

Preface

During the past thirty years the public utilities in electricity and gas distribution and in telephone services have been in the process of transforming corporate and thus market structures, with adverse consequences for their performance in the delivery of services. The new structures were single-service oriented, wrought in the crucible of intense political heat under the guise of regulatory reform, which they were not. They came to the fore just as it became possible to deliver services more efficiently in networks designed to provide larger and more complex bundles of services. This change in the direction of regulatory reform, to increase the number of firms delivering service, conflicted with economic and technological forces to reduce the number of firms to provide new and better services. The public plans and programs that were supposed to be the means of expanding service quality and volume in open competitive markets instead stalled, in partial deregulation, with the regulatory agencies focused more than ever on details in price regulation that caused network system breakdowns, stagnant investment, and corporate bankruptcy.

This pattern of partial deregulation has been recognized in specific

industry studies and in economic testimony before the relevant state and national regulatory agencies. The results in telecommunications, for example, have been delineated by Roger Noll:

The Telecommunications Act of 1996 . . . illustrates the mixed and ever dubious progress in recent regulatory policies. That legislation deregulates cable television, gives the Federal Communications Commission power to overturn anticompetitive state regulations and to decide not to regulate if it deems a market sufficiently competitive. But the legislation also created a multi-layered, complex regulatory process not only for introducing competition, but also for using regulation to protect against the largely illusory myth that technological progress and competition somehow threaten the ubiquitous provision of telephone connections to virtually everyone.¹

Reform in gas transmission markets has been focused on what happens when line capacity cannot carry volumes now required during peak winter demand periods. As described in a white paper by Energy and Environmental Analysis, Inc., “approximately \$19 billion of investment will be needed for replacement of current pipeline to maintain existing capacity . . . [and] nearly \$62 billion will be needed for new pipeline and storage projects . . . extended periods of high gas prices and increases in price volatility have been a direct result of the lack of development of [these projects].”² Price volatility has greatly increased in recent winters: “in the winter heating seasons of 2000–01 and 2002–03 gas prices spiked to levels that had previously seemed unimaginable.”³ Prices in gas transmission service markets have been substantially but not completely deregulated “in order to reduce or eliminate the risk that there will be delays in the development of natural gas infrastructure”; even so, the regulatory agency at the federal level “[has to consider] actions that attract capital to pipeline and storage projects.”⁴

Partial deregulation in electricity started with requiring the separation of power generation, transmission, and distribution. Such complete separation, however, has been achieved for only a limited number of utilities; many more have stopped short, with partial sales of their power plants and leasing but not sale of grid systems to an independent regional transmission organization. The extent of restructuring has been significantly limited by the blowout in California in 2000–01 of that state’s plan by unprecedented price spikes in wholesale power and transmission markets and rolling blackouts in the northern part of the state. Blackouts in the Midwest and Northeast the next year focused attention on the lack of reliable capacity in transmission systems. That is, “existing long distance transmission infrastructure is insufficient to support the changes

that have come about in the industry since deregulation of the early 1990s.”⁵ The solution has been to establish the partial deregulatory status quo, “while FERC [the Federal Energy Regulatory Commission] intends . . . to encourage competition and healthy markets . . . its approach creates ordered competition not a competitive order that will enable industry to benefit from innovations in technology, organizations and institutions.”⁶

The outlook for power transmission under partial deregulation may be worse than what one expects to follow from “ordered competition.” According to Roger Gray of Energy Pulse, “the real long term tragedies of the failed California Experiment are two fold. First, we have yet to fully understand how public policy could have failed so badly . . . second, we must not fall back on the 20th century utility model because we perceive it to be safe. This will effectively end progress and innovation in the utility sector.”⁷

One is struck by the similarities in these appraisals of the condition of the three industries, and of the roles the regulatory agencies played in managing deregulation in patterns that caused their current lack of capacity and quality service.

In the two transmission grids subject to FERC controls, electricity and gas, deregulation stopped at the focused control of prices at critical links or nodes in delivery networks controlled by one or few service providers. Because of the presence of few service providers, and the inference that they would ratchet up prices during peak demand periods, the response has been to impose caps on price increases. But that solution failed to generate profit returns that would make it possible to expand capacity or increase the number of providers. Price controls in “managed” partial decontrol centered on the bottleneck, setting limits that had prevented the elimination of the bottleneck.

