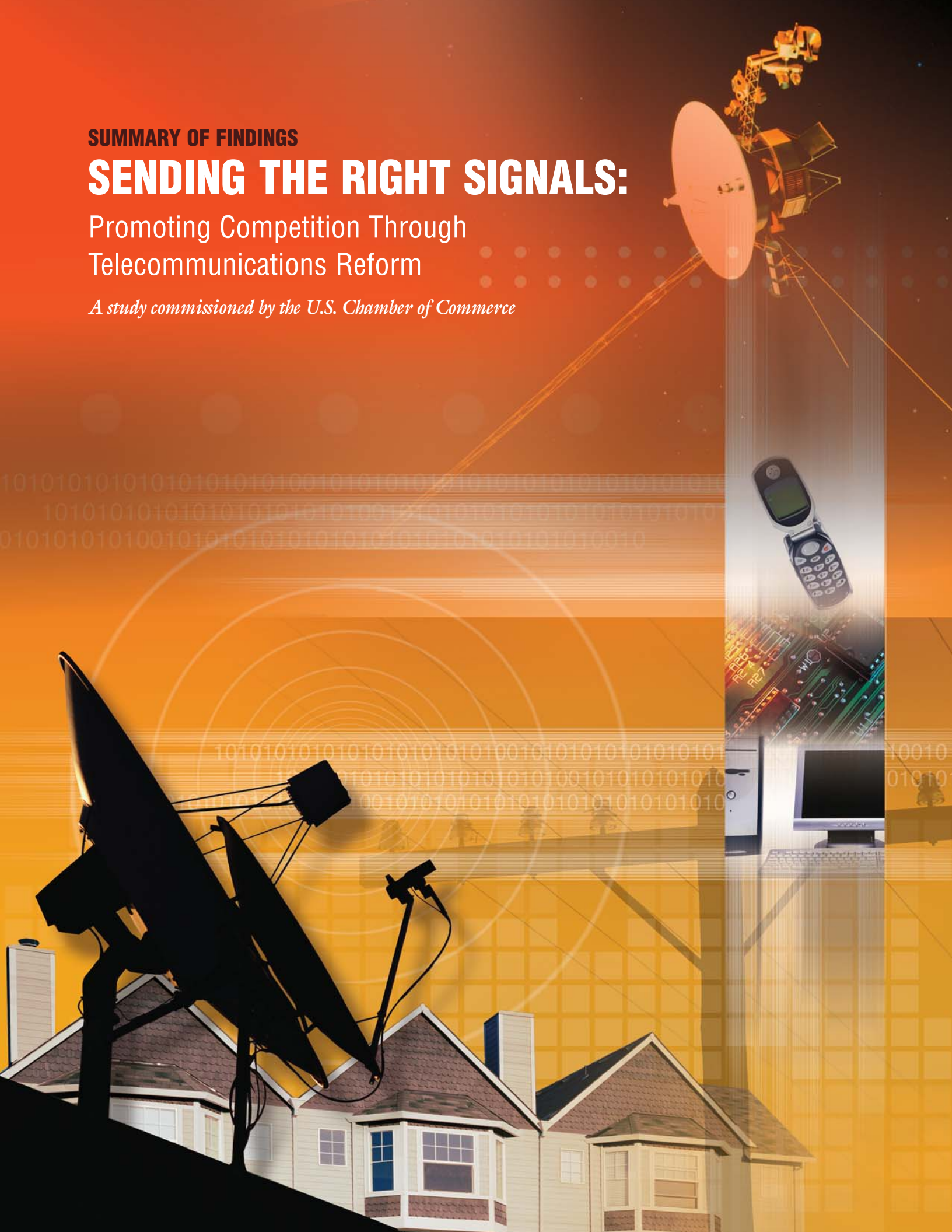


SUMMARY OF FINDINGS

SENDING THE RIGHT SIGNALS:

Promoting Competition Through
Telecommunications Reform

A study commissioned by the U.S. Chamber of Commerce



EXECUTIVE OVERVIEW

The U.S. Chamber of Commerce (the Chamber) commissioned a comprehensive independent study—*Sending the Right Signals: Promoting Competition Through Telecommunications Reform*—because the telecommunications industry is in a depressed economic condition and is not recovering along with the rest of the economy. This condition has already cost the nation more than 380,000 jobs and has diverted tens of billions of dollars of capital from the industry. It is now beginning to seriously erode the United States’ technological leadership in the world. If it is not reversed, this situation will affect the nation’s international competitiveness, causing further losses of jobs and investments, eventually harming the high standard of living of all Americans.

