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Do Elected Public Utility Commissioners Behave More Politically than Appointed Ones?

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1. Introduction.

State public utility commissions are responsible for regulating industries that have a direct impact on the daily life of nearly every citizen. These commissions are typically responsible for ensuring that consumers and businesses have access to dependable telecommunications, electricity, and water services at reasonable prices. The ubiquitous use of these services ensures that the policies adopted by state public utility commissions have far-reaching effects throughout the economy.

While these commissions can differ in a number of ways, two of the most significant are the means by which the commissioners are selected and their political affiliation. In almost every state, commissioners attain office by being appointed by the governor or by winning statewide elections.[1] Thus, depending on the state, commissioners are either chosen by a single individual or must win a plurality of the voters in the state. The political affiliation of commissioners also varies significantly across states. While a small number of commissioners describe themselves as independents, the vast majority are either Republicans or Democrats. In some states the number of Republican and Democrat commissioners differs by only one, while in others all of the commissioners are of the same party.

This paper investigates whether the means by which public utility commissioners are selected affects the influence of political affiliation on policy choices. Specifically, do appointed commissioners and elected commissioners of the same party behave differently in office? Further, does the selection method affect differences between Republican and Democratic commissioners? These questions are asked in the context of prices commissioners set at which competitive telecommunications firms can lease a portion of the incumbent's network and the incumbent's retail prices.

[1] The three exceptions to these two methods occur in South Carolina, Virginia, and Tennessee. In South Carolina and Virginia, the state legislatures elect the commissioners. In Tennessee, one commissioner is appointed by the Governor, another by the Lieutenant Governor, another by the Speaker of the House, and a final commissioner is jointly appointed by the Governor, Lieutenant Governor, and Speaker of the House.

The results suggest that there is an important relationship between how a commissioner is selected and the influence of his/her political affiliation. While political affiliation appears to have limited influence on lease prices set by appointed commissioners, it has a significant impact when these prices are set by elected commissioners. Specifically, elected Democratic commissioners are associated with higher lease prices relative to elected Republican commissioners. Conversely, the political affiliation of appointed commissioners has a stronger influence on retail prices than the political affiliation of elected commissioners. Appointed Republican commissioners are associated with higher retail prices than appointed Democrats. Taken together, these results may indicate that political influences on public utility commissioners vary both by the parties affected by the policy choice and by the manner in which the commissioners attain office.

Prior studies have analyzed the independent effects of how public utility commissioners are chosen and the influence of their political affiliation.[2] In their analyses of the telecommunications lease prices that are analyzed this paper, Lehman and Weisman (2000), Beard and Ford (2004), and de Figueiredo and Edwards (2004) find that prices are higher in states with elected public utility commissioners. Studies of the relationship between selection method and retail telecommunications and electricity prices tend to find that, in states with elected commissioners, prices are either lower (Besley and Coate (2003), Smart (1994)) or not statistically significantly different (Primeaux and Mann (1986)) from prices in states with appointed commissioners. In regards to political affiliation, de Figueiredo and Edwards (2004) do not find a link between the political affiliations of commissioners and telecommunications lease prices.

[2] While the papers mentioned in the main text are the most relevant to the analysis below, there is a long line of research into the determinants of policy choices by public utility commissioners. Important contributions include Baron (1988), Boyes and McDowell (1989), Costello (1984), Fields, Klein, and Sfirdis (1997), Hagerman and Ratchford (1978), Harris and Navarro (1983), and Navaro (1982).

This paper improves upon the existing literature both in the analysis employed and the data used. Prior studies assume that the effects of commissioner political affiliation do not vary with the method by which the commissioner came into office. By allowing these effects to be related, the estimates may provide insight into how the means by which commissioners attain office influences the policies they implement. Further, this paper compares these effects across wholesale and retail prices. The effects of political affiliation and selection method may vary across wholesale and retail prices due to differences in the parties involved and how visible the prices are to voters. To measure the effects on wholesale prices, a unique data set is employed that captures the entire history of the lease prices for each state. An analysis of retail prices over the same period for certain metropolitan locations is also performed. The results suggest that the effects of the political affiliations and selection method of commissioners differ significantly between the two types of prices.

The remainder of the paper is organized as follows. Section 2 explains how state public utility commissions set retail and wholesale telecommunications prices. Section 3 describes the data, methods, and results of the wholesale price analysis. Section 4 does the same for the retail price analysis. Section 5 concludes.

2. Background information.

The lease prices analyzed in this paper are for Unbundled Network Elements (UNEs). Under the Telecommunications Act of 1996,[3] competitive local phone companies are able to lease UNEs from incumbent phone companies in order to provide phone service to their customers.[4] The focus of this paper is the UNE price for the local loop.[5] The local loop is the wire that runs from the customer's premises to the switching equipment that connects the wire to

[3] Pub. L. No. 104-104, 100 Stat. 56 (codified at 47 U.S.C. Section 151).

[4] Some rural incumbent phone companies are not obligated to lease UNEs to entrants.

[5] Specifically, it is the price set for the former Regional Bell Operating Companies.

the broader telephone network. Unless a competitive company chooses to build its own network, it must lease the local loop from the incumbent. Typically incumbent companies favor higher UNE prices while competitive firms favor lower ones.[6]

State public utility commissions are required to set UNE prices. The Federal Communications Commission determined that the prices are to be based on the cost a hypothetical firm would incur if it were to build the network today using the most efficient technology available (U.S. Federal Communications Commission (1996)). This methodology, known as TELRIC, requires that the commissions determine both the most efficient technology and the cost of deploying that technology. These somewhat vague guidelines can introduce a significant degree of latitude in interpretation and may allow for factors other than cost to influence how the prices are set.

