

Distributive or Majoritarian?

Redistribution and the Role of state Bureaucratic Structure
in Local Telephone Deregulation 1990 ~1998

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Abstract

What is the nature of economic regulation in local telephone market? Is it exclusively distributive or foremost majoritarian? Using a theory of dual bureaucratic structure and a newly constructed panel data set of local telephone markets, this paper provides an empirical analysis of regulatory redistribution that is underway in U.S. local telephone market. Of particular interest is the differential impact of state bureaucratic structures on the balance of cross-subsidy between residential and business users. We specifically analyze internal bureaucratic structures at state Public Utility Commissions (PUCs) in the 1990s. We use dynamic measures of bureaucratic structures and advanced statistical methods – Time Series Cross Section Analysis with Panel Corrected Standard Errors (Beck and Katz 1995; 1996; 2001), which help us to generate better tests than previous works. Empirical results reveal that a state commission with broad level of discretionary authority has acted in a manner consistent with the public interest during the time period studied. This finding supports our contention that the level of substantive rules and resources in a state commission determines bureaucratic choices on regulatory redistribution.

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I. Introduction

In 1971, an economist named George Stigler questioned the conventional wisdom of the public interest view of regulation. He claimed that government regulation of industries, as a general rule, harms consumers and often give monopoly power to producers. That is, government regulate at the behest of producers who ‘capture’ the regulatory agency and use regulation to prevent competition. It has now become the mainstream view in the discipline. The public interest view of regulation, on the other hand, died away into the distance because it is normative and philosophical rather than positive and scientific. A more recent line of positive research in political science and New Institutional Economics (NIEs) has refuted the “law of the jungle” view from Chicago school. This has led to a simmering hot debate about the nature of economic regulation to date.

The ultimate objective of this article is to answer the following question: Is the nature of economic regulation exclusively or predominantly distributive, or is it first and foremost majoritarian? Does economic regulation consist largely of discrimination, in the sense of an effort to redistribute wealth in one form or the other from one group to another? Does governmental intervention over the market benefit a group of superior ability to manipulate the political process?

We argue that distribution — whether in the classical sense of who gets what, when, and how, or in the contemporary sense of how interest groups capture gains from trade — undeniably forms a part of economic regulation. However, current distributive theories of economic regulation, both theoretical and empirical, have not properly addressed the role of politics in this regard. Although a new wave of literature based on

the majoritarian perspective highlights the importance of political institutions to explain economic regulation (Berry 1979, 1983; Berry and Berry 1990; 1994; Cohen 1992; Fuchs 1984; Teske 1989, 1991, 1995; Teske et al. 1993; Levy and Spiller 1996), it has not adequately investigated how political institutions work in the regulatory policymaking. Further, few empirical works from majoritarian perspectives have been presented to counter the dominance of the distributive perspective to economic regulation, and those that have are frequently qualitative case studies or selected narratives. In this paper, we attempt to fill this gap by developing a theory of dual bureaucratic structure and then evaluating the theory using time series cross-section data on structural attributes of state Public Utility Commissions (PUCs) over regulatory matters. The theory posits that bureaucracy acts in a manner consistent with the public interest while exercising considerable discretionary authority and bureaucratic structure determines the scope of discretionary authority by regulators. We specifically analyze internal bureaucratic structures at state Public Utility Commissions (PUCs) in the 1990s. That period includes important political events and public debates over regulatory reforms and competition. Overall, this background in telecommunications offers us a valuable lens through which we can see the role of state bureaucratic structure, and gives information about its interactions with external political and economic environment. Dynamic measures of bureaucratic structures and advanced statistical methods – Time Series Cross Section Analysis with Panel Corrected Standard Errors (Beck and Katz 1995; 1996; 2001) help us to generate better tests than previous works.

II. Two Perspectives on Regulatory Redistribution

The scholarly literature on economic regulation is large and diverse, but its theoretical underpinnings fall neatly into two classes. The intellectual foundations and specifics of distributive and majoritarian approaches to economic regulation are briefly reviewed here.

1. Distributive Approach to Economic Regulation

Beginning with Bernstein's (1955) seminal life cycle theory and moving notably to Stigler's (1971) economic theory of regulation, the set of ideas known broadly as "capture theory" has influenced a variety of subsequent works in the field of regulation and has emerged as perhaps the dominant approach to economic regulation. The core of capture theory is that economic regulation transfers a disproportionately large share of social wealth to powerful interest groups at the expense of the public. So, it is inherently inefficient and thus undesirable in the context of social welfare (Stigler 1971; Peltzman 1976; Becker 1983). The argument is premised on the logic that regulated industries are better able to provide the financial resources and votes that politicians require to secure reelection and, in turn, politicians reward their patrons by crafting favorable regulation and exercising oversight of agencies in an amenable fashion.¹

Mass public, on the other hand, has essentially little incentive to devote effort or resources to become mobilized and even informed about comparative merits of regulatory policies. A single vote is both a weak indicator of preferences in multi-policy

¹ The economic theory of regulation has been confronted with a variety of criticisms from institutional economics as well as other social sciences, especially political science. We discuss two main criticisms here: (1) Not enough attention has been given to the complex web of actors such as interest groups, legislatures, courts, executives, and bureaucrats; (2) The economic theory understates the importance of regulatory institutions and environments.

elections (and almost inconsequential for policy outcome) while benefits of such legislation are spread among all participants in the population. So, the constituents fail to overcome the free-rider problem that prevents the presentation of information favorable to the public interest to politicians. This leads lawmakers to enact passage of regulation in favor small interest groups (Downs 1957; Olson 1965; Macey 1986).

Peltzman (1976, 1989) extend the Stiglian approach and apply it to take account of the deregulation of the airline, transportation, and public utility industries in the late 1970s and 1980s. He argues that no one can enjoy permanent dominance over policymaking; rather, each group is forced to share those regulatory benefits with other groups of competitors or even consumers that have sufficient stake and political resources to make effective demand. Becker (1983) asserts that technological change and economic growth facilitate the mobilization of opposition groups, thereby reducing the asymmetry of representation in the policy process. Deregulation occurs (1) if incumbent firms observe that the cost of maintaining regulation exceeds exclusive benefits from regulatory protection plus the transaction costs of nullifying it or (2) if there is power shift toward the opposition groups over the pre-dominant group.