Recognizing the urgent need to know what caused this situation to occur and how it might be fixed, the Chamber turned to independent economists for their analysis. The study that the Chamber is now releasing analyzes the history of the telecommunications industry’s decline and the impact of current economic and regulatory activities on this situation. Further, it makes six recommendations for remedying the situation. For each recommendation, the study undertakes a macroeconomic analysis to determine the benefits of the recommendation and presents estimates of the economic impacts that would result from the proposed reforms.

The study’s six recommendations fall into two categories: recommendations to end policies that favor one network over another and recommendations to end price distortions. A summary of the recommended regulatory reforms and the economic results is set forth below.

Recommended Regulatory Reforms

1. Phase out mandatory network-sharing rules and, more immediately, end regulated wholesale rates set at theoretical costs.
2. Make 438 MHz of prime radio spectrum available for commercial wireless operators.
3. Exempt high-speed cable modem and digital subscriber lines from common carrier regulations.
4. Exempt Internet services from state telephone service regulations.
5. Raise funds for universal service directly from general tax revenues, rather than from hidden costs that penalize telecommunications competition and the growth of network services.
6. Distribute universal service funds directly to targeted consumers.

In making the study available, the Chamber fully recognizes that it does not contain all the answers; it nevertheless provides a comprehensive description and solid analysis of the situation, as well as thoughtful proposals

Point Estimates of Economic Impacts From Proposed Regulatory Reforms

1. \$58 billion in new capital investment over five years.
2. Investment-led increases in economic growth that will result in GDP increases of \$167 billion over five years.
3. Increased productivity, adding an additional \$467 billion to the GDP.
4. A combined effect of both supply and demand channels totaling \$634 billion of additional goods and services, including \$113 billion in new tax revenues over five years.
5. An increase in average employment levels of more than 212,000 jobs over five years.
6. Added consumer value from price competition and innovative new services.
7. Enhanced U.S. competitiveness in the global marketplace.
8. Accelerated rollout of new technologies and advanced networks in knowledge-based industries and applications.
9. Achievement of social goals such as universal service.

for moving forward. The Chamber sincerely hopes that the report will be a catalyst for a clear and comprehensive review of the way in which the United States regulates telecommunications.

In the final analysis, however, policymakers will have to choose between two completely opposite approaches. Simply put, *either* this nation can continue to live with a regulatory system that regulators are comfortable with—but which has created such great uncertainty that investment in telecommunications has literally dried up and cost hundreds of thousands of jobs—*or* this nation can take a risk by abandoning the existing system for one that allows consumers, investors, and innovators to determine the path forward. In virtually all instances in which the United States has allowed markets and technology to lead the way, the reward for the nation and its citizens has been better technology at a lower cost.

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SUMMARY OF FINDINGS

Researchers agree that information technology investments have driven the extraordinary doubling of U.S. workers' productivity growth and may explain as much as three-fourths of overall labor productivity growth since 1995.

Telecom at a Critical Juncture

Telecommunications has been referred to as the central nervous system of the American economy. It allows citizens, businesses, charitable groups, the educational community, and virtually every entity in the United States to communicate with one another instantaneously. Through telecommunications, millions of organizations are able to transmit vast amounts of data that run their day-to-day operations and provide economic value to every citizen. Through satellites and other communications technologies, organizations can deliver video of anything on the planet and even transmit images of stars, galaxies, and the surface of Mars.

Moreover, many of these telecommunications transactions can happen in seconds. With telecommunications, the productivity and competitiveness of American companies increase exponentially. In fact, researchers agree that information technology investments have driven the extraordinary doubling of U.S. workers' productivity growth and may explain as much as three-fourths of overall labor productivity growth since 1995. Without telecommunications, the nation and the world would practically shut down because there is almost no aspect of today's economic activity that can occur without it. Yet only a few years ago, telecommunications meant telephone wires that customers used to deliver voice messages to one another. Data were transmitted by separate wires, and video was obtained through television. Because this was a very limited and structured system, federal and state

policymakers imposed stringent regulations on the few companies that delivered narrowly defined services. Over the last several years, however, a technological revolution has occurred in which communications have converged and all the formerly separate technologies (i.e., wire, wireless, cable, and satellite) can now deliver voice, data, and video. As a result of that revolution, each technology now competes against aspects of every other technology to provide the whole gamut of services.