State public utility commissions also have substantial discretion over retail telecommunications prices. The commissions control the local service prices of large incumbents through either rate-of-return regulation or some form of incentive regulation, which may include price caps or price freezes.[7] Under rate-of-return regulation, the commissions oversee retail prices by determining the margin by which the incumbent can price above cost. Incentive regulation typically involves commissions setting an upper bound on a price index that incorporate a number of services, including local service. Further, many incentive regulation plans contain specific restrictions on local phone service prices.

The potential variability resulting from the relative freedom commissions have in setting these wholesale and retail prices is compounded by heterogeneity across public utility commissions. As described above, the commissions can differ in the means by which

[6] While incumbents argue for higher UNE prices to state public utility commissions, Sappington (2005) constructs a theoretical model that suggests the price at which an entrant can lease an input may have little effect on its decision to lease the input from the incumbent supplier or make the input itself. This conclusion arises because the lease price influences the intensity of downstream competition such that the incumbent tends to price less aggressively when the lease price paid by the competitor is higher.

[7] Nebraska and South Dakota are exceptions. In 1986 Nebraska deregulated retail prices, but reserved the right to reverse local price increases upon petition by affected customers. South Dakota deregulated retail prices in 2003.

commissioners are selected and their political affiliation. The commissions can also differ in other ways, such as the number of sitting commissioners, their term lengths, the industries they regulate, and the available research support.

In their theoretical model, Besley and Coate (2003) find that elected commissioners favor consumers by setting lower retail prices. However, their model does not explicitly analyze the effects of commissioner selection method on wholesale prices such as UNE prices. Given their preference for pro-consumer policies, elected commissioners may prefer lower UNE prices as they may lead to more competitive entry and lower retail prices. On the other hand, whereas retail price determinations may be somewhat visible and easily understood by voters, UNE price determinations may be much less so. The amount paid by consumers is not directly related to UNE prices and the prices receive little attention in the media. Given the relative obscurity of UNE prices and that the methodology is dictated by the FCC, elected commissioners may feel less pressure to set lower prices. In fact, elected commissioners may view UNE prices as an opportunity to curry favor with incumbent providers that they may have previously alienated when voting for lower retail prices.

3. UNE price analysis.

3.1. Data and methods.

The sample used in the UNE price regressions is every instance from 1996 through 2004 in which a state public utility commission set or revised the UNE local loop price.[8,9] Excluded

[8] UNE prices are often revised by state commissions at the conclusion of interconnection agreements between incumbents and entrants. However, if neither the incumbent nor entrant objects to the existing UNE price, commissions typically do not revisit the existing price. Thus, the results below can be interpreted as being conditional on the commission revising the rate.

[9] An alternative to the data set used here would be a panel that includes observations for commissions and dates when the lease price was not revised. However, the relatively limited number of price changes in each state makes use of a panel data set problematic. To mitigate the relative stationarity of the dependent variable, one could use relatively long time periods as the unit of observation. However, given that the explanatory variables could have varied significantly within the time period, it would be difficult to precisely measure the effects of these variables. A shorter time period would alleviate this problem, but would exacerbate the lack of variation in the dependent variable.

from the sample are instances where the commission revised the price to address a technical error in the calculation of the previous price and where the incumbent voluntarily lowered the price. Observations for Tennessee and Virginia are also excluded because commissioners in these states are elected by state legislatures, rather than appointed by the governor or elected via statewide elections. The resulting data set contains 117 observations. Table 1 details the data employed. (The appendix describes the data sources.)

The dependent variable is the statewide[10] average monthly price to lease the local loop from the incumbent firm. Figure 1 illustrates how the prices set by the state public utility commissions varied significantly immediately after the Telecommunications Act became law. As time passed, the prices generally fell and became less divergent. During the sample period, the UNE price averaged roughly $16 and ranged from $5 to almost $30.

To proxy for the cost of the local loop, the embedded cost of the loop is used as an explanatory variable. The embedded cost is based on the actual cost that the incumbent incurred to maintain the local loop. The backward-looking nature of the embedded cost differs from the forward-looking nature of the TELRIC cost upon which the UNE price is to be based. As Table 1 illustrates, the average embedded cost is almost 33% greater than the average UNE price set by the state public utility commissions. However, the embedded cost should be highly correlated with the TELRIC cost and explain much of the variation in UNE prices.

The remaining explanatory variables are not directly related to the TELRIC cost of the local loop and should theoretically not influence the price set by the state public utility commissions. Their inclusion in the regressions below allows for a test of whether non-cost influences affect UNE prices.

Several variables are included to control for differences across state public utility commissions. As noted above, the political affiliation of the commissioners and the means by

[10] Since 2000 and sometimes earlier, state public utility commissions have set prices that vary within the state according to how densely populated the local area is. Given that these deaveraged rates were not introduced until halfway through the sample period, the statewide average is used.

which they are selected are included as explanatory variables. In the sample, Republicans commissioners on average hold a slight majority over Democrats.[11] However, this average masks a wide variability across states, as commissions in some states are composed entirely of either Republicans or Democrats. One-fifth of the UNE prices in the sample were set by elected commissions. To control for the possibility that the effects of political affiliation and selection method are interrelated, the two variables are interacted. The length of time that a commissioner serves may also influence his/her decisions. For example, commissioners who have dealt with the same incumbent over time may grow more sympathetic to the incumbent's arguments. The summary data in Table 1 indicate that one of the commissioners in a UNE price determination had served almost 20 years. It is also possible that commissioners who serve for longer terms may feel more insulated in their position and be less inclined to vote for prices that are relatively pro-consumer. To measure these potential effects the average tenure of the commissioners and the term length of their appointments are included as explanatory variables. In addition, the number of commissioners is employed to control for the possibility that the number of votes required to pass a UNE price change may be related to the price that is agreed upon.

