Advanced Workshop in Regulation and Competition

COMPETITIVE CHALLENGE IN NETWORK INDUSTRIES

14th Annual Western Conference

The Hyatt Islandia, San Diego, California, June 27–29, 2001

The Conference features some of the latest developments in the telecommunications and energy sectors, including:

- % Future of Distribution
- & Innovations in Pricing and Technology
- % Market Structure
- & Strategies under Competition and Deregulation
- % Incentive Regulation

Who should attend:

- & Industry Economists
- % Marketing and Regulatory Managers
- & Regulatory Commission Staff

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Draft: 12/15/00

14th Annual Western Conference of the Advanced Workshop in Regulation and Competition

Wednesday, June 27, 2001

3:00 - 4:00 Registration

4:00 - 4:30 Welcome to Conference–Michael Crew

4:30 - 6:00 **William Kovacic:** Regulation and the Law: The Year in Review

6:00 - 9:00 **Cocktail Hour, Dinner & Speech:**

Thursday, June 28, 2001

8:00 - 9:45 ***Concurrent Sessions***

RETAIL
Chair:
Discussants:

Jasmin Ansar, C.K. Woo and Roger Sparks: The Welfare Effects of Price Regulation in the California Electricity Market

Robert Earle: The Optimal Setting of Price Caps as a Transitional Mechanism

Stuart McMenamin: Profiling and Forecasting in Retail Electricity Markets

TELECOMMUNICATIONS TECHNOLOGY
Chair:
Discussants:

Richard Simnett: The Internet, Internet Interconnection Arrangements, Telephony, and Telephony Interconnection Arrangements

Dale Lehman: Does Regulatory Policy Affect Competitive Entry?

Christian Dippon and Georgina Martinez: Valuing Third Generation Mobile Spectrum – Another Game of Darts?

9:45 - 10:00 Coffee Break

10:00 - 11:45 ***Concurrent Sessions***

CUSTOMER ISSUES
Chair:
Discussants:

Ahmad Faruqui and Kelly Eakin: Is Price-Discrimination a Barrier to Market Based Pricing of Electricity?

Michael Crew and Paul R. Kleindorfer: The Universal Service Obligation (USO) in the Context of Deregulation of Network Industries

David Mandy and David E.M. Sappington: Incentives for Sabotage in Vertically-Related Industries

TELECOM REGULATORY
Chair:
Discussants:

Yasuji Otsuka: A Recent Development in Telecommunications Demand Estimation and Forecasting

Steve Parsons, et al.: Pricing Network Elements and Interconnection under the Telecommunications Act of 1996 and the July of 2000 Decision of the 8th Circuit Court of Appeals

Richard E. Schuler, Jr., et al.: Changes in Telecommunications Industry Equity Risk Since the Telecommunications Act of 1996

11:45 - 1:00 Lunch Break

1:00 - 2:30 ***Concurrent Sessions***

MARKET POWER I
Chair:
Discussants:

Diana Moss: Market Structure in the U.S. Electricity Industry: The Effects of M&A Activity

Robert Michaels: Competitive Power Markets: What Economics have Regulators Learned

Timothy J. Brennan: Vertical Market Power as Oxymoron: Getting Convergence on Mergers Right

PIPELINE
Chair:
Discussants:

Clifford Rochlin: Rate Design Arbitrage: The Case for Value-Based Peaking Services

Jesse David and Alan J. Cox: Competitive Analysis in the Oil Pipeline Industry

Fred Barney, et al.: Three Case Studies of Operationalizing of Sampling Theory in the Regulated Gas Distribution Companies

2:30 - 4:00 ***Concurrent Sessions***

MARKET POWER II
Chair:
Discussants:

Gary Stern: Market Power Mitigation Measures and Their Impact on the California Electricity Market

Michael Schmidt: Lessons Learned in Retail Energy Competition

Bruce Ambrose, et al.: The San Diego Experience: What Happened and Why?

14th Annual Western Conference of the Advanced Workshop in Regulation and Competition

TRANSMISSION

Chair:
Discussants:

Carl Silsbee: A Benefit-Cost Framework for Unbundled Transmission Grid Expansion

Hung-po Chao: Transmission Rights and Forward Markets for Electricity

4:00 Exercise Break

Friday, June 29, 2000

8:45 - 10:40 ***Concurrent Sessions***

DISTRIBUTION
Chair:
Discussants:

John Kelly: Scale Economies in Electricity Distribution Service: Is Bigger Necessarily Better?

Brenda Kahn: Monopoly Power Over the Last 100 Yards

Sheri Petro: Fall-out: The Summer of 2000 High Electric Prices of San Diego

FUTURE STRATEGIES
Chair:
Discussants:

Amar A. Khalifeh and Robert D. Adkins: Impact of Internet and E-Commerce On US Electricity Consumption

Pamela Lesh: Creating a New Regulatory Framework: Workable Competition in the Electric Distribution Sector

Eric Helland and Michael Sykuta: Deregulation and Board Composition: Evidence on the Value of the Revolving Door

10:40 - 11:00 Coffee Break

11:00- 12:55 **AUCTION DESIGN**
Chair:
Discussants:

Shmuel S. Oren: Market Design for Competitive Electricity: Experiences, Flaws and Remedies

Timothy Mount, et al.: Testing the Performance of Uniform Price and Discriminatory Auctions

David Salant: Recent Developments in Auctions Replacing Regulation

12:55 - 1:00 Closing Remarks–Michael A. Crew

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To Register: Please complete and return the form o the back page. Registrations are accepted by mail, email, fax, and telephone. Please confirm telephone registrations by sending in a completed and signed registration form. The deadline for registrations is May 15, 2001. Registrations received after May 15, 2001, will be admitted on a space available basis.

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Sufficient Rooms are reserved at the Hyatt Islandia for all of the Conference participants. Participants should register for the conference by returning registration forms to Hyatt Islandia. Reservations must be received by May 21, 2001. Hotel reservation forms can be downloaded from the internet at:

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14th Annual Western Conference of the Advanced Workshop in Regulation and Competition

SPEAKERS, DISCUSSANTS, AND CHAIRS

Robert D. Adkins, Director-Energy Forecasting & Research, UtiliCorp United, Inc.
Bruce Ambrose, Vice President, Analysis Group / Economics
Jasmin Ansar, Director, Pacific Gas & Electric
Fred Barney, Econometrician I, NYS Department of Public Service
Timothy J. Brennan, Professor of Policy Sciences and Economics, University of Maryland-Baltimore County
Hung-Po Chao, Area Manager-Policy and Risk Analysis, EPRI
Michael A. Crew, Professor, Rutgers University
Jesse David, Senior Consultant, NERA
Christian Dippon, Senior Consultant, NERA
Robet Earle, Manager, Economics Analysis, California Power Exchange
Ahmad Faruqui, Area Manager, EPRI
Eric Helland, Assistant Professor of Economics, Claremont McKenna College
Brenda Kahn, District Manager, Local Services and Access Management, AT&T
John Kelly, Director of Economics and Research, American Public Power Association
Amar A. Khalifeh Senior Forecaster, UtiliCorp United, Inc.
Paul R. Kleindorfer, Professor, The Wharton School: OPIM, Univeristy of Pennsylvania
William E. Kovacic, Professor, George Washington University Law School
Dale Lehman, Associate Professor of Economics, Fort Lewis College
Pamela Lesh, Vice President, Rates & Regulatory Affairs, Portland General Electric Company
David M. Mandy, Associate Professor of Economics, University of Missouri
Georgina Martinez, Consultant, NERA
Stuart McMenamin, Executive Vice President, Regional Economic Research, Inc.
Robert J. Michaels, Professor of Economics, California State University at Fullerton
Diana Moss, Senior Economist, Federal Energy Regulatory Commission
Timothy J. Mount, Professor, Cornell University
Shmuel S. Oren, Professor, University of California at Berkeley
Yasuji Otsuka, Economist, Nevada Public Utility Commission
Steven Parsons, President, Parsons Applied Economics, L.L.C.
Sheri Petro, San Diego Gas & Electric
Cliff Rochlin, Market Consultant, Southern California Gas Company
David Salant, Special Consultant, NERA
Michael Schmidt, Regulatory Policy Leader, Sempra Energy
Richard E. Schuler, Jr., Associate Economist, NYS Department of Public Service
Carl Silsbee , Manager of Regulatory Economics, Southern California Edison
Richard Simnett, Chief Scientist, Telecordia Technologies
Gary Stern, Director for Market Monitoring and Analysis, Southern California Edison
C.K. Woo, Vice President, Energy and Environmental Economics, Inc.