Closely related to this approach is the literature on the Congressional dominance of the bureaucracy (McCubbins and Schwartz 1985; Calvert et al. 1987; Banks and Weingast 1992). Bureaucrats can hardly maintain their detached professionalism and merely passive agents of their principal: the legislature. It is possible, however, that the Congress does not have complete control over the regulatory agency in question, perhaps due to the introduction of multiple principals competing for agency control (McCubbins et al. 1987; Moe 1992) or through the direct effect of one or another branch of

government, such as the President through his appointment power (Wood 1991; Wood and Waterman 1993), or the courts (Spriggs 1996; Spence 1997).

2. Majoritarian Approach to Economic Regulation

Earlier scholars of economic regulation think that regulatory decisions are (and should be) made in an effort to balance the desires of the various participants in order to nurture public interest. The government has an obligation to protect the welfare of its citizens from potential economic harms as well as imperfect market. From this perspective, regulation refers to a means of public authority for government to do its duties. An industry fails to operate with efficiency if one or more of three situations — negative externalities, inadequate information, and natural monopolies — cause market failures. Then, governments interfere with market in order to restore economic efficiency as well as to protect the public (Reagan 1987). People in academia doubted the application of this legal approach to problems in the real world since it is normative rather than positive, and philosophical rather than scientific (Mitnick 1980).

While many legal/historical arguments have normative and philosophical underpinnings, a more recent line of research is positive. A growing literature in political science and New Institutional Economics (NIEs) has refuted the survival of the fittest (or the law of the jungle) view from Chicago school. As Wilson (1980) points out, politics differs from economics in that there is not always a monetary measure of outcomes, coalitions formed can be binding to all parties, and preferences are not necessarily immutable. Since, as Riker (1985) puts it, the outcome of the regulatory process should be understood mainly in terms of the utility of policymakers and not concentrated

interests, the complexity and multidimensionality of their utility functions as suggested by Wilson points out to the infeasibility of simple economic theory. Although it is reasonable to assume that policymakers find changes to regulatory policy to be in their interest if they help to build or at least not undermine their political careers in general, the opinions of the mass public nevertheless sometimes matter — elected policymakers care about how local constituents respond to their actions on policy reform and mostly follow what their local public wants. Considering this, Wilson (1980) presents a useful typology of four different regulatory regimes, depending on the distribution of costs and benefits. If costs and benefits are both widely distributed, then regulation takes place in a majoritarian regime and interest groups have little role. In the other three combinations, however, interest groups or concentrated economic actors play at least some role in actively seeking or opposing regulation. Of these, only the narrow costs and narrow benefits condition directly describes the regime in which the economic theory is presumed to be acting.

Regulatory outcomes can also be contingent on idiosyncratic changes in the attention of mass or elite publics. In this so-called “politics of ideas” approach, deregulation is described as a political response to the criticism of inefficient regulation, disperse interests, and a shift in mass attitude in favor of deregulation (Derthick and Quirk 1985; Quirk 1988). Sometimes politicians attempt to shape the attitudes of the public to policies. Alternatively, the mass public increases its attention to a program and continues to express its own interest to policymakers otherwise.

3. Between Distributive and Majoritarian

Historically, at least within much of academia, the distributive approach has been dominant, in part due to a mass of fairly empirical evidence (Winston 1993). Nevertheless, in the real world of politics, it is not surprising that practitioners and policymakers have doubted the veracity of some of the more deterministic aspects of the distributive perspective to economic regulation. Few policymakers regard themselves as nothing but black box (or hand puppet) and believe that regulatory outcomes are the same no matter who takes care of specific regulatory matters. Unfortunately, few empirical works from majoritarian perspectives have been presented to counter the dominance of the distributive perspective to economic regulation, and those that have are frequently qualitative case-studies or selected narratives.

We believe that there are several reasons why there has been little empirical research on majoritarian perspective to economic regulation. First, the impact of political institutions on regulatory outcomes is not always instantaneous or easy to detect. As Friedman (1993) notes, there are three types of “lag”, in observation, decision and effect, which delay the effect of political changes on regulatory outcomes. Second with the exception of regulatory agencies and some interest groups, few political actors get involved in the day-to-day business of regulation and intervene in agency decisions (see section III.3 in detail).

A final reason for the dearth of empirical analysis of the political aspects of regulation is a practical one: the lack of easily accessible quantitative data. Data in political institutions are frequently difficult to quantify, hard to conceptualize, operationalize, and measure, and can also be a challenge to collect or otherwise obtain (in

contrast to economic indicators). To overcome these problems, it is necessary to collect more sophisticated data about political institutions and their change over time and to construct an empirical model that captures the dynamic structure regulation across both time and space. This paper does contribute to the empirical literature on economic regulation by creating and analyzing a new dataset that does just this, focusing on the deregulation of the telecommunications industry across the United States in the time period between 1990 and 1998.

III. Developing a Theory of Dual Bureaucratic Structure

In this section, we develop a theory of dual bureaucratic structure and then construct the empirical measures of bureaucratic structure by utilizing data on structural attributes of state Public Utility Commissions (PUCs) over regulatory matters in local telecommunications.

1. Why Dual Bureaucratic Structure?

The literature in regulation (or deregulation) has benefited from interdisciplinary approaches — mainly through works that come under the domain of economics, public administration, and political science. Among these diverse approaches, Transaction Cost Economics (TCE) and New Institutional Economics (NIE) are of particular interest because they helped to develop a systematic body of midrange empirical theory. This is a common position in the recent policy literature that has focused on the role of institutions to explain policy changes. The findings in Arrow-Condorcet theorem justify the importance of institutions as sources of stability in the government decision processes

that otherwise lead societal decision to chaos. A large body of theoretical application in the new institutional economics, either formal-economic (Moe 1984) or historical-sociological in nature (March and Olsen 1979), has shown that the role of institutions should not be overlooked (Teske 2002).