State officials outside of the public utility commissions may influence how UNE prices are set. As noted, in some states the governor appoints the commissioners. Further, state legislatures may not only have the power to block commissioner appointees, but they may determine the level of funding received by the commission. Through these and others levers governors and state legislatures may be able to exert influence over UNE prices. To control for these effects, the political affiliations of the governor and the state legislature are included as explanatory variables.

Other regulatory factors may affect how state public utility commissions determine UNE prices. For instance, in the period immediately following the passage of the Telecommunications

[11] Some commissioners identify themselves as independents or do not report a party affiliation. In the regression data, these commissioners are assigned a political affiliation value of 0.5.

Act, state public utility commissions often relied on outside arbitrators to determine the UNE price. These price determinations were based on competing proposals by the incumbent and entrant firms, rather than a cost study by the public utility commission. Also, the manner in which the incumbent firm's retail prices are regulated may influence the level of UNE prices. Lehman and Weisman (2000) argue that commissions that enact retail price cap regulation may use lower UNE rates to ensure that cost increases for the incumbent company are not passed through to retail prices. Finally, during the sample period the incumbent telephone companies applied for permission with state commissions and the FCC to sell long distance services. One of the criteria by which these applications were judged was whether the UNE prices were sufficiently low to encourage competitive entry (FCC (1999), p 129). Dummy variables for each of these regulatory conditions are included as explanatory variables.[12,13]

UNE prices set by the commissions may also reflect market conditions in the state. For example, commissions in smaller states may feel that potential entrants may be less inclined to enter due to diseconomies of scale and thus lower UNE prices are needed to encourage entry. To control for this potential effect, the number of telephone lines in the state is employed. Also, the degree of business activity may have an impact on the rates set by commissioners. As UNE-based entrants typically focus on business customers, commissioners in states with a relatively strong concentration of business customers may be inclined to use lower UNE rates to benefit business customers. The percentage of the telephone lines in the states that serve business customers is included to capture this effect.

[12] Retail rate regulation schemes are quite complex, as some plans can have price caps on some services and another form of incentive regulation on other products. In the analysis below, a dummy variable is used that reflects whether the state employs rate-of-return regulation on either residential or business basic services. Thus, the complications posed by the idiosyncrasies of the various incentive-based regulation plans are avoided. As this variable takes a value of one when rate-of-return regulation is used, the expected sign of the coefficient of this variable is positive given Lehman and Weisman's (2000) analysis.

[13] A dummy variable is included to measure the effect of the incumbent applying to sell long-distance services. The variable takes a value of one if the UNE price was set during the period that begins one year prior to the incumbent's application and ends on the date of the FCC's decision.

Two types of fixed effects are included as explanatory variables. Dummy variables for each incumbent telephone company are included to control for effects common to all states within an incumbent's operating region that do not vary over the sample period.[14] Examples of these region-wide effects include similarities in the existing phone networks and the use by incumbents of the same personnel and arguments in state UNE price proceedings throughout their service region. Year dummy variables are also included to capture national trends in UNE prices, such as the effects of court decisions regarding how UNE rates should be calculated.[15]

The estimated equation is:

$$UNEPRICE_{i,t} = \alpha + \beta_1 EMBED_{i,t} + \beta_2 PUC_{i,t} + \beta_3 GOVLEG_{i,t} + \beta_4 OTHREG_{i,t} + \beta_5 OPENV_{i,t} + \chi_j + \delta_t + \varepsilon_{i,t} \quad (1)$$

where,

$UNEPRICE_{i,t}$ is the UNE loop price set in state *i* in year *t*

$EMBED_{i,t}$ is the embedded cost

$PUC_{i,t}$ are state public utility commission variables

$GOVLEG_{i,t}$ measure the political affiliation of the governor and state legislature

$OTHREG_{i,t}$ are other regulatory variables

$OPENV_{i,t}$ are variables that reflect the operating environment in that state

χ_j are incumbent fixed effects

δ_t are year fixed effects

The regressions are estimated via ordinary least squares. The observations are weighted to control for differences in the number of observations by state. Huber-White robust errors are

[14] The identities of the incumbents are muddled somewhat by the mergers that have taken place among the former Regional Bell Operating Companies. For instance, Pacific Telesis and Ameritech were acquired by SBC in 1998 and 1999, respectively, while Verizon (formerly Bell Atlantic) acquired NYNEX in 1997. Given their geographic locations and the timing of the acquisitions, Pacific Telesis and Ameritech are treated separately from SBC while the former Bell Atlantic and NYNEX are treated as one entity.

[15] The FCC's decisions regarding UNE prices were challenged numerous times in the courts. They were challenged both on the grounds of whether the FCC had the authority to dictate the rate-setting methodology and also whether the TELRIC methodology was consistent with the Act. The Supreme Court eventually decided both issues in favor of the FCC. (AT&T v. Iowa Utilities Board (1999), Verizon, et al v. FCC, et al (2002))

used to account for potential heteroskedasticity and the observations are clustered at the state level to allow for dependence between the observations for a given state.[16,17]

3.2. Results.

Table 2 details the regression results. Column (I) contains the estimates when the percent of Republican commissioners and the method of selection are not interacted, while Column (II) contains the results when the two variables are interacted.

