

# The Future of Market Regulation

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I am grateful to Roy Ruffin for helpful discussions on this topic and to Gerry Moohr for discussions and valuable comments on an earlier version.



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Market regulation is accomplished both by competition and by external government agencies, and the trend is toward greater reliance on competition. Economists have fostered this trend and have even invented markets to help overcome some externality problems. They have contributed to a steady improvement in antitrust policy, which currently reflects economic knowledge well. They diagnosed and demonstrated problems with external regulation of the airline industry and gave assurance that regulation by competition could work in its place. Success there led not only to deregulation of airlines but also deregulation of railroads, trucks, buses, and in some ways natural gas pipelines. Two other industries, telecommunications and electricity, are now following very ambitious paths toward less external regulation and greater dependence on competition. The Internet raises new issues, but there also competition will play an important regulatory role.

# The Future of Market Regulation

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## 1. Introduction

Whether you want to buy a wireless phone or a loaf of bread, whether you click your order, telephone your order, use the mail, or travel to a store, your transactions, and indeed most economic transactions, are influenced by some form of market regulation. Imagining the present without such regulation is hard, and imagining the future without it is even harder. To predict what forms regulation will take in the future is not easy either - it is not even possible. But looking back over more than a century of market regulation in the United States, there are trends that suggest the course it will follow.

In "market regulation," the word, "regulation," usually connotes some extra-market, even administrative, guidance of the market. We'll call this *external* regulation to distinguish it from regulation by competition, which readers of this *Journal* know also regulates markets -- raising price when supplies are scarce and lowering price when supplies are plentiful. External regulation supplements competition and comes in three main forms, antitrust, industry regulation, and social regulation like environmental protection. In the future we should expect to see more reliance on competition as a regulating force and less, or more subtle, external regulation.

First, it is clear that external regulation has been imperfect. "Mistakes were made." When mistakes were made, economic lessons consistently followed, and economic forces helped to bring about corrections. This is important because regulatory institutions have often been formed by legislation or by court decisions without sound economic foundation. Firms seek favors and politicians pursue votes, and that won't stop. Remedies for flaws have usually come from economists, who - you should be pleased to know -- are the heroes of this story.

My discussion has five parts. First, in the area of social regulation I note how saleable rights are being created. I use as an example pollution rights that are used to regulate what a firm releases from its smokestacks in the form of air pollution. These are essentially markets that economists have invented, usually to make other markets work better. Second, I'll use antitrust regulation to show how much we have improved in guiding markets. Early antitrust efforts involved some bad economics, but economics has gradually improved antitrust policy. Third, on industry regulation, I'll review how external regulation of airlines was flawed, and how the analysis and recommendations of economists spawned a whole deregulation movement. Fourth, I'll turn to markets that are literally being devised right now, to let competition work in industries like telecommunications and electricity where external regulation of monopoly firms functioned for years. When we focused on problems with existing institutions -- like rate-of-return regulation -- we found serious problems and worked out improvements. Changing technology has forced more fundamental change in these industries. Finally, I'll briefly consider the design of markets for cyberspace.

## 2. Social Regulation by Creating Rights

Environmental problems, like pollution and congestion, are hard to solve.<sup>(1)</sup> Rights to pollute and rights to use highways can be created to help solve these problems and they are examples of economic ideas in practice. They will not solve all problems, or even the most difficult ones, but they show how creating new rights can regulate external effects by motivating their efficient reduction.

### *Rights to Pollute*

Creating rights to pollute the air can - paradoxically - help to control pollution. A "right-to-pollute" solution for pollution control defines a right to pollute and allows that right to be bought and sold. Defining a right to pollute is difficult, of course, because it requires measurement and enforcement. But once that hurdle is overcome, the total amount of pollution - the total rights to pollute - can be specified. This means that the level of allowable pollution can be specified, as we now do for instance to limit sulphur dioxide emissions in the United States to combat acid rain.<sup>(2)</sup>

Once pollution rights are defined and a given supply is established, a market price can be determined. Then those who can reduce pollution most efficiently, that is, for less than the value of a right to pollute, will reduce pollution and sell their rights to pollute to others. Those who face higher pollution abatement costs can buy the pollution rights and use them for permission to emit pollution. Thus, at a market equilibrium, the price of pollution rights reflects the marginal cost of controlling pollution to the level that the available pollution rights will allow.

### *Rights to Highway Use*

We pay no price for highway use. We incur the private cost of a vehicle trip between two points, including not only fuel, oil, tire wear, and so on, but also the driver's (and passengers') time, and when congestion is serious that time component goes up.<sup>(3)</sup> The familiar problem of excessive traffic congestion arises because each of us decides whether to make a highway trip on the basis of the average cost rather than the marginal cost of the trip to society.<sup>(4)</sup> An additional car can join a stream of cars on the highway and it will share in the average costs and delays of all the other cars. Yet that marginal vehicle causes delays to all the others, delays that the driver of the marginal vehicle does not take into account when joining the traffic stream.

Roughly forty years ago, Sir Alan Walters (1961) estimated the magnitude of a tax that would make road use more efficient in urban areas of the United States; in today's dollars that tax would be about 20 cents per mile. If this charge was collected as a tax on gasoline today, it would be more than \$2.50 per gallon. Even if we were to adopt taxes at this level they would be inadequate as solutions to congestion, of course, because road use would cost the same whether the use came in the middle of the night or at rush hour, and the congestion problem comes only at rush hour.<sup>(5)</sup> A solution to the highway congestion problem can come from assigning a property right in road use -- a right to delay others, like the right to pollute. Electronic devices exist now that will record time spent on a road. When placed in vehicles, these devices function like the electricity meter in your house, but they identify the time and location of your road use.<sup>(6)</sup> Technology and economics combine in these devices to make billing drivers for road use feasible, and that can avoid excessive congestion. Such devices and fees are in effective use in Singapore,<sup>(7)</sup> and many of us should expect to see them in our lifetimes.

Thus, economists have invented markets to solve market problems. There are many other areas where social regulation was introduced in clumsy forms - consumer protection for example - that are improving gradually, based on economic ideas that improve information and market function. To show this general process of gradual improvement in applying economics, we consider how economics has improved the efficiency of markets through antitrust.

