correlated with the presence of pro-consumer regulatory institutions.[6] Our analysis suggests that while both consumer advocates and elected commissioners are associated with a redistribution of rents from utilities to consumers (through a lower allowed rate of return), they serve quite different constituents: elected commissioners additionally tilt the rate structure to the advantage of *residential* consumers and to the disadvantage of industrial consumers. Consumer advocates, on the other hand, are associated with rate structures that favor *industrial* consumers. Indeed, the magnitude of estimated changes in residential

and industrial rates due to changes in the rate structure far outweigh changes due a reduced ROE – leading to the conclusion that, all else equal, elected commissioners actually increase rates for industrial consumers and consumer advocates increase rates for residential consumers. Although our estimates of the magnitudes of these effects are specific to the institutional environment within the United States, our general conclusions are likely to be of interest to governments implementing privatization and administrative reforms in other countries.

II. Consumer Representation in the Regulation of Public Utilities

Consumer advocates, who have jurisdiction in 30 states, and elected commissioners, who have jurisdiction in 11 states, operate through different mechanisms and are predicted to have distinct effects on regulatory outcomes.

II.i Consumer Advocates[7]

Consumer advocates, by participating in administrative processes, influence policy by changing the informational environment that forms the basis for PUC decisions. Regulatory policy in the utilities sector is primarily determined through periodic rate reviews conducted by PUCs, who have broad discretion to determine: the financial rate of return that utilities are allowed to earn; the allowable level of utility operating costs and expenditures (termed the *rate base*); and the rates that utilities can charge different customer classes for their services (Joskow, 1974).[8] Consumer advocates, who have an explicit statutory mandate to represent consumer interests during state administrative or judicial hearings (Holburn and Vanden Bergh, 2002), can influence PUC decisions on each of these policy dimensions by participating in rate reviews.

Advocates typically challenge utility or PUC staff proposals during rate review hearings, presenting their own testimony, evidence and witnesses. In doing so, they use data and methodologies that support relatively pro-consumer positions, for example by arguing for lower utilities' allowed rates of return. In addition, they have strong incentives to ferret out instances of imprudent management expenditures and to demand their exclusion from the allowed rate base.[9] Consumer advocates thus present new information about utility costs which, as long as it is credible, will bias downwards PUC commissioner beliefs about true utility costs and the appropriate allowable rate of return. PUC commissioners cannot simply ignore consumer advocates' arguments in their decision-making process: under due process requirements, as established in state generic administrative procedure acts and acts specifically governing PUC procedures, PUC decisions must have some reasonable basis in the evidence presented. Commissioners must therefore justify why one position on any given issue is more reasonable than the alternatives. Without some substantiation, commissioners run the risk of being overturned by the courts on the basis of arbitrary or capricious behavior. In sum, we expect that, by providing more evidence in favor of relatively pro-consumer policies, the participation of consumer advocates during rate reviews will result in lower allowed rates of return and rate bases than would otherwise be the case. As we discuss below, both effects influence the incentives of utilities to file for rate reviews.

II.ii Elected versus Appointed PUC Commissioners

In addition to consumer advocacy, it has often been claimed that consumer interests are propagated through the choice of commissioner selection mechanisms (Costello, 1984). Recent research has established the theoretical basis for how the method of commissioner selection affects regulatory policy, supporting the common intuition that elected commissioners are likely to exert a pro-consumer bias in their effect on policy relative to their appointed counterparts (Besley and Coate, 2002). Since

commissioners are responsible for determining and implementing policy, the impact of their selection method manifests itself directly through their choice of policies rather than through changes in the informational environment as in the case of consumer advocates. Commissioners who are elected by consumers, it is argued, will tend to place greater weight on consumer interests in their decisions on the allowed return on equity and rate base than will commissioners who are appointed by state governors. Even though elected commissioners may accept electoral campaign contributions from utilities, potentially leading to capture by utility interests, Besley and Coate suggest the effect will be smaller than in the alternative scenario when utilities contribute to governors who appoint commissioners. As utility issues are generally more salient in a PUC commissioner election than in a gubernatorial election, where they are bundled with general economic and social policy concerns, there is less scope for elected commissioners' policy platforms to deviate from the median voter's preferences. All else equal, therefore, and assuming that PUC commissioners are motivated in part by re-selection goals, elected commissioners will favor lower rates of return and rate bases than appointed commissioners.

II.iii Impact on Rate Structure

Elected commissioners will also have an impact on the structure of rates charged for different customer classes. Since elected commissioners are chosen by voters, i.e., *residential* consumers, they have an incentive to reduce residential rates relative to industrial and commercial rates, all else equal. For consumer advocates, Besley and Coate's reasoning about policy saliency and the electoral connection suggests that the reverse will be true: consumer advocates are appointed by elected politicians with broad policy responsibilities rather than directed elected by voters. Thus, although they will consider the interests of voters, they will be particularly receptive to lobbying by organized interests. Interest group lobbying provides consumer advocates with information and access, key ingredients for

successful influence on PUC actions. Since industrial consumers are better organized than residential consumers, consumer advocates are likely to be more influenced by interest groups reflecting industrial users than by consumer groups representing residential users. Thus, consumer advocates may be associated with relatively lower industrial rates. Differences in the method of selection between elected commissioners and advocates are thus predicted to have implications for the pattern of inter-consumer competition for policy favors.

II.iv Impact on Utility Rate Review Initiation

Consumer advocates and elected PUC commissioners affect regulatory outcomes not only through their direct influence on PUC policy decisions during rate reviews but also through their ex ante impact on utility expenditures and investments. Since it is difficult for regulatory agencies or courts to determine whether each aspect of a utility's cost base was prudently incurred, utilities have some discretion to inflate costs above levels that would obtain in a competitive environment – for example, by "gold plating" assets or by tolerating managerial slack – anticipating the formal approval of such costs during future rate reviews (Baron and Myerson, 1982). The existence of pro-consumer regulatory institutions, however, increases the risk that such costs or expenditures will be aggressively challenged during rate hearings and ultimately fully or partially disallowed by the PUC. Anticipating a more pro-consumer decision-making environment, utilities thus have an incentive to maintain tighter control over their costs than would be the case when no consumer advocate or elected commissioner participated in rate reviews. Consequently, when utility costs increase due to economic or technological shocks, total costs are less likely to reach the level where the utility triggers a rate review. In general, then, as a result of stronger cost management, utilities are less likely to initiate rate reviews in relatively pro-consumer regulatory environments, including those with a consumer advocate and elected commissioner.

Thus, our analysis suggests several impacts of consumer advocates and elected commissioners on regulatory policy and utility strategy, all else equal: first, the allowed return on equity will be lower; second, the allowed rate base will be lower; third, states with elected commissioners (consumer advocates) will exhibit lower (higher) residential rates relative to other consumers' rates ; and finally, all else equal, the presence of consumer advocates and elected commissioners will discourage utilities from filing for a rate review. In the next section we test to what extent consumer advocates and elected commissioners in the U.S. have had the predicted effects.