The results were similar because they were motivated by a singular pick-and-choose decision process. As indicated by Michael Boskin, chairman of President G. H. W. Bush’s Council of Economic Advisers, “the government ought to deregulate where competition or its prospect is likely.”⁸ But the prospect of completely deregulating market structures where there are large numbers of suppliers of approximately uniform services has not been realized because these industry networks have been driven by technologies that limit the number of service providers. Only one link is needed for efficient service to a market with numerous subscribers, or only one node is needed to provide switching at the lowest cost across hundreds of links. Although this condition was not universal, given the fact that many duplicate links or nodes had costs close to zero, it still had to result in a short list of network carriers destined for removal of controls.

Those levels of industry so selected have been integrated into the still regulated layers where regulation focused on the control of bottlenecks and set prices for those network services provided by only one to three corporations.

This study in partial deregulation searches out the common elements of the effect the focus on bottlenecks has had on the performance of the major corporations in the electricity, gas, and telecom industries, given the relationship between network technologies and market structure, and the way in which regulation cuts into investment in infrastructure. We find the sustaining presence of one to three providers in most markets for each industry, particularly at the retail level, where the incumbent utility remains dominant. The incumbents subject to reform in wholesale gas and telecom transmission became subject in their markets to forced entry of independents; those in power transmission were bundled together to form a single entity in a wholesale service transmission market. We also find that this structural reordering in the three packages of services has not substantially changed the extent of control of supply—market power—in the past fifteen years.

The limited number of providers in service delivery has led us to focus on their interactions of price and service offering. The few carriers in theory, in a world of no regulation, would be able to determine levels of prices and profits. The economic theory of pricing in oligopoly, when there are two or more overlapping networks, contains illuminating insights into how prices exceed competitive levels, or interact with regulatory caps, to generate earnings that sustain growth in capacity and service quality. Within the partially deregulated framework, we find a general tendency of the interaction to be to drive prices down, toward but not reaching competitive levels (i.e., of prices equal to marginal costs). Our investigations led to findings that on basic services in all three industries, prices were not at marginal cost or “competitive” levels but were low enough to fall short of average total costs, that is, to prevent any one carrier from generating cash flow sufficient to recover its previous investment outlays inclusive of the cost of equity capital. There have been a few significant exceptions, where the regulatory agency allowed the oligopoly to attain price levels higher for political purposes. But no major network system has been allowed to generate cash flow sufficient to prevent price spikes brought on by shortages of capacity. And during capacity shortages in California, price caps imposed on retail power were at levels one-half of wholesale prices realized in the partially deregulated auction market.

In each industry the major supply companies have set price-cost margins constrained by regulatory price caps of one type or another, but such caps in the

context of generic strategies have resulted in a broad, more or less uniform type of oligopoly behavior. The caps focused on operations at bottlenecks. These were capacity-constrained single-supplier links in pipelines or wirelines that, when there were excess demands for space, tended to produce sharp increases in product prices at exit points, that is, “spikes” in prices of the limited amount of product delivered at the exit node. Across all three industries, the deregulation mantra had been “prevent the consumer from experiencing price increases.” The result of caps then was constraints in link prices for service during peak demand periods, leading paradoxically to shortages that were relieved by broker-dealer commodity price increases.

All of this is unraveled in this book in a narrative that takes place at two levels. First, we address the interaction of network market structure and partial deregulation on pricing as practiced by FERC and the Federal Communications Commission (FCC). Chapters 1 and 2 introduce common elements of networks in electricity and gas transmission and telephone services, as well as common elements of transportation “partial” regulation, in which the agency determines pricing caps targeted against high-priced services when there are two or three service providers.