### **3. External Regulation and Competition: The Example of Antitrust**

In 1890, western farmers felt they were suffering from the steadily falling general price level and the growing power of railroads and combinations of firms in other industries. Not far behind the railroads in ruthlessness were the efforts of

trusts to control meat, oil, tobacco, steel, sugar, lead, whiskey, gun powder, and other industries. How to remedy this trust problem to obtain the benefits of competition was not at all obvious, particularly to Congressmen who were sympathetic to private business and a public that believed in private enterprise. Many states had adopted antimonopoly provisions but, with a few exceptions, they did not enforce them, either from lack of resources or from reluctance to drive large employers from their states.

At the time, it was by no means obvious that legislation could solve the trust problem. Recall the famous line from Adam Smith: "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices"?<sup>(8)</sup> Smith's next sentence was "It is impossible indeed to prevent such meetings, by any law which either can be executed, or would be consistent with liberty and justice." That sentiment indicates why most economists of the time opposed passage of the Sherman Act.<sup>(9)</sup>

In antitrust cases, courts follow either "per se" rules, under which certain facts determine guilt or innocence, or they examine circumstances more broadly and follow a "rule of reason" analysis, to determine the appropriateness of the observed behavior. The per se procedure is quicker and easier, and of course it gives more precise guidelines to business firms, but it requires what lawyers call "bright line," or clear, rules. The disadvantage of such per se rules is that they may be over or under inclusive. The alternative, rule-of-reason, analysis allows courts to examine the circumstances of each case. It is in these rule of reason analyses that economics is applied far better now than in the past.

Early applications of the rule of reason were not auspicious. Of course part of the problem was finding any practical way to rein in monopoly power that already existed, and courts sought compromises between requirements of the new Sherman Act and practices that had been accepted before it was passed. In 1920, through a "rule of reason" analysis instead of a per se application of the Act, the Supreme Court found that the United States Steel Corporation, formed from 180-odd independent companies, had not violated antitrust law, even though it controlled two thirds of the steel industry in 1901 and evidence clearly showed it had fixed prices with other firms. It wasn't until Judge Learned Hand's decision in the *Alcoa* case<sup>(10)</sup> in 1945 that mere possession of monopoly power was again seen as a violation of the Sherman Act.<sup>(11)</sup> Antitrust issues are not easier today, but attention is paid to economic consequences and economic analysis is up to date.

Let me pick out just two areas - out of many possible ones -- that illustrate how much better economics is used now in rule of reason analyses: price fixing and vertical restraints. For much of the last century they were both judged to be illegal per se. Price fixing was simply bad.<sup>(12)</sup> Vertical restraints were generally seen as inappropriate extensions of control by sellers who no longer had a property interest in the item being sold.

### *Price Fixing*

The American Society of Composers, Authors, and Publishers (ASCAP) and Broadcast Music, Inc. (BMI) negotiate license arrangements for authors, composers, and publishing companies. Copyright owners grant ASCAP and BMI nonexclusive rights to license and collect and distribute royalties, based on such factors as the nature and amount of usage of the works. ASCAP and BMI typically arranged blanket licenses over stated periods, licenses that allowed unlimited use of the copyrighted works for a fixed fee or a percentage of revenues. When CBS wanted to pay only for materials it actually used, it claimed the blanket licenses amounted to illegal price fixing. In a 1979 rule-of-reason decision the Supreme Court determined that there were desirable efficiency results in the operation of ASCAP and BMI.<sup>(13)</sup> The Court saw how a blanket license could lower costs by requiring one transaction rather than thousands and could avoid closely monitoring customers to ensure they paid for what they used. The Court supported use of the blanket license employed by ASCAP and BMI.

*United States v. Brown University* is another thoughtful application of the rule of reason to price fixing, and it might be even closer to home. The Court evaluated the practice of private universities to agree on the financial aid packages they would offer to admitted students.<sup>(14)</sup> Although this practice involved the fixing of a form of price, a scholarship, the Court noted that its goal was to allow study by more students who lacked the means to attend the institutions. Because the agreement was seen to advance that desirable goal, the practice was allowed.

### *Vertical Restrictions: Territorial Restrictions and Resale Price Maintenance*

*Territorial Restrictions* For years territorial restrictions were essentially illegal per se, although occasional cases examined specific practices to consider them more fully.<sup>(15)</sup> The *Continental T.V., Inc. v. GTE Sylvania, Inc.* case of 1977 called for rule of reason evaluation of such restrictions, and focused on economic effects.<sup>(16)</sup> Sylvania was a small manufacturer of

TV sets in the United States with only 1 to 2 percent of the national market. When Sylvania opened a new franchise in San Francisco another Sylvania dealer first objected and then moved its franchise to Sacramento. This move violated the terms of the franchise and, when Sylvania terminated it, the former franchisee sued.

In a rule of reason analysis, the Court noted a variety of reasons why the control of franchise locations might reduce *intra*brand competition, or competition among sellers of the same, Sylvania, brand of TV sets. On the other hand, with no other Sylvania dealer in the vicinity, a dealer would be motivated to advertise and seek consumers more aggressively because the sales it generated could not go to other dealers of the same brand. Through this reasoning, the Court also saw how control of locations could strengthen *inter*brand competition, the competition among different brands. *Inter*brand competition was vigorous for Sylvania, and would help to keep prices from rising far, because Sylvania had no commanding position in that *inter*brand market. The Court found for Sylvania and, since then, non-price vertical restraints have rarely been overturned.<sup>(17)</sup>

*Resale Price Maintenance* If manufacturers are able to control retail locations, in order to prevent *intra*brand competition, they might want to control the resale prices of their products. This would help them avoid the problem of double marginalization, where manufacturer and retailer each set a partly monopolistic markup that causes final product price to exceed the price an integrated monopoly would charge.<sup>(18)</sup> Resale price maintenance allows a manufacturer to set a price at which a retailer can sell the product, so it can allow separate manufacturing and retailing firms to overcome the double marginalization problem without actually integrating into a single firm. And the resulting consumer price can be lower.