III. Empirical Analysis

III.i Methodology

Since rate reviews are costly, utilities will call for a rate review only following a threshold economic or technological "shock" that has increased utility costs. This implies that there is an important potential sample selection problem in using observed rate review information. Since it is hypothesized that consumer advocates and elected commissioners reduce the extent of allowed cost recovery in a rate review, their presence effectively raises the threshold at which a utility initiates a review. States with these institutions will only experience rate reviews, then, after larger shocks. Assuming that shocks are distributed equally across states with and without advocates and elected commissioners, we will observe fewer, or potentially no, rate reviews in the latter type of state. Thus, normal OLS regression techniques using observed rate review data only will yield biased estimates of the impact of consumer advocates and commissioner selection on allowed ROE decisions. In order to produce unbiased estimates we therefore estimate the following sample selection model which incorporates the utility's decision to initiate a rate review:[10]

Utility Rate Review Initiation Decision

$$\Delta\pi = X_1\beta_1 + \delta ADVOCATE + \alpha ELECT + \varepsilon_1 \quad (1)$$

$$INITIATE = 1 \text{ if } \Delta\pi > 0, = 0 \text{ otherwise} \quad (2)$$

PUC Return on Equity Decision

$$(ROE|INITIATE=1) = X_2\beta_2 + \gamma ADVOCATE + \phi ELECT + \varepsilon_2 \quad (3)$$

$$\text{Correlation } (\varepsilon_1, \varepsilon_2) = \rho$$

In equation (1), $\Delta\pi$ represents the expected change in utility profits that would occur if a rate review was implemented. Since the utility's decision rule, as specified in equation (2), is to initiate rate reviews only when $\Delta\pi$ is greater than zero, $\Delta\pi$ is a latent variable. *ADVOCATE* and *ELECT* are dummy variables set, respectively, equal to one if a state has a consumer advocate or elected PUC commissioners, and zero otherwise. X_1 is a vector of two sets of variables: the first consists of political, demographic and institutional variables that affect the regulatory climate and which thus capture utilities' expectations that new investments will be passed through by the PUC into final rates. The second set includes variables that influence utility costs independently of managerial effort, for example changes in fuel prices or in state GDP[11]. Equation (3) estimates the PUC's allowed return on equity, *ROE*, conditional on observing a rate review. (We do not have information on the allowed rate base and so cannot assess the impact of advocates and elected commissioners on this aspect of policy). X_2 is a vector of variables that includes measures of the regulatory climate (as in X_1) and also of economic factors that additionally affect the allowed rate of return, for example the risk-free market interest rate.

When the error terms of equations (1) and (3) are correlated, i.e. ρ is non zero, simple OLS estimation of equation (3) results in biased coefficients. The coefficients of both equations and the ρ parameter are thus estimated jointly through maximum likelihood, which yields consistent and unbiased estimates of β_2,γ, α and ϕ.[12]

III.ii Data and Measurement

We begin with a discussion of the rate review initiation and allowed ROE models, turning to the rate structure model in the next section. We use information on every major electric utility rate review completed during the 1980s, covering 771 rate cases and 179 utilities.[13] By utilizing panel data we are able to control for state and year fixed effects, leading to more accurate estimation of the impact of the variables under consideration. For equation (3), the allowed ROE constitutes the dependent variable. During the 1980s, the average ROE allowed was 14.78 percent with a standard deviation of 1.3 percent. For equation (1) we construct a panel data set from 1980 to 1989 and set *INITIATE*, the dependent variable, equal to one in any year when the utility initiated a rate review and equal to zero otherwise. On average, electric utilities initiated a rate review every 2.3 years during the sample period, requesting an average revenue increase of $86m (standard deviation of $132m).

The second set of data consists of economic, political, demographic and institutional variables, both state- and firm-level, that are predicted to affect the utility's rate review initiation decision and the PUC's ROE ruling. Of primary interest here are the participation of an independent consumer advocate during rate hearings and the method of commissioner selection. *ADVOCATE* is a dummy variable set equal to one if the legislature had previously enacted a statute establishing an advocacy office in the state. Similarly, we include a dummy variable, *ELECT*, set equal to one if the PUC commissioners are

elected and zero if appointed. Thirdly, we capture the ability of the PUC to counter utility testimony and evidence with *RELSIZE*, a variable measuring utility revenue per dollar of PUC budget. All else equal, we expect that PUCs with greater resources (i.e. smaller value of *RELSIZE*) will more successfully argue against utility demands for higher returns by presenting more extensive and persuasive testimony, thus resulting in lower allowed ROEs.

In both the review initiation and allowed ROE models we also wish to capture the degree to which the regulatory climate is either pro-consumer or pro-utility. We include a variety of measures that reflect the relative bargaining strengths of competing interest groups within a state. Consumers are likely to lobby politicians and regulatory agencies for favorable policy decisions in states where utility service charges constitute a relatively greater proportion of income and where consumers are more concentrated. Since industrial consumers tend to expend relatively more on utility services than do residential consumers, we use the variable *INDUSTRY* which measures the industrial share of electricity consumption in each state. We also construct a Hirschman-Herfindahl index of concentration (by employment) of industrial enterprises in each state, *MANUHHI*, using Census of Manufacturers data from various years. To proxy for the level of residential consumer lobbying, we include the percentage of the state population which is classified as urban rather than rural, *POPURBPCT*. We assume that the problems of collective action are more easily overcome in relatively densely populated areas. Finally, we incorporate a measure of personal income, *INCOME*; ceteris paribus, as utility costs constitute an increasing proportion of household income, residential consumers will be more likely to lobby for rate reductions or lower allowed rates of return. In sum, we expect that states with relatively strong and concentrated industrial sectors, and a relatively urban and poor population, will be more likely to pressure political and regulatory actors for lower allowed rates of return. Since interest groups' lobbying pressures are likely to

be heightened in states with higher utility retail rates, we control for the cost of utility fuel purchases, which account for a large proportion of total rates; *FUELCOST* is the average price of fuel, per Btu, purchased by electric utilities within a state.

While these measures reflect the nature of the interest group environment at the state level, it is possible that important utility level variation within a state is masked. We therefore include two further variables that gauge the degree of non-market consumer competition that individual utilities will confront. *DENSITY* is the number of utility customers per ten thousand network circuit miles and *INDYCONS* is the percentage of utility sales (in MWh) to industrial customers. As at the state level, utilities with a more geographically concentrated and industrial customer base are expected to encounter stronger lobbying opposition to requests for rate increases.

Apart from interest group pressures, political preferences are also likely to reflect ideological factors (Kalt and Zupan, 1984). Since it is commonly held that political party membership is one predictor of pro-consumer ideology, we include several dummy variables that capture differences between state political environments and also which prior research has identified as correlated with states' decisions to implement consumer advocates in the 1970s and 1980s (Holburn and Vanden Bergh, 2002). *DDD* is a dummy set equal to one when the governor and majority parties of the state upper and lower legislative chambers are both Democrat; *RRR* is the equivalent variable for a Republican-aligned government. We also distinguish between aligned and divided governments to incorporate the effect of bargaining between legislatures and executives with differing ideological preferences: *RDD* represents a state with a Republican governor and Democrat-controlled legislature, with *DRR* representing the reverse configuration. Extending the same principal to the agency level (i.e to the PUC), we use a dummy

variable, *COMDEM*, set equal to one if the majority of PUC commissioners are Democrats, to proxy for the ideological preferences of the PUC. Since agencies in general, including PUCs, are overseen by state legislatures and executives, agencies need not formulate regulatory policies entirely in accordance with their own ideological preferences if they are opposed by their political principals. We capture this interaction for Democrat-controlled PUCs by including a further dummy variable, *RRRCOMD*, which is set equal to one when a Democrat PUC is overseen by an aligned Republican government.