C

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Signature of Participant: _____

Abstract#: WC09

Topic: "Regulation and the Law: The Year in Review"

Presenter:

William E. Kovacic
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Description

This presentation will review legal decisions issued from July 2000 through June 2001 that have major implications for network industries. Copies of especially significant decisions will be distributed as background material for the conference participants. Legal developments that are likely to be good candidates for discussion will include:

- The court of appeals decision in the Microsoft antitrust litigation.

- The FTC, FCC, and European Union decisions concerning the AOL/Time Warner merger.

- The recent decision of the court of appeals for the Federal Circuit adopting a broad definition of when intellectual property laws trump the operation of antitrust principles.

- The resolution of the Napster litigation (and the definition of property rights in intellectual property) in the court of appeals.

- The court of appeals decision in the Heinz/Beech-Nut baby food merger, which involves an important test of what weight a court should give to the merging parties' claims of efficiencies as a defense to theories of illegality under the antitrust laws.

- The Supreme Court decision in the EPA litigation that will determine whether EPA may consider costs as a variable in setting pollution abatement standards.

- The Supreme Court decision in a contract dispute that will define then right of employers to require employees to resort to arbitration to resolve a variety of disputes arising under federal law. (The case essentially asks the Supreme Court to consider whether employers can contract around remedies provided by federal statutes.)

- The impact of the November 2000 elections on the regulatory process, including appointments to regulatory bodies and appointments to the federal courts.

Abstract # WC35

The Welfare Effects of Price Regulation in the California Electricity Market

C.K. Woo: Energy and Environmental Economics, Inc.
Roger Sparks: Mills College, Oakland
Jasmin Ansar: Pacific Gas and Electric Company

This paper builds a model to examine the consumer welfare effects of various plans for stabilizing electric retail prices. In the model, electric prices are stochastic and exhibit the same volatility that occurred in California during a recent one-year period. In the retail market, risk-averse consumers purchase electric power from a risk-neutral, local-distribution company. The main purpose of our analysis is to shed light on which of several recently-proposed schemes for dampening retail prices would, if it had been implemented, have offered the largest (ex ante) improvement in consumer welfare.

Abstract #: WC28

The Optimal Setting of Price Caps as a Transitional Mechanism

Robert Earle
Manager, Economic Analysis
California Power Exchange

Abstract:
In the United States, price caps have been increasingly turned to as a tool to help regulators in the transition from a regulated regime to a deregulated market. While there has been much discussion of the appropriate level of price caps, there has been little formal modeling of this issue. On the one hand, if price caps are too high, they will not achieve what should be their intended effect, lessen the social welfare loss due to temporary scarcity of supply. On the other hand, if price caps are set too low, then there will be too little incentive for new entry into the market and the price caps could prolongate the period of scarcity. A Cournot model is developed and applied to two load pocket areas to explore questions of the price cap levels, the form of price caps, and the effect of price caps on entry. The results show that the type and level of price caps can have various consequences on the amount of entry that occurs. Regulators must be careful to pick the right level of price cap so as not to discourage entry. Moreover, suppliers need regulatory certainty in the application of price caps in order to be induced to build new plant. In addition, the paper develops the concept of *free-entry equilibrium* in the context of the model for measuring market power as an alternative to marginal cost.

Abstract #: WC32

Profiling and Forecasting in Retail Electricity Markets

Stuart McMenamin

In competitive markets, electricity suppliers must schedule and pay for the electricity used by their retail customers. Because the physical market is real time, and because market prices vary significantly throughout each day, it is necessary to determine customer usage on a relatively fine basis, usually hourly. Large customers are interval metered, which means that their consumption data is collected on an hourly basis. Consumption for smaller customers, however, is only measured on a monthly basis. As a result, it is necessary to estimate hourly consumption using representative profiles.

This paper provides an in-depth look at the measurement and statistical methods that are being used to develop historical profile estimates. This is a new function, that is usually implemented by the distribution company or by a centralized agency, such as an ISO. The paper focuses on the use of load research data and statistical methods to fill the need for profiles. It also discusses issues related to retail forecasting, and the use of profile models to build forecasts for a portfolio or retail customers.

Abstract #: WC24

The Internet, Internet Interconnection Arrangements, Telephony, and Telephony Interconnection Arrangements: Contrasts between the Role of the Regulator and the Market

Richard E. Simnett

When the telephone patents expired in the 1890s the industry saw competition emerge between the Bell companies and newly emerging independent companies. The Bell companies refused to interconnect, so that customers needed lines from each set of companies for complete coverage of the potential called parties and exposure to calling parties.

Once the industry became regulated, interconnection arrangements were made and a single subscription gave access to the entire network.

With the liberalization of the US industry beginning in the late 1970s a series of explicit payment arrangements had to be made for inter-carrier settlements. These followed the 'logic' of the regulatory cost allocations in force at the time, modified by the FCC's intent to subsidize entry. State commissions developed a series of payment arrangements which reflected various policies in force: such as free local calling for some customers while charged for others; and universal service obligations for some carriers and not others. When the FCC stepped in post 1996, it imposed a particular set of pricing and costing rules, which did not reflect these state policies. It also interpreted the rules so as to result in massive transfers of money from incumbents to CLECs, especially those who provided access for ISPs. This month the FCC has announced a reinterpretation of its rules, which may end these transfers. The timing is particularly unfortunate given a rising tide of bankruptcy among CLECs this fall.

The Internet began in the USA as an almost entirely government-funded operation. The National Science Foundation paid for universities to get connectivity to each other and to research institutions. The NSF essentially dictated that these networks should interconnect with each other and no money should change hands. However, when NSF funding was progressively withdrawn, and the internet backbone was privatized, the 'peering' policy changed rapidly to one of peering among equals and payments required from smaller networks to larger.

The international telephone settlement arrangements were recently the subject of FCC action, largely on the basis that the US carriers paid large net sums to foreign operators. Foreign companies and governments have complained that the US ISPs refuse to peer with any foreign operators, obliging them to pay substantial sums to connect to the US carriers. US authorities have seen no problem with this arrangement.

This talk will lay out the similarities and differences between the interconnection arrangements in the two telecommunications infrastructures in wide use. Particular attention will be paid to the US regulatory scheme and its response to the challenges of the new.

Abstract#: WC04

Does Regulatory Policy Affect Competitive Entry?

Dale Lehman, Fort Lewis College

ABSTRACT

Five years after the passage of the Telecommunications Act people are asking "where's the local competition?" Many state and federal regulatory decisions have established prices that affect the three means of entry into the local exchange: unbundled network elements, total service resale, and/or facilities-based entry. Prior research (Lehman and Weisman, *The Telecommunications Act of 1996: The "Costs" of Managed Competition*, kluwer academic publishers, 2000) has investigated the differences and causes of regulatory policy in the wake of the Act. This paper examines the extent to which differences in state regulatory policies can explain the pace and type of competitive entry. Data is available on the use of total service resale, unbundled element leasing, and collocation activity. This data is analyzed in the context of the UNE prices and resale discounts adopted by different state regulators. Three questions are investigated:

- Do lower wholesale prices (after adjusting for demographic factors) lead to increased competitive entry?
- Does the form of retail price regulation of incumbents influence competitive entry?
- Does competitive entry influence regulatory decisions?

The last of these questions arises because the regulatory decisions and entry decisions are being made contemporaneously. The answer will help determine the extent to which regulatory decisions have become politicized beyond the Act's requirement that prices be "based upon cost."

The author's view is that many state regulators have attempted to subsidize competitive entry, particularly when regulators are protected against retail rate shocks by price cap regulation. There is considerable controversy over the degree to which competitive entry has been "subsidized." Regardless of one's view on this issue, it is important to understand the degree to which entry has been affected by regulatory decisions. Do some state regulatory decisions promote entry and others inhibit it? If so, which decisions are the most important empirically? If not, how can we explain that fact and what are the policy implications for development of local competition? This paper provides evidence on these issues.

Abstract#: WC18

VALUING THIRD GENERATION MOBILE SPECTRUM—

ANOTHER GAME OF DARTS?