As expected, the embedded cost variable explains a great deal of the variation in UNE prices. In both specifications, the embedded cost estimate is statistically significant at an over 99% confidence level. However, the coefficient estimate of 0.53 indicates that there is not a one-to-one relationship between the embedded cost and the UNE price. Even after accounting for the fact that UNE prices are on average 75% of the embedded cost, there exists variation in UNE prices beyond what is explained by the embedded cost estimate.

A significant amount of this remaining variation appears to be related to the combined effects of the commissioners' political affiliation and selection method. Based on the assumption that the two effects are not related, the results in Column (I) indicate that Republican commissioners are associated with somewhat lower UNE prices and elected commissions are associated with somewhat higher UNE prices. However, the effect of elected commissions is not statistically significant.

The results in Column (II) indicate that the interaction omitted in Column (I) may be

[16] As a robustness test, the dependent variable was replaced by the ratio of UNE price to the embedded cost and the embedded cost was dropped as an explanatory variable. The results, reported in Appendix Table A1, are largely unchanged from the results reported in the main text.

[17] A potential threat to the identification is that the form of retail rate regulation may be endogenous to the choice of UNE prices. To address this concern, the model was estimated using three measures of customer satisfaction as instruments for the form of retail rate regulation. The logic underlying the choice of these instruments is that the choice of retail rate regulation involves consumer input, whereas UNE price determinations do not. The first-stage regression estimates reported in Appendix Table A2 indicate that the instruments are valid as they are both relevant and exogenous to the determination of UNE prices. However, the Durbin-Wu-Hausman test results indicate that the form of retail rate regulation is not endogenous, suggesting that the results reported in the main text are valid.

critical to fully capture the effects of commissioner political affiliation and selection method. Under the specification in Column (II), the *% Republican* coefficient measures the effect of appointed Republican regulators versus appointed Democratic regulators. Compared with Column (I), both the coefficient estimate and statistical significance of the *% Republican* variable are much smaller. The Column (II) estimate indicates that there is relatively little difference in the UNE prices set by appointed Republican and Democratic commissioners. Given the included interactions, the coefficient on *Elected* in Column (II) now measures the effect of elected Democratic commissioners. The relatively large point estimate and statistical significance suggest that rates tend to be higher under elected Democratic commissioners. The interaction variable, *% Republican * Elected*, measures the effect of elected Republicans relative to elected Democrats. The negative and statistically significant coefficient estimate suggests that elected Republican commissioners are associated with lower UNE prices than elected Democratic commissioners.

While the estimates in Table 2 indicate the direction of the effects of political affiliation and selection method on UNE prices, they provide limited information regarding their magnitude. Table 3 provides estimates of the marginal effects of the political affiliation and selection method variables on the prices. The top half of the table details the effects of selection method holding political affiliation constant, while the bottom half details the effects of political affiliation holding selection method constant. The selection method effects are calculated assuming on a two-thirds majority of seats for the specified party, while the political affiliation effects are based on a one-seat change of political affiliation given a three-member commission.

The effect of selection method diverges based upon the party in the majority. When comparing commissions with Republican majorities, the effect of selection method is relatively small and statistically insignificant. Conversely, when looking at commissions with Democratic majorities, elected commissions are associated with UNE prices almost $2.00 higher than appointed commissions. This effect is statistically significant at over a 91% confidence level and translates to over 10% higher UNE prices based on the sample mean.

The effects of political affiliation differ significantly between appointed and elected commissioners. The marginal effects suggest that there is virtually no difference in the UNE prices set by appointed Republicans and appointed Democrats. Both the point estimate and the F-statistic are nearly zero. Conversely, political affiliation appears to have a greater impact on elected commissioners. Elected Republicans are associated with UNE prices that on average are $1.84 lower than elected Democrats. This effect is statistically significant at an over 99% confidence level.

While the coefficients on the remaining explanatory variables have the expected sign, they are not statistically significant. Referring to Column (II) of Table 2, the coefficients on both the average tenure and term length of the commissioners are positive. The coefficient on the rate of return retail rate regulation variable is positive while the incumbent's application to sell long-distance service has a dampening effect on prices. Further, the number of lines and the percent of business lines have negative coefficients.

Another interesting result is the positive and nearly statistically significant effect of Republican governors on UNE prices. Cast in terms of Democratic governors, this implies that Democratic governors and elected Democratic commissioners have nearly opposite effects on UNE rates. To determine if this result is driven by the ability of governors to appoint commissioners, the *Elected* and *Governor Republican* variables were interacted. The main results were largely unaffected and did not alter the negative estimated effect of Democratic governors.

3.3. Discussion.

Taken as a whole, the marginal effects estimates suggest that while appointed Democrats, appointed Republicans, and elected Republicans are associated with similar UNE prices, elected Democrats are associated with prices that are on average almost $2.00 higher.

One possible explanation for these results is to attribute them to the incentives faced by the commissioners. For instance, the lack of difference between appointed Republicans and

Democrats may reflect that appointed regulators do not have to worry about reelection, and thus do not have to distinguish themselves from regulators of the other party. The positive effect of elected Democrats may be driven in part by concerns regarding campaign contributions. Given Democrats are likely to be pro-consumer in areas such as residential rates and low-income subsidies, incumbent firms may have a negative view of these commissioners. However, given the relative obscurity of UNE rates to most voters, these commissioners can vote for higher rates that will not be held against them in elections but will curry favor from the incumbents.

An alternative explanation may involve the backgrounds of the commissioners. For instance, appointed commissioners may tend to be apolitical technocrats for whom political affiliation does not have much influence over their policy choices. Conversely, given their experience in running for the office, elected commissioners may be more apt to have a political background. Further, elected commissioners may view being a public utility commissioner as a stepping stone to higher office. These commissioners may feel a need to establish political credentials that will benefit them in later elections.

