THE STATE OF U.S. BROADBAND: IS IT COMPETITIVE? ARE WE FALLING BEHIND?

BY EVERETT EHRLICH

progressive
policy
institute
ppi

EXECUTIVE SUMMARY

Advocates for new regulation of the U.S. broadband Internet base their case on the related contentions that (i) our nation lags behind the rest of the world in quality, price, and deployment of broadband, and (ii) the market for U.S. broadband service is not competitive. This paper analyzes the latest U.S. and international data on speed, price, profits, and investment, and concludes that both of these contentions are false.

As to the first component of the advocates' argument: the U.S. ranks 10th in the world in average broadband speed among nations surveyed by Akamai, and trails only South Korea and Japan among our major trading partners, countries with extraordinarily high urbanicity. We trail only Japan in the G-7 in both average peak connection speed and percentage of the population connection at 10 Mbps or higher. On price, the record is even more clear—the United States has the most affordable entry-level prices for fixed broadband in the OECD.

Other measures also belie the claim that U.S. broadband lags behind our international peers. Our per capita investment in telecom infrastructure is 50 percent higher that of the European Union, and as a share of GDP our broadband investment rate exceeds those of Japan, Canada, Italy, Germany, and France.

In short, when looking holistically at data on rankings, investment, prices, and affordability in their entirety, no evidence suggests that the United States is an underperforming dullard sitting in the back row of the broadband room. Our networks are faster, our prices more competitive, and our investments larger than most of the world's other major industrial nations.

The second pillar of the critics' argument is also tenuous. U.S. broadband is provided in a dynamic, quickly changing market marked by dramatic shifts in products, services, and competitors, and breakneck innovation. In such a market, the best evidence that competition is working and producing good results is the high quality of service and affordability that we see in the United States today. Critics often claim that the purportedly "small number" of broadband providers is evidence that the U.S. market is uncompetitive, although the significant capital costs of creating these networks, while limiting the ultimate number of providers, also compels them to compete to rationalize their investments. And to the extent that a narrow focus on the number of competitors in the market has any relevance, it is noteworthy that 90 percent of Americans can choose between at least one wired and one wireless provider offering four Mbps broadband, and 88 percent of Americans can choose from at least two different wired services providers.

Moreover, the profit margins of U.S. broadband providers are generally one-sixth to one-eighth of those companies (such as Apple or Google) that *use* broadband, contradicting the idea of monopolistic price-gouging by providers.

The result of this competition is that 96 percent of U.S. households have access to speeds equal to or greater than 10 Mbps, and 99 percent of Americans can now access service of at least 3 Mbps. Over 50 percent have access to service at 100 Mbps or more. This perhaps is the best evidence that critics of U.S. broadband performance misrepresent the state of broadband in America today.

We should want U.S. broadband to be diffused rapidly, priced reasonably, and used to build social, political, and economic citizenship. The evidence presented here shows that the current approach to broadband regulation is serving these goals admirably. To go further, we will need government to develop policies and programs that achieve these goals in a way that supports the current regime of high investment and continuous innovation by competitive broadband providers, not in a way that would limit or upend it.

WHEN LOOKING HOLISTICALLY AT DATA ON RANKINGS, INVESTMENT, PRICES, AND AFFORDABILITY IN THEIR ENTIRETY, NO EVIDENCE SUGGESTS THAT THE UNITED STATES IS AN UNDERPERFORMING DULLARD SITTING IN THE BACK ROW OF THE BROADBAND ROOM.

INTRODUCTION

Public policy regarding the development and deployment of broadband Internet in the United States is now the subject of a lively debate. At the crux of that debate and at the risk of oversimplification, lie two interrelated propositions put forward by advocates of greater regulation of U.S. broadband.

The first proposition is that the United States lags behind the rest of the world in the quality, price, and deployment of broadband. The second—which these advocates of regulation say explains the first—is that U.S. broadband is dominated by an uncompetitive "cable/telco duopoly." The conclusion typically drawn from these propositions can be paraphrased thus—uncompetitive broadband suppliers have charged too much for their product, this profiteering has slowed deployment, and providers have not invested and innovated at rates sufficient to keep up with the rest of the world.

The validity of this conclusion is an important question, but not an unanswerable one. As Daniel Patrick Moynihan once said, we are entitled to our own opinions, but not to our own facts. While there are always questions of interpretation when presenting data, there are readily available facts about the state of U.S. broadband service compared to other nations, including speed, prices, profits, investment, and innovation. This is not the first paper to examine these questions[1], but it is the latest, incorporating the most recent available evidence to determine the state of broadband Internet in the United States.

INTERNATIONAL COMPARISONS

The most common forms of international comparison discussed in the policy debate are international speed rankings. Let's begin there.

SPEED RANKINGS

Speed is an important measure of broadband performance, but before looking at the data we

should also be clear about what speed rankings do—and do not—convey.

Consider a world with two countries—the United States and Andorra. If we ranked the two by average broadband speed and found that Andorra was first and the United States second, of what use would that information be?

It would be most useful if we could find something about Andorran broadband policy that was applicable to the United States. Perhaps there are mandates in Andorra that move broadband forward, subsidies offered, or other policies in place that could be examined to see if they could improve our own situation. Yet many broadband critics fail to assess whether those policies truly are applicable to the different circumstances of the United States—they assert we are falling behind, and that the lesson to be learned is that we don't have the same regulatory policies as do the countries higher on the list, without delving deeper into the differences between these countries.

At the same time, broadband speed rankings are often held up as totems standing in for overall economic competitiveness and health—adopting faster broadband means a strong country ipso facto. But we know that broadband is only one of a host of factors that influence "competitiveness"—there are numerous powerful influences from education and workforce skills to physical infrastructure to savings and investment rates. Whether we lead or trail Andorra in broadband speed is likely a very small component of how the U.S. stacks up against them in economic competitiveness and health. In fact, there is a good argument to be made that the rate of change and improvement in broadband is more important than where we may stand at any given moment.

Finally, speed itself is not so simple to measure and is not a perfect measure of overall broadband service quality and performance. Average national speeds don't just reflect technical capabilities; they also depend on consumer choices and willingness to adopt high speeds. Both abroad and at home there are signs that top available speeds are not always the consumer's first choice. In addition, speed is just one aspect of network performance; it tells us nothing about reliability or security for example. Even the methods of testing speed are not without controversy; for example, many European countries that employ high quality testing through the "Samknows" service don't release their results. Presumably, those additional data would further adjust the broadband speed rankings.

