

Apples vs. Oranges: Why Providing Broadband in the United States Costs More Than in Europe

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Comparisons between U.S. and European broadband prices abound, but their respective markets are built on such entirely different cost structures as to make any comparison between the two meaningless without accounting for the differences in necessary expenditures.

KEY TAKEAWAYS

- A longstanding narrative that U.S. broadband prices are exorbitantly higher than their European peers' buttresses claims of European superiority and calls for similar unbundling requirements and regulated competition in the U.S telecom industry.
- However, U.S. broadband providers bear 53 percent higher costs than European providers pay for equivalent labor, capital investments in network infrastructure, spectrum licenses, advertising, and taxes minus subsidies.
- U.S. telecom workers' wages are higher than those in Europe, while U.S. capital expenditures surpass EU infrastructure investments both overall and per household. Critics would be hard-pressed to argue for cost-cutting in these areas.
- On the other hand, European telecom companies are taxed at a lower rate than U.S. providers and receive more government subsidies. In every regard, U.S. providers must pour proportionately higher amounts into essential expenditures.
- Finally, in response to allegations that U.S. providers artificially raise prices and pocket the difference: an analysis of operating profits shows that European broadband companies have an average profit higher than their U.S. peers.
- Comparisons between U.S. and European broadband prices are meaningless at best and misleading at worst when they fail to account for the difference in deployment and operating costs that must necessarily be assumed, at least in part, by consumers.

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OVERVIEW

For years, broadband populists in the United States have argued that the U.S. broadband system, through which most people receive broadband from large, private telecommunications or cable companies, is deficient. For most, though, their animus goes beyond the practical to the ideological: They see broadband as something that inherently requires a strong government role, not a private sector one. To advance their case, they argue that the U.S. system underperforms other nations and regions, especially in Europe, where the EU has imposed strict network unbundling requirements on incumbents. Their argument is that the metrics of performance and structure—price, coverage, speed, and competition—seem better in Europe (in fact, they are not), which makes clear the deficiencies in the U.S. system, and should therefore lead to support for a completely different system, particularly one with government-owned networks.

But as this report shows, comparing EU and U.S. broadband is fraught with difficulties, and the most important one is that any such analysis inherently involves comparing “apples to oranges.” Due to myriad important factors, including the relative cost of labor, rate of corporate taxes, and amount of expenditures on spectrum and physical capital, the cost structure of U.S. broadband is significantly higher than that of European broadband. (See Appendix 1 for a description of the methodology.) Our analysis suggests that it costs broadband providers 53 percent more to provide wireless and wireline broadband services in the United States than it does in Europe. (See table 1.) Moreover, EU broadband providers’ profits are actually higher than U.S. providers’ and U.S. wired speeds are higher than every EU nation’s except Denmark’s.¹ It’s time to end the unproductive EU-U.S. broadband comparisons and to put the misguided belief that the two structures are comparable to rest.

THE CLAIMS THAT EUROPE IS SUPERIOR

There has been a perennial claim that Europe has better broadband than the United States does. According to one report, in 2011, the United States ranked 16th in the world by a metric that measures speed and cost of available broadband connections.² It claims that a super-fast European Internet connection might cost the equivalent of \$56 in the United States, and a plan comparable to that generally available in the United States might cost a monthly average of \$6.³

Our analysis suggests that it costs broadband providers 66 percent more to provide wireless and wireline broadband services in the United States than it does in Europe.

The overall difference in market structure—heavily versus lightly regulated—is often painted as the only true difference between the U.S. and European broadband markets. Accordingly, what anti-corporate broadband advocates usually tout as the reason for the purported success of the latter’s markets is “government regulators who have forced more competition in the [European] market for broadband.”⁴ The idea being that there is more competition, which forces down profits and prices.

A more recent article cites recent improvements in broadband affordability in Europe as largely attributable to the EU member states’ shared goal to advance universal broadband, which they have buttressed with financing initiatives meant to keep costs down and a market that’s regulated to promote competition, largely through open access infrastructure.⁵ Though differences in population densities and per capita income are mentioned, the EU’s cheap,

universal availability of high-speed Internet is apparently something the United States doesn't have—but it could, if only legislators and regulators put in place the right set of regulations.

The benefits of the EU approach are said to be so cleanly transferrable, in fact, that a state such as California could reap the same benefits as a country such as Sweden simply by following the latter's open access, municipal-broadband-heavy model.⁶

In the absence of that approach, according to corporate broadband critic Susan Crawford, the United States is “falling way behind in the pack of developed nations when it comes to high-speed Internet access, capacity and prices.”⁷ She contrasts U.S. performance with that of Stockholm and Seoul, which offer gigabit symmetrical service supposedly 100 times faster than the fastest U.S. speeds available at a 17th of the price.

