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U.S. Telco Industry History as a Prologue to its Future

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Abstract

The United States telco industry has been shaped by the interplay of technological advance, free enterprise, politics, public pressure, and government regulation. The history of the industry reveals a continuing tension between the forces of competition and concentration. Having coursed through eras of monopoly, competition, and regulated monopoly, the telcos are now in a more competitive arena. There is regulatory uncertainty on the issue of net neutrality.

Introduction

The U.S. telco industry has been shaped by the interplay of technology, free enterprise, politics, public pressure, and government regulation. The history of the industry reveals a continuing tension between the forces of competition and concentration. High fixed costs and low and often declining marginal and average costs drive the industry toward higher levels of concentration. However, because a competitive market tends to benefit consumers and better allocate resources, the government has at times tried to promote a more competitive industry structure. Existing technology affects the relative validity of these two opposing forces. However, whether we examine the industry in its early stages, or today as it faces the issue of net neutrality, the basic tension between competition and concentration remains a pivotal challenge.

Having coursed through eras of monopoly, competition, and regulated monopoly, the telcos in the United States are now in a more competitive arena. As the telcos broaden their menu of services to include not only voice telephony but also television, Internet and wireless communication services, the telcos have competition from cable companies and wireless services. Going forward, the telcos face the challenge of successfully developing content and other information services rather than operating only as dumb pipes. The telcos' investment in landline infrastructure continues to be an important asset, because fixed wire provides backbone infrastructure for the rapidly-growing wireless industry.

Parts I and II discuss the history of U.S. telephony, with a focus on government regulation and market structure. Unlike in many European countries, the U.S. telco industry has been privately, rather than government, owned. Part I discusses the early years and the regulated monopoly era. Part II discusses the Post-Divestiture era, after the AT&T monopoly was separated into regional monopolies, and long distance and equipment segments. The conclusion contains a discussion about the future of the industry.

Part I

The era of patent-protected monopoly. The U.S. telco industry began as an unregulated duopoly in 1877. Both the American Bell Telephone Company and Western Union Telegraph built out competing and unconnected telephone service until 1879, when Western Union sold its network to Bell, and Bell agreed to exit the telegraph business.

[5] Figure 1 Telecommunications history in the United States

The Bell system then became an unregulated monopoly protected by patent rights. Bell licensed operating companies as territorial monopolies in major cities and metropolitan areas, requiring local exchange licensees to connect only with the Bell system (Horwitz, 1989 [6]). The Bell system initially licensed small independent companies to manufacture equipment using Bell patents. Before the patents expired and the equipment market opened to potential competitors, Bell vertically integrated by acquiring an interest in Western Electric Supply, the manufacturing branch of Western Union, in 1881. This acquisition acted as a barrier to entry and reduced potential competition. Western Electric was given a permanent exclusive license to manufacture telephones under the Bell patents. (Brock, 1981 [7]). American Bell created AT&T in 1885 to provide long distance service.

The era of competition. With the expiration of Bell's basic patents in 1893 to 1894, the industry became competitive, with widespread entry. By 1902, 3009 non-Bell commercial telephone systems had been established and by 1907, 49 percent of telephones were controlled by independent phone companies. (Brock, 1981 [7]).

To protect its market power, Bell attempted to extend its patent monopoly through broad patent interpretation or by combining multiple patents, winning more than 600 patent-infringement lawsuits (Horwitz, 1989 ^[6]). The Bell system also tried to retain market power by lowering prices and by connecting the operating companies with long-distance lines.

In 1899, AT&T acquired the assets of its parent, the American Bell Telephone Company. The Bell system had four major divisions: Long Lines, to interconnect local exchanges and long-distance services; equipment manufacture (Western Electric Company); research and development (Bell Labs); and Bell operating companies, to provide local exchange services.

