

Before the
U.S. House of Representatives
Committee on the Judiciary
Subcommittee on Regulatory Reform, Commercial and Antitrust Law
Washington D.C.
June 20, 2014

“Net Neutrality: Is Antitrust Law More Effective than Regulation
in Protecting Consumers and Innovation?”

Submitted Written Testimony of

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Director, Stanford Public Policy Program
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Thank you, Mr. Chairman, for this opportunity to address the subcommittee.

Is antitrust law enforcement sufficient to address so-called “net neutrality”? Or do we need new regulatory safeguards? Although these questions are somewhat technical and arcane, they seem to arouse strong emotions among many citizens. I commend the committee on its efforts to contribute to the public debate, and perhaps to better define the policy issues.

My written testimony briefly summarizes the analysis set out in greater detail in the publications appended to this submission.

I have devoted much of the past 45 years to study of the communications industry and its regulation, including radio and TV broadcasting, cable television, telephone service, use and allocation of the radio spectrum, the Internet, and the many technologies, old and new, used to supply such services. I have had the privilege of working in telecommunications policy analysis in the executive branch of the government, in antitrust enforcement at the U.S. Department of Justice, in academic research and teaching at Stanford and Duke, and in consulting work. My special focus has been on the effects of regulation of these industries on the consuming public.

Communications regulation does not make a pretty picture. Over the last 100 years the Federal Communications Commission has pretty generally interpreted its legislative mandate in ways that stifle competition and technological innovation. Outcomes have in many cases probably been worse for consumers than the dangers they might have faced from unregulated monopolies or oligopolies. I believe that FCC commissioners have been trying their best for the public. However, the nature of our political system can easily mislead policy makers who seek to further the public interest. When it comes to low-salience technical matters involving regulated industries, it is the regulated firms themselves and

other well-financed interest groups that dominate the policy debate. Theirs are the loudest voices heard in Washington and at the FCC. The interests of consumers are far less well represented.

Antitrust enforcement has, in general, been much more successful than regulation in service to the public. Especially since the 1970s, the goal of enhancing consumer welfare has been explicit at the antitrust agencies, and widely accepted by the judicial branch. The days of protecting competitors from competition are long past. I played a role in the litigation¹ that resulted in the disintegration of the old Bell System monopoly—both before the complaint was filed and in testimony at the trial. I believe that antitrust case, together with the burst of bipartisan deregulatory policies in the 1970s, led to the explosion of competition and technological innovation in the communications industries that we see all around us today.

The history of communications policy over the last century, however well-meant, has tended to protect incumbent providers from would-be competitors and innovators at a substantial cost to the public. This cost in my view likely far outweighs whatever benefits may have resulted from the short-term purposes served by the regulation. This applies especially to regulations that were vague, or prophylactic—that is, intended to forestall a theoretical danger in advance of its possible occurrence. In contrast, antitrust enforcement (merger law aside) is designed to deter or remedy specific instances of anticompetitive behavior, defined in terms of harms to customers. Antitrust action requires *evidence of harm*. Even in merger cases, courts increasingly require strong evidence that harm to consumers is very likely.

History lessons

History, of course, can be a useful adjunct to analysis of policy alternatives. Proponents of net neutrality may recognize their own fears and goals, for example, in the following 120-year-old claim:

[T]he paramount evil chargeable against the operation of the transportation system of the United States as now conducted is unjust discrimination between persons, places, commodities, or particular descriptions of traffic. The underlying purpose and aim of the [proposed legislation] is the prevention of these discriminations....²

This is from the legislative history of the first modern attempt by the federal government to regulate directly the behavior of large firms, in this case railroads. The result was the 1887 Act to Regulate Commerce, which contained this key provision:

[I]t shall be unlawful for any common carrier [railroad] subject to the provisions of this act to make or give any undue or unreasonable preference or advantage to any particular person, company, firm, corporation, or locality, or any particular description of traffic, in any respect

¹ U.S. v. AT&T et al. 552 F. Supp. 131 (D.D.C., 1982), affirmed February 28, 1983.

² Senate Report No. 46, 49th Cong., 1st Sess., p. 215, as quoted in *Houston E. & W. Tex. Ry. Co. v. United States*, 234 U.S. 342 (1914).

whatsoever, or to subject any particular person, company, firm, corporation, or locality, or any particular description of traffic, to any undue or unreasonable prejudice or disadvantage in any respect whatsoever.³

This and subsequent legislation gave the now-defunct Interstate Commerce Commission (ICC) the power to prevent discrimination of the kind apparently feared by proponents of net neutrality. The policy did not work.

Railroads continued to price discriminate, filing rates with the ICC to charge different prices for hauling different commodities of the same weight, volume and origin/destination. So did regulated trucking firms. Railroad tariffs grew longer and more complex each decade. In the end, before it was abolished in 1995, the ICC was little more than the titular head of a series of highly discriminatory and dysfunctional regional transport cartels. There are few today who believe that this century-long experiment with regulation achieved net benefits for Americans.

We have more recent evidence in telecommunications itself of the intractable difficulty of preventing even truly anticompetitive discrimination, in this case by vertically integrated monopolies.⁴ Few historical events resonate in telecommunications policy with the clarity of the 1982 settlement that terminated the trial in *U.S. v. AT&T*. The old Bell System agreed to settle by accepting the entire relief package sought by the government. The relief called for a platonically pure structural disintegration and future isolation of the local Bell telephone monopolies from the competitive services then offered by Bell, including long-distance service and equipment manufacturing. The reason: regulation had failed to prevent discrimination against and in fact exclusion of Bell's competitors. It was antitrust action not regulation that brought an end to the suppression of competition in telephone service.

I have more to say about transportation and telecommunications regulation later in this testimony. But it is important to explain at once that a primary focus of the net neutrality issue is vertical integration. The fear of discrimination arises, I suppose naturally, from the perception that a vertically integrated firm will use any market power it may have at any stage of production to protect or extend market power in other stages.

Abstract economic models predict that when allocation within a firm replaces what had been decentralized market exchanges, consumer welfare (present and also future, because of incentives for innovation) may increase or decrease. In other words, the economic incentive to expand horizontally or vertically is usually, though not always, compatible with the social interest in maximizing long-run consumer welfare. We have two tools to deal with the possible bad outcomes: antitrust and regulation.

³ Section three of the Act to Regulate Commerce (February 4, 1887, c. 104, 24 Stat. 379, 380).

⁴ Local telephone companies were generally assumed to be natural monopolies until at least the 1990s. *AT&T Corp. et al. v. Iowa Utilities Board et al.* 525 U.S. 366, 371 (1999).

Antitrust policy works by seeking to prevent, directly or through deterrence, welfare-reducing expansions in the scope of firms without indirectly and inadvertently deterring expansions that benefit consumers. This is easy to say, but very tough to accomplish in practice. The requisite information is difficult to assemble and assess and the same tools (e.g., statements of enforcement policy and appellate precedents) can have indirect deterrent effects on both good and bad changes in the scopes of firms.