With supposedly skyrocketing prices, lagging speeds, and the worst customer service ratings of any industry in the United States, the U.S. broadband market would appear to be in dire straits.⁸

Perhaps no organization has done more to advance the narrative that the U.S. lags behind Europe than the Open Technology Institute (OTI), as it did when it stated that “people in the U.S. pay more for slower Internet than people abroad.”⁹

In a study rife with methodological choices the Information Technology and Innovation Foundation (ITIF) has questioned before—failure to normalize for income and exclusion of low-income subscription plans, among others—OTI found in its “2020 Cost of Connectivity Report” that the average advertised price for Internet in the United States is higher than equivalent prices across North America, Europe, and Asia.¹⁰

Differential cost structures between markets lead to higher costs for providers that must necessarily be assumed, at least in part, by consumers.

The underlying message of these groups is clear: “Europe has been able to spur more affordable prices thanks to a regulated market environment that promotes competition.”¹¹ In other words, the main reason for the apparent dereliction of the U.S. broadband market is a lack of government-forced competition, which renders us uncompetitive with all comparable countries. As noted before, the logical extension of that claim is that EU prices are lower because EU broadband provider profits are lower. But the anti-corporate broadband advocates don't even try to measure this. But we do, ahead.

Similar claims abound: That U.S. customers pay more for broadband than those in most peer nations do by any metric, that a lack of competition is largely to blame (with the greater difficulty of traversing remote geography sometimes acknowledged), and that the solution is to simply force more competition, which will obligate greedy Internet service providers (ISPs) to accept lower profits, and the rest will follow.¹²

In reality, a significant number of these claims do not ring true. To start with, studies claiming U.S. broadband prices are substantially higher than those of competitors are often flawed or designed in such a way as to reach foreordained conclusions. ITIF has previously analyzed some of the most common claims about broadband price comparisons and found that when one uses a

sensible analytical methodology claims of U.S. broadband price non-competitiveness are largely without merit.¹³

ITIF found that when prices are normalized for income across countries, entry-level American broadband prices—the plans it makes sense to focus on when studying affordability—are competitive with those of peer nations. Moreover, U.S. municipal broadband prices are also not significantly more affordable than those of private providers when the plethora of associated costs are taken into account.¹⁴

Debates over pricing miss another key factor that undermines comparability between nations' broadband speeds altogether: Differential cost structures between markets lead to higher costs for providers that must necessarily be assumed, at least in part, by consumers. To shed some light on this key element of the debate, ITIF analyzed the differences in cost structures between broadband providers in the United States and Europe.

METHODOLOGY

ITIF constructed a model to analyze the cost differential between U.S. and European broadband markets by calculating what United States broadband prices would be with European costs. To that end, ITIF created a series of variables to examine what U.S. providers' costs would be under Europe's cost structure instead of U.S. costs (see Appendix).

To compare providers, we selected a sample of 11 large telecom and cable companies—AT&T, T-Mobile, Comcast, Charter, and Verizon from the United States; Telecom Italia, Telenor, Deutsche Telekom, BT, Telefonica, and Vodafone for Europe—and reviewed the companies' annual reports for data on costs and expenditures. We then aggregated reported costs in a few key areas to compare the total expenditures between the United States and Europe. We used individual company data to build a model with the most granular, accurate data available, including more-obscure expenses such as advertising costs that are generally excluded from countrywide datasets. The majority of the data was drawn from 2019 annual reports to give us a clear look at the broadband market prior to the economic upheaval caused by the COVID-19 pandemic.

Of course, the use of company annual reports means that the analysis is dependent on the accuracy and comprehensiveness of the original data. It should also be noted that accounting standards may not be identical across continents, and though ITIF made every effort to ensure each set of factors being compared was composed of the same expenditures, inconsistent reporting standards between countries may have led to minor discrepancies. Still, this assessment provides a useful comparison of differential cost structures in the U.S. and European telecom markets.

For variables of advertising, spectrum expenditures, and subsidies, ITIF calculated total expenditures (or savings, in the case of subsidies) by both U.S. and European companies within the scope of the analysis and then divided each by their respective total revenues. This allowed us to compare the two sets of amounts as proportions of total company revenues.

ITIF also calculated a labor variable by recording the average wage listed for the countries in our analysis and multiplying it by the share of frontline (blue and white collar) workers to arrive at total labor expenditures for both the U.S. and European companies. We used total recorded capital expenditures for both the U.S. and European broadband markets to ensure

comprehensiveness and comparability of the numbers. Finally, using publicly available datasets by NYU professor Aswath Damodaran, ITIF applied the 2016 industry average effective tax rates across profit-making companies to each set of companies in the analysis.¹⁵

After obtaining the two sets of cost percentages (for the United States and Europe), ITIF applied the European percentages to the U.S. expenses for each variable. This essentially showed the amount the United States would be spending (or gaining, in the case of subsidies) if it shared Europe's "intensity" for that variable.

The analysis shows that in every regard, U.S. telecom market participants are obligated to invest a higher percentage of their revenues in necessities such as capital expenditures, wages for their employees, and taxes, compared to their European peers. Moreover, European providers receive more-generous government subsidies. And in some areas, such as the purchase of spectrum licenses, U.S. companies pay nearly twice as much as European companies. (See table 1.)