Meanwhile, federal and state authorities continue to regulate telecommunications as if there has not been a technological revolution and only minimal competition exists in the marketplace. Simply put, these regulators are regulating for a world that no longer exists, one of limited telecommunications technologies and limited competition in the field. As a result, investment and innovation have been stifled, and the United States now ranks 11th globally and 10th in the Organization for Economic Cooperation and Development in terms of the number of broadband subscribers per 100 inhabitants.

The regulators' failure to recognize the fierce competition in the telecommunications marketplace has triggered devastating losses in investment and jobs. Consider these staggering facts. In the four years between March 2000 and July 2004, market capitalization in the telecommunications service industry fell from \$1,135 billion to \$375 billion, a decline of \$760 billion, or 67%. During this same period, the communications technology sector—the companies that manufacture

equipment—saw market capitalization decline from \$1,282 billion to \$338 billion, a decline of \$944 billion, or 74%.

And job losses were comparably dismal. Between March 2001 and May 2004, the telecommunications industry lost 380,500 jobs in the areas of telecom service, Internet service, and telecommunications equipment manufacturing. Voice, video, and data services were all affected. Overall, 29% of U.S. job losses during this period were in the telecommunications industry. And when overall employment increased by 1.4 million jobs between August 2003 and May 2004, telecom employment declined by another 23,000 jobs.

Danger warnings abound. The U.S. telecommunications industry is losing its competitiveness and, if this continues, it will eventually lose its ability to innovate. Misguided U.S. regulatory policy jeopardizes the nation's telecom industry, and this, in turn, could jeopardize the United States' role as the world's leader in technology. Even worse, this decline could eventually lead to the nation being displaced as the world's leading economic power.

At this juncture, the United States must choose: It can either allow regulatory uncertainty to literally deaden its central nervous system, or it can escape the regulatory quagmire and allow market forces and technological innovation to create the world's most advanced and efficient telecommunications system. If it chooses the right path, it will reap astonishing gains. It will create greater economic activity. Consumers will enjoy an abundance of services. Businesses will

realize vastly greater efficiencies and cost savings. All Americans will benefit from less government bureaucracy. And individuals and organizations will have available to them products and services that were unimaginable only a few years ago.

Facing a Crucial Choice

It is because this choice is so crucial for the American economy that the Chamber funded a completely independent analysis of the situation and the potential solutions. It is the most comprehensive review to date of the telecommunications industry and its current plight. The report contains an original, well-constructed macroeconomic analysis of the current impact of regulatory uncertainty on the industry, as well as an analysis of the influences that reform would have on the industry and the economy. It also puts forth recommendations as to how the United States can reenergize this indispensable industry.

A Changed Regulatory Consensus

Historically, American telecommunications markets were tightly regulated monopolies. Regulators not only accepted this outcome as efficient but also actively sought to discourage new challengers. In recent decades, this consensus has collapsed as competitive, unregulated telecommunications networks have pushed past regulatory barriers to produce enormous consumer benefits. In one prominent example, regulators, who originally deemed mobile phone service to be a "natural monopoly," licensed the service as a duopoly in the 1980s. The build-out of two wireless networks demonstrated the viability of head-to-head competition. The benefits

of rivalry then expanded markedly: when the Federal Communications Commission (FCC) issued several additional wireless licenses in the mid-1990s, per-minute prices plummeted by 80%.

The story of mobile telephones is not unique. The price of long-distance phone calls dropped dramatically with the entry of new competitors. Video programming jumped in quality, quantity, and variety as satellite rivals began to seize market share from cable TV. And residential broadband access is now available to nearly 9 in 10 U.S. households due to a lightly regulated deployment race between cable modem service and digital subscriber lines (DSL). One might argue that competition is, in fact, the new consensus in telecommunications; yet regulators act as if the outmoded monopolistic consensus still makes sense.