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Abstract

The privatization of Third Generation (3G) mobile spectrum around the world has raised a number of important issues. One of which is how to allocate this scarce but valuable resource. Globally, governments are debating whether to use a beauty contest or an auction to allocate this spectrum. Regardless of the method selected or whether you are a spectrum administrator or recipient, the ultimate question is how should the spectrum be valued. For the spectrum administrator, valuation is prerequisite to setting efficient reserve prices and minimum bids for auctions. Likewise, it is equally as critical when establishing fixed licensing fees for beauty contests. Bidders or spectrum applicants must conduct a business case or econometric study to estimate the value of the spectrum to determine their reservation price or, in other words, their willingness to pay.

The spectrum prices per potential customer (or Price per Pop where Pop, an abbreviated term for population, equals one person) obtained through an auction can be used as a metric of revealed preference and serves as a standard measure for comparing spectrum prices. While there is limited data available on the few 3G auctions and beauty contests that have taken place in various parts of the world, the Price per Pop varies significantly and does not demonstrate an obvious trend. Analysts differ in their Price per Pop forecasts while many auctions fall short of their forecasted revenue.

This paper addresses the issue of spectrum valuation and proposes an econometric and business case valuation model for 3G spectrum. This model incorporates information from past 3G auctions and uses industry, marketing, financial, socioeconomic, macroeconomic, and geographical data to estimate the value of 3G spectrum.

Abstract#: WC07

Title: **Is Price-Discrimination a Barrier to Market-Based Pricing of Electricity?**

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As electric markets transition towards becoming deregulated and competitive, electric service providers are seeking to gain competitive advantage and customer loyalty by pricing electricity on the basis of market demand and customer willingness to pay, rather than cost of service. This move to market based pricing (MBP) can enhance customer welfare and supplier profitability. However, a major barrier to the widespread adoption of MBP is the perception that it constitutes price discrimination and is illegal ipso facto. This paper presents evidence to help remove this barrier.

First, it defines price discrimination and discusses the conditions under which it is legal as well as the conditions under which it is illegal. This discussion draws upon the vast literature in economics on the Clayton Act, the Robinson-Patman Act, and the Sherman Anti-Trust Act. Second, the paper presents examples of legal price discrimination from several competitive industries. Third, it discusses the conditions under which successful, welfare-enhancing price discrimination can be carried out.

Fourth, it defines MBP of electricity and presents examples from current practice including spot pricing, flat pricing, time-of-use pricing, forward pricing and pricing for curtailable service. Fifth, it presents simulations from a comprehensive model of customer behavior to show that, under very general conditions, MBP is superior to uniform product pricing. The key is that the various pricing options be offered on a voluntary basis, so that customers self-select themselves into those options that best match their preferences.

The paper concludes with a discussion of how MBP can be successfully presented to regulatory commissions for approval and implementation.

Abstract#: WC11

THE UNIVERSAL SERVICE OBLIGATION (USO) IN THE CONTEXT OF DEREGULATION OF NETWORK INDUSTRIES

By
Michael A. Crew and Paul R. Kleindorfer

This paper argues that the continuation of the USO is inconsistent with deregulation, at least as currently unfolding. Regulators and policymakers have failed to recognize this problem. USO has somewhat different meanings in different industries. Generally, it means ubiquitous service at a uniform price. In postal service, delivery to (almost) everywhere is achieved for the same stamp price for a letter of a given weight although the costs of delivery vary widely according to location. In telecommunications, service is provided to extremely isolated areas not at a postage stamp rate but at a rate well below cost. In electricity similar considerations apply with rates normally not varying by location in a company's service territory. Gas distribution, by contrast, is not as ubiquitous, and this may help to explain the (arguably) successful deregulation of this industry.

Deregulation calls into question the entire basis for the USO and in some instances creates new meaning for the USO. This is illustrated in the case of electricity distribution. DISCOs, under divestiture of generation, have a major obligation that was previously rather minor, namely, the obligation to serve. Under choice between suppliers the DISCO has to provide default or standard offer service. For the California utilities this has been a major problem since June. Absent the obligation to serve they could have mitigated their problems, if not resolved them entirely, by just refusing to deliver power when the price they had to pay got significantly above what they were receiving.

The problem of the USO in "deregulated" network industries will be examined. The postal, telecommunications and electricity industries will be examined and comparisons made. Particular emphasis will be given to how entry damages the universal service provider's ability to meet its USO. The nature and potential for a graveyard spiral will be examined. The implications for deregulation and the USO will be drawn. It will be argued that successful deregulation may not be possible if a significant USO remains. These cases will be compared with "successes" of deregulation, e.g. airlines, where USO was not as important and where deregulation enabled small consumers to benefit as large commercial customers were made to absorb a large proportion of the costs, in contrast to the situation in posts, electricity and telecommunications.

Finally, this paper argues that rethinking of the USO or deregulation is required. Is a USO worth retaining? If so what kind of USO can be retained? How will it be financed? The explicit subsidies in telecommunications can hardly be applauded as a dazzling success. These and other questions regarding sustainable and efficient USO structures under various forms of liberalized entry will be addressed in the paper.

INCENTIVES FOR SABOTAGE

IN VERTICALLY-RELATED INDUSTRIES

by

David M. Mandy* and David E. M. Sappington**

ABSTRACT

We show that the incentives a vertically integrated supplier may have to disadvantage or "sabotage" the activities of downstream rivals vary with both the types of sabotage in question and the nature of downstream competition. Cost-increasing sabotage is typically profitable under both Cournot and Bertrand competition. In contrast, demand-reducing sabotage is often profitable under Cournot competition, but unprofitable under Bertrand competition. Incentives for sabotage can vary non-monotonically with the degree of product differentiation.

June 2000

* University of Missouri.

** University of Florida.

This research emanated from collaborative discussions with Dennis Weisman. We are grateful to Dennis for his many helpful comments and suggestions on this paper and on our research efforts more generally.

1. Introduction.

In many important industries, regulated suppliers of essential upstream products are capable of operating in unregulated downstream markets. For example, in the telecommunications industry, the Regional Bell Operating Companies (RBOCs) supply access to the local telecommunications network, and they could deliver long distance telephone service if they were permitted to do so. However, regulators have typically forbidden the RBOCs from providing long distance telephone service.[1] A primary rationale for this prohibition is that it prevents the RBOCs from engaging in activities that unduly favor their long distance affiliates at the expense of their downstream rivals. Such activities include: (1) providing inferior service to competitors, perhaps in part by increasing the relative frequency with which their calls are blocked (Bernheim and Willig, 1996, p. 4.10); (2) delaying competitors' attempts to implement new and improved services (Economides, 1998; Weisman, 1999); (3) withholding crucial information from competitors about how they might best utilize the network to provide valued services to their customers (Bernheim and Willig, 1996, p. 4.10; Economides, 1998); and (4) structuring services and standards to favor the operations of their downstream affiliates at the expense of rivals (Bernheim and Willig, 1996, p. 4.6; Beard et al., 1999).[2]

The economic literature refers to activities of this sort that disadvantage downstream rivals as *sabotage*, and typically assumes that sabotage serves to raise the operating costs of downstream rivals. The literature concludes that by raising the costs of downstream rivals, sabotage generally increases the profit of the downstream affiliate of the vertically integrated producer. This is the case whether downstream suppliers engage in Cournot (quantity-setting) competition (e.g., Economides, 1998; Sibley and Weisman, 1998b) or Bertrand (price-setting) competition (e.g., Weisman, 1995; Beard et al., 1999).[3] The literature also notes, though, that by inducing downstream rivals to reduce their output, cost-increasing sabotage can decrease demand for the upstream product (e.g., access to the telecommunications network), and thereby reduce upstream profit when the price of the upstream

Abstract #: WC21

A Recent Development in Telecommunications Demand Estimation and Forecasting

Yasuji Otsuka,
(PUC of Nevada)

While economists are typically reluctant to use a demand study for forecasting purposes, it has been used often under certain conditions: the market is relatively stable; and the forecasting is limited within a reasonable time frame. However, such conditions are increasingly unattainable in a dynamic industry such as the telecommunications industry. When a researcher embarks on a demand estimation study for an existing (or group of) telecommunications service(s), she must rely upon available data, based on the industry structure in which the investigated service is available. However, it is becoming rare that the market she studies remains the same even for one year. More likely, the market will have new applications and/or services, which have not been considered in her study, but may be replacing or complementing (the group of) services she has studied.

A recent paper by Lanning, O'Donnel, and Neuman introduced an alternative approach to the study of telecommunications demand and forecasting. Instead of estimating the demand for existing or foreseeable individual services, they propose to estimate aggregate demand elasticity.[1] They argue that "the positive feedback loop of technology-driven price decreases and high-elasticity demand will quickly make it possible to base forecasts on bandwidth elasticity alone." Though their paper is at the stage of formalizing models, but it appears promising.