If, in fact, U.S. costs of broadband deployment are higher than in Europe—which this analysis finds is indeed the case—then the core assumption about regulatory differences being key falls apart.

STUDY RESULTS: COSTS

The biggest problem with comparing U.S. and European broadband is that most comparisons are predicated on the assumption that the underlying cost structures are similar, and therefore any differences in price and performance have to do with differences in the performance of the companies. The implication of this assumption is that any evidence of lower EU prices, or faster speeds, must be the result of differences in performance between U.S. and EU firms. And the anticorporate broadband advocates identify the major difference between the EU and the United States when it comes to broadband as regulation. In other words, the EU required unbundling of networks to spur competition while the United States did not, so ipso facto, there is more competition, better performance, and a trend toward lower prices in Europe. This is such a compelling narrative because it fits with common (albeit simplistic) sense: More competition leads to lower prices.

The problem, of course, lies with the assumption that the underlying cost structure for companies on the two continents is the same or similar. If this assumption is incorrect, then so too are determinations of the main reasons behind price differentials. If, in fact, U.S. costs of broadband deployment are higher than in Europe—which this analysis finds is indeed the case—then this core assumption about regulatory differences being key falls apart.

To be clear, costs are different than prices. Costs refer to all the elements a company (public or private) must pay in order to provide broadband services. This includes a number of important factors, including differences in wage costs and tax rates, and in expenditures on broadband network infrastructure, spectrum rights, and advertising. Differences in government subsidies play a role as well.

All told, as shown in table 1, U.S. broadband providers shoulder 53 percent higher costs than they would in Europe for labor, capital investments in network infrastructure, spectrum licenses, advertising, and taxes (minus subsidies).

Table 1: U.S. versus EU broadband provider cost comparisons (billions)

Type of Cost	U.S. Costs	Equivalent Costs Under Europe's Structure	Nominal U.S. Differentials	U.S. Differential Percentages
Labor	\$36.3	\$31.5	\$4.8	15%
Capex	\$80.0	\$64.0	\$16.0	25%
Spectrum	\$105.2	\$54.5	\$50.7	93%
Advertising	\$15.6	\$7.6	\$8.0	105%
Taxation	\$20.2	\$11.9	\$8.3	70%
(Subsidies)	(\$2.5)	(\$3.0)	\$0.5	(17%)
Total	\$254.8	\$166.5	\$88.3	53%

Labor Costs

The broadband industry is a relatively capital-intensive business, but it does require frontline workers: line installers, repair workers, customer service agents, and the like. EU and U.S. companies employ approximately the same number of such workers per customer (2 workers for every 1,000 customers), suggesting that they have approximately the same degree of labor productivity. But the wages U.S. broadband workers receive are 13 percent higher than those of EU workers (this would be even higher if we included broadband providers from lower-income European nations). If U.S. companies paid their workers the same as European broadband companies do, they would cut their annual costs by \$4.8 billion. Not even the most anticorporate progressive would want to see lower broadband prices through wage cuts.

Network Investment

Perhaps one of the biggest mistakes advocates of the European system make is to assume that network costs are the same in the United States and Europe. After all, it's just about stringing a wire to a house. But this assumption is entirely ill-founded. The United States has a considerably more suburban, exurban, and rural economy than does Europe. It's a lot cheaper to provide broadband in Paris, France (especially since carriers can run cable through the Paris sewer system), than it is in Paris, Texas.

ITIF has previously studied the pervasive effect of urbanicity rates on broadband deployment costs.¹⁶ Urbanicity is a metric that takes into account both the degree of urbanization and the population density within cities, both of which factor into the cost of deploying broadband. Population density affects the cost of deployment at every level; in the same way a city is cheaper to connect than a rural area is, a dense city full of apartment buildings is easier still than the collection of separate, single-family homes commonly found in U.S. cities are.¹⁷

In 2013, ITIF created an index for urbanicity rates across the Organization for Economic Cooperation and Development (OECD) and found that when taking both urbanization and population density of said urban areas into account, the United States was ranked 28th out of 34 OECD countries in urbanicity (meaning its population density was lower).¹⁸ Among the countries included in this analysis, the United States ranked last with a rate of 5.2. Italy and Spain had rates around twice as high; the United Kingdom, over three times higher. These

higher-ranking countries, with a naturally more-cost-effective universe of customers, automatically face lower up-front costs when connecting users.

Second, it appears that U.S. carriers provide broadband service to a higher share of the population, with European providers often “cherry-picking” the most densely populated cities and areas. Less-densely populated areas require more capital investment per subscriber than more densely populated ones do because the same amount of infrastructure brings in fewer revenues as the number of new customers within a location decreases. Therefore “broadband operators typically start by building in the densest urban areas ... as they expand coverage into less dense areas, the average cost per potential customer rises.”¹⁹ There are “high costs associated with deploying cable networks,” such that deployment in less-populated areas can be less economically justifiable and therefore prioritized last by providers.²⁰ For example, in a 2019 study conducted by New Street Research in cooperation with Cartesian, the groups constructed a model that estimated the cost to connect urban households to fiber to be \$668 per household; the same model estimated the cost of more rural, complex deployments to be \$3,656 per household.²¹

A recently released study finds that U.S. providers lead the EU in infrastructure investments by more than three times per household, which equates to about \$700 per home every year.²² U.S. providers also have an advantage in overall deployment of speeds 30 Mbps and higher.²³ The investment differential is likely largely due to less cherry-picking by U.S. providers, which have made an effort to connect a larger share of more remote and therefore more expensive populations.