Hard as it is to calibrate antitrust policy, calibrating regulation is even more difficult. Aimed at improving serious long-term incompatibility between private incentives and social welfare, regulators intervene continuously and directly in firm decisions. The simplest case is the incentive of a monopolist to restrict output in order to maximize profit. Traditionally, public utility regulators set maximum prices and required utilities to serve all comers at or below those prices. In principle, this might achieve an efficient level of output. But in practice, the constraint itself almost invariably produced incentives that distorted internal allocation decisions of regulated firms, raising costs. In addition to and generally worse than those distortions, regulatory agencies themselves frequently have been more concerned with the welfare of the firms they regulate than with the economic welfare of the consuming public. In many cases, consumers would have been better off without regulation. The starkest evidence: deregulation of airlines, trucking, and most rail rates actually produced lower prices and more efficient industry structures.

This brings us to net neutrality. I suppose most of the people who favor net neutrality have no very specific idea what it means. Net neutrality is a slogan, not a policy. Perhaps deliberate vagueness explains the term's popularity. Of course, it is a rare curmudgeon who opposes fairness and favors unfair discrimination. Journalists tend to explain net neutrality as a condition in which all users pay the same for Internet access, no one gets inferior service, and no one is denied service, "for the same content." Regulation is thought to be required to ensure this, even though there is no significant evidence of anticompetitive discrimination today.⁵ The fear is that such behavior may develop in the future. Specifically, cable operators have long had a reputation for dubious service quality and increasing prices, and well-publicized media and telephone mega-mergers are often regarded as signs of impending threats. The most specific fear apparently is that cable television providers that currently offer both conventional "linear" TV networks and also Internet access service will discriminate against or deny service to competing providers of competing on-line video services, such as Netflix, in order to protect their profits from the traditional part of their businesses.

⁵ In fact the FCC after trying and failing twice to enact lawful versions of net neutrality (see *Verizon v. F.C.C.*, D.C. Cir. No. 11-1355, decided Jan. 14, 2014), only last week announced that it was opening an inquiry to see if it could find evidence that would justify such a policy, the week *after* it announced pursuit of yet a third version of net neutrality. Edward Wyatt for the *New York Times*, "F.C.C. to Investigate Agreements Between Content Companies and Net Service Providers," June 13, 2014 <http://nyti.ms.1qbObFG>

What is Discrimination?

The Internet is an interconnected set of facilities (fiber optic cables, servers, routers) owned by many different companies that provide services to each other and to end users. These facilities are used for many purposes, not just Internet service. Examples include ordinary telephone service and capacity leased to cell phone companies and large businesses that use private networks to interconnect plants and offices. Each Internet user negotiates terms with the owner of whatever hardware is used to connect to the greater Internet. That owner in turn negotiates terms with other networks with which it seeks to exchange traffic. Large facilities providers with roughly equal demands for each other's capacity may exchange traffic without any payment (the payments roughly cancel out, so why bother?) This is known as "peering." When demands are not symmetric, one party typically pays the other for interconnection service. The negotiation involves prices and service quality, including "bandwidth" (speed in bits per second). Prices vary with, among other things, the amount of capacity (bandwidth) supplied. This is because more capacity costs more to produce. Notably, as with telephone service, users pay both to initiate and to be able to receive communications whether open circuits or digital packets. Even retail users of the Internet often negotiate both price and service quality. New or renewing cable and telephone subscribers are typically offered various discounts (or months of free service); subscribers threatening to terminate service also may be offered discounts.

Providers typically offer different Internet connection speeds or bundles of services at different prices. For example, business users may demand and be willing to pay more for faster speeds, and this is also true for some residential users. The actual performance of any interactive system using shared facilities varies according to capacity utilization. Each user's traffic varies, and at peak times or days capacity utilization in one or more parts of a network may approach 100%. Traffic then stops or slows as longer alternative routes (if any exist) are taken. Providers offering such service must invest in enough capacity to maintain the minimum service quality promised to each user even as overall traffic grows.

Digital communications capacity is fungible, in the sense that capacity used for any given purpose can be repurposed for a different use. These changes require time and may involve new equipment; they are not costless. In this context, one must be very precise in defining "discrimination." In antitrust and economic analysis it is **not** discriminatory to charge different customers different prices unless the services provided are identical in all respects and also cost the same to produce. Note even then, discrimination may increase consumer welfare, enabling consumers with lower values to be charged lower prices.

Internet users, whether residential or industrial, should expect to pay more for goods and services that cost more to produce, even when the "content" is identical or similar. Competitive markets produce that result and economic efficiency requires that result. The reportedly adverse popular reaction to the FCC's most recent proposal on net neutrality, which essentially took the position that charging more for higher speed service was not by itself discriminatory, suggests a widespread misunderstanding of how competitive markets work. A moment's reflection should make it plain that buying more of almost any

good or service, or a better quality of service, will cost more to supply and for that reason alone carry a higher price. If regulators forbid charging more for the more costly service the result will simply be that the service will not be provided. On the other hand, charging a price significantly higher than cost creates profitable opportunities for competitors or entrants to expand their market shares. Competition provides this discipline automatically. Regulation does not.

Further, the “equal prices for all who provide the same content” interpretation of net neutrality rests on no coherent theory of social justice. Some regulatory interventions are at least nominally intended to benefit disadvantaged groups such as minorities, the elderly, or the poor, and thus to justify reductions in efficiency. There is no such argument favoring net neutrality. Unlimited Internet access at a below-cost price should not be an inalienable right. Its beneficiaries are not minorities, the elderly or the poor.

Discrimination against competitors

What about the fear that cable television operators that also offer Internet access will discriminate against suppliers of competing online video programmers? Several lines of analysis are helpful here.

First, denying access to a competing supplier of a vertical service is not necessarily profitable, even if the cable company (for example) is the only local supplier of Internet access. Such a monopoly operator can charge a monopoly price for access. If it excludes a competing program supplier, however, it gives up the increased monopoly revenue that would come from the competitor’s use of the access service. Charging users a higher price for programming is not guaranteed or even likely to offset the loss of monopoly revenue from transmission. Generally, a monopolist can only charge one monopoly price. Some exceptions exist. The old Bell System was an exception because its profits were regulated, and not at monopoly levels at a time when local telephone service was assumed to be a natural monopoly. Excluding competitors raised costs but also permitted higher prices to offset the costs of exclusion. The Bell monopoly lasted for many decades in part *because* of regulation.

Second, it simply is not true that cable television operators have monopolies in the distribution of video programming, online or otherwise. Most U.S. households have access to at least three established providers of linear video services—one cable operator and two satellite companies. In addition, wireless broadband internet service is growing very rapidly, largely because of the popularity of smart phones and tablets, which can be and are used to watch online video. A growing number of individuals use such services as their chief source of video entertainment. This adds three or four additional wireless video and Internet access providers to the three pre-existing video suppliers and the one or two Internet access providers already serving many large cities. (The largest landline telephone companies, AT&T and Verizon, offer fiber optic broadband service to residential users in several densely populated areas.) This amount of competition is sufficient to make regulation a truly bad bet for improving consumer welfare and stimulating innovation.