4. Analysis of Retail Prices.

To test the explanations offered above, a similar analysis is performed on retail prices.

4.1. Data and methods.

The Federal Communications Commission annually publishes the residential prices charged by incumbents in 95 cities in 41 states. The price chosen for this analysis is for monthly basic local residential flat-rate service. These flat-rate plans allow for unlimited local calling and abstract from potential differences across cities in how prices vary with the number of minutes used by customers. However, these price data are not available for six of the 95 cities reported by the FCC. The data are further limited to only those cities that are served by one of the Regional Bell Operating Companies that are the subject of the UNE price analysis above. The resulting sample consists of 79 cities in 35 states.

The retail price regression differs from the UNE price regressions above. First, the prices typically exhibit a substantial degree of variability across years for a given city. Thus, a fixed effects panel data analysis is appropriate to precisely measure the effects of changes in the explanatory variables over time.[18] The city fixed effects control for any influences on retail prices that do not vary over time for a given city, such as the term length of the public utility commissioners or the incumbent that serves the city. However, the panel fixed effects analysis implies that the effects of these types of variables cannot be measured.[19] Second, a number of variables that are included in the UNE price regressions are not expected to influence retail prices and are omitted from the retail price regressions.[20] Third, the state per capita personal income is included as an explanatory variable to control for income effects on the retail price. Finally, interactions between the commission political affiliations, whether the commission is elected, and the gubernatorial political affiliation are found to be statistically significant and are included in this regression. The estimated equation is:

$$RETPRICE_{i,t} = \alpha + \beta_1 PUC_{i,t} + \beta_2 GOVLEG_{i,t} + \beta_3 INTERACT_{i,t} + \beta_4 OPENV_{i,t} + \chi_j + \delta_t + \varepsilon_{i,t} \qquad (2)$$

where,

$RETPRICE_{i,t}$ is the retail price for local residential flat-rate service in city *i* in year *t*

$PUC_{i,t}$ are state public utility commission variables

$GOVLEG_{i,t}$ measure the political affiliation of the governor and state legislature

$INTERACT_{i,t}$ are interactions of variables in $PUC_{i,t}$ and $GOVLEG_{i,t}$

$OPENV_{i,t}$ are variables that reflect the operating environment in that state

χ_j are city fixed effects

[18] Given the pooled nature of the UNE price regressions, this precludes estimating the UNE price and retail price regressions simultaneously.

[19] As such, the following variables are not included in the retail price regressions: *Elected, Term Length, Number of Commissioners,* and *ROR Retail Rate Regulation.*

[20] These variables are: *Embedded Cost, AT&T Arbitration,* and *Application to Sell Long-Distance Service.*

δ_t are year fixed effects

The regression is estimated via ordinary least squares. As is the case for the UNE price regressions, Huber-White robust errors are used to account for potential heteroskedasticity and the observations are clustered at the state level to allow for dependence between the observations for a given state.

The sample used in the retail price regression is detailed in Table 4. The average retail price for the sample is $22, while the minimum and maximum prices are $13 and $36, respectively.

4.2. Results.

Table 5 details the estimates of the regressions of the retail price. Unlike the UNE price regressions, the political affiliation of the commission has a statistically significant effect on the retail price. The coefficient estimate suggests that Republican commissions are associated with higher retail prices. Interestingly, the negative coefficient on the variable *% PUC Republican * Governor Republican* indicates that the effect is mitigated somewhat if the governor is also a Republican. However, the positive coefficient of roughly the same magnitude on the variable *% PUC Republican * Governor Republican * Elect* suggests that the effect is only present if the commissioners are appointed rather than elected.

Selected marginal effects are presented in Table 6.[21] Interestingly, the sign of each marginal effect is the opposite of the corresponding effect reported in Table 3. The estimates suggest lower retail prices are associated with elected commissions, which is consistent with Besley and Coate (2003). Further, commissions that have a greater Democratic presence are also associated with lower retail prices. However, except for the effect between appointed Republicans and Democrats, none of the effects are statistically significant.

[21] To allow for comparison with Table 3, the effects abstract from the effect of the political affiliation of the governor. To calculate the marginal effects, the dummy variable for the political affiliation of the governor is assumed to be 0.5.

Whereas elected Democrats are associated with higher UNE prices relative both to Republicans (elected and appointed) and appointed Democrats, they are associated with lower retail prices. However, there is not a statistically significant difference between the prices set by elected Democrats and elected Republicans. While the positive effects of both Democratic and Republican appointed commissioners relative to their elected counterparts are not statistically significant, they are consistent with findings in the earlier studies cited in the introduction.

4.3. Discussion.

In terms of the competing explanations offered above regarding the UNE price regressions, the estimates from the retail price regressions provide mixed results. The results are consistent with the suggestion that elected Democrats choose relatively low retail prices and thus higher UNE prices may help them mitigate negative reactions from incumbents. On the other hand, the presence of an effect on retail rates from the political affiliations of appointed commissioners casts doubt on the notion that they are generally apolitical. It may be the case that, on an issue as visible as retail rates, political tendencies may be too strong to resist.

It is important to note that the comparisons offered above should be viewed in light of the differences in how the regressions are specified. As the UNE price regressions are based on pooled data and the retail price regressions employ panel data fixed effects, it is possible that the observed differences between the two sets of results are due, at least in part, to estimation methodology. However, the inclusion of incumbent and year dummy variables in the UNE price regressions mitigates this concern to some extent.