One critical defect for these TCE and NIE approaches, nevertheless, is the vague conceptualization of institutions. For (TCE and) NIE, “institution” is one of the most important and most subtle terms in its vocabulary and theoretical foundations. Numerous applications on new institutional economics have generated heated debate on the very notion of institution. They, however, found it impossible to define the term institution without using the word “institution” or one of its variants in its own definition. So, NIE scholars have tried to avoid defining the term accurately. Even when they did, that suffered from the lack of agreement. That is, every scholar has her own definition of institutions in mind².

Despite its potential, few have introduced the structural approach of sociology to the study of regulatory policy. This is mainly due to the narrow notion of structure in traditional social structuralism: structure as a kind of stasis. Its nuance implies something hard, primary, immutable, and far deterministic. It heavily underestimates the efficacy of insiders within the structure in accelerating structural transformation. For this reason, dealing with policy change is problematic because scholars can only attribute changes to ad hoc exogenous shocks or to entrepreneurial agents (Sewell 1994). Structural language

² According to Ostrom (1999), there are four difficulties to define institutions adequately; first, the term ‘institution’ refers to many different types of entities, including both organizations and the rules used to structure patterns of interaction within and across organizations. Second, institutions themselves are invisible and intangible as compared to organizations. Third, researchers need multiple inputs from diverse disciplines to understand types of institutional arrangements. Fourth, institutional studies need to encompass multiple levels of analysis because decisions made about rules at one level are usually made within a structure of rules existing at a different level (Ostrom 1999, p 36).

lends itself readily to explanation of how policy has been made in consistent patterns, but not explanation of how these patterns change over time. It only highlights the influence of a continuous bureaucratic structure, not why it changes.

2. Duality of Bureaucratic Structure

A theory of dual bureaucratic structure takes the account of structural level dynamics that facilitates changes in intrastate telephone deregulation process. The theory posits that bureaucracy acts in a manner consistent with the public interest while exercising considerable discretionary authority, and bureaucratic structure determines the scope of discretionary authority by regulators. Our argument rests on the notion of dual structure in sociological structuralism (Giddens 1976, 1979, 1981, 1984; Sewell 1992) and the observation that bureaucratic structure is a dual process: bureaucratic structure constrains bureaucrats' behavior, but at the same time, this behavior constitutes and influences the very structure that determines the capacity of bureaucrats to act. That is, bureaucrats are both the medium and the outcomes of the structure. This Giddensian reformulation of "structure" positions bureaucrats as active agents who gradually transform the bureaucratic structure. By taking this somewhat unusual approach, we contribute to the literature by identifying the element of flexibility inside bureaucratic structure — an important aspect that was overlooked in previous studies.

Bureaucratic structure refers to webs of interrelated rules and resources (Sewell 1994). Rules serve as internal formal constraints with respect to any change in the regulatory system. Resources are classified into two types: authoritative and allocative. While authoritative resources are substantive constraints on discretionary actions by

regulators, allocative resources capture internal bureaucratic capacities to enforce the restraints through a wide range of regulatory procedures.

3. A Theory of Dual Bureaucratic Structure

Studies of public bureaucracy has long explored the role of bureaucratic discretion on policymaking in a web of politics over decades: how does public bureaucracy work in response to the level of discretion given by politicians, and how does bureaucratic discretion affect policymaking procedures and eventually policy outcomes? These questions are directly related to the ongoing debate of the nature of political control over the bureaucracy. Prevailing theories of bureaucratic discretion have addressed this question by viewing bureaucrats from different perspectives: bureaucrats as responsive and representative representatives (Selden et al. 1998; Keiser et al. 2002), as neutral and competent professionals (Weber 1946; Wilson 1989), as budget maximizers (Niskanen 1971), as entities captured by the interest groups (Stigler 1971; Peltzman 1976, 1989; Becker 1983), or as interest group (Johnson and Libecap 1994). However, the theoretical implications are inconclusive and often in contrast with one another. This is mainly due to the dearth of empirical analysis on this issue, arising from the lack of easily accessible quantitative data.

To begin with, as a baseline assumption, we view bureaucrats as neutral and competent agents, *ceteris paribus*. This assumption is very restrictive, but there are three streams of studies in bureaucracy that is consistent with this approach. First is the public administration view expressed by Woodrow Wilson (1885), wherein the politics-administration dichotomy is emphasized. Weber's ideal typical bureaucracy, in turn inspired this view. Second is Terry Moe's view where he states that politicians hardwire

the agency *ex ante*, so that future coalitions or bureaucrats can't take advantage of the changing situation, holding others constant. Third is that forwarded by Noll (1999) where he mentions that the bureaucracy delays decision-making to protect its turf and discretionary powers.

In general, people are significantly more averse to losses relative to the status quo than they are attracted by potential gains (Kahneman and Tversky 1979). The loss aversion attitude in human nature and human dislike of change favors our baseline assumption. For example, the risk-averse nature of bureaucratic culture inside the FCC has been aptly reflected in an interesting joke: (Michael) Powell Doctrine of Telecommunications — the FCC should never commit itself in action without a clear objective, overwhelming forces, and an exit strategy (Lemann 2002).

Few refute that bureaucratic structure emerges out of the politics and it reflects the interest, strategies, and compromise of those who exercise political powers (Fiorina 1982; Noll 1982; Moe 1989, 1997). But once bureaucratic structures get settled in webs of political networks, bureaucrats are political actors with independent sources of power and influence (policy expertise and authorities) in regulatory polity. We hypothesize that bureaucracy produces policies in accordance with the public interest (or the will of mass public) when a state bureaucracy holds broader authority over regulator matters and vice versa, *ceteris paribus*. This is consistent with the view of responsive (or representative) bureaucracy.

Unlike regulators, few political actors get involved in the day-to-day business of regulation and intervene in agency decisions. The institutions of politics act a level more removed, shaping bureaucratic structures and the design of bureaucracy (Moe 1992).