Further improvements in wireless broadband services lie in the future, even for relatively low-population-density areas: low earth orbit micro satellites are one such possibility. Today's large broadcast satellites are in geostationary orbit, much too far away for interactive Internet services because of delays in transmission. Low earth orbit satellites are not stationary with respect to the Earth, so more of them are required to ensure that at least one is always serving a given area, but they are much less expensive to build and launch. Miniaturization, economies of scale, and private launch services continue to reduce costs. This technology may eventually offer an opportunity for even more competition in video and other broadband services. Also, suppliers in other nations, such as South Korea, are already developing so-called "5G" technology to harness new frequency ranges for terrestrial wireless services.⁶

The presence of competition in local digital transmission services means that, going forward, cable operators cannot successfully exclude video competitors from the market through discriminatory pricing or otherwise. It would be pointless to discriminate against or exclude rival program suppliers from access to digital cable subscribers. The FCC has traditionally ignored this conclusion by regulating each transmission technology as if the others did not exist. This Alice in Wonderland approach is rationalized by the structure of the Communications Act, which also takes a technology-based approach to communications law. Whatever the legal basis for the regulatory silos used by the FCC, the effect is anticompetitive. Regulation generally impedes competition.

Third, even if anticompetitive behavior took place on a broad scale (hypothetically making antitrust solutions impractical) the FCC has the power to provide a competitive rather than a regulatory solution. Virtually all of the growing competition in broadband Internet service involves use of the radio spectrum. The FCC controls the amount of spectrum available for each use. The FCC can and should make more spectrum available for wireless broadband services and also permit licensees in other bands to repurpose their spectrum for wireless broadband. Indeed, it is now clearer than ever, from the FCC's spectrum auctions and subsequent market transactions, that markets rather than regulators should be deciding how spectrum should be allocated and assigned, using a property rights system.

The bottom line here is that if a cable operator or other transmission entity is accused of attempting to exclude competitors through discriminatory tactics there should not be a high index of suspicion, and there should not be a prophylactic regulation. If what appears to be anticompetitive discrimination takes place it is more likely to be because the entity is pursuing a competitive advantage resulting from cost reductions or product improvements than because the intent is to harm consumers. In any case, exclusion is unlikely to be successful. Such situations rule out regulatory regimes and blanket prohibitions because they are likely to result in handicapping rather than encouraging competition. In contrast, antitrust law that treats each case on its merits is well-suited to the task of deterring or penalizing discriminatory behavior in the unusual situations where it may arise. Finally, if the FCC wants

⁶ "EU, South Korea to Ally on Faster Mobile Access," Wall Street Journal Online, June 16, 2014. <http://online.wsj.com/articles/eu-south-korea-to-lay-out-plan-for-5g-networks-1402844523?KEYWORDS=5G+wireless>

to ensure that Internet access is priced competitively, efficiently, and at the lowest possible prices, it can accomplish that goal best by eliminating its longstanding competitive restraints in spectrum markets. For example licensees are presently forbidden to use their spectrum assignment for anything but the narrow purpose specified in their licenses, even if the alternative use creates no interference problems and increases competition.

As noted above, a relevant example of regulatory distortion is the incentive to expand the scope of the firm vertically into the sale of unregulated products, and a concomitant incentive to exclude competitors from such markets. This was the central economic basis for the Justice Department litigation, seeking to disintegrate the old AT&T vertically, that was commenced in 1974 and led to the 1982 settlement and the actual breakup in 1984. One policy basis for the lawsuit was the failure of the FCC, despite many years of effort, to prevent AT&T from finding ways to keep competitors out of potentially competitive markets into which it had integrated vertically. One way to characterize the problem is that because the Bell system owned the local telephone monopolies, it could force them to accept the lost revenues and lost profits that resulted from exclusion of AT&T's long distance and equipment competitors. Some of the loss would be made up by rate-of-return regulation and another part from paying supra-competitive prices for the goods and services supplied exclusively by AT&T to the local companies. FCC staff officials testified in the trial of the case that, despite strenuous effort, their attempts to prevent exclusionary conduct had failed.

Behind the failure of the FCC's attempts to control AT&T's anticompetitive behavior were AT&T's control of the information (about, for example, its costs) required by regulators to monitor and control the company's behavior, AT&T's control of the definitions and pricing of its services, and the inherent constraints of administrative law on agency behavior. A leading example of those problems is the series of regulatory proceedings called Computer Inquiries I, II, and III. In those proceedings, the FCC sought to find an effective method to permit the old AT&T to provide services in unregulated competitive markets while ensuring that AT&T would not or could not engage in anticompetitive behavior by favoring its own subsidiaries.

Among the regulatory strategies explored was the concept of the "fully separated subsidiary," a corporate unit organized to provide competitive services that was separated by an accounting firewall from the monopoly side of the business. But it became apparent that a meaningful accounting separation was impossible so long as the benefits from permitting AT&T to continue to supply inputs both to its own competitive downstream businesses and to the competitors it faced in those businesses arose from economies of scope or scale in the joint provision of inputs to both monopoly and competitive markets. For example, there exists no unique, economically legitimate method to allocate joint and common costs. In any case, so long as AT&T owned both the regulated monopoly business and the related competitive business, anticompetitive incentives would persist. The Computer Inquiry rulemakings ended in morasses of complex, unworkable, and ineffective or self-defeating regulations.

Remarkably similar problems arose in negotiations between AT&T and the Antitrust Division to settle the Section 2 antitrust litigation. The negotiations took place in the last days of the Carter administration and the early days of the Reagan administration. The talks ended with complex regulatory proposals ultimately abandoned by both sides as unworkable. They were referred to by the parties as Quagmire I and Quagmire II. AT&T chairman Charles Brown later explained his decision to accept the relief sought by the government in the antitrust case. The quagmires of unworkably detailed regulatory solutions that seemed inevitably to emerge from efforts to solve the underlying problem of incentive incompatibility (not his phrase) led him to conclude that isolation of the monopoly portion of the business from its competitive components was the only way AT&T would be able to escape endless private and public disputes with competitors and regulators, and become free to focus on its business of providing communication services. AT&T therefore capitulated.

Unfortunately, Judge Harold Greene had not had the benefit of the Computer Inquiries and Quagmire experiences. When the government and AT&T filed the proposed settlement, with its stark and permanent isolation of the monopoly local service companies from participation in any competitive business requiring use of their monopoly facilities, Judge Greene rejected the platonic solution in favor of regulation by the court. He made exceptions for certain “information” services and he insisted on a waiver process, permitting the local monopolies to enter competitive lines of business on a case by- case basis with the court’s consent. Predictably, the court was subsequently bogged down in massive and bitter multiyear waiver proceedings, most of which recapitulated the lessons of the Computer Inquiries and the Quagmires.

The AT&T settlement ultimately was undone by the 1996 Telecommunications Act, which sought to solve the problem of competitive access to monopoly local telephone facilities by, among other policies, providing for the further (accounting) disintegration of local telephone facilities into “network elements,” each to be offered and priced separately to businesses seeking to compete with the local Bells. The resulting FCC implementation procedures were repeatedly challenged by the Bells, resulting in several trips to the Supreme Court. The 1996 Act failed to induce facilities-based entry into local wire line telephony. Instead, market forces took an end-run around the Bell bottleneck.

Despite Judge Greene’s misstep, the temporary isolation of the Bell companies from long-distance service, combined with growing competition from wireless telephone providers and VOIP services such as Skype was sufficient to permit competition to develop both in long-distance and local telephone service. About forty percent of the U.S. population has now abandoned wireline telephone service entirely. The arrival of competition in local telephony (and, as it turned out, video services) was made possible by the advance of digital and wireless technology and continuing reductions in the hardware costs of providing such services. Competition has finally come to local telephone service, not because of a century of government regulation, but in spite of it.