TABLE 1. AVERAGE CONNECTION SPEEDS FOR SELECTED NATIONS, 2013[2]

		avg Mbps	Q/Q change	Y/Y change
1	South Korea	21.9	-1.1%	57.0%
2	Japan	12.8	-4.4%	14.0%
3	Netherlands	12.4	-0.7%	38.0%
4	Hong Kong	12.2	-2.6%	22.0%
5	Switzerland	12.0	3.8%	27.0%
6	Czech Republic	11.4	0.7%	30.0%
7	Sweden	10.5	13.0%	30.0%
8	Latvia	10.4	-6.7%	11.0%
9	Ireland	10.4	8.4%	59.0%
10	United States	10.0	2.0%	25.0%
12	Denmark	9.5	4.0%	31.0%
13	United Kingdom	9.4	3.3%	29.0%
16	Canada	9.0	1.5%	23.0%
21	Germany	7.7	1.0%	20.0%
35	France	6.6	0.8%	35.0%
46	Italy	5.2	7.7%	25.0%

Considering these factors, what does a country's broadband speed ranking really mean? A ranking of "2nd" or "X" in the world doesn't tell us anything about the other countries ahead or behind us—is Andorra a major trading partner of ours, is it a comparably large and complex economy? By how much do we lag—are we actually very close to Andorra or separated by a large margin? And what factors account for the difference? As Atkinson, et al., noted, rankings

create an artificial kind of scarcity—only one country can be first, no matter how slight the variance among the ranked. Many nations may have ubiquitous, affordable, and innovative broadband that serves their people well, even if only one appears "on top."

All of these contextual issues arise immediately when analyzing the list of the nations with the fastest average connections as of the third quarter of 2013. Table 1 presents broadband data from Akamai, whose ratings are commonly used for this purpose.

As Table 1 shows, in fourth quarter of 2013 the United States ranked 10th among nations that Akamai surveys (those with more than 25,000 Internet addresses), with an average connection speed of 10 Mbps. We trail South Korea and Japan, but are substantially ahead of most of our other major trading partners, to whom the competitiveness argument is particularly relevant.

Closer analysis of the broadband speed rankings reveals that three of the first four places are held by highly urbanized, Asian economies in which the cost of building infrastructure is dramatically lower than in a highly suburbanized society such as the United States. (As a White House report notes, U.S. connection speeds are "the fastest compared to other countries with either a similar population or land mass."[3]) Also, the countries' differing governmental policies have directly and indirectly supported broadband build-out and adoption to varying extents.

South Korea is a perfect storm where both of these issues point to high speeds in the early phases of adoption. While in the U.S. local loops that carry signal over the "last mile" to the household are often a mile or more in length (which leads to considerable signal degradation), the equivalent local loop in South Korea often simply runs up the interior of an apartment building. Furthermore, government programs to promote broadband adoption have been the norm in South Korea for a decade. Other countries like Sweden and Japan high on this list also benefit from a high degree of government subsidy not present in the United States.[4]

Speed matters—and as we have shown the U.S. performs well now and is out-improving its rivals.

The other nations high on the list—Switzerland, Latvia, the Czech Republic and the like—are small economies with dominant urban centers (quick—what's the second largest city in Denmark?). Whether the vastly different United States ranks above or below them tells us little about U.S. competitiveness or consumer welfare.

The same is true for other international comparisons of speed. The United States ranks 10th in the world in average peak connection speed, but aside from Japan and South Korea, the nations it trails include Switzerland (5th on the list), Sweden (7th), and Latvia (8th); by contrast, we rank second among the other G-7 nations, a far more useful comparison. We rank 8th in the percentage of the population connected at 10 Mbps or better, again behind Japan and South Korea, but ahead of the other G-7 nations. Considering the dramatic differences in development, scale, and density of the countries compared, such rankings hardly suggest an underperforming U.S. broadband industry.

In addition, recall that these comparisons are for residential consumers. For businesses of any meaningful size, telecommunications and connectivity are purchased through different channels, and United States prowess in business and university connectivity remains substantial. New and sometimes experimental broadband networks that now offer 6.5 percent of American households 1 gigabit per second are novel in the residential sector, but businesses can, and do, readily avail themselves of those networks.

Another important comparison point is consistency of service. A February 2013 FCC report states that U.S. ISPs delivered, on average, 97 percent of their advertised download speeds during the peak consumer usage hours of 7:00 p.m. to 11:00 p.m. local time. Peak period download speeds were generally within 5 percent of 24-hour average speeds. For uploads, average speed was 108 percent of advertised speed—that is, faster than advertised. Naked average speed ratings do not account for this extremely consistent level of service and the ability of U.S. providers to deliver top speeds even during the highly concentrated period of highest usage in the "prime time" evenings.

Speed matters—and as we have shown the U.S. performs well now and is out-improving its rivals. But there are other aspects of international comparisons that are equally important. What good are speeds if you can't afford them? How will speeds be maintained if companies don't invest? These questions must also be answered.

PRICE

All sides of the broadband debate agree that prices should not be "too high," but what does that mean?

Comparisons of broadband prices across time and place suffer from a variety of difficulties. Even if the price of a broadband connection were to be constant over time in nominal dollars, its effective price would drop steadily as the quality of connection offered today is far better than that offered only a year or two ago. On the other hand, consumers may not value improvements in speed linearly—a connection of 100 Mbps, for example, is likely not ten times as valuable or satisfying to a consumer as is a connection of 10 Mbps.

One way to resolve the time series problem is to "chain" the products offered. This technique compares the prices of an old and new product or service when they exist simultaneously in the market to determine how consumers value one relative to the other. Over time, as newer products or service replace older ones in the basket of goods and services households consume (as when broadband phases out dial-up), the price index can be adjusted to capture the new higher value based on the consumers' own expressed preferences. In other words, by factoring in the way consumers value new and better products, we can track prices of services that improve over time like Internet connectivity or personal computers.