Third, U.S. carriers have been more aggressive in deploying advanced networks, including fiber optics, than Europe’s have. In 2021, the latest OECD data showed that fiber made up 17 percent of all fixed broadband subscriptions in the United States, ahead of Italy, Germany, and the United Kingdom.²⁴ The difference was even more stark in 2013, at which point the United States led Europe in next-generation broadband deployment by over 20 percent.²⁵ Recent USTelecom metrics show that in 2020, 55 percent of connected U.S. households had subscriptions with speeds reaching at least 100 Mbps, while Europe lagged at 34 percent.²⁶ One reason for this is the unbundling regulatory regime in Europe, which serves as a disincentive to deploy advanced networks, since the company’s competitors can have access to the new network, often at discounted rates.

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Economic literature that measures the effects on investment of what amounts to unwilling subsidization of new entrants on the part of incumbent providers has found the relationship between unbundling requirements and investment intensity to be generally negative or at best ambivalent. Briefly, unbundling requirements, in addition to disincentivizing incumbents from investing in networks by increasing incumbents’ risk exposure and therefore the cost of doing business, confront entrants with a series of trade-offs as well: While entrants face fewer barriers to entry, as they don’t need to build their own network (through service-based competition), they are also more inclined to rent infrastructure instead of investing in their own (i.e., facilities-based

competition).²⁷ This is why even today, the United States leads the EU in facilities-based competition with a rate twice as high overall, and seven times higher when comparing rural areas.²⁸ In fact, in 2009, Grajek et al. estimated the total amount lost in infrastructure investment for the European Union over a decade due to unbundling requirements to be some €16.4 billion.²⁹

Fourth, the U.S. intermodal system in which cable and fixed-line telephony companies compete against one another—and now increasingly against wireless companies selling fixed 5G services—necessitates more investment by individual companies if they want to stay competitive.

Combine all this together and we find that the capital expenditure to sales ratio is 17.3 percent in the United States and just 14 percent in Europe. If American companies invested in upgrading their networks at the same rate as European providers do, their costs would decline by \$15.9 billion per year.

Spectrum Expenditures

Some broadband companies, such as T-Mobile, provide only wireless services; others, such as Charter, provide only wireline. But some companies, such as AT&T and Verizon in the United States and Deutsche Telekom in Europe, provide both. To provide wireless broadband, companies must have access to licensed spectrum radio waves, and both the United States and EU member states' national governments license this spectrum through auctions.

Because of the irregularity of the existing auction setup, it is difficult to accurately calculate spectrum expenditures; particularly in the United States, amounts can be very high in the year of a particular spectrum auction and then low or even zero until the next major auction. To control for this inherent volatility, we looked at the total amount spent on spectrum by each of the companies in our analysis over the last six years and then calculated the amounts as a share of total revenues.

The U.S. companies in our study spent a proportionately larger amount on spectrum than the European companies did. This is one reason why North America leads Europe in 5G deployment, and is expected to have a rate of 5G connections as a share of total mobile connections almost twice that of Europe by 2025 (51 versus 35 percent).³⁰

As a share of revenues, U.S. spectrum expenditures were twice as large as EU companies' (22.8 versus 11.8 percent). If the U.S. companies spent the same share of revenues on spectrum as did the EU companies, their overall cost would be \$51 billion lower. The United States would also likely be facing a much more dismal outlook on the increasingly critical mobile connection front.

Advertising

A typical claim from broadband populists is that EU prices are lower because of competition. To be sure, most places in Europe have a broader choice of providers, as entrant companies are allowed to lease broadband lines from the major incumbents—and because of that, are able to enter the market more easily. But succeeding in a competitive market requires advertising to attract customers. Therefore, one would expect advertising expenditures as a share of sales to be significantly higher in Europe than in the United States.

In reality, the opposite is true. U.S. providers spend over twice as much on advertising as their European counterparts do, suggesting that the U.S. market is actually more competitive than the EU one. After all, if U.S. providers truly enjoyed a cozy duopoly, they'd be ill advised to waste money on advertising. If the major U.S. providers analyzed here spent the same share of sales on advertising as their European counterparts did, they would spend \$7.9 billion less a year.

Our analysis suggests that U.S. providers paid significantly more in total taxes (local, state, and federal) as a share of revenue than EU broadband providers paid.