We need not repeat history

The history of attempts to regulate the old Bell System under traditional utility regulation principles (common carrier access rules and maximum price regulation) and the ICC's even less successful experience in eliminating discrimination in transportation suggest some lessons for communications policy today. Those lessons recapitulate the story of the earlier attempts to control discrimination in rail service.

First, as the examples above attest, there is little clear evidence that traditional regulation ever achieved even its narrow objective of making nondiscriminatory service available to all at cost-based prices. On the contrary, discrimination on the basis of factors correlated with price elasticity has been a commonplace of regulation from the time of the 1887 Act to the present. The FCC, if it is to enforce what appears to be its version of net neutrality, will have to compare prices with costs for cable television systems and other multimedia providers. Joint and common costs are an inherent feature of the provision of Internet access and transmission. The task is simply beyond the FCC's abilities.

Second, the regulation remedy makes the disease worse. Regulators and regulation often have served as deterrents to technical innovation, both by incumbent monopolists and potential entrants. Bell Labs was a famous source of *invention*, but AT&T was a ponderous and reluctant *innovator*—that is, implementer of new technology. The framework of regulation and the principles of administrative law gave incumbent producers great leverage in preventing entry by competitors. This, in turn, reduced the incumbent's own incentive to innovate.

Third, there is no body of learning or experience from other contexts suggesting that these failures might be remedied significantly by "better" regulatory practices. The long run interests of consumers arguably are better served by unregulated (and therefore hopefully shorter-lived) monopoly than by regulated (and therefore likely semi-permanent) monopoly. In Internet access, fortunately, there is no incumbent monopoly and every chance that the extent of competition will increase—if the regulators act in consumers' rather than in incumbent suppliers' interest.

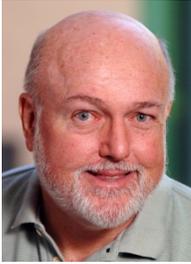
With the possible exception of the platonic isolation approach of the original, never-implemented 1982 Justice Department/AT&T settlement agreement, no approach to controlling anticompetitive behavior by vertically integrated, regulated monopolists in the communications industry or in transportation has been successful, and most have injured consumers' interests. If consumers really did face the imminent prospect of last-mile monopoly and anticompetitive access discrimination in broadband services, the sad lesson of history is that the "net neutrality" remedy is a cure far worse than the still hypothetical disease.

Appended Online Materials

[“Antitrust and Vertical Integration in ‘New Economy’ Industries with Application to Broadband Access,”](#)
[Review of Industrial Organization 38:4 363-386, 2011.](#) DOI: 10.1007/s11151-011-9291-y

[“Antecedents to Net Neutrality,”](#) *Regulation*, Fall 2007
<http://www.cato.org/pubs/regulation/regv30n3/v30n3-3.pdf>

[“Assigning Broadband Rights,”](#) *Regulation*, Summer 2004.
<http://www.cato.org/pubs/regulation/regv27n2/v27n2-2.pdf>



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PUBLICATIONS

BOOKS

“Decorrupting Government” (unpublished draft monograph, 2013).

The Internet Challenge to Television, Harvard University Press, 1999.

Economics of a Disaster: The Exxon Valdez Oil Spill, Praeger, 1995. (with others)

Electric Utility Mergers: Principles of Antitrust Analysis, Praeger, 1994. (with M. Frankena)

Video Economics, Harvard University Press, 1992. (with S. Wildman)

The Political Economy of Deregulation, American Enterprise Institute, 1983. (with R. Noll)

The Regulation Game: Strategic Use of the Administrative Process, Ballinger, 1978. (with R. Braeutigam)

Economics and Freedom of Expression: Media Structure and the First Amendment, Ballinger, 1975.

Television Economics, D.C. Heath, 1974. (with J. Beebe, and W. G. Manning, Jr.)

CHAPTERS OR SECTIONS OF BOOKS

“Communication Policy Reform, Interest Groups, and Legislative Capture.” In R. May, ed. *Communications Law and Policy in the Digital Age: The Next Five Years*. Carolina Academic Press, 2012

“Media Regulation,” *Oxford Companion to American Politics*, Oxford Univ. Press 2012

“[A Fresh Start in Communications Policy: Two Modest Reforms](#),” in R. May, ed., *New Directions in Communications Policy*, Carolina Academic Press, 2009.

“Antitrust in China 2006: The Problem of Incentive Compatibility,” in *Policy Reform and Chinese Markets*, B. M. Fleisher, et al., eds., Edward Elgar, 2008 (with S. Sun and W. Zheng).

“Local Broadband Access: Primum Non Nocere or Primum Processi? A Property Rights Approach,” in T. Lenard and R. May, eds., *Net Neutrality or Net Neutering*, Springer, 2006. (with G. Rosston).

[“Spectrum Allocation and the Internet,”](#) in *Cyber Policy and Economics in an Internet Age*, edited by William Lehr and Lorenzo Pupillo, 2003. (SIEPR Policy paper No. [01-009](#)) (with G. Rosston)

“Broadband Mysteries” in R. W. Crandall and J. H. Alleman, eds, *Broadband: Should We Regulate High-Speed Internet Access?* Brookings, 2002.

“Media as Industry: Economic Foundations of Mass Communication” in R. Islam, ed., *The Right to Know: Institutions and the Media*, World Bank, 2002.

“A Novel Conference: The Origins of TPRC,” in J. MacKie-Mason and D. Waterman, eds., *Telephony, the Internet and the Media: Selected Papers from the 1997 Telecommunications Policy Research Conference*, Erlbaum, 1998; reprinted in S. Braman ed., *Communication Research & Policy: A Sourcebook*, MIT Press, 2002.

“The Future of Television: Understanding Digital Economics,” in Noll and Price, eds., *A Communications Cornucopia: Markle Foundation Essays on Information Policy*. Brookings Institution, 1998.

United States v. AT&T: The Economic Issues, in Kwoka and White, eds., *The Antitrust Revolution*, Scott Foresman, 1988; 2nd ed. 1994. (with R. Noll)

“United States v. AT&T: An Interim Assessment,” in Hausman and Bradley, eds., *Future Competition in Telecommunications*, Harvard Business School Press, 1988. (with R. Noll)

“Defining Geographic Markets under the 1984 Merger Guidelines: An Economic Perspective (Outline),” in Practising Law Institute, 27th Annual Advanced Antitrust Seminar, Course Handbook Series No. 581, PLI, 1987.

“The Rise and Fall and Rise of Cable Television Regulation,” in L. Weiss, ed. *Regulatory Reform: What Actually Happened*, Little, Brown, 1986. (with P. Gottlieb)

Horizontal Mergers: Law and Policy, ABA Section of Antitrust Law Monograph No. 12, 1986. (contributor)

“Program Competition in the New Video Industry,” in E. Noam, ed., *Rivalry Among the Video Transmission Media*, Columbia Univ. Press, 1985. (with S. Wildman)

“Interest Group Behavior and the Political Economy of Regulation,” in J. Meyers, ed., *Incentives vs. Controls in Health Policy: Broadening the Debate*, AEI, 1985.