TABLE 2. TYPICAL BROADBAND ACCESS CHARGES AS A SHARE OF PER CAPITA GROSS NATIONAL INCOME, 2011 AND 2012, SELECTED COUNTRIES[5]

	mobile	mobile	fixed bb	fixed bb	GNI (USD)
	2012	2011	2012	2011	2011
US	0.90%	0.90%	0.40%	0.50%	48,450
Canada	1.10%	1.20%	1.10%	0.80%	45,560
France	1.20%	1.50%	0.80%	0.80%	42,420
Germany	0.50%	0.90%	1.10%	1.10%	43,980
Italy	1.10%	1.10%	1.00%	1.00%	35,330
Japan	0.80%	0.80%	0.70%	0.70%	45,180
Korea	0.40%	0.40%	1.60%	1.60%	20,870
UK	1.50%	1.30%	0.70%	0.70%	37,780

Using this approach, the Bureau of Labor Statistics determined that the price of "internet services and electronic information" dropped 25.4 percent between 1998 and 2012, or about 2.1 percent per year, when taking into account how consumers value higher speeds when they are brought to market.

Comparisons of price across different nations suffer from a different set of problems. Customer arrangements in different countries vary in many key respects—pre-paid versus contract, tie-ins of devices, "triple-play" offerings versus purchases of individual communications services, and so on.

Two notable efforts have been made to move past these issues and create meaningful comparisons. The International Telecommunications Union has developed a technique that standardizes landline telephony, mobile telephony, and wired broadband

access into one index that allows international comparisons, even though the way these are weighted within a given nation will differ (e.g., some countries have significant landline telephone infrastructure legacies, while others skipped this stage and went directly to mobile connections). The ITU data on affordability is presented in Table 2.

As shown in Table 2, United States Gross National Income per capita (GNI) was $48,450 in 2011. The (typical) annual cost of a mobile connection package (as specified by the ITU) in 2011 was 0.9 percent of GNI. The (typical) annual cost of a fixed broadband connection (again, as specified by the ITU) was 0.5 percent of GNI.

The ITU data, therefore, show that U.S. fixed broadband is the most affordable among this group of larger industrial nations, and its mobile broadband about average.[6] And by applying the percentages of GNI as presented in the ITU report, annual prices for their mobile telephony and fixed broadband packages can be calculated, as seen in Table 3.

Table 3 shows that U.S. prices for this standardized package are near the average for this group and that the annual charge for fixed broadband in the United States is the lowest within this group. This is true partly because the price of broadband in the United States is legitimately low; however, it should be noted that the "standard" fixed broadband connection used for this purpose by the ITU is an entry-level one, and the United States has been found to have the lowest entry-level prices for wired broadband access in the OECD.[7]

Some older data does suggest that U.S. prices for higher levels of speed do lag behind some of our peers, such as a 2010 survey by ITIF, which placed us 15th out of 36 nations on price for a 5-20 Mbps connection and 25th out of 28 for 20-50 Mbps. However, as shown in Tables 7, 8, and 9 the landscape has changed significantly since 2010 as the United States has rapidly expanded availability of higher speeds and shifted dramatically away from the more limited traditional DSL platform that required lengthy local loops with

TABLE 3: INDICATED PRICES FOR STANDARD MOBILE AND FIXED BROADBAND SERVICE[8]

	mobile	mobile	fixed bb	fixed bb
	2012	2011	2012	2011
US	$ 436	$ 436	$ 194	$ 242
Canada	$ 501	$ 547	$ 501	$ 364
France	$ 509	$ 636	$ 339	$ 339
Germany	$ 220	$ 396	$ 484	$ 484
Italy	$ 389	$ 389	$ 353	$ 353
Japan	$ 361	$ 361	$ 316	$ 316
Korea	$ 83	$ 83	$ 334	$ 334
UK	$ 567	$ 491	$ 264	$ 264

correspondingly high installation costs to achieve higher speeds. ITIF further concludes that the data may reflect ISP decisions to keep costs low for entry-level services at the expense of faster connection prices, which are an important and many would say valuable trade-off for broadband policy as a whole.

When looking holistically at data on rankings, investment, prices, and affordability, it simply cannot be concluded that the United States is an underperforming dullard sitting in the back row of the broadband room. Our networks are faster, our prices more competitive, and our investments larger than most of the world's other major industrial nations. This means, at the least, that assertions that the U.S. broadband industry is underperforming are off base.

INVESTMENT

The bill of particulars set forward by critics generally asserts that U.S. broadband consumers pay too much for too little and, either by assertion or inference, that Internet service providers are under investing and gouging consumers, amassing huge profits based on undue market power.

Let's begin with the fundamental question of investment in broadband. Creating and improving our broadband networks is an expensive

proposition; but without sustained investment, there can be no progress or innovation and eventually we would truly fall behind other nations who no doubt will continue to build their networks. No matter what regulatory framework we choose to adopt (including the absence of regulation), the question of how that system will affect the level of investment in U.S. broadband networks must be first and foremost.

The U.S. broadband industry has invested $1.2 trillion in wireline, wireless, and cable since the Telecommunications Act was passed in 1996. Expenditures have averaged $66 billion annually in the first four years for which we have data since the 2008 economic downturn (2008-2011). A recent White House report on the state of American broadband reported that just two U.S. telecommunications companies account for more investment than the top five oil and gas companies combined and four times the investment of the Big Three auto manufacturers; five of the 20 U.S. investment leaders in 2011 were broadband providers—Verizon, AT&T, Comcast, Sprint, and Time Warner Cable.[9]

It is useful to place these large investment numbers in context by comparing such investment in leading nations to their Gross Domestic Product. Table 4 does so for the G-7 nations plus South Korea, a global leader in broadband deployment. It uses data on investment from the International Telecommunications Union for 2010.

In 2010, the United States invested a slightly smaller share of GDP in telecommunications networks than Korea or the United Kingdom, but a sizably larger share than Japan, Canada and the other European G-7 nations. In fact, since 1996 the United States has regularly invested more than Europe. Copenhagen Economics, a European consulting firm, notes that per capita investment in telecommunications networks is more than 50 percent higher in the United States than the European Union, although part of this differential may be explained by the much lower population density of the United States, which makes building new infrastructure here more expensive (as it is in Canada and Australia). The Copenhagen Economics report notes that "had the U.S. followed the E.U.'s slower pace in ICT investments since the late 1990s, U.S. labor productivity would have been 25-30 percent lower than it is today."