As the industry grew, AT&T increased its market power by providing greater interconnectivity, a long-distance network, and in some cases, deeply discounted rates for service and equipment (Bornholz and Evans, 1983 ^[8]). Attempts by independents to form a long-distance network did not succeed. Bell's patents for long-distance transmission created a barrier to entry. As a result, the number of independent telephone companies began to decrease.

In 1907, AT&T began an aggressive campaign to buy out independent phone companies and to seek interconnections with strategically-located independent exchanges. AT&T asserted that telephony was a natural monopoly, with the slogan "One policy, one system and universal service." (Vail, 1907 ^[9]). AT&T argued that competing systems wasted resources; that, as subscriptions increased, network externalities increased the value of telephone service; and that a single company best provided integrated end-to-end service. The independents argued that competition reduced price and increased subscribers, therefore servicing consumers better than a monopoly system (Bornholz and Evans, 1983 ^[8]).

Government regulation begins. AT&T's attempt to unify the phone system led to lawsuits about rates and antitrust litigation. There was also movement toward government ownership, as existed in many European nations. Government regulation of the industry began with the Mann Elkins Act (1910), which gave the Interstate Commerce Commission (ICC) jurisdiction over interstate rates charged by phone companies. AT&T responded to the threat of government ownership by scaling back its initial plan of a unified system.

Telephony as a regulated natural monopoly. The industry's era as a regulated monopoly began with the Kingsbury Commitment of 1913. AT&T agreed to divest itself of its controlling stock holdings in Western Union, agreed to stop acquiring competing independent exchanges, and offered to open up its long-distance lines to independent exchanges that were more than fifty miles (80 kms) apart. In exchange, the U.S. Justice Department relaxed its antitrust pressure on AT&T. By reducing competition between Bell and the independents, the Kingsbury Commitment established a presumption of telephony as a local monopoly (Horwitz, 1989 ^[6]).

For a year (1918) during World War I, Congress placed AT&T under the control of the Post Office. This control, which ended because of concerns over rate increases, demonstrated the problems with government ownership. Instead, Congress passed the Willis-Graham Act (1921), which expanded federal authority by giving the ICC power to approve or disapprove consolidations and mergers of telephone and telegraph companies. However, telcos were exempted from antitrust regulation if the ICC determined that a proposed consolidation or merger would be "of advantage to the persons to whom service is to be rendered and in the public interest." The Willis-Graham Act effectively established telephone companies as natural monopolies that should be regulated and free from competition. As the U.S. House Committee stated, "there is nothing to be gained by local competition in the telephone business." (Loeb, 1978 ^[10]).

Facing financial difficulties, many independent telcos supported the Willis-Graham Act: they wanted to be bought out by AT&T (Horwitz, 1989 ^[6]). The following year, AT&T and many independent phone companies signed the Hall Memorandum (1922). AT&T agreed not to purchase, or consolidate with, independent phone companies unless demanded for the convenience of the public or special reasons. The Hall Memorandum essentially defined the boundaries of the Bell System and the structure of the telephone industry by voluntary agreement. The early competitive era of telecommunications came to a close (Sterling, 2006 ^[11]). The industry structure stabilized in the early 1920s and remained largely unchanged until the 1960s, when interexchange competition re-emerged.

The Communications Act of 1934 transferred regulation of interstate telephone services from the ICC to the Federal Communications Commission (FCC) and consolidated regulation of wired and wireless service under the FCC. The FCC's charge was to secure a rapid efficient nationwide wire and radio communication service at reasonable rates. Title II of the Act required telephone companies as common carriers to make services available to the public at reasonable rates.

At the time, AT&T had approximately 80% of the telephone market and the only significant long-distance telephone network. The remaining 20% was owned by a large number of scattered small local telephone companies dependent on the AT&T network for long distance service and interconnectivity (Brock, 1981 ^[7]). The creation of the FCC had the effect of supporting AT&T's monopoly position because the FCC accepted the institutional structure of monopoly in the telco industry (Horwitz, 1989 ^[6]). AT&T was allowed monopoly control over long distance voice telecommunications and to operate local monopoly telephone operating companies. In exchange, the FCC enforced common carrier legal obligations, requiring interconnection of carriers and charging carriers with the duty to serve all who requested service.