Reform: Going the Last Mile

U.S. regulators are now struggling with the task of extending these deregulatory successes to the local loop, the so-called “last-mile” of wires that connect the phone system to individual homes. The Telecommunications Act of 1996, which reversed essential assumptions of the regulated monopoly paradigm of the Communications Act of 1934, instructed state and federal regulators to adopt rules promoting last-mile competition. Toward this end, policymakers implemented critical reforms. For instance, they eliminated state franchise monopolies for local telephone service and mandatory interconnection among carriers, guaranteeing that subscribers to new and different phone networks can

communicate with one another.

To further invigorate competition, however, Congress directed regulators to devise network-sharing rules that enable new companies to offer local telephone service without building their own networks. Under the resulting resale provisions, entrants could offer retail customers dial tone service delivered entirely over an existing phone company’s network. The FCC established unbundling rules that required telephone companies to sell access to all parts of their networks to competitors at below-cost prices. With the unbundling provisions, entrants could lease just those parts of the network they needed. A new rival could use the existing local loop and connect last-mile traffic to a switch that it placed in the phone company’s central office. In either case, the Telecommunications Act of 1996 allows wholesale access prices to be regulated, a measure designed to counter the market power of the dominant phone companies.

Congress viewed mandatory network sharing as an insurance policy. Policymakers thought that if a natural monopoly stubbornly persisted in some areas or for some services, then competitors should be able to purchase these services at reasonable wholesale prices and provide retail services. Mandatory network sharing would prevent a stalemate in which new networks would be frozen out because of the risk involved in building new systems from scratch. Once new rivals gained substantial market share, the economics of building competing platforms would presumably improve. Soon, consumers would be able to choose among alternative networks. Regulation would fade

away, and market competition would rule. But that did not happen. Instead of fading away, these networking rules have become embroiled in a series of legal and regulatory challenges. They have been frequently revised and continuously challenged in legal and regulatory proceedings. After more than eight years of effort, widespread confusion exists today as to their status. This uncertainty has exacerbated the decline in network investment incentives that resulted from two other factors: first, the tightening in credit markets after the bubble in the industry burst and, second, the generous terms extended to resellers (i.e., relatively low wholesale prices and extensive resale opportunities), which created a disincentive to build. From the perspective of a new company entering the industry, it is much cheaper to rent access to existing telecommunications lines and equipment at prices set by the government than to build its own facilities. From the perspective of an existing company, it makes little sense to upgrade equipment when it would be forced to lease the upgraded network at low rates.

Imploding Investments

Dual capital market fiascoes have resulted: Investment in both competitors' and incumbents' networks has sharply declined. Investments in competitors' networks declined because renting was cheaper than building, and investments in incumbents' networks declined because profits flowing from new investments were reassigned to noninvestors through arbitrary pricing. Building large, modern telecom networks involves substantial outlays for "common costs." Regulations governing the use of existing networks are not easily quarantined;

new infrastructure investments are inevitably regulated too. Investors in new networks receive all the wrong regulatory signals.

A policy forcing network owners to lease their assets below rates that yield a market return on their investment is essentially a tax on capital. This tax affects capital in two ways. When the tax falls on existing capital (i.e., a network built before the tax was imposed), the asset's market value is reduced. The tax affects new capital by discouraging investors from creating additional network assets and from spending to maintain existing assets. As a result, telecom networks suffer from increasing obsolescence, similar to the deterioration of the housing stock following rent control.

Both of these factors interacted with financial market pressures to intensify the implosion of telecom capital spending in recent years. Annual capital spending in all areas of telecommunications plummeted from a peak of \$132 billion in 2000 to just \$56 billion in 2003. The loss of capital spending due to regulation is estimated to be more than \$20 billion for incumbent operators and an additional \$2 billion to \$3.5 billion for competitive entrants. As outlined in the study, this forgone capital investment substantially reduces output, employment, productivity, and competitiveness for the overall economy.

Two Conflicting Policies

Much of the blame for this drastic pullback by telecom investors lies at the feet of an ill-fitting, contradictory regulatory structure. Two policy conundrums stand out. The first is that, for fixed-line phone service, the government regulates both retail

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The economic tragedy is that the regulatory stalemate occurs just as many networks are ready and able to offer competitive phone, video, and Internet access services.

and wholesale rates, and the regimes sharply conflict. Retail rates are set so that everyone in a given state pays about the same *without regard to cost*. This means that high-cost customers (such as Aspen, Colorado, millionaires) pay what low-cost customers (such as blue-collar apartment dwellers in Denver) pay. Overall, business and long-distance charges have been kept artificially high in order to have lower prices for residential local phone service, a cross-subsidy that, according to its proponents, advances universal service.