TABLE 4. INVESTMENT IN TELECOMM AS A % OF GDP, 2010[10]

	GDP	T'com Investment (In $b USD)	% of GDP
US	14,419.4	70.15	0.49%
Canada	5,495.4	16.94	0.31%
France	3,284.5	7.82	0.24%
Germany	2,548.3	8.48	0.33%
Italy	2,256.3	7.40	0.33%
Japan	2,042.0	8.15	0.33%
South Korea	1,014.9	5.54	0.55%
UK	1,577.0	8.16	0.52%

COMPETITIVENESS AND THE MARKET FOR BROADBAND

The question of whether the broadband Internet is provided competitively is the basis for a far more consequential question—whose preferences will govern the evolution of the Internet? The presumption usually made in policy circles is that the growth and development of a product or service—even a very far reaching and important one like broadband service—can and should be guided by the balanced interaction between consumers and producers; consumers express their preferences through their behavior, and producers compete to meet their needs.

Our confidence that this market approach works is rooted in our long experience with the benefits of competition and the powerful innovating spirit that drives producers to anticipate and meet consumer demand. Conversely, when firms exert excessive market power, they can harm society by artificially restricting output, raising prices above competitive levels, selling less in the short-term and reducing the pace of innovation in the long-term, and

PILING NEW REGULATIONS THAT RESTRICT A PRODUCER'S FREEDOM WILL, IN TURN, RESTRICT THE RETURN SHE OR HE CAN MAKE FROM THEIR INVESTMENTS, WHICH MEANS LESS INFRASTRUCTURE AND INNOVATION DOWN THE LINE.

substituting market abuses for innovation and quality as a path to profits.

It's worth noting, of course, that there can be good types of market power. Patents yield a form of market power that we recognize is needed to incentivize risky investment and new invention. The first smart phones, color televisions, jumbo jets, or any other breakthrough innovation may give a compelling advantage to the innovator who developed that product, but in this case that advantage should only serve to promote further innovation and progress as others rush to compete in the new market space that has been created. Unless there are unreasonable restrictions, competition will eventually challenge these innovators, just as other firms came along to challenge Apple, RCA, and Boeing.

Broadband Internet, of course, is a landmark social phenomenon. It is the vehicle for a burgeoning share of our society's learning, communication, entertainment, commerce, and civic involvement.

There are compelling arguments that we should devote public resources to extending broadband to unserved areas, encouraging adoption, and applying broadband's functionality to such "mixed" public-private sectors as education and health. It requires appropriate public safety regulation like any other significant economic activity.
But the existence of those needs and goals doesn't mean that broadband is not being competitively provided or tell us anything about the competitiveness of the market for this importance service—it speaks to the importance of broadband, not its market structure.

The question of whose preferences will guide the evolution of the Internet is far from academic. At several junctures, advocates of increased regulation champion departures from market-based outcomes in order to compensate for what they characterize as failures of competition. These include:

- Imposing "net neutrality" on the delivery of content on the Internet, meaning that all content

must move on the same terms and conditions, and that ISPs may not offer differentiated service to Internet businesses and content providers based on their different needs;

- Eliminating data plans ("pay for what you use") and making all service "all you can eat";
- Mandating "common carriage" on ISPs, with its rigid requirements of mandatory interconnection, forced sharing of network facilities (or "unbundling"), and government price setting; and
- Limiting the amount of new spectrum the two wireless market leaders—Verizon and AT&T—may purchase at future spectrum auctions.

Substitute "peanut butter" for "broadband" and this list of proposals would seem outrageously intrusive. It would ensure that all peanut butter was of exactly the same quality, that it was sold using unlimited access licenses instead of by the jar, that any competitor could use any other manufacturer's peanut processing plant, and that some providers would have their access to peanut crops curtailed, even if they could make better peanut butter.

Yes, broadband is different—it's far more consequential than peanut butter. There are good economic and social reasons, for example, to subsidize its adoption and use. But do those differences demand the types of regulations outlined above, which would limit consumers' choices and close off innovation in business models, pricing, and service? Again, the importance of the broadband Internet does not tell us much about the market structure that provides it. And, again, this boils down to a central question—is the provision of broadband competitive?

WHAT MEASURES?

The heart of the advocates' argument that there is a "duopoly" of cable and telco providers in every market and that, therefore, the market is uncompetitive. We need to determine (i) whether this is true and (ii) whether this is relevant.

Every economics student in their first encounter with the discipline learns that the archetype of competition is a world in which firms are many in number and devoid of any power over prices, much as farmers producing winter wheat are many in number and forced to take the posted market price. At the other end of the competitive spectrum lies monopoly, in which one producer can freely pick among the many possible combinations of prices and output and consumers have no choice but to accept. The obvious extrapolation is that, all other things being equal, a greater number of producers lead to a more competitive market. In fact, the central calculations of industry economics and antitrust law have traditionally been the Herfindahl Index[11], which measures the size of firms compared to the market, or the concentration ratio, which measure the share of the market held by the first "x" firms—measures that are deeply rooted in the idea that there must be a very large number of firms to achieve a competitive outcome.

Substitute "peanut butter" for "broadband" and this list of proposals would seem outrageously intrusive

But is the converse true—does a smaller number of producers mean the absence of competition? The answer depends on the nature of the market. Indeed, economists' thinking about oligopoly or duopoly is rooted in a specific characterization of the market in which they operate. Specifically, oligopoly or duopoly assume the product at issue is a static commodity—the companies involved compete only on the basis of price, not technological progress, service quality, or other means of product differentiation. This is important because, if firms compete through innovation or other product qualities, any agreement to collude on price to stabilize market share and protect profits is fundamentally unworkable.

The provision of broadband, however, is dominated by innovation—access speeds continue to improve

How Competition Spurs Innovation

What if the broadband market really is competitive—what is the loss if we impose regulations that promote further competitiveness? What is the harm?

One issue, of course, is innovation and investment. Piling new regulations that restrict a producer's freedom will, in turn, restrict the return she or he can make from their investments, which means less infrastructure and innovation down the line. Developing the iPhone was a costly, long-term endeavor. If its initial success had been met with confiscatory regulations that took away Apple's first mover advantage and stripped out profits that were arbitrarily deemed too large, would Apple have continued to take such risks? Would we have the iPad today, for example, and the entire tablet market that has bloomed in its wake?

Equally costly, imposing regulations that are designed to enhance or mimic competition upon a market that already is competitive can have the opposite effect—it can end up distorting or breaking the market, making it less competitive rather than more. A bit of salt improves and balances the flavor of a dish; adding more salt to a dish that's already well seasoned renders it impossible to eat.

For example, the iPhone was first introduced through an arrangement with AT&T which required consumers to use AT&T's wireless network with the device. At the time, there were critics who argued that this arrangement was not competitive, as you couldn't use the phone on every wireless system, and contended that "competition" demanded that all devices and systems be interoperable.