This is not to say that politicians are uninterested in specific outcomes of regulation, for they must also consider their collective responsibility to the public.³ State politicians are likely to share some level of collective responsibility for the consequences of the decision ultimately made even if they do not have the chance to exercise any degree of influence on the eventual outcomes. Factors like issue salience, technological complexity, and the level of uncertainty can compound this dilemma for politicians, which is the case in the low salience and high complexity area of public utility regulation (Gerber and Teske 2000). In this area, there is no easy way of knowing who should get blamed for bad policy consequences (Mayhew 1975). Rather, the people are more likely to judge and blame politicians *as a whole* than attempting to sort out individual wrongdoing or error and assign blame proportionally.

4. Measurement of Bureaucratic Structure

Our State PUC bureaucracy variables intently capture two dimensions of PUC bureaucratic structures: (a) rules and (b) resources. In measuring these elements of state PUC bureaucracy, we attempt to assess whether and how each of these structural elements is likely to affect bureaucratic choices on regulatory decisions in the local telephone market. We then set up a series of testable hypotheses about whether and how each structural element influence what state PUC does.

Of special interest is state PUC authority over regulatory matters. We construct and analyze dynamic measures of bureaucratic authorities of PUC on intrastate regulatory industries. The variable construction is done in following way: (a) for every state, forty-

³ Following Boven (1998), there are two types of “collective responsibility”. One is accountability on the part of the collective as a whole for its own behavior. The other is a personal accountability on the part of all individual members of the collective for the conduct of the whole (also see French 1972, p. 39).

five indicators are collected over time (1989-1998) by using information on regulatory statutes based on state PUC rules and National Association of Regulatory Utility Commissioners (NARUC) reports, (b) these indicators are grouped into three categories on the basis of bureaucratic discretion over rates and facilities, over accounting and audits, and over financial and corporate regulation, and (c) each group is scaled in order to reflect the leverage of PUC authorities over intrastate regulatory utilities on local telephony market. A complete list of bureaucratic authority indicators for state PUC used here is provided in Table I. This allows us to test empirically a set of competing hypotheses about the role of bureaucratic authorities on regulators' choice in local telephone deregulation.

Table I ABOUT HERE

IV. A Model of the Determinants of Redistribution in Telecom Deregulation

1. Description of Variables for Empirical Analysis

Table II describes a brief definition, the data source, and the coding rule (if coding is necessary) for each variable used in this empirical analysis. However, a more complete picture of these variables follows below. Each is grouped according to the category that fits with the empirical model of redistribution in local telephone rates induced previously.

TABLE II ABOUT HERE

A. Dependent Variable

Residential and Business Cross Subsidy in Local telephone rates (R/B ratio)

To measure the balance of redistribution by intrastate telephone deregulation underway, we employ business-to-residential cross subsidy in the local telephone rates by states as a proxy. It captures the classical, but ongoing debate of political redistribution, *who gets what at whose expenses?* Moreover, it also evokes tensions among state economic and political actors.

A large sum was routed from long distance revenue to local telephone operations in the form of a cross-subsidy during the pre-divestiture era. This helped to sustain the policy of universal service and make local telephony rates affordable to all consumers. Each state, however, no longer relied as much on long distance revenue to subsidize their local operations since the AT&T breakup. States have been forced to maintain a substantial financial support to rural and high cost areas on their own, leading frequently to an increase in local rates. Often this increase has taken, in effect, the form of a new cross-subsidy from business to residential users.

The problem for state PUC regulators is to decide the level of cross subsidy between business and residential users: *what level of cross-subsidy from business to residential or high cost users is appropriate and socially acceptable?* On one hand, less well-off users (and users in high cost areas) are possibly excluded from the telephone network if local residential rates become too high, while on the other hand, raising local business rates might force local businesses to shop around for other alternatives for communications (e.g. private networks, cable services, etc.). This might also eventually lead, in turn, to higher residential rates as subsidy sources are lost (Cohen 1994).

The dependent variable *Residential and Business Cross Subsidy in Local telephone rates (R/B ratio)*⁴ is;

$$\frac{\text{Intrastate monthly Residential Telephone Rates in year } t}{\text{Intrastate monthly Midsize and Large Business Telephone Rates in year } t}$$

Data on the local telephone rates of residential and business users on state level, however, do not exist. That means that we need to construct a data set at the state level by using and inferring existing information at local telephony market to conduct an accurate empirical analysis of intrastate regulatory redistribution. Since the Modification of Final Judgment and subsequent AT&T breakup, local telephone markets are identified as geographic boundaries known as Local Access and Transport Areas (LATAs). Though local access and transport areas do not conform to any pre-established state or local government boundaries, they seldom cross state boundaries. The best existing approximation for that particular LATA is the information corresponding to the primarily metropolitan areas within a LATA without loss of generality (Abel 2002, pp 297). The Industry Analysis Division at FCC conducts an annual survey of telephone rates for local service in 95 urban areas of the United States and publishes it in *Reference Book of Rates, Price Indices, and Household Expenditures of Telephone Service*. The dependent variable construction is done in following way: (a) for each 95 metropolitan area, we first

⁴ Telephone users respond telephone rate changes more than any other category, making it among the most visible and political charged (Cohen 1994). However, telephone rates across states are difficult to compare directly since the states do not follow a uniform rate structure. A simple example is shown in table IV. If we just take either residential or business rates alone as our dependent variable, the result could be underestimated (or overestimated) with a significant level.

Table IV. Comparison of Sampled Cities in Intrastate Residential and Business Telephone Rates

1990	Rock Island, Illinois	Residential	\$ 19.85
		Business	\$ 60.77
	West Palm Beach, Florida	Residential	\$ 16.69
		Business	\$ 44.55
	New Orleans, Louisiana	Residential	\$ 23.70
		Business	\$ 72.25
	Atlanta, Georgia	Residential	\$ 23.44
		Business	\$ 42.50

calculate the sum of a monthly fixed fee and the costs of 100 minutes of metered local service for residential and business rate constructs, (b) city statistics are grouped by states, (c) the sample weights derived by the ratio of urban/state population statistics are used, and (4) the construct of the annual, state-level measures are created by averaging and taking the ratio between residential and business rates. Eight states, which do not cover above 95 metropolitan areas, are dropped from our dataset. This measure, although not perfect, is the closest one can come given the data resources currently available. We believe that it reflects the focus of our analysis well since the issue of regulatory redistributions has usually occurred in densely populated and industrialized areas such as cities. A small ratio indicates that residents are benefiting relative to business groups while a high ratio suggest the opposite, *ceteris paribus*.