5. Conclusion.

The results in this paper suggest that the way in which state public utility commissioners are selected may influence the effect of their political affiliations on policy choices. This finding may provide some insight into how state public utility commissioners should be chosen. For instance, some may feel that public utility commissions should be somewhat apolitical in their

policy decisions. Given the result that UNE prices set by appointed Republicans and Democrats are roughly similar, appointed commissioner may help achieve this goal. However, the analysis of retail prices indicates that appointed commissioners may not fully meet this potential objective.

There are a number of directions in which this paper could be extended. The results in this paper are limited to telecommunications. As noted above, electricity is another contentious industry that public utility commissions regulate. A similar analysis of electricity rates could produce very different results, especially in light of the politically charged California electricity crisis in the early 2000s. Also, data regarding the background of the commissioners could provide additional insight. For instance, do appointed commissioners with a political background behave differently than those who have more of a technical background? Finally, the difference in the specifications of the lease and retail price regressions implies that one must use caution when comparing the results. Data sets that allowed for similar specifications would provide for more confident conclusions regarding comparisons of commission behavior across regulated wholesale and retail prices.

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Figure 1 – UNE Statewide Average Loop Prices

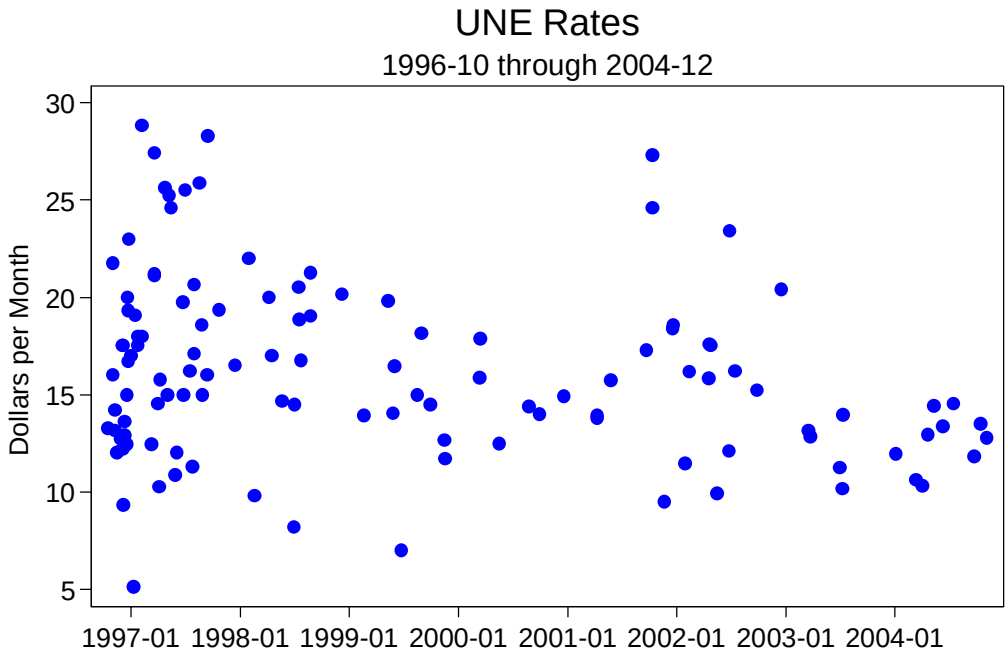

Table 1 – Summary Statistics – UNE Price Regressions (n=117)

Variable	Mean	Standard Deviation	Minimum	Maximum
State Average UNE Loop Price	$16.21	$4.66	$5.13	$28.82
Embedded Cost	$20.85	$4.45	$13.75	$34.07
Public Utility Commission				
% Republican	56	30	0	100
Elected	0.2	0.4	0	1
% Republican * Elected	12	27	0	100
Average Tenure (years)	4.7	2.7	0.7	19.2
Number of Commissioners	4.0	1.1	3	7
Term Length (years)	5.4	0.94	3	8
Governor & Legislature				
Governor Republican	0.6	0.5	0	1
% State Legislature Republican	48	14	14	85
Other Regulatory				
AT&T Arbitration	0.3	0.5	0	1
ROR Retail Rate Regulation	0.2	0.4	0	1
Application to Sell Long-Distance	0.15	0.35	0	1
Operating Environment				
Number of Lines (millions)	3.4	3.7	0.2	18.3
% Business Lines	31	4	25	43

Table 2 – OLS Estimates – UNE Price Regression

Dependent Variable: State Average UNE Loop Price		
Explanatory Variable	I	II
Embedded Cost	0.53 ***	0.53 ***
	(0.08)	(0.08)
Public Utility Commission		
% Republican	-0.02 **	-0.005
	(0.009)	(0.011)
Elected	0.57	3.47 **
	(1.12)	(1.31)
% Republican * Elected		-0.05 **
		(0.02)
Average Tenure	0.13	0.17
	(0.11)	(0.10)
Term Length	0.02	0.07
	(0.33)	(0.32)
Number of Commissioners	-0.21	-0.22
	(0.31)	(0.31)
Governor & Legislature		
Governor Republican	1.69 **	1.30
	(0.80)	(0.80)
% State Legislature Republican	0.02	0.02
	(0.02)	(0.02)
Other Regulatory		
AT&T Arbitration	0.82	0.56
	(1.16)	(0.49)
ROR Retail Rate Regulation	0.98	0.87
	(0.92)	(1.07)
Application to Sell Long-Distance Service	-0.13	-0.53
	(1.26)	(1.15)
Operating Environment		
Number of Lines (millions)	-0.15	-0.16
	(0.09)	(0.12)
% Business Lines	-0.16	-0.15
	(0.13)	(0.12)
Year Fixed Effects	Yes	Yes
Incumbent Fixed Effects	Yes	Yes
# Observations	117	117
R-squared	0.68	0.69

Notes -

Huber-White robust standard errors clustered by state are reported in parentheses.