But resale price maintenance had been seen as a form of vertical price fixing, and was not allowed for much of the twentieth century. In an early effort by a manufacturer to control the retail price of its product, a secret proprietary medicine of Dr. Miles Medical Company, the Court ruled that, having sold goods to a wholesaler, the manufacturer could not control the terms at which the wholesaler resold the goods.<sup>(19)</sup> In 1997, in *State Oil Co. v. Kahn*, the Supreme Court turned aside the *Dr. Miles* precedent and allowed a supplier to impose a maximum price that a gasoline dealer could charge.<sup>(20)</sup> Evaluation of economic effects under the rule of reason led the Court to stress effects of the pricing on *inter*brand competition, or competition against other brands of gasoline. The Court found that *inter*brand competition was vigorous, and was well served by the resale price maintenance policy. Thus, rather than adhering solely to property rights principles, the possible economic advantages of resale price maintenance are now evaluated under the rule of reason.

About antitrust law, they say that in England, anything that is not expressly forbidden is allowed; in Germany, anything that is not expressly allowed is forbidden; and in France, everything is forbidden, but almost anything can be arranged. Although it won't get a laugh, I suppose we could say that in America, we allow whatever competition allows. We are beginning to replace external regulators with competition as regulator in many parts of the economy, a movement that was spearheaded by deregulation of the airlines.

#### 4. Spur to the Deregulation Movement: Deregulating Airlines

Unlike most regulatory agencies, the Civil Aeronautics Authority, which was created by the Civil Aeronautics Act of 1938, was specifically charged with promoting the fledgling airline industry. The Authority was renamed the Civil Aeronautics Board (CAB) soon afterwards, and it regulated airlines for four decades.<sup>(21)</sup> Its creation came after airplanes had played a significant role in World War I, Charles Lindbergh had flown from New York to Paris, airmail service had been introduced, and passenger service had begun. Regulation was adopted to assure the safety -- and the economic success -- of air travel. This was not really a lasting basis for regulation, however, and it set up the opportunity for deregulation 40 years later.

Deregulation was not inevitable. In fact many economists -- Jim Miller, George Douglas, Ted Keeler, Dick Caves, Lucille Keyes, Betsy Bailey, Mike Levine, Robert Frank, John Snow, Darius Gaskins, especially Fred Kahn -- and many others worked extremely hard to make arguments and compile evidence that would bring about the deregulation of airlines. Make no mistake, such studies also fostered the whole deregulation movement, first in other transportation industries like railroads, trucking and buses and then in natural gas pipelines, telecommunications, and electricity. Economists were there, they were able to see effects of external regulation and estimate them empirically, and as a consequence they brought about important economic change.

It really started largely because some airlines operated within single states, and thus were not subject to Civil Aeronautics Board (CAB) regulation. Unregulated, competitive markets, within the states of Texas and California, had much lower fares per mile and more seats filled in their planes,<sup>(22)</sup> compared with CAB regulated airlines. This illustrates the

importance of having an alternative for comparison.

CAB economic regulation had two main features. First, the number of airlines serving any route was limited.<sup>(23)</sup> Indeed, there was virtually no entry into the main routes in 40 years of CAB regulation. Second, the CAB established fares for each route. If the regulated fare set for all airlines serving a particular route seemed well above costs, each airline would want to attract passengers. It cannot lower fares, because fares are regulated, so it advertises more and serves better in-flight meals, and it schedules more flights in an effort to meet customers' most convenient travel times. As a result, costs rise until any profit from the high fare is eliminated. Service quality under this regulatory regime was high (a customer could decide to fly at the last moment and find a seat available) but it was costly, largely because airplanes were not very full.

In addition to this problem of nonprice competition pushing costs up to the level of high CAB-prescribed fares, there was a tendency to set fares even higher on long-distance flights (more than 400 miles) and lower on short distance flights.<sup>(24)</sup> Such pricing was politically popular (it will be seen also in telephone price regulation). Politicians sought service to small communities in their states, and wanted it provided at low fares. Long distance flights, on the other hand, more often served business travelers who were not as sensitive to price level, nor so numerous as to be influential individually with legislators. The political preferences worked their way into CAB decisions and resulted in long distance flights subsidizing short distance flights.

In the early 1970s, the complaints of some potential entrants who had tried for years to enter long-distance, cross-country markets became especially loud. The inherent bias of CAB regulation toward high quality, high cost service, and thus high fares, plus the tendency to favor shorter distances with lower rates, made the rates in long-distance markets so high they were very attractive to potential entrants. Commuter airlines were flourishing, too, despite low regulated short-distance fares. These small airlines could escape CAB regulation by using very efficient newly developed airplanes that weighed just under 12,000 pounds, which was the lower limit for planes to be subject to CAB regulation.

Under the leadership of economist Alfred Kahn, the CAB moved to allow entry and to foster greater pricing flexibility. Instead of accepting harm to an existing airline as a reason for denying new entry, for example, the CAB required a showing that the entry of a new carrier would bankrupt an existing airline. And a band of price cutting, first up to 5%, was permitted. Incidentally, I can tell you there was strong resistance to the use of economics within the CAB. I spent the summer of 1978 there because Fred Kahn thought it would be good to have someone provide economic advice to administrative law judges, who heard cases and recommended decisions to the Board. Out of 17 judges, a couple were quite interested in using economics, but about three-fourths of the judges would not even speak to me.

After these policy changes, airline profits, which had suffered from significant fuel price increases in the 1970's, actually improved. With this encouraging result, evidence from unregulated intrastate experience, and many analyses of the problems with existing CAB regulation, Congress passed the Airline Deregulation Act of 1978. Events proceeded faster than the timetable in this Act, with entry free by early 1980 and fares freely set shortly afterwards.