B. Independent Variables

There are three sets of independent variables in our model; state PUC bureaucracy, political and economic controls over state PUCs, and control variables. We now describe each of these categories in turn.

Public Utility Commissions (PUCs)

Resources: We demonstrate elsewhere that state bureaucracy may produce policies in accordance with the will of mass public in the issue of cross-subsidy between residential groups and midsize and large business users. This condition is more likely to hold if a state bureaucracy exercises broader authority over regulatory matters, *ceteris paribus*. We consider three constructs as proxies for these: *PUC authority over telephone rates and facilities*; *PUC authority over accountings and audits*; *PUC authority over*

financial and corporate regulation. The variable, *number of commissioners in a state* is included to reflect the difference in the transaction cost to reach an agreement among commissioners. The transaction cost is inversely related to the number of commissioners, holding others constant.

Two important features of a state commission are whether its commissioners are elected or appointed and the political independence of the commission. It is widely understood that elected commissioners would act differently than appointed commissioners. Following Teske (1989, 1991), we hypothesize that those elected by popular votes may be more responsive to the public and enjoy wider discretion than those politically appointed, leading to a majoritarian outcome favoring residential users over business ones. The variable *ELECT PUC* is a dummy variable, taking on the value of one if the commissioners in the state are elected and zero if they are appointed. The legislative statue of a particular state public utility commission is likely to influence the regulatory process with regard to two variables: PUC as legislative arm and bureaucratic independence. The former is a dichotomous variable equaling one if a particular state PUC is an arm of state legislature and zero otherwise. The latter is coded one if PUC is neither an arm of state legislature nor under a state governor and zero otherwise. We demonstrate elsewhere that if a particular state PUC is independent from external political pressure, it may work as a guardian to protect the public interest, not its principals'. If a particular state PUC is an arm of state legislature, a state PUC is expected to respond negatively to a relative increase of residential benefits at the expense of business and large users, *ceteris paribus*. This is especially true if we consider the theory of congressional dominance (McNollgast 1981, 1983).

Rules: Two variables — *statutory requirement for PUC commissioners* and *revolving door hypothesis* — are included to capture substantive constraints on the qualifications and opportunistic behaviors of state PUC commissioners in the state. We define statutory requirement for PUC commissioners as a binary variable that takes the value one if specific professional background is required to be eligible to serve on the commission under state legislation and zero if it is not required. We do not offer any a priori prediction about this variable. The variable, *revolving doors hypothesis*, concerns the imposition of restrictions on how long after service on a commission must a commissioner wait before taking a job with the regulated industry. We hypothesize that if PUC commissioners are restricted from working for the regulated for a certain period after departure from PUC, they are less likely to be captured by special interest groups while at work. This is consistent with Gormley (1979) and Cohen (1986).

Political and Economic Control of the Bureaucracy

Economic and political controls over the bureaucracy in the state are likely to influence four specific areas of the regulatory process: state legislatures, governors, the mass public, and most importantly specific interest groups — Incumbent Local Exchange Carriers (ILECs), long distance carriers, and the power balance between consumers and business groups.

State Legislatures: There are three main claims of congressional control over bureaucracy in conflict (Wilson 1989). First, the Congress controls the major day-to-day activities of an agency. In that case, the Congress is the principal and the agency is its agent. If this is true it must mean that there are no other significant sources of influence. Second, the Congress has the ability and inclination to intervene when it

learns that an agency runs away from its will. It implies that other forces — the president, the courts, interest groups or the bureaucrats themselves — have influence on the agency independent of the Congress. Third, the Congress just creates and maintains the structural conditions within which an agency operates (pp 236-237), which is consistent with the politics of bureaucratic structure view (Moe 1989). We include two variables, *the ratio of Democrats to Republican in the lower house* and *the ratio of Democrats to Republicans in the upper house*⁵ in order to test these competing theories of congressional control over bureaucracy empirically. It is assumed that Republicans are more likely to favor business groups, whereas Democrats stand up for the consumer side. If either the first (congressional dominance) or the second is true, both estimates are expected to be statistically significant and to be negative (if the first is true) or no expectation a priori (if the second is true). We expect both estimates to be statistically insignificant regardless of the direction, if the third is true.

State Governors: Political executives are held responsible for taking action on virtually the full range of problems facing society regardless of party. They have the incentive to think in grander terms about what is best for society as a whole (Moe 1989, 1992, 1997). Governors have their own agendas that may depart substantially from what even their more prominent supporters might want. This leads them to promote moderation that will eventually increase the social welfare. Therefore we expect a negligible effect of *Governors' partisanship* on state regulatory decision-making. The variable, *percent of vote cast for Governor elected is included* as a proxy for relative strength of governors' power in a state. The larger the vote share of the Governor, theoretically the more authority he can exercise in a state. Our prediction for this variable

⁵ Unicameral and nonpartisan Nebraska is treated as having a ratio of 0.50.

is, however, ambiguous as well, and we include it more for completeness vis-à-vis the literature.

Mass Public: There is a body of evidence that differences in public opinion are strongly correlated with state policy differences (Page and Shapiro 1983; Stimson 1991; Hanson 1996). Berry et al (1998) develop an index of ideological sentiments for U.S. states. This variable ranges continuously from zero to one hundred, with scores closer to one hundred signaling liberal sentiment and scores closer to zero signaling conservative one. The variable state ideology score is related negatively to our dependent variable, the rate ratio between residential and business telephone users.