*** - 99% confidence level, ** - 95% confidence level, * - 90% confidence level

Table 3 – Selected Marginal Effects on UNE Prices

Comparison	Estimated Effect (F-statistic)	
Selection Method		
Elected Republican Majority vs Appointed Republican Majority	$0.15 (0.02)	
Elected Democratic Majority vs Appointed Democratic Majority	$1.81 (3.11)	*
Political Affliliation		
Appointed Republican vs Appointed Democrat	-$0.18 (0.25)	
Elected Republican vs Elected Democrat	-$1.84 (11.64)	***

Notes -
*** - 99% confidence level, ** - 95% confidence level, * - 90% confidence level
Estimated selection method effects based on a two-thirds majority in a three member commission.
Estimated political affiliation effects based on a one-seat change in a three-member commission.

Table 4 – Summary Statistics – Retail Price Regressions (n=632)

Variable	Mean	Standard Deviation	Minimum	Maximum
Price for Residential Flat-Rate Local Service	$21.62	$4.42	$13.05	$35.56
Public Utility Commission				
% Republican	61	32	0	100
% Republican * Elected	7	21	0	100
Average Tenure (years)	4	2.2	0.4	14
Governor & Legislature				
Governor Republican	0.67	0.5	0	1
% State Legislature Republican	46	12	13	75
Additional Interactions				
% PUC Republican * Governor Republican	49	41	0	100
% PUC Republican * Governor Republican * Elect	4.4	16	0	1
Operating Environment				
% Business Lines	31	4	25	43
Per Capital Personal Income (thousands)	29	4.7	18	44

Table 5 – OLS Panel Fixed Effects Estimates – Retail Price Regression

Dependent Variable: Retail Price for Residential Flat-Rate Local Service		
Explanatory Variable		
Public Utility Commission		
% Republican	0.03 (0.01)	**
% Republican * Elected	-0.02 (0.02)	
Average Tenure	0.16 (0.10)	
Governor & Legislature		
Governor Republican	-0.004 (0.42)	
% State Legislature Republican	0.02 (0.08)	
Additional Interactions		
% PUC Republican * Governor Republican	-0.02 (0.01)	*
% PUC Republican * Governor Republican * Elect	0.02 (0.01)	**
Operating Environment		
% Business Lines	0.17 (0.10)	*
Per Capita Personal Income	-0.17 (0.18)	
Year Fixed Effects	Yes	
City Fixed Effects	Yes	
# Observations	632	
Within R-squared	0.61	

Notes -
Huber-White robust standard errors clustered by state are reported in parentheses.
*** - 99% confidence level, ** - 95% confidence level, * - 90% confidence level

Table 6 – Selected Marginal Effects on Retail Prices

Comparison	Estimated Effect (F-statistic)
Selection Method	
Elected Republican Majority vs Appointed Republican Majority	-$0.86 (0.47)
Elected Democratic Majority vs Appointed Democratic Majority	-$0.42 (0.47)
Political Affliliation	
Appointed Republican vs Appointed Democrat	$0.75 * (3.15)
Elected Republican vs Elected Democrat	$0.68 (1.43)

Notes -

*** - 99% confidence level, ** - 95% confidence level, * - 90% confidence level

Estimated selection method effects are based on a two-thirds majority in a three member commission.

Estimated political affiliation effects are based on a one-seat change in a three-member commission.

Appendix.

Data Sources

The UNE prices used in the study were obtained primarily from state commission orders and incumbent documents. For 4 of the 117 observations de-averaged rates were reported and a statewide average was neither reported nor could be calculated based on the available data. In those instances a simple average of the de-averaged rates was used as the statewide average rate. The state commission orders and incumbent documents were also used to determine if the rate was the result of an arbitration case between the incumbent and AT&T.

The retail price data come from the FCC's Reference Book of Rates, Price Indices, and Household Expenditures for Telephone Service (2004) (http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/ref04.pdf), Table 1.4 ("Monthly Residential Telephone Rates in the Sample Cities"). The FCC samples those cities that were included in the Bureau of Labor Statistics Consumer Price Index in 1986.

The embedded cost is reported by the National Exchange Carrier Association Universal Service Fund annual submissions (Appendix E). These reports were also used to determine the number of lines served by the incumbent.

The political affiliation and tenure of the PUC commissioners were derived from *Profiles of Regulatory Agencies of the United States & Canada: Yearbook 1995-1996* (NARUC) and NARUC membership directories (specifically, directories dated January 1998, February 1999, February 2002, February 2003, July 2003, and March 2004). Besides being reported as either a Democrat or Republican, a commissioner could also be listed as independent or have no reported political affiliation. For the purposes of this analysis, those commissioners who were reported as independent of for whom a political affiliation was not reported are equally Democrat and Republican. (For example, if a state's PUC is composed entirely of independents and/or commissioners for whom their political affiliation is not reported, the value of the variable percent of commissioners that are Republican for that PUC would be 0.5.) The means of

selection, term length, and number of commissioners were taken from the *Book of the States* (editions 1998-1999, 2000-2001, 2002, and 2003).

The gubernatorial data are obtained from the Book of the States (The Council of State Governments, 1996-1997, 1998-1999, 2001-2002, 2002, 2003) and the CNN.com web page "2004 Election Results" (http://www.cnn.com/ELECTION/2004/pages/results/governor/full.list/). The state legislature data are obtained from *Statistical Abstracts of the United States* (U.S. Census Bureau, 2002, 2003, 2004-2005) and the National Conference of State Legislatures website (2005 Partisan Composition of State Legislatures, http://www.ncsl.org/ncsldb/elect98/partcomp.cfm?yearsel=2005). As Nebraska's legislature is non-partisan, for this analysis the percentage of state legislatures that are Republican is assumed to be 50%.