From an engineering perspective, the idea that all systems and devices could be entirely interoperable was more fantastic than a letter to Santa. The old "Ma Bell" phone system was designed to have universally interoperable systems and devices, but that system was abandoned over a generation ago because it failed to deliver innovation or declining prices. But, beyond the technical issues, the most important lesson is that the decision not to peremptorily regulate the initial iPhone, including its network exclusivity, produced a result that was even more competitive than what might have transpired if Apple had been compelled to make its invention available to all wireless systems.

Consider this: If the iPhone had been available on every wireless system, it well could have achieved a virtual monopoly over the entire wireless industry through compelling "first-mover" advantages. For example, it might have killed off potential competitors by denying future generations of iPhones to carriers who dealt with those competitors, or threatened app providers in a similar fashion. Less nefariously, it might have swallowed up the market for other devices by occupying the smartphone space on all major carriers. But an Apple monopoly over smart phones not only would have slowed the dissemination of these incredible devices and raised their prices, but it would have had a similar effect on the entire "app economy" that has evolved, which, according to credible estimates, supports 752,000 jobs.

The arrangement Apple struck with AT&T strengthened the latter as a competitive provider, in large part because it allowed AT&T to compete in both sides of a "two-sided market"—attracting vendors such as Apple to entice more customers and, in turn, attracting more customers to get better terms from vendors. It helped with early adoption of the novel iPhone technology by giving AT&T a real stake in reaching and persuading new customers—and subsidizing their purchase of new devices.

That dynamic then rippled out through the market as a whole. In the presence of the Apple/AT&T arrangement, wireless providers competing with AT&T had a powerful incentive to find companies to develop and manufacture competing smartphones, which invited such powerhouses as Samsung, Google, Microsoft and others into the market for phones and their operating systems. The result has been a staggering rate of innovation as phones acquire greater functionality—consider how the device in your pocket compares to what you had only six or seven years ago—and manufacturers rush to fill market niches beyond the high-end iPhone space. Today Apple has just 12 precent of the global smartphone market, while second mover Samsung now has 32%.[12] This pressure in turn has forced Apple to innovate and diversify its offerings—introducing Siri for example, and the lower-cost, broader reach iPhone 5C.

So, in the end, the Apple deal with AT&T—which many advocates argued was uncompetitive—set in motion the burgeoning innovation of mobile devices, apps, and services that has vastly improved consumer welfare in the past 10 years. Yet, had we heeded the call to impose regulation designed to "spur competition" upon a market that did not need it, that surge of innovation and consumer well-being, not to mention growth in output and employment, may not have occurred. That is why regulations, even those designed to champion competition, must be deployed only when there is a clear and compelling threat to competition that must be remediated. We should heed this lesson with respect to all of the components of the Internet experience—for example, competition in mobile devices, in mobile operating systems, or in important applications or services, such as search or social networking, as well as broadband network services themselves.

dramatically, allowing consumers to weigh price and speed even as they buy the equivalent of steak today at the same price as the equivalent of hamburger yesterday. Reliability, pricing models (beyond absolute price levels), and in-home and mobile features all drive consumer choice in this space. Thus, even if firms were to collude on price, they would still be forced to compete on other factors, making their collusion on price irrelevant—thus defeating any claim of oligarchy or duopoly as an economic matter.

Further, the conventional view of competition (or its absence) assumes individual producers face "normal" cost structures, that is, the (marginal) costs of providing additional output rise with the level of output. That rising cost structure drives oligopolists to collude—were they to expand their production to the "competitive" level, the higher costs associated with the incremental output would reduce their profit.

But broadband does not have this cost structure. In all its variants—and particularly wired delivery—the system has very high fixed costs associated with building infrastructure, while the cost of hooking up and running a connection to premises are far smaller. Thus, the profitability of providing service depends on the number of subscribers over which the fixed cost of infrastructure can be spread. This is another key difference from the assumptions of the "oligopolistic" model.

Moreover, measures such as the Herfindahl Index or concentration ratio assume that we know whom to count as a competitor. For peanut butter, that's simple—you either make it or you don't. For broadband, it's less so. Delivering broadband services to the consumer may involve a range of services and devices, from network access to in-home devices like routers and modems, to software and customer support. These elements combine to form different value propositions for consumers and again limit the rise of any potential collusive or oligopolistic market. For example, wireless phone companies are moving towards making texting free because consumers can get free instant messaging from companies such as Google, that for the most part are not themselves broadband service providers.

TABLE 5: AVERAGE PROFIT MARGIN FOR PUBLICLY TRADED TELCOMMUNICATIONS AND CABLE BROADBAND COMPANIES OCTOBER 2011—DECEMBER 2012[13]

Rank	Country	Average net profit margin
1	United Kingdom	21.1%
2	Turkey	19.9%
3	Sweden	13.6%
4	Australia	13.2%
5	Denmark	13.1%
6	Mexico	12.3%
7	Canada	12.2%
8	Belgium	11.2%
9	Greece	9.9%
10	Spain	9.7%
11	Poland	8.1%
12	France	6.9%
13	Japan	6.3%
14	Switzerland	5.1%
15	Netherlands	4.9%
16	Korea	4.4%
17	Norway	4.3%
18	Portugal	3.4%
19	United States	1.9%
20	Austria	-3.0%
21	Germany	-3.1%
22	Italy	-4.6%

These aspects of competition in the broadband sector create a quandary for economists. Various aspects of broadband providers—rapid product innovation, high fixed costs—don't fit the conventional model of duopolists or oligopolists. Competition takes a different form as the other components of the integrated broadband package reduce broadband providers' pricing power. Rather than a one-dimensional sprint, broadband competition is more of an n-dimensional "cage match."