As a regulated monopoly, AT&T and the smaller telcos were guaranteed pricing levels that provided a fair rate of return. No criteria were set up to determine if rates were reasonable. Instead the Commission began a process known as continued surveillance in which informal negotiations were carried on between the Commission and the telephone company to determine the appropriate interstate rates (Brock, 1981 ^[7]).

Monopoly challenged. After World War II, technological advances led to challenges to AT&T's monopoly position. The regulated monopoly model supported by FCC regulations had offered the benefit of universalizing telephone service, using value of service pricing and cost averaging to finance service expansion. However slow innovation, limited service options, and relatively high prices for heavy users created economic and technical incentives for large users to get out from under monopoly and for new providers to service these large corporate customers. In addition, the Justice Department resumed its pre-war investigation into AT&T's violation of antitrust laws.

Competitive challenges to AT&T's monopoly power arose because of two issues: terminal equipment attachments to the AT&T network and microwave technology for long-distance communication. These two challenges led to a modification of FCC regulations. It is debatable whether this shift signaled a reorientation of the FCC's regulatory policy toward introducing new competition into the telecommunications market, (Loeb, 1978 ^[10]) or was a response to unmet demand that the FCC reasoned would not have a significant negative effect on AT&T (Horwitz, 1989 ^[6]).

The Challenge of the Terminal Equipment Market Incentives existed to enter the terminal equipment market at the end user level because AT&T equipment was priced above competitive costs and often did not meet specialized needs. In the 1940s and 1950s, the FCC repeatedly supported prohibitions against any foreign attachments to the AT&T telephone network. The Hush-A-Phone case (1956 ^[12]) challenged AT&T's ability to maintain absolute control over terminal equipment attachments. The U.S. Court of Appeals reversed the FCC's Hush-a-Phone decision stating "the mere fact that the telephone companies can provide a rival device would seem a poor reason for disregarding Hush-A-Phone's value in assuring a quiet line?". The FCC subsequently issued an order requiring telephone companies to rescind tariff regulations that prohibited use of external devices, unless the device caused injury to the public or the telephone system.

Subsequently, AT&T's tariff prohibited the Carterfone device, a device that connected the landline system with two way mobile radios to provide radio telephony to entities located too far away from local networks, such as oil drillers. The FCC found that the AT&T tariff was unreasonable and discriminatory: it prohibited the Carterfone attachment whether or not it harmed the telephone system, while permitting customers to attach equipment similar to Carterfone if the equipment was provided by AT&T. Large users, such as the American Petroleum Institute and the National Retail Merchants Association, had backed the liberalization of entry into the terminal equipment market (Horwitz 1989 ^[6]) and the U.S. Justice Department had found that the tariff against foreign attachments violated antitrust laws.

AT&T responded by requiring that all foreign attachments first connect to protective coupling manufactured and sold only by AT&T, in order to protect the integrity of the system. Although the protective device charges decreased competitors' profits, potential profits were still sufficiently high to attract new companies (Brock, 1981 ^[7]).

The FCC's Part 68 rule (1975^[13]) strengthened the impact of the Carterfone decision by requiring that terminal equipment connect to the network through standard plugs and jacks. Any manufacturer that met the Part 68 standard was authorized to produce customer premises equipment. Further strengthening the Carterfone decision were the FCC's Computer Inquiries, decided in the 1970s and 80s. In these Inquiries, the FCC promoted competition in the telephony equipment market by requiring telephone companies to sell equipment through separate subsidiaries. The Carterfone decision, and the Part 68 rule, may have helped to enable the growth of the internet. Without Part 68, users of the public switched network would not have been able to connect their computers and modems to the network (Ismail, 2011^[14])