Although some aspects of service quality have been reduced -- airplanes have a greater percentage of their seats filled so it may be harder to find a last-minute seat on a particular flight -- overall welfare has improved.<sup>(25)</sup> Even though all passenger miles are not flown at fares lower than under regulation, evidence shows convincingly that fares are lower on average - by roughly 25 percent - than could be expected under regulation.<sup>(26)</sup> And this is the case despite concerns about concentration in the industry.<sup>(27)</sup> Relative to the regulated world, gains from price and quality have been estimated to be currently worth more than \$20 billion per year.<sup>(28)</sup>

Of course if you traveled a lot this past summer, with its record numbers of delays, you may not believe the effects of airline deregulation are so positive. But deregulation does not appear to be the villain behind this summer's troubles.<sup>(29)</sup> Problems are being traced more to inefficient management of the air travel system, the airports and landing systems administered by governmental bureaucracies. Indeed, the Federal Aviation Administration has admitted it makes inefficient use of the airways, with procedures that do not respond well to poor weather and that are not uniform across the country.<sup>(30)</sup> We should expect deregulation to go farther, as it has in Canada, to include the air traffic control system. Market forces could also improve control of landing slots at government-run airports, through application of more effective allocation of landing slots, fully by price, that would include some form of peak-load pricing.<sup>(31)</sup>

The prospects for further deregulation are not encouraging at the moment, judging from DOT actions and Congressional debate. But the economic forces are strong and persistent, and we economists can urge their release by abandoning more



barriers that remain in their way. On the whole, airline deregulation is a success story that places greater regulatory responsibility on competition and has brought substantial benefits over external regulation of the industry. Although economic lessons have been extended successfully to railroads, trucking, buses, and natural gas pipelines, making competition work has been far more ambitious - and more difficult -- in telecommunications and electricity.

## 5. Devising Ways for Competition to Provide Market Regulation

For many years, we adopted government regulation whenever problems were found with competition, without evaluating whether a governmental solution would be better than market competition. Indeed, George Stigler compared our procedure to that of a judge in a singing contest who listens to the first singer and immediately awards the prize to the second. We consider here two examples of regulated -- and deregulated -- industries: telecommunications and electricity. In both cases technology opened the possibility of competition in part of the industry. Legal or bureaucratic ways have been found to bring competition into these markets but unlike airlines, regulation remains. We have to point out problems that result and try to find solutions.

After the *Munn v. Illinois* case in 1877 led to the creation of public utilities,<sup>(32)</sup> we didn't ask how to motivate them to serve the public interest. We just focused on the question of how much profit to allow.<sup>(33)</sup> It took us until 1944 to answer that question, in the *Hope Natural Gas* case,<sup>(34)</sup> which essentially defined rate-of-return regulation. Later, Averch and Johnson (1962), Wellisz (1963), and Westfield (1965) showed us how faulty rate-of-return regulation could be, and a host of empirical studies confirmed their arguments. Our response was to design better incentives.<sup>(35)</sup> Price-cap regulation was first suggested by Baumol (1968) and given theoretical foundation by Vogelsang and Finsinger (1979). It was applied to motivate both cost and pricing efficiency at British Telecom in 1982, at AT&T long distance after the break-up of AT&T, at some local phone companies, and, occasionally, in electric utilities. When technological change came to regulated industries it not only brought the force of competition, it also opened ways for competition to function, at least in parts of the industries.

In both telecommunications and electricity, competition plays a new role today because the owner of a facility that is essential to the provision of a service and that cannot be economically duplicated must allow others to use it. Sharing the use of an essential facility goes back to a 1911 Supreme Court decision<sup>(36)</sup> over a railroad bridge that established what is called the essential facilities doctrine.<sup>(37)</sup> That Court decision said the terms to be offered to nonowners should "...place every such company upon as nearly an equal plane as may be with respect to expenses and charges as that occupied by the proprietary companies."<sup>(38)</sup> On this principle telephone companies have to open their networks so other companies can complete their calls, and electric utilities have to offer electricity transmission services to generators of electricity.

### *Telecommunications*

The Federal Communications Commission (FCC) was created in 1934 to regulate telephones and radio. Looking back, it is clear that regulation made long-distance rates much higher, relative to costs, than was true for local calls, and rates generally were higher for businesses and lower for residences.<sup>(39)</sup> So when microwave technology came along to lower the cost of long-distance calls in the 1950s, entry into long distance markets was irresistible. MCI transmitted long distance calls by microwave and wanted interconnection with the Bell System so it could complete the calls and thus compete with AT&T. Largely because of its resistance to such possible competition, the Department of Justice filed an antitrust complaint against AT&T in 1974. A bold solution was finally worked out in 1982 between AT&T and the Department of Justice that modified a 1956 Consent Decree and broke the country's largest firm into a long distance service company, which kept the AT&T name and would compete with other providers of long distance service, and seven Bell operating companies (or BOCs) -- now four -- that would complete calls for *all* long distance companies.

Biases in externally regulated pricing persisted under this arrangement, however. Residential rates were still relatively low while rates for businesses were high. The universal service obligation -- minimal service at low cost so service could be widely (universally) enjoyed -- was paid for by established service providers, who were disadvantaged as a result. Competition between telephone and cable providers that had been held off by regulators for years was finally emerging. The stage was set for vigorous competition to win telephone service business from several different kinds of service providers.<sup>(40)</sup> Yet the rules for that competition were not clear.

In February, 1996, Congress passed the Telecommunications Act, the first legislation for telecommunication in over sixty years. The Act does not contain a well thought out plan for telecommunications competition, and provisions requiring Internet services to high schools and universal service on a cross-subsidized basis handicap competition. The Act was a

compromise between regional Bell operating companies and long-distance companies that allowed local exchange carriers to enter long distance markets and long distance carriers to enter local markets. But these steps were subject to complex regulatory supervision, especially as interpreted by the FCC. When the FCC revealed its rules for access pricing in August of 1996, the BOCs, GTE Corp., and other local service providers sued to block their application. The case went to the Supreme Court, which ruled in January, 1999 that the FCC had authority to specify rules for implementing the Telecommunications Act of 1996, although some of its rules were seen as not being tied sufficiently to the goals of the Act.<sup>(41)</sup>

But prices are still distorted by regulation. It is not just that the FCC rules for pricing access to local service favor entrants over incumbents through low access charges. In addition, prices for residential customers are still low due to regulatory rate setting, mainly at the state level. Both AT&T and WorldCom have abandoned plans to enter local phone service, saying they cannot make money, although WorldCom may provide local service to businesses through its own networks.<sup>(42)</sup> Two BOCs are now competing in long distance service, however, using other company's lines. So access to the facilities of others plays some role in fostering competition. Cross-industry competition between telephone and cable service providers has not yet developed, although there is some preliminary activity by cable companies to move into telephone service.<sup>(43)</sup>

Meanwhile, wireless telephone service is booming, and new competitors are participating all around the country. The Omnibus Budget Reconciliation Act of 1993 included a provision requiring the FCC to auction electromagnetic spectrum for wireless communications. Prices for wireless service are unregulated and falling, and about one million wireless phones are put into service each month, some of these actually replacing land-line phones. Quitague, Texas, with a population of 500, has a digital telephone network that is totally wireless. The wireless alternative will put growing pressure on regulators to sort out the land-line phone access pricing problem.