TABLE 6: PROFITABILITY OF SELECTED INTERNET-RELATED FORTUNE 500 COMPANIES[14]

F500 rank	"Internet Using" companies	Revenue	Prof% rev	%assets
6	Apple	$156.5	26.7%	23.7%
35	Microsoft	$73.7	23.0%	14.0%
55	Google	$52.2	20.6%	11.4%
196	Ebay	$14.1	18.5%	7.0%
198	Viacom	$13.9	14.3%	8.9%
482	Facebook	$5.1	1.0%	0.4%
494	Yahoo	$5.0	79.1%	23.1%
		$320.5 weighted	**24.4% weighted**	**17.7% weighted**
			26.2% unweighted	**12.6% unweighted**
	"Internet Providing" Companies			
11	AT&T	$127.4	5.7%	2.7%
16	Verizon	$115.8	0.8%	0.4%
46	Comcast	$62.6	9.9%	3.8%
87	Sprint/Nextel	$35.3	-12.2%	-8.4%
102	DirectTV	$29.7	9.9%	14.3%
134	Time-Warner Cable	$21.4	10.1%	4.3%
189	Dish	$14.3	4.5%	3.7%
382	Cabelvision	$6.7	3.5%	3.2%
398	Level 3	$6.4	-6.6%	-3.2%
492	Frontier	$5.0	2.7%	0.8%
		$424.6 weighted	**3.7% weighted**	**2.1% weighted**
			2.9% unweighted	**2.2% unweighted**

Thus, the issue of whether broadband is being competitively supplied can best be answered by judging the results of the industry's behavior, in terms of investment and deployment as well as value, prices, and profit levels. Comparisons to other nations can be helpful, but they must be carefully done—on both the grounds of comparing "apples to apples" for these economic measures, but also with regard to the question of dynamic competition, the incentives to innovate and improve. So the "duopoly" argument is, at best, far from definitive, and at worst, irrelevant. Some critics of course will eschew this type of economic modeling and make far more superficial arguments about the competitiveness of the broadband market, focusing not on how the market operates but the stark and narrow question of how many firms are present in the market. But if "# of competitors is the question," the answer in the United States today is that there are plenty.

The FCC finds that 90 percent of American households have access to at least one wired and one wireless broadband provider (at speeds of at least 4 Mbps downstream and 1 Mbps upstream) and that nearly 88 percent of Americans can

choose from at least two wired providers of broadband regardless of speed (typically choosing between a cable and telco offering). Three of the four national wireless companies report that they now offer 4G LTE to between 250-300 million Americans, with the fourth (T-Mobile) sitting at 209 million and counting. So at a bare minimum, nearly every American can choose from 5-6 service providers. And that's not counting markets that also feature cable overbuilders or regional wireless data companies, nor does it count pre-paid wireless services or satellite broadband, which now offers download speeds of 12-15 Mbps or more.[15]

Within these half-dozen choices, not every service is a perfect substitute for every other service, nor does it have to be. Consumers can not only choose from among different technologies but from different speed levels, fixed versus mobile, usage-based pricing versus unlimited, and so on. The broadband market has both competition and differentiation.

PROFITS

Perhaps the best evidence to judge whether U.S. broadband prices are unreasonably high is to look at the profitability of providers.

ITIF performed such a survey, using Bloomberg profitability data to examine the net profit margins (as a percentage of sales) for publically traded telecommunications and cable companies for the period October 2011-December 2012. Those results are reproduced in Table 5.

According to the public statements of these companies, U.S. telecom and cable companies have a profit margin of 1.9 percent on revenues, compared to an international average of 7.4 percent for companies operating in this space.

An unknown economist once remarked that an epochal invention is one for which more money is made using it than making it. Thus, another way of examining the competitiveness of prices is to look at the profitability of companies that use broadband Internet in comparison to companies that provide it. After all, if broadband were being supplied in a noncompetitive fashion, the profits of producers would come at the expense of users.

To address this question, we examined the profitability—as a percentage of sales and of assets—of all the firms in the Fortune 500 whose primary purpose is either to provide services on broadband Internet or to provide broadband Internet itself—that is, broadband users versus broadband providers. Table 6 presents the results.

Claiming that half of U.S. households are stuck in a sub-3 mbps backwater is misleading at best and does a gross disservice to an important and consequential debate.

As the data show, the average rate of profit as a percentage of sales for the seven companies that use broadband—from Apple to Yahoo—was 26.2 percent, and the average rate of profit on assets was 12.6 percent. Alternatively, if the results are weighted by the revenue of the companies involved, the average rate of profit on revenue on sales was 24.4 percent, and on assets 17.7 percent. In contrast, the weighted average rate of profit for broadband providers was 3.7 percent on revenue weighted (2.9 percent unweighted) and 2.1 percent on assets (2.2 percent unweighted).

This sizable difference makes clear that providers of broadband connectivity are not extracting undue profits from broadband users. Even if broadband providers made no profits whatsoever, the resulting change in delivered prices would be trivial. In fact, this data suggests that broadband is more than reasonably priced, as the companies that use it are far more profitable than those who provide it.

SPEED AND ACCESS

On a recent radio program, one regulatory advocate argued for intervention by claiming, the "FCC says … only 50 percent of Americans have access at home to 3 megabits per second."[16]

TABLE 7. NATIONWIDE AVAILABILITY OF 3 MBPS BROADBAND[17]

	HU	margin of error (+/-)	Pop	margin of error (+/-)
Any Technology	98.35%	0.68%	98.75%	0.56%
Wireline	93.39%	0.00%	93.92%	0.00%
DSL	73.65%	0.00%	73.95%	0.00%
Asymmetric	73.14%	0.00%	73.41%	0.00%
Symmetric	16.16%	0.00%	16.17%	0.00%
Copper	39.52%	0.00%	41.38%	0.00%
Cable	87.27%	0.00%	88.12%	0.00%
DOCSIS 3.0	81.01%	0.00%	81.81%	0.00%
Cable Other	9.22%	0.00%	9.21%	0.00%
Fiber	22.82%	0.00%	21.22%	0.00%
BPL	0.00%	0.00%	0.00%	0.00%
Any Wireless	95.31%	1.97%	96.28%	1.61%
Terrestrial Fixed	37.23%	3.83%	38.17%	3.74%
Unlicensed	32.14%	3.48%	33.10%	3.40%
Licensed	14.33%	1.62%	14.56%	1.63%
Terrestrial Mobile	94.09%	2.01%	95.25%	1.67%
Other	0.00%	0.00%	0.00%	0.00%

The Department of Commerce's National Telecommunications and Information Administration ("NTIA"), the agency responsible for surveying the nation's broadband capabilities, said on its website only a week before that radio interview:

> As of the end of 2012, nearly 99 percent of Americans had access to broadband speeds of 3 Mbps downstream and 768 Kbps upstream through either wired or wireless service. And 96 percent had access to broadband speeds of 6 Mbps downstream and 1.5 Mbps upstream—speeds that will soon be considered a basic requirement for accessing many online services. Moreover, nearly 90 percent of Americans had access to 4G wireless broadband, defined as service with download speeds of at least 6 Mbps, as of the end of 2012.[18]

A White House report from June 2013 states that:

> Broadband networks at a baseline speed of >10 megabits per second now reach more than 94 percent of U.S. homes.