Juxtaposed to the retail rate regulation and universal service policies are regulations mandating that wholesale access to networks be priced *on the basis of cost*. The focus on costs in the wholesale market is an attempt to send the correct economic signals to entrants so that they build networks only when they can do so more efficiently than incumbents. Combined with retail price regulation, this policy fails because entrants leasing existing facilities will be drawn to markets where regulated prices are kept artificially high rather than to those where the new rivals most efficiently satisfy consumer demand. In fact, new local competition has been relatively robust in business services, which regulators intentionally price above cost. By December 2003, new rivals provided approximately 25% of local business phone service, compared with 14% of the residential and small business market.

Entrants naturally seek to capture profits offered by regulatory pricing distortions, but this diverts the productive efficiencies that market rivalry delivers. According to

the study, one excellent solution would be to rationalize retail pricing by charging consumers for the costs they generate. Many rural customers could see bills go higher, while the majority of customers—urban and suburban households and businesses virtually anywhere—would see total phone charges fall. Yet rural customers need not suffer because billions of dollars in subsidies—today, largely wasted—could compensate for expected price increases. Moreover, the subsidy could be raised and distributed more efficiently. The social payoff would be enormous: better, more competitive telecommunications services. In addition, by using these subsidies, rural consumers could choose whatever form of technology best meets their needs. Current rules, however, force outmoded technologies onto rural customers.

The second intrinsic regulatory contradiction involves discrimination against investors that create new phone networks. To encourage construction of competing systems, some regulations can be effective, including mandatory interconnection. But expanding wholesale access by mandating large discounts kills the investment incentives of incumbents, just as price controls generally deter investment. Those regulations also undermine the creation of competitive networks, because deeply discounted wholesale access to existing networks allows resellers to take market share from facilities-based entrants. Even the threat of inexpensive resale can deter the risk capital needed to build a new network to compete with existing systems.

Market data support this view. With the

sharp decline of wholesale access prices (set by regulators) over the past five years, the number of resold lines has exploded. Concomitantly, the growth of facilities-based competitive lines has collapsed. And capital expenditures for networks have imploded, despite strong demand for broadband services. Incumbents and competitors have failed to attract capital to build bigger and better networks, and those firms large enough to generate their own capital are using the money for other things—for instance, to build wireless networks, to pay dividends to shareholders, or to reduce debt.

Markets Ready for Change

The economic tragedy is that the regulatory stalemate occurs just as many networks are ready and able to offer competitive phone, video, and Internet access services. Business markets demonstrate that, with heavy demand and dense usage, competitive rivals can build alternative platforms for voice and data. Even in residential markets, rival telecommunications pathways exist. Incumbent phone companies no longer own the sole communications path to the customers' premises. A potentially competitive—highly competitive—marketplace is already on the horizon.

There are about 109 million U.S. households. The typical residence receives service from a telephone line provided by an incumbent local exchange carrier (ILEC)—a Baby Bell (i.e., BellSouth, SBC, Qwest, or Verizon) or an independent (such as Broadwing or SureWest). About 15 million households and businesses getting this ILEC service receive bills from a reseller, not the ILEC. Virtually all the

intense regulatory, legal, and political skirmishing has been devoted to setting the terms of a network-sharing scheme called unbundled network elements-platform (UNE-P). UNE-P includes some combined use of a phone company's network system (e.g., the loop, switch port, switching, transport, signaling systems, and databases). Fortunately, however, multiple networks are now emerging to offer popular service substitutes. These include cable, wireless, and satellite platforms, as well as new applications creating Virtual Networks, such as Voice over Internet Protocol (VoIP).



*Competitive Telecommunications:
Pathways to U.S. Households*

Americans now have many options when choosing their telecommunications services, options that have sprung up rapidly in recent decades and have reduced the old wireline telephone system to only one of numerous choices. What follows are some of the core technological innovations that have changed the telecom landscape:

Cable—The typical house is serviced by a high-capacity communications conduit owned by the local cable TV system, providing analog video, digital video, video on demand, and high-speed Internet access. Note the discrepancy in coverage:

- Cable operators offer phone service to 16 million households—of which about 2.5 million subscribe.
- Cable operators offer broadband service to approximately 97 million households—of which about 15 million subscribe.