The Challenge of Long Distance Communications. During World War II, the U.S. government had invested heavily in microwave technology research, which was generally not patent-protected. However, microwave transmission required radio frequency spectrum allocations from the FCC. The FCC's initial policy was to grant regular microwave licenses only to common carriers and to grant non-common carriers only temporary licenses for experimental use. Even with the restricted FCC policies, many companies found it profitable to build temporary microwave networks because they were unable to obtain service from AT&T. In 1959, the FCC opened the market by agreeing to lease microwave frequencies to any private user, ruling that the availability of common carrier facilities would not be a factor in granting private microwave applications (Brock, 1981^[7]). This decision did not enable free entry into the long-distance market but did allow the build-out of private systems for proprietary use. AT&T responded with the Telpak tariff, offering large discounts for groups of private lines, to remove the financial incentive to build out a private system where AT&T facilities were available. However, the Telpak rate structure showed that AT&T's single line long-distance rates far exceeded microwave costs, creating an entry incentive.

In 1963, Microwave Communications Inc. (MCI) filed a request with the FCC for authorization as a common carrier. The FCC approved MCI's application in 1969, and a large number of similar specialized microwave service applications followed. The applicants countered AT&T's opposition by arguing that they would offer specialty services not generally available at rates equal to or less than traditional companies such as AT&T. In 1971, the FCC ruled in favor of increased competition, stating that "there is a public demand for the proposed services and competition in the specialized communications field is reasonably feasible."

In 1974, MCI, facing financial challenges by offering only specialized communication services, filed with the FCC to offer Executive Network (Execunet) service, which effectively duplicated AT&T's regular message toll service and was a forerunner to MCI's entry into regular long-distance service. In 1975, the FCC rejected Execunet, claiming that MCI had been authorized to provide only private line or specialized communication service. In 1977, the U.S. Court of Appeals reversed the FCC decision, ruling that once the FCC licensed a firm to provide any service, that firm could provide every service unless the FCC specifically denied it. The Court questioned the legitimacy of AT&T's monopoly. "There may be very good reasons for according AT&T de jure freedom from competition in certain fields; however, one such reason is not simply that AT&T got there first."

In 1980, the FCC issued its Computer II Order, which distinguished between basic services and enhanced services. Basic services, such as telephone service, which provided pure transmission capability, were regulated under Title II of the Communications Act. Enhanced services, that is, any service offering more than basic transmission over the telecommunications network (eg., computer processing applications) were not regulated under Title II.

Meanwhile, the Department of Justice's antitrust case against AT&T was gaining momentum. AT&T claimed that it was immune from federal antitrust regulation because it was regulated by the FCC. For the Justice Department, any settlement had to include opening up AT&T's network to competition (Sterling, 2006 ^[11]).

The landmark case against AT&T's regulated monopoly status was MCI's antitrust suit against AT&T. The case was decided in favor of MCI in 1980, with the jury and then the district court awarding MCI \$1.8 million in damages. When AT&T filed a motion to dismiss, Judge Greene (1981 ^[15]) ruled that AT&T had violated antitrust laws "in a number of ways over a lengthy period of time" and "used their local exchange monopolies to foreclose competition in the equipment market" and "monopolized the inter-city service market". This suit, coupled with the Department of Justice antitrust suit brought against AT&T, eventually led to the voluntary breakup of the Bell System and a dramatic change in the structure of the telecommunications industry.

Part II

Divestiture of AT&T. In 1982, the Justice Department and AT&T agreed to settle the antitrust lawsuit brought by the Department of Justice. Under the terms of the Divestiture Agreement, on January 1, 1984, AT&T divested itself of its 22 local operating companies, which represented approximately two-thirds of AT&T's assets. These local operating companies were divided into seven regional Bell operating companies (RBOCs), which were subject to traditional rate of return regulatory oversight and were not allowed into competitive markets of long-distance, equipment manufacture, or data processing. AT&T became a vertically integrated company comprised of its extensive long-distance operations (Long Lines), Western Electric and Bell Labs. In addition, AT&T was permitted to enter emerging areas of communications, including the growing computer industry, a market not regulated by government.