Taxes Paid

The price of a good or service provided by a for-profit company includes the taxes it must pay. Lower taxes mean a lower cost structure and the ability to charge lower prices. For the sake of analysis, we applied 2016 average effective tax rates for money-making companies to operating profits recorded by the companies in the analysis to create a hypothetical amount each company would pay. Our analysis suggests that U.S. providers paid significantly more in total taxes as a share of revenue than EU broadband providers paid. If they paid at the EU tax rate instead, U.S. providers' costs would be \$8.3 billion less per year.

Government Subsidies

European countries have a long history of generously subsidizing their broadband providers as part of a national imperative to achieve universal coverage.

We used Eurostat data that aggregated the total amount of government subsidies put toward the telecom industry in European countries. On average, European countries were subsidized at a rate of 0.47 percent as a share of sales.

Equivalent data for the United States shows aggregate subsidies that total 0.39 percent of total revenues. If the U.S. companies in this analysis could rely on proportionate assistance from U.S. government, they would be given an extra \$513 million in subsidies.

STUDY RESULTS: PROFITS

While it is abundantly clear that the costs of deploying broadband in the United States are higher, particularly because U.S. companies are competing to deploy the most advanced wired and wireless networks, the question of profits remains. The argument could be made that cost structures aside, whichever set of companies generates proportionately larger average profits is unjustly benefiting at the expense of consumers.

When the anticorporate broadband advocates argue that European broadband is better, cheaper, and faster because governments there have mandated network unbundling, they imply that the cost differential comes from profits. If only we had more competition in the United States, the refrain goes, we'd have lower prices.

There are only two ways this desired increase in competition could lead to lower prices. The first is that somehow U.S. broadband companies are lazy and have massively excess costs. If only they had more competition, they'd be more efficient and could lower costs. Yet not only do workers per unit of sales appear to be similar between U.S. and EU companies, but also does

anyone really believe that in an environment of capitalism wherein shareholders demand high returns, the CEOs of U.S. broadband companies are running slack, inefficient companies?

The second possibility, and the one the broadband advocates point to (almost always without any evidence) is profits. Clearly, the advocates argue, with less competition, profits are too high, and excess profits mean higher broadband prices.

Well, the data suggest otherwise.

Datasets compiled by Damodaran list various industry metrics over time in the United States and Europe, including data on net margins.³¹ General utility (e.g., electricity and gas providers) metrics are a useful point of comparison, as utilities are generally price controlled and represent the type of regulatory structure broadband populists would like to see injected into the broadband market.

It may come as a surprise, then, that in 2015, the U.S. general utility industry boasted net margins higher than those of both U.S. wireless and wireline telecom companies. European telecom net margins were also equal to or higher than those in the United States (at -0.89 percent for wireless and 5.18 percent for wireline for Europe; -1.79 percent for wireless and 5.18 percent for wireline on the U.S. side). EBITDA (earnings before interest, dividends, taxes, and amortization) as a share of sales was also higher for European telecom companies (24.14 percent for wireless, 30.96 percent for wireline in Europe; 16.47 percent for wireless, 25.83 percent for wireline in the United States).³²

It does not appear that U.S. broadband profits are higher than EU broadband profits. If anything, they are lower.

Research from information and communications technology (ICT) industry analyst Howard Rubin paints a similar picture.³³ A sample of 11 U.S. telecommunications companies finds an average operating margin of 12.8 percent in 2021, while the average operating margin of 36 European companies amounted to 15.7 percent, 18 percent higher. In short, it does not appear that U.S. broadband profits are higher than EU broadband profits. If anything, they are lower.

CONCLUSION

Broadband populist advocates have long argued that the United States should aspire to the regulatory structure of European telecom companies, and that the proof of the latter's superiority is in its greater metrics of success: price, speeds, competition, etc. These claims are not only factually incorrect but misleading at the outset, as there's no real basis of comparison between the distinct cost structures that shape each market.

The U.S. and European broadband markets are built on such totally different cost structures as to make any comparison between the two essentially a comparison between apples and oranges.

Because the U.S. and European broadband industries are composed of markedly different labor markets, serve customers with different geographic makeups, are subject to differing taxes and subsidies, and must allocate different proportions of their revenues to various costs in order to

stay competitive, to ignore these inherent differences in the two markets is to write a false story of the regulatory differences that have made one market “succeed” where the other has “failed.”

And the real story is that not only have U.S. companies not failed—and consistently boasted high metrics of success and managed to sustain the new normal through a global pandemic—they have also had to contend with a market that demands greater expenditures every step of the way.

There is certainly a place for productive, informative comparisons between industries, but there is nothing to be gained from false equivalencies. The U.S. and European broadband markets are built on such totally different cost structures as to make any comparison between the two essentially a comparison between apples and oranges.

APPENDIX

ITIF conducted this analysis using company annual reports for 2019 as the main source of data, which allowed us to build a cost model with the most granular, accurate data available. Using individual companies as data sources also allowed for more accessible, comparable expenditures on both sides. On the flip side, this means our analysis is both dependent on the accuracy and comprehensiveness of the original data and may include small inconsistencies that can be attributed to different accounting standards in the United States and Europe. This analysis is also not comprehensive, nor does it attempt to be. We selected specific categories for comparison based on accessibility of the data and size of the expenditure—and because an attempt to compare all associated costs for even the companies in this analysis would have contained so many inconsistencies as to render it meaningless.