This summer brought no great problem for consumers of telephone service, but providers of the service are in financial trouble. Capital spending in the industry jumped from \$40 billion in 1996 to \$80 billion in 1999. Sales have not grown with capacity, however, and rates of return have fallen. As a consequence, telecommunications stocks have fallen 40 percent from last year, and investors are not happy. That is why AT&T is reorganizing into four separate companies, essentially repudiating the business plan it has pursued for the last three years.<sup>(44)</sup> Worldcom is changing its plans in a similar way.<sup>(45)</sup> On the whole, the prices of telephone services have been rising at less than the consumer price index. For consumers there is no pricing problem, we just get more telephone calls from phone companies at suppertime than we want.

It is not surprising that a law that was more than ten years in the making will take some time to have effect. The problem is larger, though, than working out some details. It is possible to bring the competitive process more deeply into a former monopoly telecommunications industry, but regulators are now in the way, with complex pricing rules that distort investment incentives, and legislated cross subsidies that have similar effects. We need further substantial change in this industry -- and in the way it is regulated -- in the near future. International competition is opening up, and there is the unregulated wireless alternative. The process is not neat, or pretty, but it constitutes significant change. Economists will just have to keep diagnosing problems and proposing changes.<sup>(46)</sup>

### *Electricity*

Some time ago I asked a student what he thought would result from deregulation of electricity. He said, "I guess it means I'll be getting even more telephone calls at supper time." We pay more for electricity, at over \$200 billion a year, than we spend on telecommunications. And bringing competition to the provision of electricity is even more ambitious than bringing it to telecommunications. After all, there is no busy signal for electricity. Supply and demand can not be out of line for more than 30 seconds or the whole system can go down. The delicate balancing of electricity loads -- all the time -- lets us enjoy at the flick of a switch the things that power can do.

The origins of electricity deregulation also go back to the 1970s, when OPEC's successful effort to raise worldwide fuel prices brought hard times to electric utilities. The Congress that deregulated airlines also passed the Public Utility Regulatory Policy Act of 1978 (PURPA) to influence state public utility commissions in the way they regulated gas and electric utilities, to improve efficiency and conserve energy -- mainly to reduce our dependence on petroleum exporting countries. Not much noticed at the time, yet from today's perspective perhaps the most important part of PURPA, was its requirement that electric utilities purchase power from cogenerators and small power producers that used renewable

sources of energy (e.g., water, solar energy, geothermal energy).<sup>(47)</sup> The Energy Policy Act of 1992 (EPA) carried initiatives of PURPA to a level that was revolutionary.<sup>(48)</sup> It opened the possibility that a transmission network would have to transmit electricity for *any* producer, and this fostered the development of a competitive market for wholesale electric power.<sup>(49)</sup>

The generating facilities owned by many public utilities are not as efficient as new combined-cycle-turbine technology allows. Formerly integrated electric utilities developed in quite different ways over the years, because they were protected from competition, with the result that some now have costs twice as high as others.<sup>(50)</sup> In deregulating, most states have imposed price caps or some form of price reduction,<sup>(51)</sup> but the plans are still intended to compensate utilities for the losses they suffer in asset values -- called "stranded costs" -- that competition will cause. Some states limit the price reduction by essentially imposing a tax, which compensates existing utilities for the losses they will suffer when competition ends their monopoly positions. States have also imposed rules that usually handicap incumbents, requiring separate organizations for transmission and distribution, for instance, and for marketing electricity, and even limiting possible market shares. Plans sometimes require formal divestiture of generating plants from transmission activities, to avoid favoritism toward an integrated generator over an independent one in granting access to scarce transmission facilities.<sup>(52)</sup>

Markets for trading generated power have existed for some time in many parts of the country, and they take different forms. In Florida a spot market in power has been operating for 25 years among investor owned utilities, municipal utilities, and rural electrical cooperatives.<sup>(53)</sup> The Florida Coordinating Group (FCG) operates the FCG Energy Broker, a spot market that arranges hourly purchases and sales of energy. In Virginia, long-term contracts are used rather than a spot market, largely because a number of independent producers sell power to a single dominant utility buyer, Virginia Power,<sup>(54)</sup> which retains the right to dispatch this power. Virginia Power can thus solve in a manageable way its problem of maintaining load balance throughout its system despite demand fluctuations. This coordinating function would be carried out in a competitive market by an independent system operator, or ISO. States usually choose between setting up a power exchange or an ISO to guide their electricity market after deregulation.

California mixed these models after it embraced competition for electricity in 1994 and the California Public Utilities Commission decided to allocate oversight functions to two organizations in 1995.<sup>(55)</sup> A California Independent System Operator, CAISO, is responsible for maintaining system balance. This oversight is similar to that provided by Virginia Power under its arrangements with independent power producers, but is more complex because many independent producers are making agreements to supply at weeks, days, and hours ahead, while many users are agreeing to take electricity at these same times. In addition, a power exchange operates a spot market in electricity, called the California Power Exchange, or CALPX, which is comparable to the Florida Energy Broker except that it arranges *all* transactions instead of just extra ones, say to cover an integrated company's peak needs, which was the case in Florida. Besides using two organizations, California created oversight boards for each of them that included representatives of all interested parties, almost ensuring there would be conflicting views at the highest levels. California has also authorized competition at the retail level, but it is not yet clear just how this competition will be achieved.