Which raises the question—what is the track record of investment, deployment, and consumer value created by broadband suppliers? The balance of this paper investigates those questions.

The most recent comprehensive data we have regarding the speed and availability of broadband connections comes from NTIA's National Broadband Map ("NBM"). A recent report based on the NBM released by the NTIA and FCC showed that 98.35 percent of U.S. households (and 98.75 percent of the population) have access to broadband with at least a 3 megabit download speed and 768 kilobit upload speed. 93.39 percent of U.S. households have wired access at that speed; the remaining 5 percent gain such access solely through wireless. Table 7 summarizes the NBM results.

At these speeds, there is a substantial overlap in coverage. According to the NBM data, traditional DSL over legacy copper wires covers almost 90

TABLE 8: NATIONWIDE AVAILABILITY OF ALL BROADBAND, BY SPEED[19]

ALL					
Mbps	10-Jun	12-Jun	12-Dec	cagr 6/10 to 6/12	cagr 6/12 to 12/12
3/.768	0.9549	0.9818	0.9875	1%	1%
6	0.9033	0.9617	0.9753	3%	3%
10	0.8537	0.9439	0.9655	5%	5%
25	0.4979	0.7851	0.8288	26%	11%
50	0.4611	0.7515	0.7875	28%	10%
100	0.1054	0.4709	0.5207	111%	22%
1000	0.0106	0.0317	0.0653	73%	324%

TABLE 9: NATIONWIDE AVAILABILITY OF WIRELINE BROADBAND, BY SPEED[20]

WIRED					
Mbps	10-Jun	12-Jun	12-Dec	cagr 6/10 to 6/12	cagr 6/12 to 12/12
3/.768	0.9025	0.9341	0.9392	2%	1%
6	0.8908	0.9281	0.9335	2%	1%
10	0.8481	0.9091	0.9179	4%	2%
25	0.4931	0.7811	0.8251	26%	12%
50	0.4590	0.7485	0.7947	28%	13%
100	0.1036	0.4687	0.5180	113%	22%
1000	0.0174	0.0317	0.0653	35%	324%

percent of households, cable reaches about 87 percent of homes, and fiber reaches only 23 percent of homes. Wireless provides access at these speeds to 97 percent of the population.

As to higher speeds, almost 97 percent of the population has access to speeds equal to or greater than 10 megabits. Through the widespread introduction of "fourth generation" LTE technology, wireless alone now reaches about 97 percent of U.S. households at that speed. 85 percent can access cable networks with speeds capable of 100 Mbps. While traditional DSL at this point currently only covers 52 percent of households at the 10 Mbps rate, new technologies, such as very-high-bitrate DSL, or VDSL or G.FAST, will soon bring speeds of 50 to 100 megabits per second to households served by legacy copper.[21]

Those results were as of December 2012. It's instructive to compare them to the equivalent results issued by NTIA for June 2012, only six months prior. Moreover, we have the same results for June 2010. These results are shown in Tables 8, 9, and 10.

As seen here, the availability of connections greater than 25 Mbps and greater than 50 Mbps grew from less than one half of the population in 2010 to over three-quarters in mid-2012, and at an 11 percent annual rate in the six months following. The share of the population with access to a 100 Mbps connection rose from just over 10 percent in 2010 to over half by the end of 2012. More Americans have access to a 100 megabit connection today than had access to a 25 megabit connection two-and-a-half years ago.

Table 9 shows these data for wireline connections.

Almost one out of five homes that did not have access to a wired broadband connection at 50 Mbps in June 2012 obtained access in the subsequent six months. This rapid rate of growth explains the finding above that the United States is "out-improving" our peer nations in high-speed broadband penetration.

The equivalent data for wireless is shown in Table 10.

This data shows the incredible speed with which LTE has been introduced in the last few years. Wireless provided only 8 percent of the population with a 10 Mbps connection in mid-2010. By mid-2012, this share rose to over 80 percent, and rose again to almost 90 percent only six months later. As

TABLE 10: NATIONWIDE AVAILABILITY OF WIRELESS BROADBAND, BY SPEED[22]

WIRED					
Mbps	10-Jun	12-Jun	12-Dec	cagr	cagr
				6/10 to 6/12	6/12 to 12/12
3/.768	0.8133	0.9437	0.9628	8%	4%
6	0.3750	0.8417	0.9117	50%	17%
10	0.0786	0.8066	0.8954	220%	23%
25	0.0336	0.0494	0.0557	21%	27%
50	0.0112	0.0303	0.0344	64%	29%
100	0.0018	0.0180	0.0221	216%	51%
1000	0.0000	0.0000	0.0000	-	-

VDSL becomes more widely available, we would expect to see a similar pattern of rapid diffusion.

Thus, in the last several years, wired connections between 25 and 100 Mbps have become commonplace, and wireless has done the same between 6 and 10 Mbps—a greater share of the population has wireless access to 10 Mbps today than had access to 3 Mbps in mid-2010. And, again, it is likely that wireless connections will continue to increase in speed, reflecting consumer demand.

Moreover, national speed averages conceal a wide variation among the states. Were we to count the 50 states as separate entities, U.S. states and the District of Columbia would hold six of the top 10 and 10 of the top 15 global ranks in average connection speed.[23] That comparison not only speaks to the state of U.S. broadband, but also to the role of land use and low population density in U.S. broadband access and adoption.

In short, regulatory advocates are right in claiming that our economy and society will continue to need faster and wider-reaching broadband service. But they have not fairly represented the current situation, or the vigor with which both wired and wireless providers have improved their offerings in only the last several years. Claiming that half of U.S. households are stuck in a sub-3 Mbps backwater is misleading at best and does a gross disservice to an important and consequential debate.

CONCLUSIONS

The hallmarks of a "competitive" industry are sustained innovation and investment, responsiveness to consumer preferences and demand, and market pressure on prices and profits. The evidence presented here makes the case that the provision of broadband in the United States is "competitive" by these standards.

For some with a pro-regulatory agenda, this finding is unsatisfying. But it is important to recognize that there is a substantial disconnect between saying "broadband is important to society and we should encourage its provision" and arguing "broadband isn't being competitively provided." We accept that food is important, but we also accept that it is competitively provided. We may supplement that competitive market with public policies to fill gaps such as the Supplemental Nutrition Assistance Program (food stamps), but that reflects our policy goals, not economic claims about the structure of the market.