The antitrust suit and the subsequent Divestiture Agreement signaled the industry that the government was committed to competition and may have had a dampening effect on mergers and acquisitions. In markets such as long-distance service where competition was possible, competitors developed new services and prices generally decreased. Where regulation was continued, primarily the local telco market, prices remained at comparable levels or increased (Shaw, 2001 ^[16]).

Post-Divestiture. The goal of the Divestiture Agreement was to subdivide the telephony industry into two sectors: a regulated monopoly sector for local telephony and a more competitive long-distance sector. However technological advances were creating opportunities for a more integrated telephony structure. Rather than accepting the confines of the Divestiture Agreement, the RBOCs began to file requests for permission to enter other lines of business such as equipment leasing and the provision of software programs. For example, Bell Atlantic, one of the RBOCs, set out to be a full-service company in the related emerging telecommunications and computer sectors. Because larger customers could potentially set up their own information systems, Bell Atlantic targeted medium-sized customers, offering this customer base everything from information services equipment and data processing to computer maintenance (Verizon Communications Inc., 2006 ^[17]).

During the 1990's, there were several major developments in the telecommunications industry that changed the nature and the structure of the industry. First of all, the convergence of the computer, broadcasting and telephone industries challenged the arbitrary distinctions in communication services, and the local telephone monopolies. Cable companies had the capacity to offer telephone service and telephone companies had the technology to offer television service.

Moreover, responding to increased demand for wireless communication services, in 1994, the FCC began to hold spectrum auctions, a competitive bidding process for the allocation of wireless spectrum licenses across the United States. While the FCC had granted experimental wireless system licenses in the 1970s and the 1980s, the auction process that began in 1994 (and is still ongoing) was the first opportunity for widespread competitive entry into the wireless market. It is interesting to note that during these first auctions, AT&T Wireless acquired spectrum in 94 percent of the Major Trading Areas (MTA).

The RBOCs responded to these market changes by merging with each other, and by acquiring wireless spectrum. By 2006, four of the seven original RBOCs had merged with or been acquired by the new AT&T Inc., which had directly or indirectly acquired both AT&T Corp. and AT&T Wireless. Two of the RBOCs had been acquired by Bell Atlantic, rebranded as Verizon.

During the two decades that followed the initial spectrum auction, AT&T and Verizon, with approval from the FCC and the Department of Justice, expanded their wireless footprint through mergers and acquisitions, and by successfully bidding on spectrum.

The Telecommunications Act of 1996, which modified the 1934 Act, had the goals of promoting competition and reducing regulation in the telecommunications industry. The Act redefined and deregulated telephone service. Prohibitions on equipment manufacture by the RBOCs were repealed. The 1996 Act significantly reduced the applicability of Title II common-carrier regulations by defining firms as providing either telecommunication services or information services. Telecommunication services were defined as the transmission between or among points specified by the user, of information of the users choosing, without change in the form or content of the information sent and received. Information services were defined as having the capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information via telecommunications, and included electronic publishing. A telecommunications carrier, that is, a firm providing telecommunication services, was defined to be a common carrier. An information service provider was not required to meet common-carrier regulations. Congress thus created a significant regulatory distinction between companies that act as mere conduits for telecommunications and ones that manipulate or enhance communication. Congress also created a third category of information services, the telecommunications management exception, treating as a telecommunications service any use of an information service for the management or operation of a telecommunications service.

The 1996 Act also contained provisions to enable the build out of wireless communications. Section 332(c)(7) of the Act preserved state and local authority over zoning and land use decisions for personal wireless service facilities, but preempted local decisions premised directly or indirectly on the environmental effects of radio frequency (RF) emissions, if the provider was in compliance with the Commission's RF rules.