To deal with unique aspects of performance in each of these industries, the narrative’s second level describes results that differ not in nature but in their extent. Chapter 3 describes specific pricing and service offerings of the gas and electric industries and associates them with attributes of deregulation in those industries. The “regulatory reform” process took place there on the basis of congressional or agency initiatives at different times from 1980 to 2002. But these initiatives all involved separating local production of whatever was transported from transmission by the network carrier (where previously the carrier owned what was delivered). The reform process had two goals: that product markets at points of origin would be deregulated, since divestiture would generate numerous suppliers, and that markets for final delivery services would be released from price controls only after the entry of (again) numerous independent retailers. The transmission grid could not be broken into independent entities that would be competitive enough for the elimination of price controls. This partial deregulation, after the fact, involved price controls at the retail level and transmission services at the wholesale level. The consequence of continuing controls in electricity and gas transmission included frequent excess demands on link capacity, which worked through the network to create price spikes for the product at terminal nodes. Chapter 4 describes the extreme case of the performance of Pacific Gas and Electric Corporation, which was driven

into bankruptcy when deregulated wholesale markets realized prices higher than those capped at retail for power delivered over a patched-together statewide grid that was also functioning under price caps.

Chapter 5 analyzes the performance of incumbent local and long distance telephone networks that provide the predominant service in “mass” and “business” wireline service markets. The price cap policies of the FCC, for local access services provided to long distance carriers, when combined with the strategies of three dominant long distance carriers resulted in a pattern of corporate behavior that rendered the local exchange carriers unwilling to invest in broadband technologies for rapid access to the Internet. Here the FCC was totally involved in every aspect of network element pricing for each of the four regional local service providers providing access to long distance.

From the middle 1980s, when settlement of the federal antitrust case against AT&T resulted in separating local retail from national long distance service provision, the long distance company price-cost margins were sustained in the range of 50 to 70 percent, while returns on capital were still at levels below those necessary to sustain and recover wireline network investments. There was an important exception. The long distance carriers took the opportunity provided by the FCC to set higher price-cost margins to generate cash flow for a Universal Service Fund required by regulation. This was in keeping with the FCC facilitating entry by independents to reduce prices while still taking the opportunity to assist in raising prices where there was not sufficient cash flow to fund a federal program. But there were constraints both on the capacity expansion of advanced technology networks and on returns to investors. Chapter 6 considers the implications of capacity constraints in the form of price spikes in these industries in terms of whether they call for “reform” by undertaking to restore regulation (“retro-regulation”) or to complete deregulation to the limit as an endgame.

The readers, critics or enthusiasts, of various drafts of this work have been more than helpful in reaching this point. George Borts (Brown University) provided an elegant and highly relevant version of oligopoly (conjectural variation) theory; Richard Lee Schmalensee (MIT) corrected my estimates of conjectural variations in Chapter 5; and Larry Darby (Darby Associates), Thomas Hazlett (George Mason University), Gregory Sidak (Georgetown Law School), and Dennis Weisman (Kansas State University) went over the chapter on telecommunications as if my intent should be that each word should be correct. Jean Rosenthal (Yale Senior Olin Fellow) checked and measured the gas and electricity chapter with colleagues in the regulatory agencies and the corpora-

tions. The Yale Olin Fellows, all second-year MBA candidates, crunched numbers for the charts and tables on HHI, price spikes, EVA, and the Lerner Index; they included R. Wonodi, A. LeCuyer, C. McCune, and S. Hassell (electricity), G. Ageshin and C. Reyes (natural gas), and A. McGowen, G. Sypeck, and A. Vohra (telecommunications). They will never forget EVA. My gratitude to all for the care and consideration they provided.

This book has been an “endgame” itself, since it is the last project at the Yale School of Management funded by the John Olin Foundation. The Yale Olin projects have consisted of more than two dozen working papers, subsequent journal articles, and four books published by the MIT Press, Yale University Press, Princeton University Press, and Stanford Business Books. The work for these publications centered on understanding the relationships of corporations to complex and interventionist government regulation at the state and national levels. The funding over twelve years, 1992–2004, by this foundation exceeded \$1 million. For those involved, the gains in learning and experience from such cooperative analytical work in my estimation greatly exceeded the “dollar worth.”

The Olin Foundation has now departed, having spent its endowment and closed its doors, according to the wisdom of its founder. It will be missed, not only by those involved in research on regulation at Yale but also by those who enjoyed the foundation’s support of research in law and economics in universities across the country. I am grateful for the assistance of Senior Olin Fellow Jean Rosenthal on this work as well as on previous Olin projects, and of the Olin Fellows who worked so diligently and imaginatively with me; and I dedicate this, the last in my line, to the late William E. Simon, president, and James Pierson, executive director, of the Olin Foundation.