In 1996, the Federal Energy Regulatory Commission, or FERC, issued two orders that provide a framework to support the functioning of competition for electricity. In its Order 888, FERC required that the owner of a transmission line offer nondiscriminatory access to any company wishing to send electricity to any wholesale buyer such as a local distribution system or a power marketer.<sup>(56)</sup> A specific tariff must be published for all transmission services. The Order also requires that when the transmission line operator is an integrated firm with generating capability, it must make services available to other generators on a separate, or unbundled, basis. Then any user can choose just the services it wishes to use, and the integrated firm will have to pay the same fees to the transmission company that other users pay. Order 889 requires any party that operates transmission facilities in interstate commerce to participate in an "open-access, same-time information system," to provide, electronically, information about available capacity, prices, and other necessary information for a market in power to operate.<sup>(57)</sup>

Massachusetts, Pennsylvania and about a dozen other states, usually those with relatively high electricity prices, have joined California in deregulating electricity. In January, 1997, Massachusetts regulators approved a plan of the New England Electric System to sell its generating plants, which are located in six states and include hydroelectric facilities. These separate generating companies are now competing with one another for customers. Electricity rates were initially cut by ten percent and consumers could choose from whom to purchase electricity. Pennsylvania relies on a regional power exchange, like Florida's (PJM, involving Pennsylvania, New Jersey and Maryland) and like the Mid-West, rather than creating new institutions as California did. The Pennsylvania government gave high priority to informing consumers

about choices through advertising, with the result that more than ten percent of the consumers have thus far chosen new providers. Those new providers, in turn, have built new capacity in or near Pennsylvania. The state claims consumers have saved almost \$3 billion in the past three years because of lower electricity bills under agreements that prevented price increases while competition was developing in the generation of electricity.

You may have noticed from reports this summer, or from recent summers, that deregulation of electricity has not gone smoothly.<sup>(58)</sup> In normal times, a megawatt hour of electricity can cost between \$25 and \$125. In the summer of 1998, the wholesale price of electricity in Chicago briefly reached \$2000 per megawatt hour. It went almost that high again in the summer of 1999, when the price in some other parts of the Midwest reached \$6000. Texas in 1999, and California this summer, briefly had prices of \$500 per megawatt hour. California utilities, which must buy power on the California Power Exchange to deliver to their customers, have lost huge sums from spikes in wholesale electricity prices this summer, and dealing with these losses will be almost as difficult as dealing with stranded costs. The California Public Utility Commission put a cap on prices for small-usage residential and business customers this past August in San Diego,<sup>(59)</sup> which was the first big market in the state to be deregulated in a phased plan that gradually moved north. But supplies were scarce, and San Francisco suffered rolling brownouts in June in order to keep the power system going. Last week, the Federal Energy Regulatory Commission proposed rule changes in the California system, to cap prices but also to allow utilities to buy electricity from any source rather than be confined, as they now are, to purchasing from the California Power Exchange.<sup>(60)</sup> FERC also proposes that the unwieldy boards of the California Independent System Operator and the California Power Exchange be reconstituted to be less representative - and therefore less political - than they presently are.

Electricity deregulation has doom and gloom forecasters.<sup>(61)</sup> It is true that developing ways for electricity markets to function is much more complicated than the task was for airlines or even telecommunications. And unlike airline deregulation, electricity deregulation came at a bad time. Generating capacity was scarce relative to demand, because few new power plants have come on line recently, and a booming economy has stimulated demand generally. We have also had warm summers, so use of air conditioning - which accounts for thirty percent of summer electricity demand in California for example -- is high.

Despite the great price swings, I think we are unlikely to see the return of the public utility and its regulatory commission in electricity. Twenty-five states have enacted electrical restructuring legislation or issued regulatory orders to that effect. A host of other states have regulatory orders or legislation pending. Only seven states have taken no action so far on electricity deregulation. The issue of stranded costs -- a major transition problem -- has largely been resolved. New institutions, which will continue to change and develop, control the pricing and allocation of electricity and they do it every hour of every day. As was obvious in airlines, the design and location of facilities will change - perhaps more slowly in electricity - but change is taking place. FERC, which made adroit changes in the 1980s to bring competitive market forces into natural gas pipelines, is primarily facilitating the transition with valuable coordinating actions. Deregulation is occurring at state levels, where lessons from smaller scale experiments can benefit all. Operating electricity markets is hard, and will take efforts by economists if it is to be done in the best possible way.<sup>(62)</sup> While it has not been -- and will not be -- easy, the development of a competitive market for electricity generation is a remarkable achievement that will reduce the role of external regulation. But whether we can design markets so competition can regulate is still to be tested in cyberspace.

## **6. Regulating the Internet: Designing Market Architecture**

Should the Internet be regulated? Revenues on the Internet are at the rate of \$330 billion annually and climbing, involving five million web sites.<sup>(63)</sup> At the moment we are essentially following an infant industry policy that exempts a new technology from regulation. This includes freedom from taxation while the institution - if that is the right word - grows. Of course when it reaches significant size, the tax advantages that Internet retailers now enjoy over retail stores, or over sellers in taxing countries, will not continue. Internet e-commerce does face some handicaps, and not surprisingly they come partly from other regulated interests, such as brick-and-mortar liquor stores that are able to win passage of laws preventing California wine ordered over the Internet from being delivered into the state.

On the consumer side of Internet transactions, search possibilities are greatly enhanced so information is available at low cost, and there is evidence that this reduction in information costs lowers prices.<sup>(64)</sup> At the same time, sellers on the Internet can obtain information not only about their customers, but also about their competitors' prices. The sellers can then follow pricing policies automatically, and the pricing protocols they choose can clearly affect market outcomes.<sup>(65)</sup> Thus, we have new pricing and searching possibilities on the Internet that can reduce transaction costs and influence firm

and industry organization.<sup>(66)</sup>

Some of the Internet antitrust issues are suggested by the Microsoft case, which involves proprietary software in network circumstances.<sup>(67)</sup> In 1998, after many private complaints and earlier litigation, nineteen states joined the Department of Justice in a suit that accused Microsoft of engaging in a pattern or practice of illegal behavior.<sup>(68)</sup> The government plaintiffs saw Microsoft as aiming to prevent widespread use of its competitor, the Netscape Navigator Internet browser. Microsoft wanted to advance the use of its own Internet Explorer browser because browser access to the Internet will be so important for controlling other applications in the future. Microsoft was found guilty of antitrust law violations at the trial court level and the case is now pending appeal.