Interest group, ideological and institutional variables thus together shape the nature of a state's regulatory climate. For utilities, the prospect of greater ex post expenditure disallowances associated with stronger pro-consumer environments induces tighter ex ante cost control – thereby leading to fewer rate reviews. PUC commissioners with relatively pro-consumer preferences, or else operating in procedural environments favoring consumer representation, will tend to make lower ROE decisions during rate cases.

In addition to the regulatory climate, separate sets of independent variables enter the rate review initiation and ROE equations. In the former, we include factors that affect firm costs independently of managerial effort (the choice of which is related to the regulatory climate). For example, $\Delta FUEL$ measures the annual percentage change in average electric utility fuel costs (on a per unit basis) within a state, and is driven mainly by external market forces. Increases in the cost of utilities' fuel purchases, as occurred during the early 1980s, directly reduce utility profits, thereby increasing the probability that utilities will initiate rate reviews[14]. $\Delta INCOME$ measures three-year lagged percentage changes in state income, which will be correlated with new utility investments in generation, transmission or distribution assets. $\Delta INTRATE$, the annual percentage change in the interest rate on ten year Treasury bills, measures

fluctuations in the cost of capital and hence in the cost of servicing long-term debt. *TIMESINCEREVIEW* measures the elapsed time since the utility initiated its last rate review.

In the ROE equation, we include *INTRATE*, the average interest rate on ten year Treasury bills as a measure of the risk-free interest rate. Modigliani and Miller (1958) have shown that the cost of equity capital is a positive function of the debt-equity ratio, which may then serve as a proxy for firm risk; the variable *DEBT* is a firm-specific measure of the allowed debt-equity ratio. We also include *FIRMSIZE*, the utility's annual sales in MWh, since prior research has suggested that larger utilities achieve higher allowed ROEs (Hagerman and Ratchford, 1978).

Tables 1a, 1b and 1c summarize these variables with a brief description, descriptive statistics and correlation matrices.

III.iii Hypotheses

The impact of consumer advocates and elected commissioners on regulatory outcomes is identified by the coefficients on the *ADVOCATE* and *ELECT* dummy variables which we expect to be negatively signed in both the rate review initiation and ROE models.

IV. Empirical Results

IV.i Review Initiation and Allowed ROE

Tables 2 to 5 present the results of the empirical analysis. We initially estimate two models: the first contains the main variables under consideration along with year fixed effects. State fixed effects, which are additionally included in Model 2, are found to be statistically significant.[1516] Table 2 provides the estimation of the rate review initiation model. The negative coefficients on *ADVOCATE*, statistically

significant at the ten percent level in Model 1, suggest that utilities are indeed more likely to postpone in time the initiation of rate reviews in states where consumer advocates have statutory jurisdiction. A similar but stronger result is found for states with elected rather than appointed PUC commissioners, with negative and highly significant coefficients on *ELECT* in both models. Nor is the magnitude of the economic impact negligible: the presence of a consumer advocate is estimated to reduce the probability of a utility requesting a rate review by 4.5 percentage points in any given year, and elected PUC commissioners by 11.6 percentage points. Together, these findings suggest that when the institutional "rules of the game" favor consumers, utilities adjust their investment and rate review initiation strategies in anticipation of less remunerative regulatory rulings. Not all utilities are alike, however: utilities that are large relative to the PUC (increasing *RELSIZE*) are significantly more likely to initiate reviews, possibly expecting their greater resources will yield an advantage in the hearing process or in counter-lobbying the legislature and executive against the PUC.

Economic variables, similarly, appear to be important in the decision to initiate a rate review. The positive coefficients on $\Delta FUEL$ and $\Delta INCOME$, both statistically significant when state fixed effects are included (Model 2), imply that utilities tend to trigger rate reviews following increases in fuel costs and in state economic wealth, the latter raising demand for utility network expansion. The coefficient on $\Delta INTRATE$ is negative, however, though this probably reflects the result of a positive correlation with a negative time trend in the number of annual rate reviews during the 1980s.

In contrast to supportive findings on the institutional and economic variables, evidence for the importance of the interest group and political environment is somewhat weaker: the estimated coefficients on interest group and political regime variables are statistically insignificant (with the

exception of *URBPOPPC*) though are mostly signed as expected. Since both institutional and interest group factors are found to be statistically important in final PUC decisions on the allowed ROE (see discussion below and Table 3), the fact that interest group variables are largely statistically insignificant at the initiation stage is surprising. One potential explanation is that it is more difficult for utilities to determine the preferences, and degree of lobbying organization, of multiple interest groups, and to identify their impact on PUC decisions, than it is to discern the effect of institutional aspects of the rate review process which are highly visible.

The results in Table 2 provide some of the first statistical evidence for Joskow's early proposition that rate reviews tend to be observed mainly during periods of rising costs as utilities initiate reviews more frequently (Joskow, 1974). However, the results also suggest that utilities behave in a more sophisticated manner than simply responding to exogenous cost shocks alone. Since rate reviews can result in a reduction, as well as an increase, in utility rates and profits, utilities tend to delay initiation when the procedural features of the agency's decision-making environment are stacked towards consumer interests. While consumer advocates appear to have a non-negligible influence, we find that the method of PUC commissioner selection has an especially strong effect on utilities' initiation strategy.

Turning now to the allowed ROE model (Table 3), we consider whether the actual effect of these procedural characteristics on regulatory policy decisions is consistent with implied utility expectations. Several results are noteworthy. First, the coefficient on *ADVOCATE* is negative and significant, both statistically and economically in Models 1 and 2, implying that consumer advocates do pose a threat to utilities' revenues by pushing downwards PUC decisions on allowable rates of return during rate reviews. The impact of consumer advocates is estimated to reduce the allowed ROE by between 0.19

and 0.37 percentage points. Second, as in the rate review initiation model, the PUC commissioner selection method also has a material impact: elected commissioners tend to lower allowed equity returns, to the tune of 0.56 to 2.1 percentage points, than their appointed counterparts. These results, to the extent that they imply less favorable rate review outcomes, reflecting a greater weight placed on consumers' interests, are thus consistent with utilities' strategies to postpone rate reviews in states with consumer advocates and elected commissioners.