“Some Economic Implications of the Divestiture of the Bell Operating Companies,” in H. Shooshan, ed., *Disconnecting Bell*, Pergamon Press, 1984. (with R. Crandall)

The Use of Economists in Antitrust Litigation, J. Greenfeld, ed., ABA Section of Antitrust Law, 1984. (contributor)

“Economic and Postal Pricing Policy,” in J. Fleishman, ed., *The Future of the Postal Service*, Praeger, 1983. (with R. Willig)

"Differing Media, Differing Treatment?" in D. Brenner and W. Rivers, eds., *Free But Regulated: Conflicting Traditions in Media Law*, 1982.

"The Rise and Fall of Cable Television Regulation," in L. Weiss, ed., *The Regulatory Revolution*, Little, Brown, 1981.

"Diversity and Television," OTP Staff Research Paper, 1972, reprinted in D. H. Ginsburg, *Regulation of Broadcasting*, West, 1979.

"Alternative Structures for Television," OTP Staff Research Paper, 1972, reprinted in D. H. Ginsburg, *Regulation of Broadcasting*, West, 1979. (with J. H. Beebe)

"The Place of Print in an Electronic Society," in G. O. Robinson, ed., *Communications for Tomorrow: Policy Perspectives for the Future*, Praeger, 1978.

"Cable Television: The Framework of Regulation," in Study on Federal Regulation, App. to Vol. XI, Framework for Regulation, Comm. on Govt'l Affairs, United States Senate, 95th Cong., 2nd Session, October 1978.

"Economic Policy Research on Cable Television: Assessing the Cost and Benefits of Cable Deregulation," in P. A. MacAvoy, ed., *Deregulation of Cable Television*, American Enterprise Institute, 1977. (with others)

"The Role of Analysis in the Formation of Cable Television Policy," in R. E. Park (ed.) *The Role of Analysis in Regulatory Decision Making: The Case of Cable Television*, Lexington Books, 1973.

ARTICLES

["Antitrust and Vertical Integration in 'New Economy' Industries with Application to Broadband Access," *Review of Industrial Organization* 38:4 363-386, 2011.](#) DOI: 10.1007/s11151-011-9291-y

"The Temptation of Media Regulation," [Regulation, Vol. 31, No. 1, Spring 2008](#)

"Antecedents to Net Neutrality," *Regulation* (Fall 2007)
<http://www.cato.org/pubs/regulation/regv30n3/v30n3-3.pdf>

["China's Competition Policy Reforms: The Antimonopoly Law and Beyond,"](#) 75 *Antitrust Law Journal* 401 (2008) (with Su Sun and Wentong Zheng)
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=978810 Reprinted in *Library of Essays on Chinese Law, Volume III, Law and the Market Economy in China*, Perry Keller, ed., 2011.

"Antitrust in China: The Problem of Incentive Compatibility," 1 *Journal of Competition Law and Economics* Winter, 123-48, 2005, (with Su Sun and Wentong Zheng).
<http://ssrn.com/abstract=595801>

"Assigning Broadband Rights," *Regulation*, Summer 2004.

<http://www.cato.org/pubs/regulation/regv27n2/v27n2-2.pdf>

"Coordinated Interaction and Clayton Enforcement," 12:1 *Geo. Mason L. Rev.* 89, 2003
(with Stuart Gurrea) http://papers.ssrn.com/sol3/papers.cfm?abstract_id=406840

"Regulatory Reform: The Telecommunications Act of 1996 and the FCC Media Ownership Rules" 2003 *Michigan State-DCL Law Review* 671, 2003.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=406261

"Determining Optimal Access to Regulated Essential Facilities," 58 *Antitrust Law Journal* 887, 1989.

"Competitive Policy Considerations in Cable Television Franchising" 4 *Contemporary Policy Issues* 69, April 1986. (with P. Greenhalgh)

"The Evolution of Clayton §7 Enforcement and the Beginnings of U.S. Industrial Policy" 31 *Antitrust Bulletin* 409, Summer 1986. (Reprinted in D. Audretsch, ed., *Industrial Policy and Competitive Advantage*, Edward Elgar, 1997.)

"[An Economic Analysis of Alternative Fee Shifting Systems](#)" 47 *Law and Contemporary Problems* 801, 1984. (with R. Braeutigam and J. Panzar)

"Structural Approaches to the Problem of TV Network Economic Dominance," 1979 *Duke Law Journal* 191, 1979

"Diversity in Broadcasting: The Economic View of Programming," 28 *Journal of Communication* 43, Spring 1978.

"Television Programming, Monopolistic Competition and Welfare," 91 *Quarterly Journal of Economics* 103, February 1977. (with A. M. Spence)

"Kickbacks, Specialization, Price Fixing, and Efficiency in Residential Real Estate Markets," 29 *Stanford Law Review* 931, May 1977. (with J. Grundfest)

"Regulating Diversity: The Case of Radio Formats," 21 *Journal of Broadcasting* 305, Summer 1977.

"Television Rivalry and Network Power," 24 *Public Policy* 33, Winter 1976. (with W. Manning)

"Newspaper and Television Station Joint Ownership," 18 *Antitrust Bulletin* 787, Winter 1973.

"Monopoly Pricing in Combined Gas and Electric Utilities," 15 *Antitrust Bulletin* 713, Winter 1970.

"Public Policy and Emerging Technology in the Media," 18 *Public Policy* 539, Summer 1970.

NOTES AND REVIEWS

["The FCC and the Unfree Market for TV Program Rights,"](#) Free State Foundation, Perspectives from FSF Scholars, March 2011.

["Saving Mt. Wilson -- and Increasing Spectrum Efficiency,"](#) Free State Foundation, Perspectives from FSF Scholars, October 27, 2009.

["A Better Way to Manage Spectrum,"](#) Free State Foundation, Perspectives from FSF Scholars, April 6, 2009.

["The Temptation of Media Regulation,"](#) Free State Foundation, Perspectives from FSF Scholars, May 1, 2008

[Book review](#) of Beato and Laffont, eds. *Competition Policy in Regulated Industries: Approaches for Emerging Economies. Journal of Economic Literature.* 2005.

"Imported Antitrust," Review of Michal Gal, *Competition Policy for Small Market Economies*, 21 *Yale Journal on Regulation* 441 2004.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=525042

Book Review of G. W. Brock, *Telecommunications Policy for the Information Age*, 34 *Journal of Economic Literature* 797 1996.

Book Review of F.M. Scherer, *Competition Policies for an Integrated World Economy*, 33 *Journal of Economic Literature* 1993, 1995.

"Flawed Reasoning," *Public Utilities Fortnightly*, July 15, 1993. (with M. Frankena)

"Antitrust Analysis of Electric Utility Mergers After the Energy Policy Act," *International Merger Law*, No. 30, February 1993. (with M. Frankena)

"Merger Control in Argentina," *International Merger Law*, No. 27, November 1992.

"Competitive Issues in Electric Utility Mergers," *International Merger Law*, No. 26, October 1992. (with M. Frankena)

"The Electronic Media," in *Proceedings of the 1990 Stanford Symposium on Democracy, Diversity, and News Media Ownership* (forthcoming).

[Book Review](#) of P. Temin, *The Fall of The Bell System*, 1988 *Regulation: AEI Journal on Government and Society* 2.