Cable systems could add phone service with incremental investments. Yet incentives to offer telephony have proven relatively weak. This is not surprising, given the threat that resellers pose by using the incumbent carrier's network at politically determined rates. A cable company anticipating revenues per subscriber of \$50 a month from local and long-distance telephone subscriptions may well be deterred when rivals reselling the incumbent telephone company's service offer similar services for \$40, depending on where regulators decide to fix wholesale prices. This cloud shadows a potential cable entrant's investment in telephony much as it does an ILEC's, the difference being that the newcomer can avoid government interference by simply declining to invest. Maturing VoIP technologies, fortunately, offer new capabilities and cost savings, encouraging major cable operators to deploy new forms of voice service to customers.

Wireless—Competitive pathways increase dramatically with wireless

technologies. Six national networks now serve the U.S. market, and consumer demand for mobility is making wireless an arch rival of wireline phone systems. Wireless service has already replaced about 43% of wireline long-distance calls. By 2005, the United States will probably have more wireless than fixed-line subscribers, the global switchover having occurred in 2001. In developing countries, wireless is now the technology of choice for new construction. In developed countries, wireless substitution is eliminating large numbers of wired connections altogether.

Satellite—While analyses of local telephone policy have often overlooked satellite communications, satellite platforms can form key elements in a more competitive marketplace. While standard phone calls suffer quality handicaps when transmitted via traditional satellite connections, direct broadcast satellite (DBS) systems have proven effective in delivering multichannel video, competing with cable TV operators. This has prompted cable operators to upgrade their systems for digital services and has helped to ignite deployment of cable modem service. In turn, phone companies have had to respond with investments in DSL, broadband links supplied via phone lines. With VoIP technology turning broadband connections into phone lines, local loop competition is at hand. Cable's introduction of "triple play" offerings—voice, video, and high-speed data—in discounted bundles has pushed satellite and telephone companies to form alliances, bundling telephone

company voice and DSL service with DBS video.

Emerging Technologies

Other promising technologies and applications appear ready to challenge the status quo. Electric power networks offer an additional distribution grid capable of transporting large quantities of data delivering voice and video to homes and offices. Terrestrially based, fixed wireless technologies can provide expanded communications links. DBS operators have begun delivering high-speed Internet access.

Sending the Right Regulatory Signals

With opportunities now ripe for competitive network development, onerous and unwise network-sharing mandates have proven to be a costly distraction. Complex to evaluate, difficult to craft, and contentious to enforce, these arranged marriages dictate that a network must host its rival on terms established by government fiat. To enforce cooperation among parties with diametric interests, regulators predictably impose more and more comprehensive regulations. Rulemakings are stacked upon rulemakings, followed by complaints, petitions for reconsideration, litigation, appeals, and appeals of the appeals. Uncertainty is rampant as regulators and courts declare, amend, overrule, and then reconstitute various rules. Risk increases, and capital investment is deterred. This dynamic has important effects on the overall economy by reducing output, employment, and productivity. Lawyers and lobbyists profit—while consumers wonder what happened to the advanced

networks and innovative services “deregulation” was supposed to bring.

Given the observed effects of this approach and the demonstrated availability of competitive networks, policymakers now have a golden opportunity to reform telecommunications rules by substituting market forces for regulation. The report describes the internal contradictions in the existing regulations and recommends an exit strategy. The report’s recommendations will generate economically productive investment, produce efficient, price-lowering competition, and stimulate innovation in advanced telecommunications services. Recommended reforms, which require regulatory or legislative action at the state or federal level, fall into two categories: ending policies that discriminate among networks and ending price distortions in telecommunications markets.

Ending Policies That Favor One Network Over Another

This category of reforms necessitates four significant measures:

1. *Phase out wholesale access based on theoretical costs in favor of the basic price-setting mechanism now used for total service resale and sunset such price controls (perhaps after three to five years).* Current pricing is based on what a company might charge if operated at a theoretically ideal level of efficiency. This approach sets a low wholesale price that encourages new entrants to use existing company networks rather than build their own facilities. Additionally, this approach has the perverse effect of

With opportunities now ripe for competitive network development, onerous and unwise network-sharing mandates have proven to be a costly distraction.