While consumer advocates and PUC's exist as independent institutional actors, they operate under the oversight of the courts and legislative and executive bodies who may have differing policy preferences. In Models 3 and 4 we thus explore the possibility that consumer advocates and elected commissioners have differential impacts on regulatory policy in different types of political environments by interacting *ELECT* and *ADVOCATE* with the two aligned government variables, *DDD* and *RRR*, to create four new variables. The results imply that these institutions do indeed behave differently in Republican- and Democrat-controlled political regimes, consistent with the "Congressional Dominance" hypothesis of bureaucratic decision-making (Weingast and Moran, 1983). In Model 3, advocates in states with aligned Democrat governments are statistically associated with allowed rates of return 0.58 percentage points lower than in states with divided legislatures; in Republican regimes, by contrast, advocates are associated with 1.01 percentage point *increases* in allowed rates of return.[17] A similar but smaller divergence in estimated impacts is found for elected commissioners: rates of return tend to be 0.76 percentage points lower in elected commissioner Democrat states, 0.67 percentage points lower in elected commissioner Republican states. Consumer advocates and elected commissioners thus both have stronger pro-consumer impacts on policy in Democrat than Republican political regimes. There are two potential reasons why agency behavior appears sensitive to the political environment: first, advocates

and commissioners, anticipating budgetary or other sanctions of policy decisions that are considered mistaken by the legislature, deliberately moderate their actions in order to pre-empt such reactions. Elected PUC commissioners thus adopt a weaker pro-consumer position in their rulings when overseen by Republican-controlled legislatures who typically place relatively greater weight on the interest of industry, including utilities, over residential constituents. [18] A second explanation is that aligned governments simply appoint advocates with similar policy preferences to their political principals. In either case, and as the evidence suggests, unified political preferences are associated with a measure of observed agency compliance.

In addition to institutional factors, state interest group variables appear to have some influence on PUC decisions. More concentrated manufacturing sectors (*MANUHHI*) are associated with statistically lower allowed ROE returns, consistent with the Stigler-Peltzman hypothesis of interest group coordination. Contrary to initial expectations, however, states with relatively large industrial bases (*INDUSTRY*) are associated with higher allowed rates of return on average. One potential explanation for this finding is that it reflects the outcome of a complex series of lobbying interactions between a variety of interest groups. Industrial trade organizations may lobby for lower rates, ceteris paribus, by focusing on the PUC's decision on the rate structure rather than on the overall allowed return. Industrial lobbies may find it more effective to lobby against competing, and less organized, consumer groups, such as residential consumers, than to oppose the utility on the allowed ROE. Industrial lobbies would then benefit from achieving favorable reductions in their rates relative to other consumer classes, even at the expense of higher allowed ROEs, ceteris paribus. We explore this hypothesis below with an analysis of utility rate structures.[19] Thus, while measures of industrial consumer interests are generally statistically

significant, those for residential consumers (*URBPOPPC* and *INCOME*) are mostly not significant nor exhibit stable signs, suggesting that they are less of a competitive threat to utilities.

At the firm-level, there is strong evidence that the size of the utility is positively correlated with higher allowed returns though, interestingly, only in relation to the size of the PUC (*RELSIZE* is statistically significant at the five or one percent levels in all models, *FIRMSIZE* is always insignificant). This supports the proposition that when agency decisions are required to relate to the information and arguments presented publicly, the party with greater resources is likely to better advance its own position and to refute those of its opponents, thus gaining more favorable rulings. Again, this result is consistent with the finding in the initiation model the relatively large utilities are more likely to trigger rate reviews. In contrast to the state-level interest group results, the utility-level interest group variables (*DENSITY* and *INDYCONS*) are not statistically significant, suggesting that consumers are organized at the state rather than local level.

Finally, the coefficients on the economic variables, *INTRATE* and *DEBT* are signed as expected and are both statistically significant at the one percent level across all models: PUCs adjust allowed ROE's upwards with increasing risk-free market interest rates and firm-specific risk, both of which increase utilities' cost of capital.

IV.ii Impact on Rate Structure

While the results so far strongly suggest that consumers benefit at the expense of utilities from the presence of consumer advocates and elected commissioners on one dimension of regulatory policy, any changes in rate *structures* between customer classes will dimish or augment the gains from a lower

allowed ROE. We thus investigate how consumer advocates and elected commissioners affect residential and industrial consumers differentially by considering their impact on the structure of final rates. Since PUC commissioners determine what share of utility costs and revenues each customer class should bear, a reduction in rates for one class implies, ceteris paribus, an increase in rates for another class. We anticipate first that, since elected PUC commissioners are chosen by residential consumers and on the basis of a relatively narrow policy platform, such commissioners will favor lower residential rates relative to other customer classes, all else equal. In contrast, since the electoral connection is not so close for consumer advocates – being appointed generally by state governors – we expect that industrial consumers, being more organized in lobbying activities than residential consumers, will tilt the rate structure in their favor.

To test these hypotheses we regress each utility's residential-to-industrial rate ratio on a set of institutional, political and interest group variables similar to that used in the Allowed ROE specification.[20] Again, by using panel data at the utility level, we are able to control for state and year unobserved characteristics. As before, we estimate two models with differing combinations of fixed effects (see Table 4). The results for the institutional variables are strong: in each model *ELECT* is negative, as predicted, and statistically significant at the 0.1 or 5 percent level. In states with elected commissioners, the residential-industrial rate ratio is estimated to be between 0.05 and 0.2 points lower than in states with appointed commissioners.[2122] Elected commissioners thus indeed appear to favor residential consumers as predicted. Consumer advocates, on the other hand, are associated on average with residential-industrial rate ratios that are 0.02 to 0.03 points *higher* than in states with no consumer advocates (coefficient on *ADVOCATE* is significant at the 0.1 percent level in Model 1, insignificant in Model 2). There is some evidence then that consumer advocates benefit industrial consumers. Beyond

these institutional characteristics, coefficients on most other variables are not statistically significant at conventional levels. Two exceptions are noteworthy, customer density (*DENSITY*) and the proportion of urban customers (*POPURBPC*), both of which are significant in all models at the 0.1 percent level. The negative coefficients on these variables are consistent with the lower transmission and distribution network costs of serving high density customer regions.

Combined with the results of the Allowed ROE model, an intriguing picture of interest group competition between utilities, residential consumers and industrial consumers emerges. Residential consumers, when they elect PUC commissioners, are a threat to both utility and industrial consumer interests: elected commissioners allow lower rates of return and tilt the rate structure towards the residential class. In fact, the estimated adverse impact on industrial rates due to changes in the rate structure (increase in industrial rates of 1.8% to 5.6%) far outweighs the beneficial impact due to a reduced ROE (decrease in industrial rates of 0.8% to 3.1%). Elected commissioners thus appear to make industrial consumers worse off after both affects are accounted for, all else equal (see Table 5 for calculations).

Industrial consumers, however, appear to be more of a threat to residential consumers than to utilities. Larger industrial classes are associated with higher allowed rates of return, which have the benefit of encouraging utilities to invest in generation assets and transmission networks, thereby securing electricity supplies for industrial firms. Industrial customers gain further at the expense of residential consumers when consumer advocates have statutory jurisdiction; in general, it appears that industry is able to use consumer advocates as a vehicle for lobbying against residential consumers by shifting the rate structure in their favor. This is consistent with the prediction that the influence of organized interest

groups depends on the saliency of the policy issue to the regulatory institution – which is argued to be lower for appointed advocates than for elected agency heads. As with elected commissioners, the impact on ultimate rates due to changes in the rate structure is much greater than the impact due to changes in the allowed ROE. The former is estimated to increase residential rates by between 2.0% and 2.3% while the latter decreases residential rates by up to 0.5%. All else equal, consumer advocates, on average, thus leave residential consumers worse off but industrial consumers better off.