Economic Interest Groups: It is well established that the setting up and maintenance of a local telecom network (within a state) is more expensive than setting up and maintenance of an interstate network. Because of this, the Federal government mandated that the long distance carriers would have to pay the local carriers an access fee to maintain the local network. This access fee therefore works as a subsidy to high cost local telephony. Of course, this is a service to the consumers of high cost, low-density telephone network areas. Local dominant carriers (mainly Baby Bells) want to keep residential rates down because for two reasons: (a) to justify the existence of the access fee as huge extra revenue sources from long distance carriers and further defend the universal service claim, and because low residential rates serve as implicit entry barriers against potential competitors in the local market. We attempt to measure these considerations two ways. The first variable, *Baby Bells* is taken as a proxy for the pressure from local dominant carriers (especially RBOCs, Regional Bell Operating Companies) on the regulatory agency. We use the RBOC percentage of market share in

prescribed telephone lines by state. We expect that the surge and decline of RBOC market share in intra-LATA telephony has a strong impact on state regulatory decision-making.

The variable *AT&T market share*, a proxy for dominant long distance carriers' influence on state regulators, is a measure of the percentage of AT&T market share of prescribed telephone lines by state. Since accelerated competition in local telephony is directly linked to the reduction of their burden of cross subsidy from interstate to intrastate telephony, it is reasonable that long-distance carriers like AT&T will be in favor of local competition, not local equality. Since the AT&T breakup, AT&T has still remained a market leader, holding about 63% of the nation's lines in 1998 but minimal (if not negligible) in local telephony market. So, we expect there to be a negligible effect of long-distance carriers' interests on intrastate telephone price distribution.

Control Variables

Our first two indicators are *yearly differences in telephone penetration rates in a state* and *unemployment rate in previous fiscal year*. We use the (lagged one year) state unemployment rate as proxy for the overall state economy. It is widely believed that the state of economy is an important predictor of policy. Scholars of economic development argue that innovation toward a new regulatory regime occurs if there are substantial economic disruptions (Rose 1987; Kahn 1988). An increase in unemployment rate in a state substantially lowers the probability of increasing residential rates (but see Vogel 1989).

The variable *Penetration Rate* is defined as yearly difference in telephone penetration rate within a state, given by the number of mainlines per capita. We use this

as a proxy of the stock of telecommunications infrastructure in a state. Greenstein, Lizardo, and Spiller (1997) survey several studies that investigate the impact of telecommunication and information technology infrastructure on economic performance. We assume that policymakers perceive the possible tradeoff between economic efficiency and equality. If state policymakers interpret the penetration rate as a determinant of the need for further expansion of service (towards universal service), then for a given the number of residential users and telecom infrastructure within a state, the higher the penetration rate, the more will be the weight towards economic equality in policy (thus decreasing the ratio of consumer/business rate).

We also include a variable, *state office in Washington D.C.* which is a dichotomous variable equaling one if a state has its lobbying office in Washington D.C and zero otherwise. This is a proxy for how seriously each state lobbies the Federal government. However, no clear a priori prediction about the impact of this variable is expected here. We include it more for completeness vis-à-vis the literature.

2. Estimation

Since our data varies in time (1990-1998) and space (42 states), our econometric model should account for both the time-serial and panel aspects of our data. Data of this form—so-called “time series cross section” (TSCS) data—is problematic in at least three ways: autocorrelation over time, cross-correlations within each panel-year and non-constant error variance.

There are no generally accepted diagnostic procedures, such as the Box-Jenkins methodology for non-panel time series, for TSCS data. Accordingly, we use a mixture of

theory-based assumptions and empirical tests to guide our selection of an appropriate estimator. The first potential problem, autocorrelation, is particularly challenging to diagnose in TSCS analysis. One compromise in the literature (e.g. Beck and Katz 1996) is to assume an AR-1 autoregressive structure and model it by including lagged values of the dependent variable as a predictor. In this paper, we reject this approach and choose instead to ignore autocorrelation in our data. We believe this decision can be theoretically justified by the not-so-unreasonable assumption that telecommunications companies set rates as rational firms — they respond to political and market conditions and set rates without “memory” of prior rates.

However, the problem of cross correlation among errors cannot be ignored. Many researchers find that observations are densely connected with one another in the U.S. States (e.g. Peterson and Row 1990; Vogel 1997; Ringquist and Garland 1999). That is, observations collected across U.S. states have complex dependence structure unlike, say, random sampling survey data.

In the case of telecommunications, the dependence among these separate observations is complicated, central to U.S. state politics, and critical for methodological analysis. Under the Modification of Final Judgment (MFJ) in 1984, AT&T was forced to divest seven Regional Bell Operating Companies (RBOCs) on intrastate LATA (Local Access and Transport Area) calls. Each of seven RBOCs were allowed to carry local calls and short haul toll calls that originated and terminated within the same LATA, but prohibited from carrying calls across LATAs, including calls across state boundaries or within states. Before even sequential mergers between Southwestern Bell and Pacific Telesis and between Bell Atlantic and NYNEX, each RBOC has served approximately 11

or 12 percent of U.S. local telephone subscribers and cover one or more states (Harris and Kraft, 1997, p96). For instance, except California and Nevada, U.S. West Co. (Now Qwest Inc.) provided telecommunication services to other 14 western states. Given these facts, we cannot ignore the issue of cross-dependency among error terms here.

Heteroscedasticity is also a potential problem in our data. Differences in city size, clustering of cities within states and similar grouping within regions of the country all may contribute to non-constant error variance—panel heteroscedasticity—within a given panel year. These differences in variance within panel years have the potential to greatly reduce the efficiency of estimators that do not account for them.

In sum, we have TSCS data with correlated and non-constant errors within each panel. Accordingly, we follow Beck and Katz (1995; 1996; see also Greene 2000) and apply the least squares estimator with Panel-Corrected Standard Errors (hereafter PCSE OLS estimation) here. This method is flexible, efficient, and arguably superior to either the Parks or Kmenta feasible generalized least squares estimators in finite samples.

V. Results

The result of PCSE OLS estimation is presented in Table III below. Since the interpretation of the coefficients with below four decimal points is complex and confusing, our interest resides in directions of the coefficients and in the level of statistical significance with a substance.