The Microsoft case is important because it involves new and complex technology -- with network relationships -- that is changing rapidly. How the rules are drawn and applied can have far reaching effects on the behavior of firms in other settings with similar characteristics. A harsh punishment might make firms more timid in wielding market power from new technological discoveries. Less aggressive tactics might delay progress or it might allow more varied and diverse developments. It is too early to tell. But the Microsoft case gives a hint of what the future holds.

In addition to complex antitrust questions, the Internet raises truly new property rights issues, such as delivery of digitalized music and videos - the MP3 and Napster controversy. One expects that institutional arrangements can solve these problems. I know a person who invested early in the business of renting movie videos. He had a 59-count indictment against him that was dropped after the firm agreed to terms for compensating those who held rights to the films. The recently announced agreement between Bertelsmann and Napster to form a music service for paying members<sup>(69)</sup> suggests that solutions will come here as well.

In most of our previous examples of market regulation, institutions were already in place before economists got to work on them. The Internet presents brand new problems of market design. Lawrence Lessig has argued that the powerful and innovative uses we see in the Internet may be greatly influenced by the rules chosen, and he points out that those rules are contained in software code.<sup>(70)</sup> He finds early Internet relations have been guided by social norms from regular space, not cyberspace, social norms developed in part with the aid of law that sanctioned certain kinds of behavior and encouraged others. In cyberspace, to quote Lessig, "If a regulator wants to induce a certain behavior, she need not threaten, or cajole, to inspire the change. She need only change the code - the software that defines the terms upon which the individual gains access to the system, or uses assets on the system."<sup>(71)</sup> These systems have a design, or architecture, built around the software code that can control operations and access. Lessig sees closed, or proprietary, architecture as easier to regulate from outside, largely because of the power that will reside in code. Open, or nonproprietary, architecture has advantages of freedom but is harder to regulate. He suggests that neither extreme is ideal, and that careful thought should be given to these choices.

Legal scholars now debate whether private contracts, plus Internet markets, can guide transactions involving intellectual property better than legislation can.<sup>(72)</sup> Letting the market rip may not lead us to the best outcome here. We face a different, and possibly more ambitious, task in Internet markets because the circumstances of transactions differ from what we are used to and the rules can take new forms. But economists should still see things that others do not, and should find the best institutional arrangements for guiding decentralized choices in a most efficient way.

## 7. Conclusion

I do not think that markets always do the right thing or that competition is always a perfect regulator. But it is easy to see that the capacity of economists to understand the market process and to prescribe effective remedies for problems has improved remarkably in the last hundred years. We are inventing ways to create tradeable rights that can enable competitive markets to help solve the externality problems - such as air pollution -- that otherwise prevent markets from serving society well. We are able today to make much sounder arguments in antitrust cases, and to influence courts much more than was true a hundred years ago.

Of course some technologies, often network industries with scale economies, can complicate the functioning of competition. Early forms of external regulation -- like rate-of-return regulation - were not successful. Greater use of competition is now being prescribed, in part because of the successful deregulation of airlines and other transportation industries. Deregulation of telecommunications and electricity has been based on altered property rights that force the owner of an essential facility to allow competitors to use it. But telecommunications deregulation faces serious problems, mainly because price setting by the FCC, and other terms of the Telecommunications Act of 1996, distort incentives and

handicap the functioning of competition. Alternative sources, like wireless telephones and even foreign service providers, will exert wholesome pressure on regulators and land-line service providers. Electricity is more promising, despite great difficulties, in part because there is less central control. Useful lessons can come from states trying alternative ways to make competition function. The genie is out of the bottle in telecommunications and electricity, and I expect in time that competition will play an important and effective role in both industries.

Finally, we face the future of the Internet, and the prospect of its remarkable market transactions. There are important design issues to be settled here in order to preserve scope for competition. If we get it wrong, we may later have to return with changes in rights, as we have done in several areas of market regulation once we saw the benefits of doing so. Change may be more complicated when the rights are embedded in software codes, though, so we should try to help guide developments along the way.

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## ENDNOTES

1. For illustration of their complexity, see Fullerton (2000).

2. For demonstration of the effective use of pollution rights to control acid rain, see Ellerman, et al. (2000).
3. Even without congestion there can be biases among transportation modes. See Sherman (1967).
4. This is a classic problem first raised by A.C. Pigou (1920). For an early analysis and further references see Knight (1924). For a modern analysis see Mills (1981).
5. See Sherman (1971).
6. Devices of this sort have been evaluated as early as 1964 in Great Britain. See Ministry of Transport (1964) and Walters (1968). For modern uses see Theriault (1999).
7. For description of the electronic road pricing system in Singapore, see Phang and Asher (1997).
8. See Smith (1937), Book I, Ch. X, Part II, p. 128.
9. Sherman Act provisions went beyond simple codification of existing common law to make restraining trade and monopolizing crimes, and to motivate civil suits by granting to a successful plaintiff three times the extent of damages suffered. This incentive to prosecute was expanded by the Antitrust Improvements Act of 1976, which allowed state attorneys general to sue on behalf of residents and, if successful, to collect treble damages for the state. See the Hart-Scott-Rodino Antitrust Improvements Act of 1976, 15 U.S.C.A. Sec. 15c (1977).
10. See *United States v. Aluminum Co. of America*, 148 F.2d 416 (2nd Cir. 1945).
11. For review of antitrust policy over the twentieth century, see Kovacic and Shapiro (2000).
12. There have been exceptions. As early as 1918, the possibility for reasonableness considerations for pricing arrangements was expressed by Justice Brandeis in the *Chicago Board of Trade (Chicago Board of Trade v. United States)*, 246 U.S. 231 (1918) case, involving an arrangement for setting grain prices outside normal operating hours. Justice Brandeis argued that the important question is whether the practice merely regulates and perhaps thereby promotes competition, or whether it suppresses or even destroys competition.
13. See *Broadcast Music, Inc. v. Columbia Broadcasting System, Inc.*, 441 U.S. 1, 99 S.Ct. 1551, 60 L.Ed.2d 1 1979).
14. See *United States v. Brown University*, 5 F.3d 658 (3rd Cir. 1993).
15. See *White Motor Co. v. United States*, 372 U.S. 253 (1963).
16. See *Continental T. V., Inc. v. GTE Sylvania, Inc.*, 433 U.S. 36 (1977). A per se restriction on resales being subject to territorial restrictions had come in an analysis of distribution practices for Schwinn bicycles in 1967. See *United States v. Arnold, Schwinn and Co.*, 388 U.S. 365 (1967).
17. See Ginsburg (1991).
18. We might note that the Miller-Tydings Act of 1937 (15 U.S.C. Sec. 1 (1970)) exempted manufacturers and retailers from prosecution under Section 1 of the Sherman Act when the retailers adhered to minimum prices, wherever state laws allowed them to do so. The resale price maintenance (RPM) scheme allowed under Miller-Tydings probably helped retailers to avoid price competition, but it was eventually overwhelmed by the discount-store revolution. The Robinson-Patman Act also helped small retailers hold off the chain-store revolution, but that revolution also came.
19. See *Dr. Miles Medical Co. v. John D. Park and Sons Co.*, 220 U.S. 373 (1911).
20. See *State Oil Co. v. Kahn*, 871 U.S. 96 (1997).
21. For roughly half of its life the CAB regulated safety as well as economic aspects of the industry. In 1958, the Federal Aviation Administration (FAA) was created to regulate airline safety. The FAA still exists, and its usefulness is seldom disputed. The CAB had probably fulfilled its function of aiding the development of air travel, and when it closed down in 1982 it was in the way of efficiency.