V. Conclusion

In sum, the empirical analysis presented here provides robust support for the thesis that interest group representation through administrative procedures and institutions has real implications for agency-determined policy outcomes. We provide the first statistical evidence that interest groups who participate by altering the agency's informational environment, as opposed to vetoing policy agendas or decisions, are associated with favorable policy biases. Political decisions to "stack the deck" at the agency level in favor of particular interest groups thus appear not to be purely a matter of providing pork or visibility, but instead an attempt to exercise political control over delegated policy domains. Indeed, one of the notable results is the persistently strong statistical and economic significance of institutional variables compared to traditional interest group and political measures that are routinely used by regulation scholars adopting the Stigler-Peltzman approach to policy analysis. Although interest group competition is difficult to measure accurately, the evidence here suggests that interests groups influence policy to a large extent through the design of administrative institutions. Further work, however, is required to develop the theoretical foundations of an approach that combines interest group and institutional elements.

From a policy perspective, we find that implementing consumer representation institutions in the U.S. has shifted regulatory policy to the disadvantage of utilities through lower allowed rates of return. While the method of commissioner selection has the largest impact on this dimension of policy, shaping the PUC's informational environment through admitting consumer advocates also has a significant effect. Utilities do not behave passively in such environments: since major policy decisions are made in the context of rate reviews, utilities react to the expectation of unfavorable decisions by postponing rate review initiation. Utilities thus act as "gatekeepers" in this respect, preventing opposing interests from competing against them in agency procedures and from potentially instigating rate reductions.

Consumers do not benefit uniformly, however, from institutionalized representation. Depending on the method of representation, some classes can be advantaged while others can be disadvantaged as a result of rate structure rebalancing. Our estimates of significant changes in both residential and industrial rates build on existing research on the impact of commissioner selection method which concludes that, "In summary, it probably makes little difference to the average ratepayer whether a PUC is elected or appointed" (Costello, 1984). The salient word in this quote is *average* since it masks what we find to be important inter-consumer class variation. Residential and industrial consumers are likely to care very much whether commissioners are elected or appointed: the former are expected to experience an increase in welfare through lower rates while the latter may in fact experience a reduction in welfare.

Although we find a significant impact of consumer representation institutions as practiced within the U.S., similar results need not obtain in other countries where the institutional rules governing regulatory procedures are likely to differ. In the U.K., for instance, even though the government has implemented U.S.-style advocacy bodies, the reasoning and evidentiary requirements of the regulatory agency are

substantially weaker than in the U.S. Thus, while consumer advocates have substantial resources and procedural rights, regulatory officials need not incorporate or account for their claims in final decisions. Predicting the policy impact of consumer advocates in different countries thus requires close attention to the specific rules of the institutional environment.

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Table 1a: Variable Names and Descriptions

	Variable	Description
Constant	C	Constant
Economic	INTRATE	Treasury-Bill Interest rate (10 year)
	∆FUEL	Percentage change in annual cost of fuel purchased by electric utilities in a state
	∆INCOME	Percentage change in annual state personal income
	∆INTRATE	Percentage point change in annual average Treasury-Bill Interest rate
Institutional	ADVOCATE	Consumer advocate dummy
	ADVDDD	Consumer advocate in aligned Democrat government dummy
	ADVRRR	Consumer advocate in aligned Republican government dummy
	ELECT	Elected PUC commissioner dummy
Political	DDD	Aligned Democrat government dummy
	RDD	Republican governor, Democrat-controlled legislature dummy
	RRR	Aligned Republican government dummy
	DRR	Republican governor, Democrat-controlled legislature dummy
	COMDEM	Democrat-controlled PUC dummy
	RRRCOMD	Democrat-controlled PUC dummy, aligned Republican govt dummy
Interest Group	FUELCOST	Average cost of fuel purchased by electric utilities in a state ($ per Btu)
	INDUSTRY	Ratio of industrial to total state electricity consumption
	URBPOPPC	Percentage of state population that is urban
	MANUHHI	Concentration of state manufacturing enterprises (by employment, Hirschman-Herfindahl index)
	INCOME	State personal income
Utility-specific	DEBT	Utility debt-equity ratio
	FIRMSIZE	Utility size (MWhrs sold)
	RELSIZE	Utility size in relation to PUC size (Utility revenue/PUC budget)
	DENSITY	Utility customer density (number of customers/10000 circuit miles)
	INDYCONS	Ratio of utility's industrial sales volume (MWh) to total sales
	TIMEREVIEW	Number of years since last rate review divided by 10000

Table 1b: Variables and Descriptive Statistics

Rate Review Initiation Probit Model and Rate Structure Model

Variable	Mean	Std Dev	Minimum	Maximum
ADVOCATE	0.5602	0.4965	0	1
ELECT	0.13524	0.34207	0	1
RELSIZE	9.11358	0.15741	0	2.13021
ΔFUEL	0.019949	0.18348	-0.81034	2.45686
ΔINCOME	0.31473	0.98972	-0.96832	27.77231
ΔINTEREST	-0.21823	1.94074	-6.38	8.35
INCOME	0.094663	0.094917	0.004424	0.59096
MANUHHI	1.43821	0.15344	1.22991	2.04279
FUELCOST	1.79880	0.93179	0.45020	6.64487
INDUSTRY	0.36834	0.090831	0.12309	0.64922
URBPOPPC	0.68664	0.1399	0.33773	0.91295
DDD	0.35074	0.47733	0	1
RRR	0.087411	0.28251	0	1
RDD	0.28312	0.45064	0	1
DRR	0.073667	0.2613	0	1
COMDEM	0.58879	0.49219	0	1

Allowed ROE Model

Variable	Mean	Std Dev	Minimum	Maximum
ROE	14.81037	1.28795	10.963	19.1
INTRATE	10.80464	2.59279	6.45	14.8
ADVOCATE	0.52584	0.49971	0	1
ADV*DDD	0.21581	0.41169	0	1
ADV*RRR	0.006079	0.07779	0	1
ELECT	0.10942	0.31241	0	1
DDD	0.36322	0.48129	0	1
RDD	0.25988	0.4389	0	1
RRR	0.089666	0.28592	0	1
DRR	0.079027	0.26999	0	1
COMDEM	0.60182	0.48989	0	1
RRRCOMD	0.0091185	0.095127	0	1
FUELCOST	1.8874	0.96876	0.4502	6.12971
INDUSTRY	0.37033	0.086029	0.14162	0.64458
URBPOPPC	0.68908	0.14011	0.33773	0.91295
MANUHHI	1.43279	0.15401	1.22991	2.04279
INCOME	0.091045	0.091537	0.0044235	0.59096
DEBT	38.04893	5.18458	10	53.6
FIRMSIZE	0.10459	0.11453	0.003606	0.682
RELSIZE	0.13111	0.17217	0.0008137	2.13021
DENSITY	0.032084	0.075936	0.0022499	1.02199
INDYCONS	0.35824	0.11985	0.047565	0.81009