Why upgrade if government regulations require you to lease to a competitor at a price that is lower than the cost of investment?

discouraging existing companies from upgrading or even maintaining their own networks through new investment. Why upgrade if government regulations require you to lease to a competitor at a price that is lower than the cost of investment?

Instituting this proposed change would send the right signal to new entrants to build rather than to lease network facilities, and furthermore, it would tell existing companies that they should bring new communications technologies to the market because they could earn a reasonable profit on their investment. This proposal would end the reliance on highly controversial theoretical pricing mechanisms and, instead, would set prices based on actual pricing data, thereby ending eight years of stalemate and stagnation under the current pricing regime.

- 2. Expediently allocate at least 438 MHz of additional prime radio spectrum for flexible use by competitive wireless licensees.* Currently, U.S. spectrum policy has created an artificial scarcity of airwaves. Allocating more bandwidth would make wireless telecom service an effective third competitor with DSL and cable. Competition would drive down the prices of all three services and would create billions of dollars in consumer savings. The extra bandwidth would fuel substantial growth of mobile phone voice networks and would give homes and small businesses the ability to receive high-speed telecommunications services at lower prices. It would also make U.S. businesses far more productive. In short,

allocating additional airwaves would substantially enhance competition and thereby spur new telecom services, lower costs, and benefit both businesses and individual consumers.

- 3. Declare both cable modem and DSL services to be information services, which are not subject to common carrier regulatory obligations, and preempt state regulation of these services under the guise of "open access."* Cable modem service has been tentatively treated as an information service, and this approach has helped the service become more broadly used by businesses and homes. But uncertainty about the regulatory status of cable modem and DSL services has made investors jittery about investing in these communications technologies for fear of possibly being subject to telecommunications regulations that would undercut profitability. Policy-makers should end the uncertainty over broadband by permanently abandoning efforts to regulate the technology.
- 4. Extend to all VoIP services the FCC declaration of Internet-only VoIP as "information services" not subject to regulation and preempt Internet phone service from state regulation, specifically leaving the quality of service unregulated.* State regulators have expressed interest in licensing and regulating VoIP providers in the same way that they now regulate telephone companies. Internet services are provided regionally, nationally, and globally. Consequently, having different state regulations, taxes, and fees on VoIP services would be highly disruptive. The worst case scenario would be to have

50 different state regulations. This can be avoided, and uniformity achieved, through federal preemption of state rules, thereby ensuring that VoIP can prosper and provide its many benefits as a genuine competitor to traditional wireline service.

Ending Price Distortions

This category of reforms entails two additional significant measures:

1. *Raise funds for universal service in a competitively neutral manner. Funds should be appropriated from general revenues or generated via a relatively nondistortionary telecommunications tax, for example, a fixed monthly fee levied on each telephone number.*

U.S. social policy dictates that telecommunications services should be made available to all Americans as a critical link to society that every citizen should enjoy. But the high cost of serving rural and other underserved customers would deter telecom companies from providing service without government subsidies. Current universal service subsidies, however, favor traditional telephone service at the expense of newer technologies, and today's universal service policy is fundamentally hostile to competitive telecommunications markets. The report therefore recommends a change in the way funds are collected and distributed. Currently, long-distance, urban, and business telephone uses are generally billed above cost, while local, residential, and rural uses are often subsidized. These pricing distinctions are complex and create market distortions. The report recommends

nondistortionary approaches—for instance, drawing universal service subsidies from general tax revenues or assessing a fixed monthly fee for each telephone number—to achieve a fairer and more efficient market.

2. *Distribute universal service funds via consumer vouchers, not with payments to telephone companies, to allow competition among suppliers and choices for customers. This would allow consumers to select the most appropriate technology for their needs rather than being forced to use wirelines.*

Under the current universal service funding system, high-cost telephone companies are subsidized by the government, as opposed to the government's compensating phone users in high-cost areas. As presently constituted, some firms that qualify for subsidies are favored over others. This has two negative effects. First, it reduces incentives for suppliers to be efficient because their losses are made up by taxes. Second, it prevents consumers in areas that qualify for universal service subsidies from receiving the most advanced technologies, such as wireless or VoIP. Under the proposed voucher system, consumers could choose to apply the subsidies to whatever telecommunications services best meet their needs, whether it be traditional wireline, wireless, or newer broadband services.