The Challenge of an Open Internet: Regulatory Policy. Applying this statutory framework to broadband, in 1998, the FCC classified the transmission component of DSL, that is, the phone lines, as a telecommunications service. Then, in 2002, the FCC's Declaratory Ruling reversed position by reducing the applicability of Title II common-carrier requirements to broadband Internet providers. The Ruling held that cable modem service offered the end user more than data transmission capability and therefore qualified as an information service. This Ruling brought cable, DSL, and other wireline internet providers outside of the common carrier requirement. The Ruling was challenged by potential competitors seeking to use existing wireline networks. In 2005, the U.S. Supreme Court upheld the FCC's 2002 Ruling in *National Cable and Telecommunications Association v. Brand X Internet Services*, agreeing that a cable internet provider is an "information service", not a "telecommunications service." Thus, competing ISPs like Brand X Internet were denied access to the wires to provide competing internet service. The Supreme Court's approval solidified FCC authority to create a regulatory framework for ISPs under existing telecommunications laws. Moreover, by bringing ISPs outside of common-carrier regulations, the FCC signaled a policy shift that reflected the competitive and deregulatory intent of Congress (Hedge, 2006^[18]).

The next open-internet controversy occurred when Comcast claimed the management right to slow cable customers' access to a file-sharing service, because such programs consume significant amounts of bandwidth, and the FCC ruled against Comcast. Comcast filed a lawsuit and in April 2010, the U.S. Court of Appeals ruled that the FCC could not prevent internet service providers from blocking or slowing specific sites and charging video sites to deliver their content faster to users. The Court found that the FCC had not demonstrated that its action—barring Comcast from interfering with its customers' use of peer-to-peer networking applications—is reasonably ancillary to the effective performance of its duties and had failed to cite any statutory authority that would justify its order compelling a broadband provider to adhere to certain open internet practices.

FCC Open Internet Orders. In response, the FCC adopted its first Open Internet Order (2010^[19]). This Order contained three rules governing internet service providers: no blocking, no unreasonable discrimination, and transparency. Restrictions on blocking and discrimination were subject to an exception for reasonable network management. The Order exempted mobile service providers from the anti-discrimination rule. The FCC's position on internet openness reflected its belief in the virtuous circle where richer and more diverse content on the edge jumpstarts demand, which brings about infrastructure investment, which brings about even richer and more diverse content.

Verizon challenged this Order, arguing that the Order exceeded the FCC's regulatory authority and violated the Act. In 2014 the U.S. Court of Appeals upheld the FCC's determination that the 1996 Act granted the FCC authority to regulate private internet service providers and to enact open internet rules. However, the Court vacated the no blocking and anti-discrimination provisions because the FCC had chosen to classify broadband service as an information service under the Act, which expressly prohibits the FCC from applying common carrier regulations to such services. Likewise, the Court found that the no blocking rule applied to mobile broadband conflicted with the FCC's earlier classification of mobile broadband service as a private mobile service rather than a commercial mobile service.

In response to the Verizon decision, the FCC in 2015 (3-2 vote) amplified and clarified its 2010 Open Internet Order. The 2015 FCC Open Internet Order ruled in favor of net neutrality by reclassifying broadband as a common carrier under Title II of the 1934 Act and Section 706 of the Telecommunications Act of 1996. The Order set forth "bright-line" rules banning blocking, throttling (i.e., impairing or degrading lawful Internet traffic on the basis of content application service or use of a non-harmful device) and paid prioritization by providers of both fixed and mobile broadband Internet access service. The FCC's rationale for applying openness rules to mobile broadband was the widespread deployment and usage of 4G LTE mobile networks.

The U.S. Telecommunications Association et.al. filed a lawsuit challenging the FCC's power to classify Internet providers as common carriers under Title II, claiming that these rules will undermine future investment by large and small broadband providers, to the detriment of consumers. The lawsuit also questioned whether the FCC had the authority to group wired and wireless services under the same rules. In June 2016, the Appeals Court (2-1) upheld the legal authority behind FCC's Open Internet Order. Regarding the regulation of wireless services under the rules for wired services, one of the judges opined: "So if I'm walking in my house with an iPad, at one end of the hall I connect to my Wi-Fi, at the other end, my device switches over to my wireless subscription? did Congress really intend these two services to be regulated totally differently even if I can't tell the difference?"