Book Review of A. Brown, *Commercial Media in Australia: Economics, Ownership, Technology and Regulation*, 17 *Economic Analysis and Policy* (n.s.) 105, March 1987.

"Recent Developments in Cable Television Regulation," 1 *Regulatory Reform: The ABA Section of Antitrust Law Industry Regulation Committee Newsletter*, December 1985.

"Cynicism and Credulity in Explaining Regulation," in *The Political Economy of Regulation: Private Interests in the Regulatory Process*, FTC Law and Economics Conf., March 1984.

Book Review of F. Fisher, et al., *Folded, Spindled, and Mutilated: Economic Analysis of U.S. v. IBM*, *Sloan Management Review*, Winter 1984.

R. G. Noll and B. M. Owen, "What Makes Reform Happen?" *Regulation*, March/April 1983.

"Discussion" prepared for the Session on the Economics of the First Amendment, annual meetings of the American Economic Association, New York, December 1973, 64 *American Economic Review* 400, May 1974.

"Comment on the Perfectly Competitive Allocation of Public Goods," *Review of Econ. and Statistics*, November 1969.

CONFERENCE PROCEEDINGS

Papers and Proceedings, 1972 Conference On Telecommunications Policy Research, Office of Telecommunications Policy, 1972. (editor)

Report of Papers and Proceedings, 1975 Conference on Telecommunications Policy Research, Aspen Institute for Humanistic Studies Program on Communications and Society, 1975. (editor)

OTHER

[Decorrupting Government: The United States Board of Overseers](#). working paper. 2013.

[Consumer Welfare and TV Program Regulation](#), Mercatus Center Report May 2012

[Communication Policy Reform, Interest Groups, and Legislative Capture](#), working paper 2012.

[Shooting in the Dark: Comments](#), CeLPU & CTIC Fourth International Conference on Equal Access Issues in Communications Law, Honolulu, November 26, 2010

[Antitrust and Vertical Integration in 'New Economy' Industries: Application to Broadband Access](#) Stanford Law and Economics Olin Working Paper No. 400. October 26, 2010.

[Old Media Policy Failures, New Media Policy Challenges](#), Keynote Speech, Conference on the Future of Public Broadcasting, University of Bayreuth, Germany May 2009

Comments of 71 Concerned Economists: Using Procurement Auctions to Allocate Broadband Stimulus Grants,

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1377523 2009

"Supreme Court Amicus Brief Regarding Morgan Stanley Capital Group Inc. v. Public Utility District No. 1 of Snohomish County, Washington" (November 01, 2007). Baumol, William J., Blaydon, Colin, Cicchetti, Charles J., Dubin, Jeffrey A., Fisher, Franklin M., Hahn, Robert W., Hausman, Jerry A., Hogan, William W., Kalt, Joseph P., Kleindorfer,

Paul R., Michaels, Robert J., Owen, Bruce M., Pirrong, Craig, Salinger, Michael A, Shavell, Steven, Smith, Vernon, Stulz, Rene, Sweeney, James L., Willig, Robert D. and Wolfram, Catherine D., AEI-Brookings Joint Center Brief No. 07-02 Available at SSRN:
<http://ssrn.com/abstract=1034200>

Bamberger, G., Baumann, M., Gale, J. Hazlett, T., Katz, M., Mikkelsen, K., and Owen, B., Economists Joint Letter on Bundling of Cable Programming, FCC Docket MB 04-207, 2004

[Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets](#) in Promoting Efficient use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, FCC WT Docket No. 00-230, (with 36 other concerned economists) February 7, 2001.

“Brief of Economists Amici Curiae,” State of New York, et al., v. Microsoft, United States District Court (DC), (with others) June 18, 2002.

“Lies, Damn Lies and the Legal Fictions of American Broadcast Regulation,” presented at American Enterprise Institute Conference on the Role of Government in the Transition to Digital Television, October 26, 2001.

“Vertical Integration by Cable Systems,” prepared for ABA Section of Antitrust Law, Cable Television: Was Regulation Right or Wrong?, National Symposium on Competition in the Cable Television Industry, Washington, D.C., June 12, 1990.

“[Economic Incentives and Legal Reform](#),” *Perspectives: Journal of the Overseas Young Chinese Forum*, (English edition). (with J. Portillo) June 2003

“Economists as Trustbusters?” *Wall Street Journal*, January 22, 1987.

“Cable Competition at Sufferance of Cities,” *Wall Street Journal*, May 9, 1985.

“Give AT&T the Freedom It Didn’t Want,” *Wall Street Journal*, December 6, 1984.

“How Roles Grew in a TV Rule-Making Drama” *Wall Street Journal*, October 19, 1983. (with R. Noll)

“A Most Expensive ‘Real Estate Custom,’” *Los Angeles Times*, December 4, 1977. (with J. Grundfest)

RESEARCH REPORTS

“The Net Neutrality Debate: Twenty Five Years after United States v. AT&T and 120 Years after the Act to Regulate Commerce” Stanford Institute for Economic Policy Research Working Paper 06-15 February 2007. <http://siepr.stanford.edu/papers/pdf/06-15.html>

“[Antitrust in China 2006: The Problem of Incentive Compatibility](#),” August 2006, (with Su Sun and Wentong Zheng). Working Paper, Stanford Center for International Development. <http://siepr.stanford.edu/papers/pdf/03-40.html>

“Confusing Success with Access: ‘Correctly’ Measuring Concentration of Ownership and Control in Mass Media and Online Services Stanford Law and Economics Olin Working Paper No. 283, SIEPR Policy Paper No. 03-026.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=545302 May 2004

“Cable Networks: Bundling, Unbundling, and the Costs of Intervention,” Economists Incorporated, July 2004 (with John Gale).

“The Effect of Controlling for Frequency Band (UHF/VHF) When Comparing the Quantity of Local News and Public Affairs Programming on Television Broadcast Network Owned and Operated Stations Relative to Network Affiliate Stations.” Economists Incorporated. Filed at FCC May 12, 2003. (with M. Baumann and R. Mortimer)

“Affiliate Clearances, Retransmission Agreements, Bargaining Power and the Media Ownership Rules.” Economists Incorporated. Filed at FCC April 21, 2003. (with M. Baumann and K. Mikkelsen)

“The Project for Excellence in Journalism’s PEJ Study of Ownership and Quality of Newscasts: A Critique. Economists Incorporated. Filed at FCC March 13, 2003. (with M. Baumann and K. Mikkelsen)

“News and Public Affairs Programming: Television Broadcast Network Owned and Operated Stations Compared to Network Affiliated Stations.” Economists Incorporated. Filed at FCC December 19, 2002. (with K. Mikkelsen, R. Mortimer, and M. Bauman)

“Statement on Media Ownership Rules.” Economists Incorporated. Filed at FCC January 2, 2003.