Table 1c: Correlation Matrices (Rate Review Initiation and Rate Structure Models)

	ADVOCATE	ELECT	RELSIZE	FIRMSIZE	FUELCOST	PUCSIZE	FUELDELT	INCDELTA	INTDELTA	INCOME	MANUHHI	INDUSTRY	URBPOPPC	DDD	RRR	RDD	DRR	COMDEM	DURATION
ADVOCATE	1.000																		
ELECT	-0.214	1.000																	
RELSIZE	0.035	0.078	1.000																
FIRMSIZE	0.076	-0.037	0.483	1.000															
FUELCOST	-0.005	-0.119	0.104	0.085	1.000														
PUCSIZE	0.058	-0.199	-0.239	0.329	0.139	1.000													
FUELDELT	-0.062	0.004	0.061	-0.036	0.170	-0.099	1.000												
INCDELTA	-0.011	-0.021	0.112	0.074	0.025	-0.004	0.050	1.000											
INTDELTA	-0.027	-0.003	0.021	0.002	-0.041	-0.009	0.275	0.046	1.000										
INCOME	0.138	-0.261	-0.116	0.390	0.243	0.864	-0.090	0.025	0.000	1.000									
MANUHHI	-0.152	0.215	0.011	-0.140	-0.264	-0.311	0.001	-0.044	-0.010	-0.434	1.000								
INDUSTRY	0.039	-0.055	0.127	-0.080	-0.162	-0.276	0.055	0.017	0.051	-0.240	0.305	1.000							
URBPOPPC	0.082	-0.269	0.019	0.213	0.398	0.419	-0.016	0.051	0.004	0.585	-0.460	-0.334	1.000						
DDD	0.070	0.045	0.095	0.026	0.197	-0.156	0.019	-0.018	-0.056	-0.142	-0.041	-0.045	0.030	1.000					
RRR	-0.261	0.107	0.002	-0.106	-0.156	-0.150	0.014	-0.018	0.021	-0.176	0.159	-0.001	-0.243	-0.232	1.000				
RDD	0.002	-0.111	-0.024	0.067	-0.056	0.084	-0.049	0.016	0.055	0.164	-0.119	-0.084	0.085	-0.451	-0.188	1.000			
DRR	-0.180	0.095	0.007	-0.095	0.083	-0.149	0.047	-0.014	-0.030	-0.217	0.232	0.048	-0.075	-0.210	-0.087	-0.170	1.000		
COMDEM	0.100	0.182	0.133	0.060	0.202	-0.077	0.023	0.027	-0.083	-0.113	0.037	0.080	-0.014	0.456	-0.217	-0.351	0.127	1.000	
DURATION	0.097	0.023	-0.043	0.082	-0.025	0.136	-0.255	-0.099	-0.328	0.119	0.012	-0.113	-0.013	-0.030	-0.057	0.002	-0.015	0.034	1.000

Table 1c: Correlation Matrices (Allowed ROE Model)

	ROEALD1	INTRATE	ADVOCATE	ADVDDD	ADVRRR	ELECT	DDD	RDD	RRR	DRR	COMDEM	RRRCOMD	FUELCOST	INDUSTRY	URBPOPPC	MANUHHI	INCOME	DEBT	FIRMSIZE	RELSIZE	DENSITY
ROEALD1	1.000																				
INTRATE	0.408	1.000																			
ADVOCATE	-0.013	-0.117	1.000																		
ADVDDD	0.019	0.001	0.498	1.000																	
ADVRRR	0.091	0.003	0.074	-0.041	1.000																
ELECT	-0.123	0.058	-0.135	-0.077	-0.027	1.000															
DDD	-0.003	-0.040	0.103	0.695	-0.059	0.019	1.000														
RDD	-0.096	0.019	-0.110	-0.311	-0.046	-0.086	-0.448	1.000													
RRR	0.071	0.187	-0.288	-0.165	0.249	0.060	-0.237	-0.186	1.000												
DRR	0.055	0.047	-0.162	-0.154	-0.023	0.114	-0.221	-0.174	-0.092	1.000											
COMDEM	0.057	-0.030	0.117	0.381	0.024	0.126	0.479	-0.233	-0.321	0.146	1.000										
RRRCOMD	0.020	0.034	-0.005	-0.050	0.610	0.120	-0.072	-0.057	0.306	-0.028	0.078	1.000									
FUELCOST	0.188	0.096	-0.005	0.104	-0.005	-0.101	0.127	-0.077	-0.197	0.148	0.213	-0.055	1.000								
INDUSTRY	0.078	0.089	0.055	0.030	0.041	-0.054	-0.095	0.042	0.042	0.031	0.026	-0.031	-0.265	1.000							
URBPOPPC	0.154	-0.044	0.080	-0.076	-0.022	-0.203	0.010	0.089	-0.281	-0.062	0.016	-0.076	0.401	-0.352	1.000						
MANUHHI	-0.083	0.046	-0.045	0.074	0.014	0.162	0.015	-0.062	0.057	0.271	0.082	0.075	-0.270	0.370	-0.450	1.000					
INCOME	0.048	-0.219	0.180	-0.090	0.015	-0.232	-0.147	0.083	-0.180	-0.231	-0.102	-0.020	0.297	-0.266	0.592	-0.465	1.000				
DEBT	-0.263	-0.378	-0.012	-0.120	-0.050	-0.036	-0.108	0.134	-0.102	0.003	-0.153	0.025	-0.023	-0.058	0.036	-0.150	0.151	1.000			
FIRMSIZE	0.031	-0.102	0.063	0.060	-0.008	-0.045	0.073	0.043	-0.146	-0.118	0.054	-0.040	0.064	-0.083	0.195	-0.074	0.381	0.012	1.000		
RELSIZE	0.022	0.058	0.032	0.132	-0.014	0.055	0.097	0.015	-0.015	0.042	0.138	-0.043	0.035	0.135	0.000	0.115	-0.156	-0.037	0.412	1.000	
DENSITY	0.012	0.023	0.115	0.150	0.013	-0.065	0.132	-0.079	-0.072	-0.080	0.029	-0.001	0.208	-0.171	0.204	-0.133	0.055	0.010	0.078	0.107	1.000
INDYCONS	0.004	0.023	0.045	-0.030	0.090	0.033	-0.096	-0.003	0.086	-0.038	0.001	0.086	-0.150	0.437	-0.231	0.246	-0.069	-0.100	0.079	0.233	-0.147

Table 2: Rate Review Initiation Model

Dependent variable is *INITIATE*[23]