In this paper, I survey the existent traditional telecommunications demand studies, in particular attention being on the dichotomy of demand estimation and demand forecasting. I also survey the new approaches, represented by the above study, that appear to emphasize the forecasting side of telecommunications demand estimation. The paper should shed some light on a more productive demand studies in the telecommunications study.

[1] The paper, "A Taxonomy of Communications Demand," was presented at the 1999 Telecommunications Policy Research Conference, Alexandria, VA, Sept. 27th, 1999.

Abstract #: WC33

PRICING NETWORK ELEMENTS AND INTERCONNECTION UNDER THE TELECOMMUNICATIONS ACT OF 1996 AND THE JULY 2000 DECISION OF THE 8TH CIRCUIT COURT OF APPEALS: BACK TO THE FUTURE?

SALVATORE MASSA
MARK E. MEITZEN
STEVE PARSONS

The Telecommunications Act of 1996 ("TA96") and the FCC's resulting regulations regarding competitive entry into the local exchange have generated significant legal controversy over many of the reforms involving local exchange competition. As a result, the TA96 has yet to be effectively implemented. Unsurprisingly, one central dispute relates to the appropriate charges that CLECs should pay for UNEs, and other network facilities. The standard applied to UNEs will also be employed by the FCC to determine the reciprocal compensation rates for terminating traffic from other carriers. As local telecommunications markets become more competitive, prices will increasingly be determined by market forces, regardless of what is determined by the cost models regulators employ. However, the more accurately UNE and termination prices reflect those of an efficient markets, the more likely consumers will be to enjoy the fruits of competition—avoiding the problems of either too much entry or too little entry.

Conceptually, the price of UNEs could be set from three different perspectives: 1) backward-looking embedded costs; 2) a hypothetically efficient standard; 3) a forecast of the costs that actually will be incurred by the firms providing the services.
The FCC largely relied upon the second approach in determining the pricing methodology to be used for UNEs and traffic termination for reciprocal compensation. The FCC coined a new phrase, Total Element Long-Run Incremental Cost (TELRIC) to refer both to a costing approach and a UNE pricing methodology. However, the Eighth *Iowa Utilities* has suggested the third approach would be a more appropriate costing method than the FCC's interpretation of TELRIC. The Court abated portions of the UNE rules.

This article will carefully review the framework established by the Telecommunications Act, the relevant FCC orders, and the Eighth Circuit opinion in *Iowa Utilities*. These will be considered from the standpoint of law, sound public policy, and relevant economic principles. The implications for entry, capital investment, and efficiency will be considered. A public policy recommendation will be advanced. In addition, we will suggest options for ILECs seeking to move forward in the new environment following the Eighth Circuit opinion. The article will be thoroughly documented and will treat each topic in detail.

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Abstract#: WC16

Changes in Telecommunications Industry Equity Risk Since the Telecommunications Act of 1996

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We take a two pronged approach in analyzing changes in telecommunications industry equity risk levels associated with the pro competitive and deregulatory polices that culminated with the Telecommunications Act of 1996. Peltzman (1976) described the buffering effect of regulation on utility industry risk levels. Given this insulating effect, we would expect to see greater volatility in equity returns associated with the transition from a protective, rate of return regulated environment, toward a more deregulated and increasingly competitive telecommunications industry. In contrast, industries that experience a rush of consolidation activity sometimes enjoy reduced risk levels. This paper applies a number of techniques to analyze the impact of deregulation and competition on regulated industry equities. Both short-term abnormal return analyses and longer term trending approaches are relied upon. Using a combination of event study and rolling regression techniques, we discover that changes in risk levels do not always meet our a priori expectations regarding the transition from a regulated to a more competitive and deregulated environment.

Question: What has had a larger impact upon telecom industry risk levels, the increased competition engendered by the Telecom Act of February 1996 or the consolidation and merger activity in the industry which began in March of 1997?

1) Short Run Approach. The effect of the Telecom Act's provisions for increasing competition upon Telecom Industry investor risk. This section relies upon two event study methods for analyzing the impacts of regulatory announcements associated with the Act and the announcement of mergers in the industry. Effects of other events that are company-specific are adjusted for so as to clean the returns data.

Method 1. Market and CAPM models estimated over the 100 day period preceding events

a. Returns forecast over twenty-day event period around each of the five announcements and compared with the actual returns during those periods.

b. Abnormal and cumulative abnormal returns are tested for statistical significance.

Method 2. Varying betas estimates analyzed over time over time

c. Beta estimates are regressed on dummy variables that delineate the event windows

d. Significant coefficient estimates for the event dummy variables indicate an unanticipated impact of the event upon the firm's risk.
Interpretation of Abnormal Returns and Beta Shifts for the Five Events. Are they consistent with the competitive framework envisioned by the Telco Act?

2) Longer Run Approach. Estimating Longer Term Effects of Changes in Market Competitiveness and Market Structure on Equity Risk

Three Null Hypothesis for Empirical Tests for Changes in Market Competitiveness and the resultant Effect of Increased Competition and Deregulation Upon Telecom Industry Investor Risk

$H_{O,1}$ Mean beta level across telecom equities has not changed over time

$H_{A,1}$ Mean beta level across telecom equities has increased or decreased since the onset of competition and de-regulation

$H_{O,2}$ Average ,absolute difference between mean beta level and telecom equities has not changed over time

$H_{A,2}$ Average, absolute difference between the mean beta level and telecom company betas has increased or decreased since the onset of competition and de-regulation

$H_{O,3}$ Frequency of change in the relative rankings of beta levels across equities has not changed over time

$H_{A,3}$ Frequency of change in the relative rankings of beta level across companies has changed more frequently since the onset of

competition and de-regulation

Overall Findings

Initially puzzling á and â shifts followed the five major events studied. A priori expectations concerning the impact of increased deregulation and competition upon equity risk levels did not always ring true, especially regarding the more recent events.

Over the longer run, the beta levels of the telecommunications companies analyzed do not increase in their mean level over the time period

The volatility of the ranking of Beta estimates increases

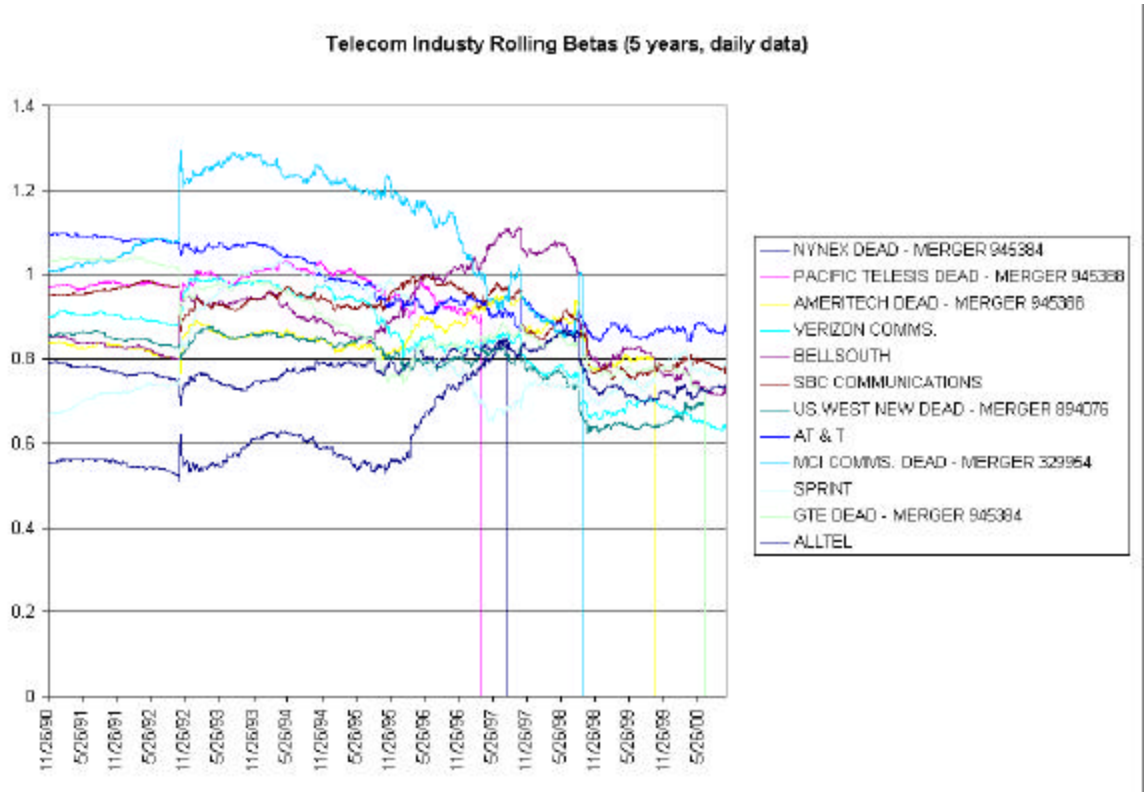
Dispersion of Beta estimates decreases

These latter two observations, although not consistent with the more traditional view that increased competition should result in a requirement of higher returns, are consistent with a change from two distinct telecommunications sub markets to an overall competitive one stop shopping, combined local and toll market.