TABLE III ABOUT HERE

In general, the results are consistent with theoretical analyses suggesting that the effects of (structural) bureaucratic factors on state regulatory outcomes are important and robust across different areas and over time.

The PUC authority measures are found to have statistically significant coefficient estimates with expected negative signs. This finding supports our contention that the level of substantive rules and resources in a state commission determines bureaucratic choices on regulatory redistribution. State bureaucracy does produce policies in accordance with the public interest rather than special interest groups. This condition is more likely to hold if a state bureaucracy exercises broader authority over regulatory matters, *ceteris paribus*.

The *elected PUCs* and *statutory requirements for PUC commissioners* variables are also statistically significant with expected signs. These results indicate that state regulatory decisions are strongly correlated with rules and resources of bureaucratic structure. Furthermore, these results indicate that state regulatory decisions are strongly correlated with rules, a finding also consistent with Wilson (1989): prior experience, professionalism, and ideology of state PUC commissioners influence how they behave especially when laws, rules, and circumstances do not precisely define bureaucratic tasks (pp. 70-71).

The coefficient on the *revolving door hypothesis* variable is statistically significant, but in the opposite direction from that expected. In other words, we find that mandatory waiting periods preventing commissioners from immediately working for regulated industries after leaving the PUC are correlated with more residential consumer-friendly rate structures. There are at least two feasible reasons for this unexpected

outcome. First, our measure only considers the “exit” phase of the revolving door. As Gormley (1979) points out, the revolving door hypothesis can also involve *prior* service or employment within the regulated industry. This may effectively limit the pool of potential applicants for the post of commissioner and thus bias the effect of this variable.

Of the political and economic control of bureaucracy variables, none of the four variables—*the ratio of Democrats to Republicans in the upper and lower houses*, and *the measures of Governor’s party affiliation and percentage of votes received* – is found to be statistically significant. This is not unexpected in the case of the Governor covariates, but more difficult to explain for the legislature. We believe that politics matters for regulatory policymaking and outcomes, but perhaps equally important questions are *when* does politics matter and *how long* until the effects of changes in politics are felt. If politics shape bureaucratic structure, and the design of a bureaucracy reflects the interests, strategies and compromises of those who exercise political power, then changes in bureaucratic behavior as a result of politics might only be noticed when there are major shifts in the ruling coalition—and even then the changes may take a long time to be measurable. Our data are measured over a relatively short period (1990-1998), and the partisan balance in legislatures perhaps shifts more slowly.

Consistent with our expectations, Baby Bell share is statistically significant with the expected sign whereas the AT&T market share is not significant (as expected). The *State Lobbying Office in Washington D.C.* variable is statistically significant and predicts that having such an office is favorable to residential consumers, although exactly why this should be the case is unclear. *Citizen ideology* is also found to be significant and in the expected direction: more liberal states are found to have a lower relative residential

telephone rates. Finally, *Telephone Penetration Rate* and *Unemployment Rate (t-1)* are also significant and in the expected direction.

VI. Conclusions

What is the nature of economic regulation in local telephone market? Is it exclusively distributive or foremost majoritarian? Using a theory of dual bureaucratic structure and a newly constructed panel data set of local telephone markets, this paper provides an empirical analysis of regulatory redistribution underway in U.S. local telephone market. Of particular interest is the differential impact of state bureaucratic structures on the balance of cross-subsidy between residential and business users. Empirical results reveal that a state commission with broad level of discretionary authority has acted in a manner consistent with the public interest during the time period studied. This finding supports our contention that the level of substantive rules and resources in a state commission determines bureaucratic choices on regulatory redistribution.

Our empirical analysis shows that the effect of political control over state regulators is minimal. This finding, though apparently surprising to some readers, might not necessarily contradict the contention that politics matters for regulatory policymaking and outcomes. It certainly does, but perhaps equally important questions are when does politics matter and how long until the effect of change in politics are felt. If the politics shape bureaucratic structure, and the design of a bureaucracy reflects the interests, strategies, and compromises of those who exercise political power, then change in bureaucratic behavior as a result of politics might only be noticed when there are major

shifts in the ruling coalition—and even then the change may take a long time to be measurable. Our data is measured over a relatively short period (1990-1998), and the partisan balance in the legislatures perhaps shifts more slowly.

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Table I: List of Bureaucratic Authorities for State Public Utility Commissions

1. PUC Authorities over telephony rates and facilities

Rates

- The agency has power to authorize temporary/interim rates pending investigation
- The agency has authority to require prior authorization of rate change
- The agency has authority to suspend proposed rate changes
- The agency has authority to initiate rate investigation upon its own motion
- The agency has authority to regulate or control rates on sales to ultimate consumers
- The agency has authority to regulate or control rates on retail sales to ultimate consumers (Basic local exchange service- Bell LEC and Non-Bell LEC)

Facilities

- The agency has authority to regulate standards by setting safety standard
- The agency has authority to authorize interconnections
- The agency has authority to require interconnections
- The agency has authority to regulate standards by requiring utility to act as common carriers
- The agency has authority to regulate standards by requiring joint use facilities
- The agency has authority to regulate standards by requiring line extension within the area served
- The agency has authority to require certificates of convenience and necessity for initiating service
- The agency has authority to require certificates of convenience and necessity for constructing major additions-generating plants
- The agency has authority to require certificates of convenience and necessity for constructing major additions- transmissions lines
- The agency has authority to require certificates of convenience and necessity for constructing for major additions- distribution lines
- The agency has authority to require certificates of convenience and necessity for constructing major additions- other plants
- The agency has authority to require certificates of convenience and necessity for abandonment of facilities or service
- The agency has authority to issue indeterminate permits

- The agency has authority to allocate unincorporated territory among utilities

2. PUC Authorities Over Accounting and Audits

Accounting

- The agency has authority to prescribe a uniform system of account
- The agency has authority to require specific entries or adjustments in accounts
- The agency has authority to prescribe rules for preserving records
- The agency has authority to interpret uniform systems of accounts
- The agency has authority to prescribe units of property