	Variable	Model 1	Model 2
Constant	C	0.5116 (0.501)	0.4902 (0.488)
Institutional	ADVOCATE	-0.137* (0.074)	-0.118 (0.074)
	ELECT	-0.353*** (0.110)	-0.363*** (0.108)
	RELSIZE	0.7506*** (0.191)	0.6501*** (0.204)
Economic	∆FUEL	0.2385* (0.135)	0.3754*** (0.143)
	∆INCOME	0.2265 (0.159)	0.3079* (0.180)
	∆INTRATE	-0.060*** (0.016)	-0.063*** (0.017)
Interest Group	MANUHHI	-0.324 (0.264)	-0.305 (0.259)
	INCOME	0.0113 (0.508)	0.0240 (0.491)
	FUELCOST	0.0384 (0.041)	0.0422 (0.041)
	INDUSTRY	-0.101 (0.430)	-0.194 (0.426)
	URBPOPPC	-0.611* (0.337)	-0.601* (0.330)
Political	DDD	-0.072 (0.105)	-0.039 (0.104)
	RRR	-0.076 (0.149)	-0.097 (0.154)
	RDD	-0.096 (0.100)	-0.093 (0.101)
	DRR	-0.016 (0.161)	-0.007 (0.161)
	COMDEM	-0.023 (0.085)	-0.045 (0.085)
Utility-specific	TIMESINCEREVIEW	-5.541*** (0.872)	-4.557*** (0.942)
Dummies	YEAR	YES	YES
	STATE	NO	YES
	N	1649	1649
	Positive obs	658	658
	Log likelihood	-1843.94	-1688.12

Table 3: Allowed ROE Model

Dependent variable is ROE[24]

	Variable	Model 1	Model 2	Model 3	Model 4
Constant	C	12.145*** (0.990)	9.3536*** (2.494)	12.380*** (0.992)	10.018*** (2.539)
Economic	INTRATE	0.2624*** (0.048)	0.4040*** (0.048)	0.2622*** (0.048)	0.3705*** (0.046)
	FUELCOST	-0.002 (0.057)	-0.199* (0.105)	-0.031 (0.059)	-0.160 (0.106)
Institutional	ADVOCATE	-0.193** (0.092)	-0.365** (0.183)	-0.344*** (0.114)	-0.468** (0.187)
	ELECT	-0.551*** (0.134)	-2.054*** (0.538)	-0.792*** (0.167)	-2.087*** (0.519)
	ADV*DDD			0.3339* (0.188)	0.0106 (0.205)
	ADV*RRR			1.6896*** (0.640)	0.9901 (1.009)
	ELECT*DDD			0.6101** (0.251)	0.1495 (0.652)
	ELECT*RRR			0.4521 (0.451)	0.9531 (0.811)
Interest Group	INDUSTRY	1.9336*** (0.557)	6.8315*** (1.566)	1.8159*** (0.562)	6.5616*** (1.550)
	MANUHHI	-1.056*** (0.310)	-0.577 (1.006)	-1.151*** (0.319)	-0.640 (1.052)
	INCOME	1.4204* (0.817)	-2.759 (2.004)	1.1515 (0.818)	-2.555 (2.055)
	URBPOPPC	0.6310 (0.413)	-0.425 (1.377)	0.8175* (0.420)	-0.645 (1.401)
Utility-specific	DEBT	-0.027*** (0.008)	-0.032*** (0.009)	-0.026*** (0.008)	-0.031*** (0.008)
	RELSIZE	0.6744*** (0.218)	0.5341* (0.222)	0.6171*** (0.208)	0.5635** (0.221)
	FIRMSIZE	0.7042 (0.436)	0.2244 (0.382)	0.6535 (0.429)	0.2775 (0.381)
	DENSITY	-0.464 (0.928)	-0.340 (0.595)	-0.501 (0.918)	-0.338 (0.609)
	INDYCONS	-0.442 (0.325)	-0.249 (0.299)	-0.405 (0.318)	-0.256 (0.296)
Political	DDD	-0.272** (0.129)	-0.047 (0.143)	-0.581*** (0.193)	-0.102 (0.190)
	RDD	-0.337 (0.123)	-0.036 (0.133)	-0.406*** (0.125)	-0.104 (0.132)
	RRR	-0.130 (0.165)	-0.477** (0.239)	-0.334* (0.174)	-0.698*** (0.240)
	DRR	0.2418 (0.191)	0.0191 (0.496)	0.1927 (0.197)	0.1478 (0.527)
	COMDEM	0.0167 (0.107)	-0.023 (0.107)	0.0250 (0.105)	-0.037 (0.107)
	RRRCOMD	0.3784 (0.508)	0.7530* (0.455)	-0.420 (0.698)	0.2587 (1.009)
	rho	0.7869*** (0.059)	0.3994*** (0.038)	0.7806*** (0.063)	0.6331*** (0.045)
Dummies	YEAR	YES	YES	YES	YES
	STATE	NO	YES	NO	YES
	N	658	658	658	658
	Log-likelihood	-1843.94	-1688.12	-1835.00	-1684.44

Table 4: Rate Structure Model

Dependent variable is *Residential-Industrial Rate Ratio (at utility level)* [25]

	Variable	Model 1	Model 2
Constant	C	1.815*** (0.086)	2.316*** (0.415)
Economic	FUELCOST	-0.02*** (0.006)	-0.00 (0.012)
Institutional	ADVOCATE	0.029*** (0.010)	0.015 (0.023)
	ELECT	-0.05*** (0.015)	-0.14** (0.069)
	PUCSIZE	-0.16 (0.105)	0.263 (0.230)
Interest Group	URBPOPPC	-0.21*** (0.057)	-0.91*** (0.177)
	MANUHHI	-0.18*** (0.040)	-0.35 (0.223)
	INCOME	0.124 (0.138)	0.306 (0.382)
	INDUSTRY	0.066 (0.061)	0.286 (0.217)
Utility-specific	DENSITY	-0.32*** (0.038)	-0.24*** (0.039)
Political	DDD	-0.00 (0.015)	0.016 (0.021)
	RDD	0.027* (0.015)	0.022 (0.019)
	RRR	-0.00 (0.021)	-0.02 (0.030)
	DRR	0.145*** (0.024)	0.002 (0.044)
	COMDEM	0.007 (0.013)	0.021 (0.015)
	RRRCOMD	0.122*** (0.038)	-0.02 (0.038)
Dummies	YEAR	YES	YES
	STATE	NO	YES
	N	1637	1637
	R-SQUARED	0.209	0.41

Table 5a: Estimated Impact of Commissioner Election on Residential and Industrial Rates[26]

Percentage Change in Rate Level due to Impact of Elected Commissioner on:		
	Allowed ROE[27]	*Rate Structure*[28]
Residential Rate	-0.8% to –3.1%	-0.2% to –3.1%
Industrial Rate	-0.8% to –3.1%	+1.8% to +5.6%

Table 5b: Estimated Impact of Consumer Advocates on Residential and Industrial Rates

Percentage Change in Rate Level due to Impact of Consumer Advocates on:		
	Allowed ROE	*Rate Structure*
Residential Rate	-0.3% to –0.5%	+2.0% to +2.3%
Industrial Rate	-0.3% to –0.5%	-0.9% to -1.3%

[1] The authors are grateful to Jean-Philippe Bonardi, Richard Green, Stephen Littlechild and David Mowery; to participants at the 2002 American Law and Economics Association meeting; and to participants at the 2002 International Society for New Institutional Economics meeting for helpful comments and suggestions. Financial support for this research from the University of California Energy Institute is also gratefully acknowledged.