A number of other limitations should be noted: Many companies chose to round large numbers, which led to slight over- or under-estimates. Some 2019 annual reports refer to varying 12-month intervals. All costs were also converted into USD using their respective currencies’ conversion rates, which are inherently variable over time.

Two additional caveats: T-Mobile, which operates as one of the largest mobile carriers in the United States and was included in our analysis, is a subsidiary of Deutsche Telekom, a large European carrier that sells both wireline and wireless broadband. To avoid double-counting amounts, each sum associated with Deutsche Telekom was calculated by examining the breakdown of amounts by country and removing the American segment.

Finally, many of the companies within the analysis had internal segments not directly associated with telecom activities. In most cases, the costs and revenue associated with nontelecom segments had a nominal impact on the overall calculation, so we included them. The exception was U.S.-based company Comcast, whose operating segments include the provision of activities such as media entertainment and theme parks; a significant amount of its total costs were associated with its nontelecom activities. In that case, ITIF used only the data associated with the company’s U.S. cable communications segment.

Labor Costs

The first variable ITIF looked at was labor costs. To calculate this, we gathered annual mean wage data for telecommunications workers for each country involved in the study, using the Bureau of Labor Statistics’ estimated average U.S. telecom industry wage for equipment installers and repairers, which was \$64,510 in 2019.³⁴ The average national wages for telecom

workers in Germany, the United Kingdom, Italy, and Spain were taken from their respective Bureau of Labor Statistics equivalents for 2019.³⁵ The exception was Germany, whose latest available data was from 2016, so ITIF factored in inflation to estimate a current annual wage. To create a European variable equivalent to the U.S. average wage, we calculated the mean of the four European countries' wages in our analysis.

To find total labor costs, we estimated a variable called “frontline employees” and multiplied that by each wage value. First, we recorded average number of employees reported by each country in the analysis. Telecom Italia, from one of the countries in our analysis, reported a staff breakdown that estimated 91 percent of its employees to be what we call “frontline” employees (blue- and white-collar workers, excluding executives and middle management). We applied that 91 percent to each company’s number of employees to create the frontline employee variables, and then multiplied both the United States’ and Europe’s total numbers of frontline employees by their respective average annual wages.

Table 2: Total staff costs, 2019³⁶

	Number of Frontline Employees	Average Industry Wage	Total Staff Costs (Billions)
United States			
AT&T	225,233	\$64,510	\$14.5
Verizon	122,706	\$64,510	\$7.9
Charter	86,439	\$64,510	\$5.6
Comcast	79,986	\$64,510	\$5.2
T-Mobile	48,173	\$64,510	\$3.1
Europe			
Vodafone	89,981	\$55,935	\$5.0
Deutsche Telekom	151,157	\$55,935	\$8.5
Telefonica	103,454	\$55,935	\$5.8
Telecom Italia	47,189	\$55,935	\$2.6
BT	96,983	\$55,935	\$5.4

**Numbers may vary due to rounding.*

We found that the U.S. companies in our analysis spend over \$36 billion on frontline salaries alone. Under the European cost structure, U.S. companies would save almost \$5 billion annually through wage reductions.

Capex

Capital expenditures include investments in both tangible and nontangible assets. It's also one of the most inconsistently defined expenditures in annual reports. To avoid comparing apples to oranges, ITIF used the aggregated amount of capex associated with both the U.S. and European telecom markets. For the U.S. variable, we used the Government Accountability Office's annual assessment of U.S. broadband capital expenditures, which was \$80 billion in 2018.³⁷ For its European counterpart, we used the €26 billion amount listed for 2018 in the 2019 European Telecommunications Network Operators "Annual Economic Report."³⁸ ITIF then divided each total capex amount by total revenue of the associated companies to calculate capital intensity for each.

The capital intensity variable for Europe was 13.86 percent and its American counterpart was 17.32 percent, suggesting that American companies must spend a larger portion of their revenues on expenditures meant to maintain, improve, and upgrade their existing business capabilities.

Advertising

Advertising expenditures can be looked at as an indicator of market competitiveness, as the amount put into advertising indicates the need for companies to proactively market themselves in order to attract consumers. Advertising costs for 2019 were available for four U.S. companies and three European companies within our analysis; to avoid penalizing the side with fewer data points, we divided total costs by only the revenues of those companies for which the data was available. ITIF aggregated the costs for each continent and divided the totals by their respective companies' revenues to create an "advertising intensity" variable, or the advertising expenditures made as a share of sales.

U.S. companies' average advertising intensity was almost twice that of Europe, at 3.74 and 1.66 percent respectively. Moreover, if U.S. companies were able to match Europe's advertising expenditures and remain competitive, they would save an estimated \$7.9 billion per year.