Audits

- The agency requires annual audits by independent accountants (or another interval); yes=1 no=0
- The agency has authority to require annual audits by independent accountants under either a general statute or a specific status?
- The agency requires copies of independent audit report

3. PUC Authorities over Financial and Corporate regulation

The agencies regulate or control utility purchases, merges and consolidations, the issuance of securities, the purchase of securities of other utilities, the declaration of dividends, budgets and capital expenditures and other financial and corporate transactions

Financial

- Approval of the agency is required prior to sale of facilities (entire operating units)
- Approval of the agency is required prior to purchase of facilities (entire operating units)
- Approval of the agency is required prior to merger or consolidation
- Approval of the agency is required prior to issuance of securities- mortgage bonds
- Approval of the agency is required prior to issuance of securities- debentures
- Approval of the agency is required prior to issuance of securities- notes over 1 year

- Approval of the agency is required prior to issuance of securities- notes under one year
- Approval of the agency is required prior to issuance of securities- preferred stocks
- Approval of the agency is required prior to issuance of securities- underwriting of new common stock
- Approval of the agency is required prior to purchase or issuance of securities by utilities operating in the state but incorporated in another
- Approval of the agency is required prior to Issuance of restricted stock options
- Approval of the agency is required prior to entrance into lease transactions

Corporate

- The agency has authority to disqualify directors and officers where interlocking directorates and conflicts of interests are involved
- The agency has authority to require advance submission of budgets on capital expenditures
- The agency has authority to regulate the declaration of dividends
- The agency has authority to regulate the entry of utility into non-utility activities either directly or through an affiliate
- The agency has authority to regulate approved diversification

Table II: The Variables

<i>Variable</i>	<i>Description</i>	<i>Range (Theoretical)</i>
Residential/Business Ratio (Dependent Var.)	The ratio of intrastate residential and business monthly telephone rates (on average)	0.25-1.32 (0- ∞)
AT&T Market Share	Percentage of AT&T long-distance lines out of Total pre-subscribed lines in a state.	0-92.9 (0-100)
Pro Bell	Percentage of Bell Lines out of Total pre-subscribed lines in a state.	0-100
Residential/Business Line Ratio	The ratio of intrastate residential and business lines in a state	0.02-4.18 (0-100)
Elected PUC	PUC commissioners are elected by the public (1) or appointed by political actors (governor and/or legislators: 0)	0-1
Time Restrictions	Time Restrictions on Commissioners Departing Commissions to work for Regulated Industry. If yes =1, otherwise 0	0-1
Number of Commissioners	Number of Commissioners in a state PUC	3-7 (0- ∞)
Statutory Requirement	In order to be eligible to serve on the commission, are there any statutory requirements for professional backgrounds? If yes, 1	0-1
Legislative Arm	If the state PUC is an arm of legislature (1) or not (0)	0-1
Independent Branch	Neither a legislative arm nor executive branch. If yes it is coded 1, otherwise 0	0-1
PUC Authority I	PUC Authorities over telephony rates and facilities	4-18 (0-20)
PUC Authority II	PUC Authorities Over Accounting and Audits	3-8 (0-8)
PUC Authority III	PUC Authorities over Financial and Corporate regulation	0-17 (0-17)
Penetration Rate	Yearly differences in telephone penetration rates	0.89-1.05
Unemployment rate (t-1)	Unemployment rate at previous fiscal year.	2.2-11.4 (0-100)
Ratio of Democrats and Republicans in Lower Chamber	The Ratio of Democrats and Republicans in the Lower House in a State	0.18-12.4 (0- ∞)
Ratio of Democrats and Republicans in Upper Chamber	The Ratio of Democrats and Republicans in the Upper House in a State	0.16-33.0 (0- ∞)
PG votes	Percent of votes cast for Governor elected	18.9-82.4 (0-100)
Governor's PID	Governor's Party Affiliation Democrat = -1, Independent = 0, Republican = 1	-1 - 1
Office in D.C.	A state has an intergovernmental relations office in Washington D.C.	0-1
Citizen Ideology	Citizen Ideology by Berry et al. (1998)	0-100

Table III: TSCS Regression Result with Panel Corrected Standard Errors

	β	s. ϵ	z value
AT&T Market Share	-0.0002537	0.0003802	-0.67
RBOC Intrastate Market Share	-0.0006592***	0.0001819	-3.62
The Ratio of Residential/Business Prescribed IntraLATA Lines.	-0.0227	0.144043	-1.58
Elected Public Utility Commissioners	-0.0342565**	0.0163421	-2.10
Number of Commissioners In a State	0.0088322**	0.002626	3.36
Revolving Door Hypothesis	0.052173***	0.0075181	6.94
Statutory Requirements For PUC Commissioners	-0.0103948*	0.0057893	-1.80
State PUC as a Legislative Arm	0.528246***	0.0107862	4.90
Bureaucratic Independence	-0.0093605	0.0096678	-0.97
PUC Authority I. (Rates & Facilities)	-0.0068129***	0.0017737	-3.84
PUC Authority II (Accounting & Audits)	-0.0229961***	0.0060851	-3.78
PUC Authority III (Financial & Corporate Regulation)	-0.0040352**	0.0018119	-2.23
Yearly Differences In Telephone Penetration Rates	-0.0152261***	0.002319	-6.57
Unemployment Rates (t-1)	-0.0116147**	0.0036592	-3.17
Dem/Rep. Lower House	0.0012981	0.0027883	0.47
Dem/Rep. Upper House	0.0003797	0.0025181	0.15
Governor Percent Vote	-0.0012305	0.0009584	-1.28
Party Affiliation of Governor	0.0006737	0.0038633	0.17
State Office in D.C.	0.0490459**	0.01595	3.07
Citizen Ideology	-0.0009456**	0.0004233	-2.23
Constant	2.517996***	0.257699	9.77
Number of Cases: 364	R^2 : 0.2485	Probability > χ^2 : >.001	

*** significant at .001

** significant at .05

* significant at .1