[2] By drift we mean that by delegating policymaking authority to a regulatory agency, legislators introduce the risk that the policy choice of the agency is different from the policy preference of the legislature.

[3] See also Harris and Navarro (1983) and Primeaux and Mann (1986) for studies of the relationship between electricity rates and commissioner selection methods.

[4] The rate structure consists of the different rates charged to residential, industrial and commercial consumers.

[5] As the New Mexico Public Utility Commission recently commented about its discretionary powers, "*[there is] a zone of reasonableness between confiscation [of utility assets] and extortion [of consumers] in which the Commission has great discretion in setting just and reasonable rates*". (New Mexico PUC Brief, Supreme Court Case No. 24,148, PNM Gas Services vs. NMPUC. 1998).

[6] See, for example, Hagerman and Ratchford (1978).

[7] Consumer advocates were mainly initially established in the U.S. during the 1970s and 1980s when utility costs and rates were steeply rising, reversing several decades of continuous technological improvement and falling rates (Holburn and Vanden Bergh, 2002; Joskow, 1974, 1989; Gormley, 1981, 1983). Consumer advocates in these states operate as independent institutional actors that have been granted funding and the authority to represent residential and industrial consumer interests in utility proceedings before state agencies and courts. Generally, the state governor or attorney general with the advice and consent of the legislature appoints the head consumer advocate. As the Arkansas legislature noted in 1980, "The people of Arkansas need aggressive and effective representation in utility rate hearings and other utility-related proceedings." Arkansas Code 23-4-302(3), Public Utilities and Regulated Industries

[8] Utilities tend to trigger rate reviews in response to rising costs (Joskow, 1974). Since rates cannot be adjusted otherwise, reviews are an important mechanism by which firms can restore their profitability after periods of cost inflation. Upon initiation of a rate review, a series of public hearings is held where the utility, PUC staff and other intervenors (including consumer advocates), present arguments before a commissioner or Administrative Law Judge about the appropriate estimate of utility costs and level of profitability. Commissioners, after considering all evidence and testimony presented, make a majority decision on several factors: the allowed rate of return, the allowed rate base and the rate structure. While the majority of rate reviews result in rate increases, utilities typically receive only a fraction of the total increase requested and, for electric utilities during the 1980s, ten percent of all rate cases led to a reduction or zero change in rates. See Hyman (2000) for a more detailed description of the rate review process.

[9] The rate base is the level of operating costs and investment expenditures that the PUC deems prudently incurred and on which the utility is allowed to earn a return. Changes in the rate base arise as the PUC formally approves new investments that the firm has recently completed, for example, the completion of new electric generation capacity or the extension of transmission facilities. The allowed rate of return is usually set in reference to the firm's weighted cost of capital so that it may raise new capital on the debt or equity markets in order to finance future investments. The appropriate rate of return will fluctuate over time as broader capital market conditions and interest rates change, though the official allowed rate of return can only be adjusted accordingly in the context of a rate review. Since rate reviews are costly and lengthy procedures, PUCs often allow firms to earn actual profits which imply a somewhat greater rate of return than the allowed rate.

[10] Roberts, Maddala and Enholm (1978) also estimate a sample selection model but do not consider the impact of political, institutional or economic factors on the firm's decision to initiate a review or on the PUC's allowed ROE.

[11] It is not possible to use observed changes in utility costs as an independent variable in the initiation equation since observed costs reflect managerial effort as well as the impact of exogenous factors. As we assume that managerial effort is chosen by the utility in response to the regulatory climate, including observed costs in the model will yield biased coefficient estimates.

[12] This approach provides more efficient coefficient estimates than the conventional Heckman (1979) two-stage method which uses the inverse Mills ratio function of the probit residuals as an extra variable in the regression equation.

[13] The data were compiled from a utility rate review report conducted by a private consulting firm. Rate cases are classified as major if the rate request was $5m or greater, or if the rate decision resulted in a rate revision of $3m or more. Interim rate orders or non-rate of return related revenue adjustments, for example due to tax revisions or fuel cost changes, are excluded.

[14] Some states adopted automatic fuel adjustment clauses (FACs) during the 1980s which allowed utilities to pass through fuel costs without requiring a formal rate review. However, since such clauses rarely allowed utilities to pass through 100 percent of the cost increases, fuel cost-triggered rate reviews were not completely eliminated.
[15]

[16] A Likelihood ratio test comparing Model 2 with Model 1 enables us to reject at the 1% confidence level the null hypothesis that state effects are identical.
[17] A likelihood ratio test comparing Models 4 and 1 allows us to reject the hypothesis, at the one percent confidence level, that advocates and elected commissioners have identical impacts across Democrat and Republican controlled political regimes.
[18] Republican legislatures may simultaneously satisfy the interests of utilities and large industrial consumers of utility services, both natural Republican constituents, by supporting higher allowed rates of return coupled with rate structures that favor industrial over residential consumer classes.
[19] In this scenario, interest group competition thus occurs between different consumer groups, e.g. industrial, commercial, rural, urban, rather than between consumers in aggregate and the utility. By diverting some of the resources used in opposing the utility, this strategy has the further benefit of encouraging the utilities to make infrastructure investments that ensure a reliable and long-term supply of electricity, a matter of considerable importance to industrial consumers in particular.
[20] Rates are in fact average rates, measured by dollar revenues divided by megawatt hours sold per customer class. The data is available through utilities' FERC Form 1 annual filings.
[21] The average residential-industrial rate ratio during the 1980s was 1.45.
[22] This is consistent with Besley and Coate's (2002) finding that residential rates are lower in states with elected commissioners though they do not explicitly consider the rate structure as the dependent variable.
[23] *, **, *** denote statistical significance at the 0.1, 0.05 and 0.01 levels respectively
[24] *, **, *** denote statistical significance at the 0.1, 0.05 and 0.01 levels respectively
[25] *, **, *** denote statistical significance at the 0.1, 0.05 and 0.01 levels respectively
[26] Figures in each cell represent an estimated range of impact on rates. The range of impact is established by using the minimum and maximum values of coefficients on *ELECT* and *ADVOCATE* from Models 1 to 3 in the Allowed ROE and Rate Structure tables.
[27] Impact of reduced allowed ROE is calculated as change in utility revenue divided by total utility revenue. Change in revenue is estimated by percentage point change in ROE (coefficients on *ELECT* or *ADVOCATE* in Table 3) multiplied by the rate base (average value assumed of $12bn in a state). This figure is adjusted for a 40% equity-debt ratio. Average annual state electric utility revenues assumed to be $3.3bn.
[28] New residential and industrial rates, and percentage changes, are calculated using the estimated rate ratio (using coefficients on *ELECT* and *ADVOCATE* in Table 4), under the constraint that combined residential and industrial utility revenues do not change. Individual combined utility revenue of $443m assumed, derived from average 3460m mWh sales to residential customers, 3850 m mWh sales to industrial customers.