So far, no challenge with the Supreme Court has been filed. However, the newly-appointed FCC Chairman Ajit Pai opposes net neutrality, writing one of the two dissenting opinions in the FCC's 2015 Open Internet Order and calling net neutrality a last-century bit of regulation developed to tame a 1930's monopoly.

Conclusion

The telecommunications industry globally has been propelled by technological advance. The history of the U.S. industry shows that technology has triggered changes in the regulatory environment and the structure of the industry, from regulated monopoly to a more competitive market.

Historically, all three levels of government, legislative, executive and judicial, have contributed to the current regulatory framework. The FCC has issued rulings and orders, some of which have been upheld or overturned by the Appeals Court and the Supreme Court. Congress has enacted legislation, such as the Communications Act of 1934 and the Telecommunications Act of 1996. During periods of major transformation in the industry, FCC regulation has tended to lag behind technological advance. The Courts and Congress, often with pressure from industry, have introduced significant changes in industry structure and regulation.

Going forward, the impact of new technology on industry structure is unclear. Given a permissive regulatory environment, new technology that creates profit opportunities may attract new entrants, expanding competition. However, if technological advances introduce opportunities for increased economies of scale, the result may be a less competitive market, again given regulatory assent.

Currently, fixed-wire telecommunication companies have built out high-capacity, low latency, reliable fiberoptic and coaxial networks, which service end users and are the backbone of the wireless industry. At the end user level, these telcos face the challenge of operating as dumb pipes and/or operating in the competitive arena of content providers. As dumb pipes, the telcos provide core infrastructure, since streaming content from edge providers requires internet access and wired internet access has superior performance metrics. However, open internet regulation may significantly reduce the profitability of operating as dumb pipes.

As content providers, telcos compete with edge providers who have a jumpstart on knowledge of their consumer base and consumers' digital footprint. Telcos in the streaming market as content providers also face edge competitors who enjoy brand-name recognition and consumer loyalty. However, telcos have the advantage of being able to bundle streaming services with internet and/or cable TV and/or landline telephony. In the absence of net neutrality regulations, telcos could make it difficult and costly for start-up edge providers to function in the content market.

The structure of the U.S. telecommunications industry will be affected by the outcome of the net neutrality debate. Although the U.S. Appeals Court has supported the FCC ruling for net neutrality, opponents may challenge this ruling with the Supreme Court.

The argument against net neutrality is that such regulation creates uncertainty and reduces investment in broadband. ISPs oppose net neutrality, claiming that they have made considerable investment in fiberoptic landlines and should be able to obtain a reasonable return on their investment. Without the expectation of a reasonable rate of return on future infrastructure investment, ISPs say that they will not expand and improve the broadband network. Data from US Telecom shows a \$1 billion decline in total U.S. broadband spending in 2015 (the year the FCC ruled for net neutrality) compared to 2014. Yoo (2014 ^[20]) found that the U.S. policy (at the time) of not regulating broadband as a public utility subject to common carrier requirements was more effective than the European net neutrality approach at reducing the digital divide. Open internet or net neutrality may also raise privacy concerns because government regulators need a mechanism to monitor, verify and enforce open internet regulation.

In support of net neutrality, startups claim that without such regulation, broadband providers could take advantage of their control over consumers' access to the internet by charging companies extra fees to reach customers faster, or making deals with preferred competitors, or by offering ancillary services themselves. Such abuse of market power is particularly likely in the numerous geographic areas serviced by only one high speed service. Moreover, there is a great deal of vertical integration in the industry, with major U.S. telcos owning or colluding with media conglomerates. The potential for abuse of market power among U.S. ISPs supports the argument for net neutrality regulation.

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