The type of retail rate regulation employed in each state is derived from reports in the *State Telephone Regulation Report* (1/25/96, 2/8/96, 3/20/97, 4/3/97, 4/3/98, 4/17/98, 8/20/99, 9/3/99, 9/29/00, 10/13/00, 10/27/00, 2/15/02, 3/1/02, 3/15/02, 5/9/03, 5/23/03, 6/6/03, 7/30/04, 8/13/04, and 8/27/04). For some of the descriptions of the regulatory plans, only a year was given for the beginning or the end of the plan's duration. In those instances, the exact dates were inferred from the prior or succeeding plan. Data regarding RBOC applications to provide long-distance service are obtained from the FCC web page "RBOC Applications to Provide In-region, InterLATA Services Under § 271" (http://www.fcc.gov/Bureaus/Common_Carrier/in-region_applications/).

The percent of lines to business customers is derived from the annual FCC ARMIS Report 43-08. The three residential customer satisfaction variables used as instruments for the form of retail rate regulation come from the annual FCC ARMIS Report 43-06. Specifically, they are the percent of customers surveyed that are dissatisfied with the RBOC's installation, repair, and billing services.

The per capita personal income data are taken from the Bureau of Economic Analysis at the U.S. Department of Commerce (http://www.bea.gov/bea/regional/spi/default.cfm?

satable=summary).

Table A1 – OLS Estimates Using Loop Price / Embedded Cost Ratio as Dependent Variable

Dependent Variable: Ratio of UNE Loop Price and the Embedded Cost		
Explanatory Variable	I	II
Public Utility Commission		
% Republican	-0.0005 (0.0005)	-0.000004 (0.0060)
Elected	0.02 (0.05)	0.14 ** (0.06)
% Republican * Elected		-0.002 * (0.00)
Average Tenure	0.005 (0.005)	0.007 (0.005)
Term Length	0.004 (0.016)	0.006 (0.016)
Number of Commissioners	-0.011 (0.016)	-0.011 (0.016)
Governor & Legislature		
Governor Republican	0.07 * (0.04)	0.06 (0.04)
% State Legislature Republican	0.0005 (0.0011)	0.0003 (0.0011)
Other Regulatory		
AT&T Arbitration	0.03 (0.06)	0.02 (0.06)
ROR Retail Rate Regulation	0.02 (0.05)	0.02 (0.05)
Application to Sell Long-Distance Service	-0.009 (0.058)	-0.02 (0.05)
Operating Environment		
Number of Lines (millions)	-0.004 (0.004)	-0.005 (0.004)
% Business Lines	-0.004 (0.01)	-0.003 (0.01)
Year Fixed Effects	Yes	Yes
Incumbent Fixed Effects	Yes	Yes
# Observations	117	117
R-squared	0.34	0.35

Notes -
Huber-White robust standard errors in parentheses.
*** - 99% confidence level, ** - 95% confidence level, * - 90% confidence level

Table A2 – 2SLS Estimates Treating Retail Rate Regulation as Endogenous
(Page 1 of 2)

First Stage Dependent Variable: Rate-of-Return Retail Rate Regulation Second Stage Dependent Variable: State Average UNE Loop Price			
Explanatory Variable	First Stage	Second Stage	
Embedded Cost	0.008 (0.015)	0.56 (0.08)	***
Public Utility Commission			
% Republican	-0.001 (0.002)	-0.007 (0.011)	
Elected	0.26 (0.31)	4.29 (1.70)	**
% Republican * Elected	-0.002 (0.004)	-0.06 (0.02)	**
Average Tenure	-0.017 (0.015)	0.10 (0.12)	
Term Length	0.03 (0.04)	0.08 (0.32)	
Number of Commissioners	-0.009 (0.038)	-0.25 (0.27)	
Governor & Legislature			
Governor Republican	-0.05 (0.10)	0.95 (0.68)	
% State Legislature Republican	0.004 (0.004)	0.03 (0.03)	
Other Regulatory			
AT&T Arbitration	0.03 (0.14)	0.50 (0.97)	
ROR Retail Rate Regulation (instrumented)		2.21 (2.78)	
Application to Sell Long-Distance Service	-0.07 (0.13)	-0.72 (1.08)	

Table A2 – 2SLS Estimates Treating Retail Rate Regulation as Endogenous
(Page 2 of 2)

First Stage Dependent Variable: Rate-of-Return Retail Rate Regulation Second Stage Dependent Variable: State Average UNE Loop Price				
Explanatory Variable	First Stage		Second Stage	
Operating Environment				
Number of Lines (millions)	0.001 (0.011)		0.15 (0.10)	
% Business Lines	-0.04 (0.01)	***	-0.28 (0.15)	*
Instrumental Variables				
% Residential Customers Dissatisfied with Installations	0.02 (0.03)			
% Residential Customers Dissatisfied with Repairs	0.02 (0.01)	*		
% Residential Customers Dissatisfied with Business Office	-0.04 (0.02)			
Partial R-Squared of Instrumental Variables	0.10			
Year Fixed Effects	Yes		Yes	
Incumbent Fixed Effects	Yes		Yes	
# Observations	117		117	
R-squared	0.45		0.64	

Notes -
Huber-White robust standard errors in parentheses.
*** - 99% confidence level, ** - 95% confidence level, * - 90% confidence level