Spectrum

ITIF looked at spectrum expenditures during the years 2016–2021 to account for the year-to-year variability in the size and number of spectrum auctions. On the U.S. side, ITIF took data from the Federal Communications Commission's summary for each of the auctions conducted during the time period, and aggregated the recorded winning bid amount for each successful bid by one of the companies in the analysis.³⁹

On the European side, the majority of companies recorded annual spectrum expenditures in their annual reports. The exception was BT, which only had spectrum expenditures recorded in one of the annual reports for the 2016–2021 time period. As BT is based in the United Kingdom, ITIF looked to the spectrum awards archive on OFCOM, the UK's telecom regulator.⁴⁰ In addition to the 2018 purchase from the annual report, there was a winning bid in a 2021 auction under BT's mobile brand EE.

One thing to note is that in the case of Deutsche Telekom, some of the recorded spectrum expenditures were attributable to its American subsidiary T-Mobile. To account for this, we subtracted the amount spent by T-Mobile from the total amount spent on spectrum by Deutsche Telekom.

To calculate spectrum intensity, ITIF took each aggregate amount of spectrum expenditures and divided it by the total revenue calculation for both the United States and Europe. ITIF's findings show that in the time period studied, the U.S. companies purchased spectrum for almost twice the percentage of revenues as did the European companies: 22.77 versus 11.8 percent.

It should be noted that one of the U.S. auctions in the analysis, whose proceedings began in 2021, concluded in early January 2022. Because we mostly used spectrum expenditures on the European side from the companies' annual reports to work with comprehensive, year-long data, we were unable to perfectly line up the time periods.

In fact, our methodology disadvantaged U.S. companies, two of which are majority wireline companies that only purchased spectrum once each during the time period studied. Had we eliminated the nonwireless U.S. companies from the equation, U.S. companies would have purchased spectrum at a rate almost three times higher than that of their European peers: 29 versus 11.8 percent.

Subsidies

Using Eurostat data on general government expenditure by function, ITIF found the aggregate amount of telecom subsidization that takes place in European countries.⁴¹ We divided the total subsidy amount in Europe across 2018 by total revenue in those same countries and found that in the European countries with available data, subsidies granted totaled 0.47 percent of total revenues.⁴²

On the U.S. side, data from USSpending.gov for fiscal year 2018 (which largely overlaps with calendar year 2018) shows that in the same period, subsidies were granted at a rate of 0.39 percent of revenues.⁴³ If American companies were subsidized in line with their European peers, they would see an extra \$513 million in subsidies.

Revenues

Revenue served a major function in this analysis, as it constituted the denominator by which we could compare the various "intensities" of different expenditures (or the amount of each as a share of revenue). Revenues consist of the total reported revenues by each company in its reporting period (again, excluding Deutsche Telekom and Comcast, each of which had to be separated out in some way).

ITIF calculated total revenues for both the U.S. and European sides of the equation as the aggregate of reported annual revenues for each. For the companies within the scope of the analysis, U.S. revenues were calculated at \$462 billion, while European revenues amounted to \$215 billion.

Tax Rate

Finally, ITIF compared the proportion of revenues lost through taxation in Europe and the United States.

To find average tax rates across each, we used publicly available datasets created by Professor Damodaran, who calculated the average effective tax rate across money-making companies for the U.S. telecom industry to be 37.72 percent for wireless telecom and 34.77 percent for wireline (labeled "services" in the dataset). In Europe, the wireless and wireline average rates were calculated to be 20.03 and 23.47 percent, respectively.⁴⁴

The majority of tax-related debates took place over the decade prior to U.S. tax rates being lowered in 2018. For the sake of this analysis, we used 2016 tax rates to approximate an average for the 2010s.

ITIF recorded each company's operating profits for the year (or "income before taxation" where available) and applied either the wireless or wireline tax rate as appropriate. Since many companies provide both types of services, for those companies, we approximated a mobile/fixed breakdown by looking at the proportion of revenue earned through each type of service (or whatever other metric was available) and applying those percentages to the operating profits. As an example, if a company's revenue comprised about 60 percent mobile services and 40 percent fixed, its total tax amount was calculated by applying the wireless tax rate to 60 percent of its operating profits and the fixed tax rate to the other 40 percent. Those amounts, added together, constituted the company's total tax amount. Because of the nature of these calculations, the wireless/wireline breakdowns are necessarily approximations (some more so than others depending on the data provided).

Finally, ITIF applied the European average tax rates to the U.S. companies to highlight the difference in taxation and found that within this analytical framework, U.S. companies would save a total of \$8.3 billion paying European tax rates instead of their own.

This is in line with data collected by ICT industry analyst Howard Rubin who, using samples of 11 U.S. telecommunications companies and 36 European companies, found average operating margins in the United States to be significantly below those of European companies: 12.8 versus 15.7 percent.

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About ITIF

The Information Technology and Innovation Foundation (ITIF) is an independent, nonprofit, nonpartisan research and educational institute focusing on the intersection of technological innovation and public policy. Recognized by its peers in the think tank community as the global center of excellence for science and technology policy, ITIF's mission is to formulate and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress.