“News and Public Affairs Programming Offered by the Four Top-Ranked Versus Lower-Ranked Television Stations.” Economists Incorporated. Filed at FCC January 2, 2003. (with K. Mikkelsen and A. Ivory)

“Effect of Common Ownership or Operation on Television News Carriage, Quantity and Quality. Economists Incorporated. Filed at FCC January 2, 2003. (with K. Mikkelsen, R. Mortimer, and M. Baumann)

“Comments on FCC Ownership Study #10. Economists Incorporated. Filed at FCC January 2, 2003. (with M. Baumann, R. Mortimer, and K. Mikkelsen)

“Comment On FCC Ownership Study #4. Filed at FCC January 2, 2003. (with M. Baumann and R. Mortimer)

“Concentration Among National Purchasers of Video Entertainment Programming.” Economists Incorporated. Filed at FCC January 2, 2003. (with M. Baumann)

“Counting Outlets and Owners In Milwaukee: An Illustrative Example.” Economists Incorporated. Filed at FCC January 2, 2003. (with K. Mikkelsen)

“Preemption By O&Os Compared To Affiliates. Economists Incorporated. Filed at FCC January 2, 2003. (with M. Baumann and A. Ivory)

“News and Public Affairs Programming: Television Broadcast Network Owned and Operated Stations Compared To Network Affiliated Stations.” Economists Incorporated. Filed at FCC January 2, 2003. (with K. Mikkelsen, R. Mortimer and M. Baumann)

“Economic Comments on Media Ownership Issues. Economists Incorporated. Filed at FCC February 3, 2003. (with M. Baumann and K. Mikkelsen)

“Competition Policy in Latin America” Stanford Law and Economics Olin Working Paper No. 268. <http://ssrn.com/abstract=456441> SIEPR Policy Paper No. [03-003](#). (October 2003).

“Legal Reform, Externalities and Economic Development: Measuring the Impact of Legal Aid on Poor Women in Ecuador” May 2003. Stanford Law and Economics Olin Working Paper No. 255; Stanford Law School, Public Law Working Paper No. 55.

<http://ssrn.com/abstract=406260> SIEPR Policy Paper No. [02-032](#) (with J. Portillo)

[Impact of Legal Aid: Ecuador](#), World Bank, 2003. (with others)

An Economic Approach to Project Impact Measurement and Evaluation Methods in Legal and Judicial Reform, World Bank, 2002 [DRAFT]

“Cable Modems, Access and Investment Incentives,” report prepared for the National Cable Television Association, December 1998. (with G. Rosston)

Competition Policy in Peru: Report and Recommendations, November 1995. (with others)

An Economic Analysis of the Broadcast Television National Ownership, Local Ownership and Cross-ownership Rules, May 17, 1995, 2 vols. (with others)

An Economic Analysis of the Prime Time Access Rule, March 7, 1995, and A Supplementary Analysis of the Prime Time Access Rule, May 26, 1995. (with others)

Cable Rate Regulation—A Multi-Stage Benchmark Approach, January 1993. (with others)

Competition Policy and Consumer Protection in Argentina, Report of the Advisory Team to the Government of Argentina, July 1992. (with others)

An Economic Analysis of the Effect of the Exxon Valdez Oil Spill on Alaskan Seafood Prices, Report to the Trans-Alaska Pipeline Liability Fund, December 1991. (with others)

Competition Policy in Jamaica, Report of the Advisory Team to the Government of Jamaica, January 1991. (with R. Skitol and R. Crandall)

Federal Antitrust Policy and the Incentive to Undertake Research and Development in the Information Technologies, prepared for the Office of Technology Assessment, U.S. Congress. Economists Incorporated Research Report, 1989. (with M. Spence and P. Greenhalgh)

Economic Effects of the Financial Interest and Syndication Rule. Economists Incorporated Research Report, 1983. (with R. Crandall and R. Noll)

A Framework for Economic Analysis of Electronic Media Concentration Issues. Economists Incorporated Research Report, 1982. (with K. Baseman)

Notes on the Merger Guidelines: Economic Perspectives, Economists Incorporated Research Report, 1982. (with P. Greenhalgh and W. Myslinski)

Five Propositions on the Social Effects of Television, prepared for the Sloan Foundation, Duke University, 1979.

Policy Options in Mobile Radio Spectrum Management, prepared under contract with the UHF Task Force of the FCC, Stanford University, 1978. (with D. Dunn)

Licensing of Real Estate Brokers as Underwritten Title Insurance Agents, Report to the State of California, Studies in Industry Economics #64, Stanford Univ., 1976. (with J. Grundfest)

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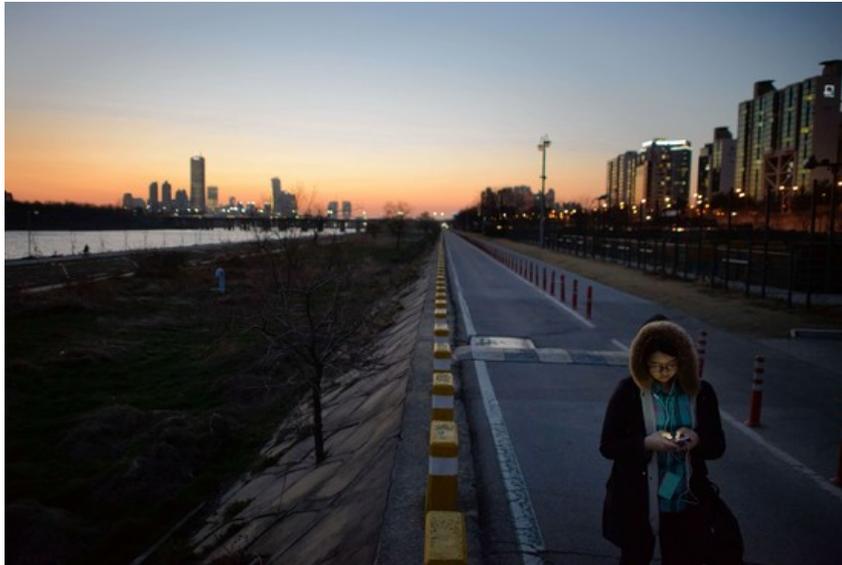
TECHNOLOGY

EU, South Korea to Ally on Faster Mobile Access

So-Called 5G Could be Crucial for European Bloc, Which Trails Telecom Rivals

By FRANCES ROBINSON in Brussels and MIN-JEONG LEE in Seoul [CONNECT](#)

Updated June 16, 2014 3:30 a.m. ET



In South Korea, more than one mobile device is in use for each person. Agence France-Presse/Getty Images

In the race to get the world's fastest mobile Internet service, South Korea and the European Union on Monday announced a major new pact to join forces on so-called 5G networks.

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The deal sets up a joint group to develop systems, set standards and get radio frequencies ready to accommodate the new technology. The aim is to have a global consensus and vision on 5G by the end of 2015, according to a statement released by the Korean government.

The agreement could be crucial for the EU, which is lagging behind in the global telecommunications race after late and patchy implementation of the current 4G standard. While users can download a one-hour high-definition film in six minutes on 4G mobile Internet, 5G would slash the time to six seconds, according to EU data.

European businesses have long warned that Europe's growth will suffer if the bloc continues to trail its rivals on mobile technology. The 5G race is already on: Huawei Technologies Co. of China is investing heavily—\$600 million through 2018—in the next-generation network. The U.S. doesn't have a nationally backed program, but universities are researching various aspects of the next-generation standard.

The Journal reported the news on Sunday, based on a draft of the agreement.



The EU is eager to regain its position as a global leader in mobile standards. The European GSM standard led the world

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when people first started using portable phones.