The immediate impact of deregulation and competition upon equity risk levels was not the overall increase in risk initially expected

Closer examination of the deregulatory event related cumulative abnormal returns and the trends in estimated beta coefficients over time suggests that changes in investor risk levels are consistent with the one stop shopping paradigm that the telecommunications act intended.

It is concluded that analysis of changes in financial betas over time should continue to be performed. These analyses can provide regulators and legislators with an objective (i.e. financial market evaluations of telecommunications industry equities are made outside of the regulatory process) indication of the success of deregulatory measures in bringing about effective competition.


Telecom Industy Rolling Betas (5 years, daily data)
1.4
1.2
1
0.8
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11/26/90
5/26/91
11/26/91
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PACIFIC TELESIS DEAD - MERGER 945388
AMERITECH DEAD - MERGER 945386
VERIZON COMMS.
BELLSOUTH
SBC COMMUNICATIONS
US WEST NEW DEAD - MERGER 894076
AT & T
MCI COMMS. DEAD - MERGER 929964
SPRINT
GTE DEAD - MERGER 945384
ALLTEL

Abstract #: WC31

Market Structure in the U.S. Electricity Industry: The Effects of M&A Activity

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Abstract

Restructuring in the U.S. electricity industry has proceeded rapidly over the last few years. For example, the number of merger and acquisition filings made at the Federal Energy Regulatory Commission have more than doubled since 1998. Higher activity levels stem from a number of factors: market expansion and risk management through product-line diversification, cost reduction through the realization of scale and scope economies, eliminating double margins through vertical integration, state restructuring initiatives, and the formation of Regional Transmission Organizations (RTOs).

Of potential concern is that rapid restructuring in the U.S. electricity industry has produced dramatic changes in the structure of regional markets, particularly those that are characterized by significant transmission constraints. For example, firms that were new entrants a few years ago are now large incumbents and the level of "churn" in generating assets suggests caution in pursuing structural approaches to antitrust review. At this time, sufficient data is available to undertake a meaningful analysis of the effects of mergers on market structure in regional U.S. markets. The analysis will compare pre- and post-merger effects within and across a number of regional electricity markets. This analysis will likely provide useful background for regulators and policy makers in assessing the competitive effects of mergers, crafting remedial conditions for problematic mergers, and in "designing" markets where market structure is not conducive to competitive outcomes.

Abstract#: WC06

Abstract of Proposed Paper for Western Conference

COMPETITIVE POWER MARKETS: WHAT ECONOMICS HAVE REGULATORS LEARNED?

Robert J. Michaels

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Economists have long ridiculed the state of regulatory knowledge of economics. When rates are based on cost-of-service, regulators have little choice but to abandon economic logic while discharging their duty of setting rates on the basis of booked costs. As competition comes, regulators face quite different situations. They must now add competition to the list of factors considered in their decisions. This paper argues that electricity regulators have been abandoning traditional industrial organization theory surprisingly fast upon seeing that it has failed to illuminate competitive issues, and that the new institutional economics is rising as a paradigm for their market analyses. As a case at issue, I examine the reactions of FERC and the California Public Utilities Commission to problems encountered in that state s restructuring.

I consider two broad markets for illustration: In generation, the two commissions are abandoning comparisons of short-term energy prices with booked costs, and have been placing less emphasis on concentration measures in their evaluation of mergers and market-based rates. They are instead concentrating on conditions of access to essential facilities and the range of contracts that they intend to allow market participants to make. FERC Staff s recent report on competition in the west illustrates both the nature of the change and the difficulties the Commission faces in formulating policies that are consistent with precedent and the new learning.

Second, the analysis of transmission is changing analogously. Alongside the abandonment of the perfectly competitive energy market as a policy ideal, regulators are questioning the usefulness of nodal transmission prices when the range of transactions extends beyond the short-term. It is becoming clearer that nodal transmission prices are really measures of the value of generation at different locations, that they bear no relationship to the cost of producing transmission facilities, and that hedge instruments to deal with nodal price risk are inadequate in practice. Again, regulators are in the process of rejecting this theory and moving toward a system of flow-gate markets with exchangeable physical rights to move power across barriers. The new system generates superior incentives for users of the system and is more likely to give rise to usable financial hedges. I then draw some conclusions about the likely long-term prospects for competitive electricity in light of the speed with which regulators appear to be learning about real markets.

Abstract#: WS01

Vertical Market Power as Oxymoron: Getting Convergence Mergers Right

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Convergence mergers in the utility industry—between a generation company and a fuel supplier, e.g., a natural gas provider—are widely feared because they may lead to the exercise of "vertical market power." We argue that such a characterization is theoretically suspect and empirically error-prone. To avoid these pitfalls, we lay out a framework for analyzing convergence mergers based on a more sound, "horizontal" approach.

In merger analysis, "market power" refers to the ability of a firm or group of firms to raise price above the competitive level without fear of competition from independent suppliers of substitutes, related by definition horizontally. Accordingly, "vertical market power" is something of an oxymoron. Vertical mergers typically eliminate independent provision of complements, not substitutes.

To a first approximation—sometimes all that antitrust enforcement can accurately handle—vertical mergers might then be regarded as benign. If there's a monopoly at one stage of the production chain, it may well be able to exercise most of the monopoly power present in an industry. Other effects—greater control over pricing, eliminating double marginalization, and improving organizational efficiency, can promote efficiency and, most of the time, reduce product prices. The oft-mentioned vertical concern with "raising rivals' cost" is, in essence, one about raising input prices, which requires power in an input market—a horizontal rather than vertical problem.

Analyzing mergers or practice in vertical terms bring both Type I and Type II error. The more long-standing criticism is "false positives," that benign vertical relationships come under unwarranted attack. However, we describe instances of "true negatives," where the vertical perspective can and has invited conclusions that a relationship that could enhance market power is

wrongly excused because it did not meet vertical criteria, e.g., having market power at both stages of a production chain.

This is not to say that vertical considerations can never matter, but that those charged with implementing competition policy should have a tight story. One such example, that vertical integration can enable a regulated monopolist to exercise its market power by cross-subsidizing or discriminating in favor of unregulated affiliates, is a hallmark of telecommunications and electricity policy. Strategic considerations may come into play if vertical integration or relationships changes timing, information, or credibility of commitments necessary to change outcomes, but models too often tend to beg the question by assuming rather than deriving these changed circumstances. One relevant scenario is that a vertical merger could increase incentives to exploit quasi-rents in ways unanticipated by initial contracts. Finally, vertical integration may increase the marginal profitability of horizontal monopolization, but no measures seem useful for fine tuning merger policy to recognize this possibility.

Applying this to convergence mergers should lead the analyst to ask to what extent does one merger approximate a horizontal merger. This leads to a three-step checklist:

1. Would a merger of the electric utility and the gas company's utility customers constitute an anticompetitive share of a relevant electricity market? If "no", stop; if "yes" …

2. Does the gas company already have market power in supplying gas to those generators in the relevant electricity market who buy from it? If "no", stop; if "yes" …

3. Is the gas supplier the dominant fuel supplier for the acquiring electric company?

If the answer to this last question is "yes," as with the first two, the gas company already controls the electricity market, and the convergence merger does not make matters worse. Perhaps paradoxically, a convergence merger is more likely to be problematic the less it is strictly vertical, i.e., between a generation company and its fuel supplier.

In summary, "vertical market power" is a concept neither theoretically sound nor empirically helpful. Recognizing these flaws leads to a three-step test that can help identify when a convergence merger may be problematic, i.e., when it is most like a (horizontal) merger of generation companies.