22. See Keeler (1972).
23. For early criticism of CAB policy toward entry, see Keyes (1951).
24. See Douglas and Miller (1974).
25. See Morrison and Winston (1986, 1989, 1995, 2000).
26. See Morrison and Winston (2000).
27. Fares under deregulation are higher on more concentrated routes, and that is not implied by contestability theory. See Baker and Pratt (1989).
28. See Morrison and Winston (1999).
29. See Morrison and Winston (2000).
30. See "A Jam at 32,000 Feet," *Economist*, February 5, 2000, p. 57.
31. For criticism of present practices that limit entry, such as long-term leasing of landing slots and gates reserved for exclusive use by one airline, see FAA/OST Task Force Report, 1999, *Airport Business Practices and Their Impact on Airline Competition*, U.S. Department of Transportation.
32. *Munn v. Illinois*, 94 U.S. 113 (1977).
33. See Sherman (1989), Ch. 7.
34. *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).
35. For examples, see Crew (1992).
36. The case that opened this right of access to essential facilities was decided in 1912, when the Supreme Court required railroads jointly owning a railroad bridge to allow other railroads to use it. See *United States v. Terminal Railroad Association of St. Louis*, 224 U.S. 383 (1912) and 236 U.S. 194 (1915).
37. For descriptive evaluations of the doctrine, see Kovacic (1992) and Lipsky and Sidak (1999).
38. 224 U.S. at 411.
39. See Temin (1987, p. 26).
40. For description of this situation see Mitchell and Vogelsang (1991).
41. See *AT&T Corporation, et al. v. Iowa Utilities Board, et al.*, 119 S.Ct. 721 (1999).
42. At this date only about 3 percent of local phone users can choose between local phone service providers. See Schiesel (2000c).
43. For evaluation of effects of the Telecommunications Act of 1996, see Crandall and Hausman (2000).
44. See Schiesel (2000a).
45. See Schiesel (2000b).
46. For a good example of such constructive work, see Crandall and Hausman (2000).
47. Cogenerators usually produce heat as a by product from a process that serves some other purpose, and the heat can be used to produce electricity.
48. For a review of the Act, see Jeffrey D. Watkiss and Douglas W. Smith (1993, pp. 447-492).

49. The right of access to a transmission service was established in an antitrust case, *Otter Tail Power, Inc. v. United States*, 410 U.S. 366 (1973). It required a privately owned utility to transmit power for a municipal electric system when denial of the transmission service would have brought municipal business to the privately owned utility.
50. For a description of the way the electricity industry has been organized historically and how it is being changed, see Kwoka (1996).
51. See Statement of Thomas M. Lenard (1999).
52. For lessons from electricity restructuring in England, see Kwoka (1997).
53. This early electricity market is described by Linda Cohen (1982).
54. See Gregg Easterbrook (1993).
55. For description of the California plan, and of deregulation efforts to date, see Joskow (2000).
56. Order 888, "Promoting Wholesale Competition through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities," issued April 24, 1996, 75 FERC §61,080.
57. Order 889, "Open Access Same-Time Information Systems," issued April 24, 1996, 75 FERC §61,078.
58. See Banerjee (2000a, p. C1).
59. See Sterngold (2000, p. 12).
60. See Banerjee (2000b, p. 1) and Smith (2000, p. 1)
61. See, for example, Weisman (2000).
62. For examples of work by economists that tries to understand possible strategic behavior in these new markets, see Newberry and Pollitt (1997) and Fernando, Kleindorfer, and Wu (2000).
63. See Wiseman (2000).
64. See, for example, Brown and Goolsbee (2000).
65. See, for example, Deck and Wilson (2000).
66. See Merges (1997).
67. For treatment of antitrust applications in an Internet world, see Eisenach and Lenard (1999).
68. Based on a 1962 Supreme Court decision, the pattern or practice of illegal behavior can be supported by internal documents that reveal such a pattern or practice within the firm, whether every one of its challenged acts was a violation or not. See *Continental Ore Co. v. Union Carbide and Carbon Corp.*, 370 U.S. 690 (1962).
69. See "Bertelsmann, Napster Set Plans For Subscription-Based Service," <http://interactive.wsj.com/articles/SB973003901518638873.htm>, October 31, 2000.
70. See Lessig (1996, 1999a, 1999b).
71. See Lessig (1996, p. 1408).
72. See, for examples, Cohen (1998), O'Rourke (1995), and Merges (1997).