What are our objectives for broadband in U.S. economic and social policy? We should want it to be diffused rapidly, priced reasonably, and used to build social, political, and economic citizenship. The evidence presented here shows that the current approach to broadband regulation is not hindering these goals, but serving them admirably. To go further still, we will need to develop policies and programs that achieve these goals in a way that complements the current working regime of high investment and continuous innovation by competitive broadband providers, not one that would limit or upend it.

ENDNOTES

1. Richard Bennett, Luke A. Stewart, Robert D. Atkinson, "The Whole Picture: Where America's Broadband Network Really Stand" The Information Technology & Innovation Foundation, February 12, 2013: www.itif.org/publications/whole-picture-where-america-s-broadband-networks-really-stand.
2. Akamai, "The State of the Internet," 4th Quarter 2013: http://www.akamai.com/dl/akamai/akamai-soti-q413.pdf?WT.mc_id=soti_Q413.
3. Office of Science and Technology Policy and National Economic Council, "Four Years of Broadband Growth" The White House, June, 2013: http://www.whitehouse.gov/sites/default/files/broadband_report_final.pdf.
4. Saul Hansell, "The Broadband Gap: Why Do They Have More Fiber?" New York Times, March 12, 2009: http://bits.blogs.nytimes.com/2009/03/12/the-broadband-gap-why-do-they-have-more-fiber/?_r=0.
5. International Telecommunication Union, "Measuring the Information Society", 2013: http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf.
6. Note that this analysis uses current exchange rates rather than purchasing power parity. It does so because PPP is a substitute for current exchange rates when trade is roughly balanced. Thus, while using current exchange rates adds some volatility to year-to-year comparisons, that volatility is a legitimate component of international comparisons. In essence, these data answer the question "what would it cost for an American consumer to buy these services abroad?".
7. International Telecommunication Union, "Measuring the Information Society", 2013: http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf.
8. Ibid.
9. Diana Carew, Michael Mandel, "U.S. Investment Heroes of 2013: The Companies Betting on America's Future" Progressive Policy Institute, September 19, 2013: http://www.progressivepolicy.org/2013/09/u-s-investment-heroes-of-2013-the-companies-betting-on-americas-future/.
10. International Telecommunication Union, "Measuring the Information Society", 2012: http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2012/MIS2012_without_Annex_4.pdf.
11. Investopedia,"Herfindahl-Hirschman Index - HHI", http://www.investopedia.com/terms/h/hhi.asp.
12. Steve Kovach, "Samsung Is Still Crushing Apple In Smartphone Market Share" Business Insider, November 14, 2013: http://www.businessinsider.com/samsung-apple-smartphone-market-share-2013-11.
13. Richard Bennett, Luke A. Stewart, Robert D. Atkinson, "The Whole Picture: Where America's Broadband Network Really Stand" The Information Technology & Innovation Foundation, February 12, 2013: www.itif.org/publications/whole-picture-where-america-s-broadband-networks-really-stand.
14. Financial Reports as posted at Yahoo.com, September 2013.
15. Exede Internet, http://www.exede.com/, and HughesNet, http://www.hughesnet.com/index.cfm?page=Plans-Pricing.
16. The Diane Rehm Show, "The Future Of Television" NPR, August 13, 2013: http://thedianerehmshow.org/shows/2013-08-13/future-television/transcript.
17. "Broadband Statistics Report: Access to Broadband Technology by Speed" National Broadband Map, February 2014: http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf.
18. Anne Neville, "New Broadband Map Data Shows Progress, But Work Remains" National Broadband Map, August 5, 2013: http://www.broadbandmap.gov/blog/3075/new-broadband-map-data-shows-progress-but-work-remains./.
19. "Broadband Statistics Report: Access to Broadband Technology by Speed" National Broadband Map, February 2014: http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf.
20. Ibid.
21. "Broadband Statistics Report: Access to Broadband Technology by Speed" National Broadband Map, February 2014: http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf; Verizon Wireless, http://www.verizonwireless.com/wcms/consumer/4g-lte.html#/4g-network-verizon-wireless; NCTA, "Issue Overview: America's Internet Leadership", https://www.ncta.com/positions/americas-internet-leadership; Sebastian Anthony, "1000Mbps over copper telephone lines: ITU begins work on G.fast, successor to DSL" ExtremeTech, December 17, 2013: http://www.extremetech.com/computing/172990-1000mbps-over-copper-telephone-lines-itu-begins-work-on-g-fast-successor-to-dsl.
22. "Broadband Statistics Report: Access to Broadband Technology by Speed" National Broadband Map, February 2014: http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf.
23. Akamai, "The State of the Internet," 4th Quarter 2013: http://www.akamai.com/dl/akamai/akamai-soti-q413.pdf?WT.mc_id=soti_Q413.

ABOUT THE AUTHOR

Everett Ehrlich is a senior fellow at the Progressive Policy Institute and the president of ESC Company, a Washington, DC based economics consulting firm. Ehrlich served in the Clinton Administration as under secretary of commerce for economic affairs. He also served as vice president for strategic planning and chief economist of Unisys Corporation, senior vice president and research director for the Committee for Economic Development, and assistant director of the Congressional Budget Office. Ehrlich was also the executive director of the CSIS Commission on Public Infrastructure under Co-Chairmen Ambassador Felix Rohatyn and Senator Warren Rudman.

ABOUT PPI

The Progressive Policy Institute is an independent, innovative, and high-impact DC-based think tank founded in 1989. As the original "idea mill" for President Bill Clinton's New Democrats, PPI has a long legacy of promoting break-the-mold ideas aimed at economic growth, national security, and modern, performance-based government. Today, PPI's unique mix of political realism and policy innovation continues to make it a leading source of pragmatic and creative ideas.

About the Progressive Policy Institute

progressive policy institute ppi

The Progressive Policy Institute (PPI) is an independent research institution that seeks to define and promote a new progressive politics in the 21st century. Through research, policy analysis and dialogue, PPI challenges the status quo and advocates for radical policy solutions.

Progressive Policy Institute
1101 14th Street NW
Suite 1250
Washington, DC 20005
Tel 202.525.3926
Fax 202.525.3941
Email info@ppionline.org
www.progressivepolicy.org