Abstract#: WC08

Rate Design Arbitrage: The Case for Value-Based Peaking Services

Cliff Rochlin

This paper quantifies the value a firm implicitly receives from being able to arbitrage between different gas transportation rate designs when a state-regulated gas utility is required to provide access, for all customers, to its transportation system at the same system-wide, all-volumetric tariff rate. In California, large customers have the option to procure their own gas supplies and separately purchase gas transportation services from many different suppliers. Federally regulated gas pipelines serving these customers are mandated to price transportation services with a straight-fixed-variable (SFV) rate design. California state-regulated gas pipelines serving these customers are required to price transportation services with an all-volumetric rate design.

As long as the firm can purchase residual or peaking demand from the utility at the going all-volumetric rate, the firm will reserve a relatively smaller amount of gas transportation capacity on the SFV rate design pipelines. If the firm does not have the ability to purchase its residual gas transportation demand from the utility, the firm will choose a higher level of reserved capacity from the SFV supplier. However, because firms face an uncertain demand for their product, they also face an uncertain demand for gas transportation services. By explicitly incorporating

uncertainty in gas transportation demand into the firm's loss function, the probability of choosing no more than the optimal level of reserved capacity can be determined. The cost differential between the levels of reserved capacity in these two scenarios is a measure of the implicit value of having the right to use the utility's transportation service at the going, all-volumetric rate. This cost differential can also form the basis of a value-based peaking rate.

Abstract # WC36

Competitive Analysis in the Oil Pipeline Industry

Jesse David and Alan J. Cox
NERA

Abstract

There has been little published review of competitive analysis in the crude and refined oil pipeline industry since the Antitrust Division of the Department of Justices issued *Oil Pipeline Deregulation* in 1986. A re-examination of these issues is timely, however, since regulatory authorities are currently dealing with mergers that involve pipeline assets, challenges to pipeline rates, application for the authority to set market-based rates, and deregulation. This paper reviews many of the issues that need to be addressed in undertaking a competitive analysis of liquid pipelines. It also describes some of the methods required in undertaking a comprehensive analysis. Explicit reference is made to several recent cases. The relationship of this work to other energy transmission facilities such as natural gas pipelines and electricity transmission lines is also discussed.

There are several subtle issues in undertaking competitive analysis in this industry. The first involves market definition as required under the methodology for laid down in the *Horizontal Merger Guidelines* promulgated by the Antitrust Division and the FTC. There is the related question of the appropriate size of a "small but significant" price increase used in identifying actual and potential competitors. One result, generally well accepted, is that a petroleum products pipeline operates in two distinct markets: an *origin* market and a *destination* market. Competitive alternatives must be identified in each market separately.

There are several tools of competitive analysis that are particularly important in this industry but poorly understood by non-economists. One is the estimation of the "critical volume," the volumes that, if lost as a result of a price increase, will make that price increase unprofitable. This is the concept described in Harris and Simons, "Focusing Market Definition: How much Substitution is Necessary?" It is particularly relevant in a high margin industry such as oil pipelines. Another important consideration is the role of local petroleum consumption in limiting the market power of pipelines. A third consideration is the role of product exchanges, a widespread feature in the oil industry, in limiting the ability of a pipeline to exercise market power. We also discuss the threat of entry as an important limiter of market power.

In order better explain these concepts, we describe a surprisingly complex case involving a short petroleum products pipeline in Los Angeles. The owner of the line had applied before FERC and the California PUC for leave to charge market-based rates. We discuss the case in light of the theoretical discussion above. We also discuss the proper calculation of the implicit price contained in the contract that resulted in the building of the pipeline. This is important because an error in the calculation of this price could lead to erroneous conclusions as to the competitiveness of the market.

Abstract#: WC12

Three Case Studies of Operationalizing of Sampling Theory in the Regulated Gas Distribution Companies

by Fred Barney et al.

This paper explores the operationalization of statistical sampling in gas distribution companies. We begin by formulating the argument that a number of factors are converging to facilitate and force drastically revising the use of engineering/regulatory rules of thumb associated with data gathering in this industry. From there, we move into the three areas where we see that sampling theory can and will be applied in gas companies: meter accuracy, inspection of contractor's work, and gas record audits[1].

The section on meter accuracy begins by reviewing the institutional constraints that must be satisfied in any attempt to assure billing accuracy through the examination of the accuracy of meters. Within these constraints, there are models that are acceptable to the stakeholders. These models breakdown into either acceptable or unacceptable meter accuracy with or without adjustments for meters running fast or slow. These models can be estimated by computer or by use of the sample tables that exist under the term "acceptance sampling." In this context, we do not find that the substitution for a questionable approximation is reasonable when an exact answer is readily computable.

The section on inspecting contractors work follows a similar pattern. The constraints that any sampling plan must operate in are delineated. The sampling plans that satisfy these constraint plans are variations of sequential sampling or simple random sampling. In this case, the authors improvement over current practice was not a profound sampling program; rather it is suggested that it is probably safer to inspect wields before the pipeline is buried rather than after.

The section on sampling records for code compliance introduces the use of sampling procedures that give gas inspectors solid documentation so that they can withstand charges of arbitrary use of enforcement powers. Also, it can give the mangers of gas inspectors confidence that they are allocating their resources in a manner that maximizes the effect of inspections on promoting a corporate culture of conforming to the gas safety code.

The final section draws together lessons from these case studies in operationalizing statistical theory. While we have a number of detailed observations, our main conclusion is that applied statistical work is much like an effective quality control program; a number of people have to be enrolled in a process that adapts as insight is gained on the way to obtaining a mutually agreed upon outcome.

[1] Do not be distressed that these terms are almost content free. The use of statistics in this sector is relatively new and the interest of regulators in this sector is less than in the glamorous sectors of telecommunications and the provision of electric power

Abstract#: WC10

Market Power Mitigation Measures and Their Impact on the California Electricity Market

by Gary Stern
Southern California Edison

Since the electricity market began in California, in April of 1998, it has been plagued with periods of price spikes in its energy and ancillary services markets. Starting in June of 2000, the price spikes turned into sustained periods of extreme prices based on all metrics applied to the market. After many investigations, a variety of forms of market power mitigation have been proposed. This paper will examine the relative benefits of risks associated with the various proposals, as well as examining the plan that has been approved for implementation to protect consumers during the summer of 2001, when tight supply conditions are expected to result in the potential for the continued exercise of seller market power.

Market Power mitigation proposals have included price caps, bid caps, cost based pricing, pay-as-bid auctions, load differentiated price caps, time differentiated price caps, regional price caps, municipalization, and other forms of re-regulation. To some degree these and other market power mitigation measures will be discussed and evaluated.

Abstract#: WC13

LESSONS LEARNED IN RETAIL ENERGY COMPETITION

Michael Schmidt
Regulatory Policy Leader
Sempra Energy[1]

Without exception, the transition to competition from the traditional monopoly utility selling a bundled energy product has been challenging. In some states, there appears to be a tendency for public policies that have a propensity to "regulate" competition in the name of protecting the public interest. This action has tended to restrict ESP entry. Yet, in other cases the regulator appears to be going overboard and establishing competition at the expense of the incumbent utility. The result has been artificial prices in the form of rate caps, customer confusion, low customer acceptance, market uncertainty, and industry resistance.

Transition issues that appear to be stifling competition include:

- Most states allow incumbent utilities to provide default/standard offer service to customers, which restricts ESP opportunities for entry.
- Most states allow competition transition charges (CTC) for the recovering of stranded investment that result in artificially inflated distribution charges.
- Most states require rate caps or discounts by the incumbent utilities during CTC recovery periods. This is inconsistent with market-based pricing and restricts ESP opportunities for entry.
- There are often long phase-in schedules for customer choice, particularly for mass retail markets such as the residential customers.

- Many utilities resist development of an ESP-friendly transactional platform (billing software and transfer procedures) to ease implementation of customer choice.
- Many states have implemented weak consumer information programs on energy deregulation, leading to customer confusion and indifference, further slowing customer choice.
- In many cases utilities in the default provider role are required to divest of their own generation, exposing the utility and its default customers to uncertain market prices.

There are no easy solutions to these issues. And in what can be described as an often highly charged political environment, appropriate economic and business practices often take a back seat (or no seat at all). It may take some political courage, but policymakers must rely on the market for permanent solutions and not try and impose a "quick fix" that will only exacerbate the problem in the long run.