While Europe rested on its laurels, South Korea pushed ahead to set out fresh revenue streams, with the first comers to the technology expected to hold a leading

share in the industry.

South Koreans are perhaps the world's most dedicated smartphone users. The country's mobile-penetration rate of more than 100% means that more than one mobile device is in use for each person.

Forging ahead together would benefit both Europe's mobile-equipment manufacturers—such as Ericsson, Nokia Siemens Networks Oy and [Alcatel-Lucent SA](#) [ALU.FR +0.89%](#)—and, among others, South Korea's [Samsung Electronics Co.](#) [005930.SE 0.00%](#), the world's largest maker of smartphones.

Samsung, which relies heavily on its mobile business for profit, is expected to play an active role in realizing South Korea's goal of seizing a firm foothold on patent rights on related telecom technologies.

Last year, the company [claimed a breakthrough in the development of 5G technology](#), saying it found a way to transmit large volumes of data using a much higher frequency band than conventional ones, which would eventually allow users to send massive data files at much faster speeds through their mobile devices, "practically without limitation." In January, the South Korean government announced its road map for 5G wireless-communication technology, with a goal of being the first to bring the technology to commercial markets, in December 2020.

This would be achieved through joint private-sector efforts involving the country's three mobile carriers—[SK Telecom Co.](#) [017670.SE +1.98%](#), [KT Corp.](#) and [LG Uplus Corp.](#) [032640.SE +1.76%](#)—and manufacturers such as Samsung and [LG Electronics Inc.](#) [066570.SE +1.17%](#). The government forecast the country would invest a combined 1.6 trillion won (\$1.57 billion) over the next seven years in trying to bring the technology live.

Under the plan, the government is aiming for total revenue of 331 trillion won from sales of mobile devices and network equipment that support 5G communications technology, during the 2020-26 period.

From the EU side, in December 2013 the European Commission said that it would allot €700 million (\$948 million) and industry partners more than €3 billion to conduct exploratory research into 5G "without delay." The commission, the EU's executive arm, intends to select the first set of projects to fund at the end of this year, with €125 million to allocate.

The partnership will be led by two groups: Europe's 5G PPP, which is based in Belgium and includes European technology and telecom companies such as [Telefónica SA](#) [TEF.MC +0.36%](#) and [Nokia Oyj](#) [NOK1V.HE +0.77%](#); and its South Korean equivalent, the 5G Forum.

Work on 5G should start "the sooner the better—it is extremely important that we take the lead again," said EU digital commissioner Neelie Kroes. "In the '90s we were in the driver seat, talking about GSM, so it would nice to be back in that position."

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MEDIA | NYT NOW

F.C.C. Begins Investigation Into Quality of Internet Download Speeds

By EDWARD WYATT JUNE 13, 2014

WASHINGTON — The Federal Communications Commission has opened an investigation into recent deals where entertainment companies like Netflix have agreed to pay Internet service providers like Comcast and Verizon for faster video delivery, a practice that critics contend will divide Internet service into fast and slow lanes.

Tom Wheeler, the F.C.C. chairman, said on Friday that the purpose of the investigation was to see whether consumers were getting the speed and quality of service that Internet service providers had promised. The inquiry resulted in part from more than 19,000 public comments submitted to the F.C.C. in recent weeks urging it to protect Internet freedom, he said.

“Consumers pay their I.S.P. and they pay content providers like Hulu, Netflix or Amazon,” Mr. Wheeler said. “Then when they don’t get good service, they wonder what is going on. I have experienced these problems myself and know how exasperating it can be.”

He added: “To be clear, what we are doing right now is collecting information, not regulating. We are looking under the hood. Consumers want transparency. They want answers. So do I.”

The thousands of comments from the public came in response to the agency’s proposal last month to institute a new set of rules that Mr. Wheeler and other commissioners said would keep the Internet free and maintain net neutrality, the concept that Internet service providers should

treat all legal web traffic equally.

Critics, however, say the F.C.C.'s proposal would destroy net neutrality by allowing pay-for-priority deals, which could stifle start-up companies that do not have the cash to pay the tolls.

The move by the F.C.C. is significant because it has begun an investigation of Internet service providers at the same time that it is trying to define whether it has jurisdiction over their businesses. There is no guarantee that the commission has the power to do anything, because there are currently no rules in place to enforce net neutrality; two earlier attempts by the F.C.C. to forge rules were thrown out by an appeals court.

The agency has managed to get Internet service providers to agree to abide by net neutrality. But the deal between Netflix and Comcast, struck in February, has opened the commission to criticism that it is not enforcing net neutrality principles. Even Netflix itself, after agreeing to pay Comcast, objected to the terms of the agreement, asserting that it should not have to pay to stream its video content to its customers.

Mr. Wheeler as well as many others at the F.C.C. and in the Internet industry say that such agreements — known as peering or interconnection agreements — are not covered by net neutrality, arguing that the concept extends only to the so-called last mile of Internet service to the consumer's screen.

The agency does, however, have the authority to ensure that telecommunications companies act in the public interest, and Mr. Wheeler appears to be acting under that authority.

Mr. Wheeler said he had viewed, "a couple of times," a recent comedy segment by John Oliver on HBO's "Last Week Tonight" that explored the net neutrality debate. Mr. Oliver urged viewers to contact the F.C.C. and protest against net neutrality rules that would allow fast and slow lanes. So many people did so that the comments section of the F.C.C.'s website became gridlocked.

Calling the sketch "creative and funny," Mr. Wheeler also noted that "satire is not C-Span," suggesting that Mr. Oliver stretched some facts in

the interest of comedy. Nevertheless, “it represents the high level of interest that exists in the topic in the country, and that’s good,” Mr. Wheeler said. Comcast and Verizon said they welcomed the inquiry.

“We welcome this review, which will allow the commission full transparency into the entire Internet backbone ecosystem and enable full education as to how this market works,” Sena Fitzmaurice, Comcast’s vice president for government communications, said in a statement.

Most Internet service providers have said they intend to abide by net neutrality, and Comcast, as a result of concessions made when it bought NBCUniversal, is bound by the F.C.C.’s previous rules even though a court threw them out. Comcast has also said it will abide by net neutrality rules as a condition of its present efforts to buy Time Warner Cable, as has AT&T with respect to its proposed acquisition of DirecTV.

Public interest and consumer advocacy groups cheered the opening of the F.C.C. inquiry. These groups have been pushing for a strict definition of net neutrality and have asked the agency to reclassify Internet service so that it can be regulated like a utility, similar to telephone service or electricity.

Republicans in Congress have warned the F.C.C. against trying to regulate the Internet, echoing comments made by the agency’s two Republican commissioners, who have said the net neutrality proposal is “a solution in search of a problem.”

But Senator Patrick J. Leahy, the Vermont Democrat who leads the Judiciary Committee, said the inquiry was important.

“As I said during the Judiciary Committee’s hearing on the Comcast-Time Warner Cable merger,” he said, “when Internet service providers can charge tolls or block access to their networks at the interconnection point, net neutrality rules alone may no longer be enough to promote an open Internet.”

A version of this article appears in print on June 14, 2014, on page B3 of the New York edition with the headline: F.C.C. Begins Investigation Into Quality of Internet Download Speeds.