The reforms recommended in the study would benefit virtually all telephone users and produce enormous economic gains. Not only would social goals such as universal service continue to be met, but competition-enhanced

efficiency would markedly increase the productive use of telecommunications networks. Competitors would shift unproductive investments in the regulatory process toward efficient investments in new networks and innovative applications. The sector—now heavily taxed—would be unburdened. U.S. businesses would witness dramatic cost savings, as artificially high business phone rates would fall. Consumers would gain from these efficiencies, as well as from lower prices and myriad innovations in residential market telecom services.

New Investments, New Jobs

Reforming telecom policies would lead to dramatic increases in capital spending, output, and employment in the sector. On the basis of the report's estimates, the changes outlined could generate a total of \$58 billion in incremental capital spending on network assets over the next five years by facility-based competitive local exchange carriers (CLECs), wireless companies, and cable operators.

In addition, increases in capital spending would lead to increases in output and employment in other industries—the multiplier effect described in macroeconomics textbooks. Standard Bureau of Economic Analysis multipliers, for example, suggest that each additional \$1 of telecom capital spending leads to \$2.86 in extra output, while every \$1 million rise in telecom capital spending leads to 18.2 new jobs. On the basis of the report's estimates, the proposed reforms would add \$167 billion to output and would increase average employment levels by more than 212,000 jobs over the next five years.

Consumers and Businesses Will Benefit From Lower Prices

Less direct, but no less real, are the effects of enhanced communications networks and lower prices for telecom services on the productivity, employment, costs, profits, and market values of the businesses that use information services as inputs in producing nontelecom outputs. The report's recommendation to increase available radio spectrum, for example, would lead to a reduction in wireless prices of approximately 50%, allowing users to increase their use of wireless minutes by 95%. Increases in consumer surplus would exceed \$77 billion; nontelecom businesses would see costs fall and profits increase.

Deregulation Will Enhance Productivity

The most powerful impact of the proposed telecom reforms will most likely occur indirectly through the enhanced productivity and competitiveness of American workers and companies. Reforming regulations to encourage investments in new, high-speed networks will both reduce costs and improve service quality for U.S.-based companies. This factor-substitution effect would be especially important in professional services, technology, health care, education, and other knowledge-based industries, which increasingly drive U.S. growth and will constitute the battleground in global outsourcing for years to come.

CONCLUSION

A consensus has emerged among economists that information technology investments have been the principal drivers behind the extraordinary doubling of U.S. workers' productivity growth since 1995. Advances in information and communications technology may account for as much as three-fourths of overall labor productivity growth since 1995. High-speed communications systems have helped corporations pursue the restructuring activities known variously as reengineering, demand-flow manufacturing, lean manufacturing, speed-to-market, or cycle-time reduction. These strategies show up as reduced inventories, lower working capital, improved product quality, and increased output per hour of work—the key drivers of long-run increases in living standards.

Investments in high-speed telecom networks and other information technology capital may be responsible for nearly one full percentage point of the annual increase in U.S. productivity since 1995. Yet the telecom-driven productivity boom has mainly been restricted to large companies and urban areas that have access to high-speed telecom networks. The capital spending that would likely take place if the report's proposed regulatory reforms are implemented would bring the advantages of high-speed telecom networks to small companies nationwide that produce more than half of the GDP and account for 75% of job creation, and it would generate a second wave of productivity growth by as much as 0.25% per year. At current GDP levels, this productivity boost would add

\$93 billion per year to the GDP, or a total of \$467 billion in additional goods and services over the next five years.

The total impact of the telecom reforms recommended in the report is the sum of the demand impact of increased capital spending on network assets plus the supply impact of increased productivity growth. The report's estimates suggest that telecom reform has the potential to increase average annual GDP by \$127 billion per year over the next five years by adding \$634 billion in additional goods and services and by increasing average employment levels by more than 212,000 jobs over the same period.

Unless U.S. telecom policies change—and change soon—the nation's central nervous system will continue to receive confused, destructive signals. What could be turned into genuine gains that are vital to America's future prosperity will be lost. The United States cannot let this happen. The economic gains from telecommunications reform are too important to pass up.

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