This paper will examine the above mentioned issues and identify the lessons learned in various states. In addition, the paper will examine the issues associated with the California price spikes of the summer of 2000. Several lessons were learned in that debacle. Power supply shortages, retail price caps, transmission constraints, and consumer apathy are factors that are hindering the development of retail energy competition in the United States. There is no one state that "got it right," but there is enough experience to draw from to help future efforts at the state and federal level to succeed.

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[1] Do not even dream that the view points expressed herein necessarily represent the views of Sempra Energy, its affiliates, officers, or employees.

Abstract #: WC30

"The San Diego Experience: What Happened and Why?"

Prepared by
B Ambrose, P Griffes, E Kahn, J Landon
Analysis Group/Economics

Press reports from California indicate that consumers in the San Diego area have seen substantial increases in their power bills over those received for the comparable period last year. This occurred as San Diego Gas & Electric Company became the first California utility to move to full deregulation of electricity generation prices from the transition period during which it collected its stranded costs. Utility executives, public officials (including the Governor), state and federal regulators and market participants have all been forced to address the problem in an expedient manner. This paper presents a close look at the details of the situation, rather than the hyperbole in the press, and explains how a unique confluence of the following factors has caused California's problem:

Market Design Flaws - The paper first explains how regulatory uncertainty and California's treatment of several market design issues left San Diego consumers subject to the full price volatility of the electricity market that was created by state legislation.

Unexpected Demand Growth – The paper reviews the state's official projections of growth in electricity demand and explains how a booming California economy created unexpected demand growth that has made a substantial contribution to the overall problem.

Supply Shortage - On the supply side, the paper looks at California's history of discouraging the construction of new power plants and assesses the prospects for new plant development in both the state and the southwestern region that might bring an end to the existing supply/demand imbalance.

Restricted Import Capability - The essentially unchangeable limits on the state's ability to import power from neighboring areas are also discussed.

High Natural Gas Prices - The paper explains why natural gas prices are a major determinant of California electricity prices and sets out the effect of substantial increases in gas prices that occurred during the spring and summer of 2000.

Emission Allowance Price Increase - Federal efforts to reduce pollution in southern California have led to substantial increases in the cost of the NO_x allowances needed by many California generators in order to produce power. The paper explains the nature of these allowances, how they are traded and the substantial affect their price had on Summer 2000 electricity prices in the state.

The paper concludes with a short catalog of the initial responses of California policy-makers, utilities and the owners of merchant generation seeking to provide relief to consumers in both the short and long term.

By the time of presentation, the paper will be updated to take account of recent developments and to suggest lessons learned for other regions.

Abstract#: WC17

Abstract
14th Annual Rutgers Western Economics Conference

Subject: **Transmission Investment Decisionmaking**

Title: **A Benefit-Cost Framework for Unbundled Transmission Grid Expansion [Preliminary, Subject to Change]**

Author: **Carl Silsbee, Manager of Regulatory Economics**
Southern California Edison

Abstract:

In electrical systems with unbundled competitive generation suppliers, a regional transmission organization (RTO) adjusts prices in the grid when necessary to constrain electrical flows across congested transmission paths. This gives rise to congestion revenues, i.e., the revenues retained by the RTO for accepting electricity at a lower-priced location and delivering to a higher-priced location. It is commonly believed that RTOs should invest in new facilities to reduce congestion revenues. This is not the appropriate welfare – maximizing strategy, however, since looking only at the effect of transmission investment on congestion revenue ignores the effect that additional transmission capacity has on the locational prices faced by buyers and sellers. The appropriate decision rule is to invest in new transmission when the additional congestion revenues the RTO obtains by increasing transmission capacity (ignoring any loss of congestion revenues on the RTOs existing transmission capacity) exceeds the cost of this additional transmission capacity. Thus, the appropriate transmission investment strategy for the RTO is to maximize "profits" on incremental investments, ignoring the potential to exercise monopsony power.

Abstract # WC20

Transmission Rights and Forward Markets for Electricity

Hung-po Chao

The lack of liquid forward markets is a widely recognized defect of the prevailing electricity restructuring. Following the original work by Allaz, we study supply function equilibrium in forward markets of electricity, considering an interconnected transmission network with incomplete spot market. We show that the existence of forward markets mitigates market power to the benefit of consumers. We further examine the impacts of forward markets under the Coasian and Pigouvian models of transmission rights.

Abstract#: WC14

Scale Economies in Electricity Distribution Service: Is Bigger Necessarily Better?

John Kelly
Director of Economics and Research
American Public Power Association

Arguments that bigger electric power distribution systems are necessarily more efficient than smaller ones are often uncritically accepted as fact. Accompanying these arguments is the suggestion that distribution systems should consolidate soon in order to capture efficiencies which will then be passed on to consumers. One version of this view contends "there is no efficiency reason for having" so many distribution systems and calls for a "substantial consolidation" of America's roughly 3,000 systems. But such calls rarely come with evidence to support their underlying assumption that "bigger is necessarily better".

This paper will review the professional literature on scale economies in electric power distribution along with the results of a recently completed study which includes many more utilities and more detailed information than in previous studies. The evidence shows that "stand alone distribution service is subject to significant scale economies, but primarily at the extremes of the size distribution." All things being equal, this suggests a reduced role for very small utilities -- a decrease in the total number; but it also suggests a reduction in the size of very large utilities -- an increase in the total number. There does not seem to be an "ideal size" utility nor an "ideal number" of utilities, as such. Rather, wide ranges exist for both.

The other major focus of the paper is to more carefully interpret the results of empirical investigations and address important, relevant issues that are usually ignored. "All things are 'not' equal". Consequently, economic and policy analyses need to consider important questions beyond the isolated analyses of the productive efficiencies of various-sized distribution plants. Issues such as technical versus economic efficiency, types of service, quality of service, and opportunity cost as it relates to consumer choice should be included in evaluations of the appropriate size of electric distribution systems. This paper will address these issues and what they suggest about the appropriate size for electric distribution systems.

A convincing case can be made that larger systems, per se, are not necessarily "better" -- in terms of leaving consumers better off. And consolidations into very large distribution systems are likely to leave consumers worse off -- paying higher rates, poorer quality service, or less consumer sovereignty -- or with some combination of these.

Abstract # WC19

Monopoly Power Over the Last 100 Yards

Brenda Kahn

As competitive local exchange providers expand their facilities, we move the monopoly bottleneck closer and closer to the customer premises. In some cases, monopoly power may extend only to the last 100 yards or so of distance. In such a situation, unique circumstances apply. New monopoly providers have entered the Last 100 Yard market. Some building owners forbid more than one company to provide telephone service, some new companies (BLECs) have wired up new buildings and refuse to allow others to use their intra-building wiring. The FCC has established rules that require incumbent local exchange carriers (ILECs) to allow others to use their intrabuilding wiring at prices that would reflect forward-looking, efficient costs and are offered under non-discriminatory, competitively neutral terms and conditions.

My paper would describe the activities at the federal and state levels to deal with the old and new monopolists that serve customers in large apartment buildings, campus arrangements and office parks. This issue is relatively new and is actively being discussed across the nation. The paper would benefit from my experiences in appearing before regulatory bodies in Florida, New Jersey and Illinois explaining AT&T's requirements as well as my experiences in providing comments to the FCC on how to best develop rules that support competition for customers that are located in multi-tenant buildings.

- Competitive Networks Building Access Proceeding FCC 00-366

Abstract #: WC27

Fall-out: The Summer of 2000

High Electric Prices on San Diego

Sherri Petro

In light of the new realities and perceptions resulting from the very high prices for electricity in the summer of 2000, San Diego Gas and Electric reevaluated its role as an energy delivery provider in the marketplace. This paper will address the original role the utility took as requested by regulators when deregulation was initiated in California, recent marketplace activities and the consequential changing role of the utility.

As deregulation came to bear, the utility shed generation and became an energy delivery company only. Though messages to the marketplace about the utility's role were rolled out, customer interest was not high as it had little immediate direct impact for certain customer classes. Large commercial and industrial customers, who saw direct impact, were the most responsive to the possibilities deregulation could bring; though, even they, who initially saw benefit from moving to other commodity suppliers, were stymied by the market prices experienced this past summer.

Customers could simply not tolerate the high prices and became unhappy with the utility's role as a delivery company only. The situation was exacerbated by the inability of many energy service providers to thrive in the competitive market and offer customers value. Customers demanded SDG&E play a different role in the market. Given this customer need and market conditions, SDG&E reassessed its role and began a shift from an energy delivery company only to a full-service utility.

Sherri B. Petro,
San Diego Gas and Electric
December 5, 2000

Abstract # WC34

Impact of Internet and E-Commerce On US Electricity Consumption

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Internet and e-Commerce activity in the US has grown rapidly since the mid-1990s. Some industry analysts have estimated that, by 1998, internet-related and e-Commerce activity accounted for 8-13% of US electricity consumption, and is projected to grow to 30-50% by 2010. The US EIA-DOE, Lawrence Berkley Labs, and others have evaluated various studies, and concluded that internet-related and e-Commerce activity is more realistically estimated at 1-3% of US electricity consumption as of 1998, and internet-related electricity growth is projected to closely track GDP growth. The purpose of this paper is to provide a literature review of various studies on internet and e-Commerce impacts on US electricity consumption, and understand key driving factors. The paper also provides a macro economic model and analysis of major factors by sector driving historical and projected internet and e-commerce related electricity consumption at the US and state levels.

Abstract # WC22

Creating a New Regulatory Framework:
Workable Competition in the Electric Distribution Sector

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For most of the last decade, the electric utility industry, its regulators, and its customers have lavished time, money and other resources on supply deregulation. Public policy at the state and national level has sought to encourage the discipline of market competition in network industries. Regulators have used benchmarking and yardstick regulation, for example, as incentives for network companies to act efficiently. Some experiments have been successful; others, as in California, have disrupted the movement toward liberalization of electric energy sector. This movement, intended to lower prices to consumers through incentive mechanisms and improve service performance to consumers, is very much a work-in-progress and begs for a clarifying vision. This paper will elaborate on a vision under development in the state of Oregon.

The new framework employs several key concepts:

- Unbundling of an electric utility's regulated activities and costs into defined services, e.g. transmission, distribution, power supply, customer service, etc. anchored in the results achieved, rather than the cost inputs.
- Redefining the role of the public utility commission to represent aggregated consumers in the procurement and delivery of these defined services.
- Formulating commercial contracts between the customer aggregators and service providers, defining reliable and appropriate performance for each service.
- Establishing recognizably competitive pricing benchmarks in each contract for the a defined service.

This paper explains that the primary reason for pursuing a new vision is that traditional cost of service regulation is broken and, thus, worthy of abandonment. It then offers several principles to guide the development of new regulatory frameworks. Finally, it expands on one framework that meets the principles, which is a commercial contract model. The commercial contract concept is developed in some detail for the special and probably most difficult case of distribution services. The key components of that contract are:

- Scope
- Performance commitments
- Consequences of non-performance
- Contract administration
- Pricing
- Term, Termination and Unwinding – proposed solutions to end effects problems.

The methods suggested for applying these devices do not require sudden radical changes in the practice of regulation or the operation of utility businesses. The early experience in the United States and Britain with contract franchises serves as a precedent for the application of this concept. Also, franchise bidding procedures have been proposed as a means of replacing command and control regulation with a competitive market discipline. The particular method and suggested next steps to move the industry toward a competitive model, however, is untried with few practical applications. The model proposed for Oregon is capable of delivering service to consumers that effectively harnesses human ingenuity in pursuing technical progress and exploits competitive forces to efficiently minimize the cost of that service. The primary thrust of the vision is the replacement of the regulation of *utilities* with the regulation of certain *services* in the same way that commercial parties normally regulate their conduct – by bargaining for value.

Abstract#: WC03

Deregulation and Board Composition: Evidence on the Value of the Revolving Door

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Abstract

According to the conventional wisdom, a revolving door operates between government and industry. High ranking government officials leave office and head for Washington law firms or major corporations where they use their connections and influence to further their new employers' political interests. Despite the pervasiveness of this story, remarkably little evidence exists on the motivations underlying the revolving door phenomenon. In this study we examine the participation of "political" directors on the boards of natural gas companies over a period of deregulation. The basic question could be called the lawyers versus engineers hypothesis: When an industry is deregulated do we see fewer lawyers and more engineers? Our focus is on the 1986 partial deregulation of the natural gas industry. The data for the test cover the period from 1978 to 1998. We test whether deregulation altered composition of the board as the firm's environment changed. In particular, did deregulation cause firms to reduce the number of "political" directors on their boards? We find evidence that board members serve a rent-seeking role. In general, the 1986 deregulation of natural gas extraction is associated with a decrease in the proportion of "political" directors on the boards of extraction companies. In addition, using a fixed-effects model we find that deregulated firms reduce the number of "political" directors.

Abstract #: WC26

Market Design for Competitive Electricity: Experiences, Flaws and Remedies.

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We will examine various aspects of market design in the restructured electric power industry in the US. In particular we will examine design flaws in reserve markets, transmission pricing and energy markets and illustrate by means of simple examples gaming opportunities that such flaws create. The **paper** will address market design flaws identified in the California market, New England and New York and analyze the remedies that have been proposed to address these problems. We focus special attention to the design of bid selection protocols and settlement rules in ancillary service markets. Such markets are typically operated by an independent system operator (ISO) for competitive procurement of reserves that are needed to ensure the secure operation of a competitive electric power system. Reserve types are characterized in terms of response time and they are downward substitutable (faster responding reserves can replace slower ones). We explore how this substitutability is accounted for in alternative market protocols and we analyze the efficiency, distributional aspects and incentive compatibility of such protocols.

Abstract#: WC05

Testing the Performance of Uniform Price and Discriminatory Auctions

T. D. Mount, R. J. Thomas and R. D. Zimmerman*

Abstract

The high prices that occurred in southern California during the Summer, 2000 led to a substantial amount of regulatory and political intervention. Price caps were lowered and the Federal Energy Regulatory Commission (FERC) proposed that a new type of hybrid auction should be adopted. This auction combines a standard uniform price auction with a discriminatory auction for offers higher than a specified level ($150/MWh). Nevertheless, there is little available evidence to show that this new auction will work well, or guarantee lower average prices. The objective of this paper is to provide some experimental evidence about the relative performance of different types of auctions for electricity markets. The experiments use a class of engineering and economic graduate students at Cornell University who represent generators in a "smart" market, POWERWEB. This market replicates the physical constraints of meeting loads in an electrical grid. The paper has three major components. The first describes how the high price volatility observed in many electricity markets can be replicated. The key features are 1) load is stochastic, 2) incentives are provided to withhold capacity from the market, and 3) the price is determined by a uniform (last accepted offer) price auction. The results with six identical generators in the auction show 1) price spikes are common, and 2) average prices are higher than competitive levels. This confirms the belief that electricity markets need more participants than typical markets to ensure competitive prices.

The second part of the paper describes experiments using a discriminatory price auction. The total cost of meeting load is minimized, subject to operating constraints, in the same way as the uniform price auction. However, generators selected in the optimal dispatch are paid their actual offers instead of nodal prices based on a uniform clearing price. Average prices in this auction are still higher than competitive levels, but there is little volatility. Aggregate offer curves are much flatter, as expected, than the corresponding curves in a uniform price auction. There is no evidence that average prices are lower than they are in the uniform price auction.

The third part of the paper describes the performance of the FERC hybrid auction. The first experiments for this auction are scheduled for 11/30/00. It is not clear at this time how well the hybrid auction will work. However, if the initial results look promising, additional tests will be conducted early in 2001.

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Abstract #: WC23

Recent Developments in Auctions Replacing Regulation.

David Salant

This paper reports on parallels in recent auctions in which auctions are replacing regulation. Beginning in 1994, with the FCC spectrum auctions, and with the pollution rights auctions, auctions have been used increasingly to replace regulation. Here I report on recent developments. I focus on three developments.

A) The application of the Simultaneous Multiple Round (SMR) ascending auction to other sectors. Most notable has been the use of the SMR format to sell generating assets. The first use of this format was the Alberta PPA auction. I discuss how that auction compared with spectrum auctions and the limitations of this format for selling other generation assets and derivatives thereof.

B) The introduction of combinatorial or package bidding. The FCC has recently adopted the Simultaneous Ascending Auction with Package Bidding (SAAPB) for selling spectrum rights. The first application of this mechanism is to the sale of two spectrum licenses in each of six geographic regions. With only twelve licenses there are 2 ^ 12 - 1 = 4,095 possible combinations. I explain how this mechanism works and its pros and cons compared to alternative methods.

C) The application of the SMR format to reverse, or procurement auctions. This format has been introduced for the purchased of water rights. It has applicability to other sectors which I will discuss.