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ENDNOTES

1. Speedtest Global Index, “Global Median Speeds, Fixed Broadband,” Speedtest, February 2022, <https://www.speedtest.net/global-index#fixed>.
2. Rick Karr, “Why is European broadband faster and cheaper? Blame the government,” Engadget, June 2011, <https://www.engadget.com/2011-06-28-why-is-european-broadband-faster-and-cheaper-blame-the-governme.html>.
3. Ibid.
4. Ibid.
5. Katie Collins, “Crossing the Broadband Divide: What the US can learn from Europe about broadband affordability (and what it can’t),” *CNET*, June 2021, <https://www.cnet.com/tech/tech-industry/what-the-us-can-learn-from-europe-about-broadband-affordability-and-what-it-cant/>.
6. Ibid.
7. The Industry, “Author: When It Comes To High-Speed Internet, U.S. “Falling Way Behind,” NPR, February 2014, <https://www.npr.org/sections/alltechconsidered/2014/02/06/272480919/when-it-comes-to-high-speed-internet-u-s-falling-way-behind>.
8. Karl Bode, “Shockingly, Cable TV and Broadband Customer Satisfaction is Still The Worst In America,” *Techdirt*, June 2019, <https://www.techdirt.com/2019/06/17/shockingly-cable-tv-broadband-customer-satisfaction-is-still-worst-america/>. The reality is broadband service quality rankings are also very low in the United Kingdom, which has forced unbundling and more competition. So perhaps these ratings are more related to the complexity of providing broadband services.
9. Charlotte Morabito, “People in the U.S. pay more for slower internet than European, Canadian, and Asian counterparts, according to the Open Technology Institute,” *CNBC*, October 2021, <https://www.cnbc.com/2021/10/06/heres-why-high-speed-internet-is-so-expensive-in-the-us.html>.
10. Becky Chao et. al, “The Cost of Connectivity 2020,” (Open Technology Institute, July 2020), <https://www.newamerica.org/oti/reports/cost-connectivity-2020/>.
11. Katie Collins, “Crossing the Broadband Divide.”
12. For example, “How Do U.S. Internet Costs Compare to the Rest of the World?” BroadbandSearch, <https://www.broadbandsearch.net/blog/internet-costs-compared-worldwide>.
13. Doug Brake and Alexandra Bruer, “Broadband Myths: Are High Broadband Prices Holding Back Adoption?” (ITIF, February 2021), <https://itif.org/publications/2021/02/08/broadband-myths-are-high-broadband-prices-holding-back-adoption>.
14. Ibid.
15. Aswath Damodaran, “Effective tax rate by Industry,” 2016, telecom (wireless) and telecom services (wireline), <http://people.stern.nyu.edu/adamodar/>.
16. Richard Bennett, Luke A. Stewart, and Robert D. Atkinson, “The Whole Picture: Where America’s Broadband Networks Really Stand” (ITIF, February 2013), <https://itif.org/publications/2013/02/12/whole-picture-where-americas-broadband-networks-really-stand>.
17. Jonathan Jones, “U.S. Cities With the Most Single-Family Homes,” *Construction Coverage*, December 2021 <https://constructioncoverage.com/research/cities-with-the-most-single-family-homes-2021>.
18. Richard Bennett, Luke A. Stewart, and Robert D. Atkinson, “The Whole Picture.”
19. Michael Mandel and Elliott Long, “The State of U.S. and European Broadband Prices and Deployment” (Progressive Policy Institute, August 2021), <https://www.progressivepolicy.org/wp->

- content/uploads/2021/08/PPI_The-State-of-U.S.-and-European-Broadband-Prices-and-Deployment_V5.pdf.
20. European Commission, Directorate-General for Communications Networks, Content and Technology, (2020). Broadband coverage in Europe 2019 : mapping progress towards the coverage objectives of the Digital Agenda : final report, European Commission. <https://data.europa.eu/doi/10.2759/375483>.
 21. FTTH Study 2019: Summary Findings, Prepared for Fiber Broadband Association, (Cartesian, 2019), <https://optics.fiberbroadband.org/Portals/0/Cartesian%202019%20FTTH%20Study%20Summary%20Findings%2020190604%20SENT.pdf>.
 22. BTR Staff, “Study: U.S. leads Europe in broadband deployment, adoption,” *Broadband Technology Report*, April 2021, <https://www.broadbandtechreport.com/in-the-home/article/14201886/study-us-leads-europe-in-broadband-deployment-adoption>.
 23. Ibid.
 24. “Fibre, DSL and cable subscriptions in total fixed broadband” (OECD, June 2021), <https://www.oecd.org/sti/broadband/broadband-statistics-update.htm>.
 25. Larry Downes, “How to Understand the EU-U.S. Digital Divide,” *Harvard Business Review*, October 2015, <https://hbr.org/2015/10/how-to-understand-the-eu-u-s-digital-divide>.
 26. “US. vs. EU Broadband Trends 2012 to 2020,” USTelecom, April 2022, <https://www.ustelecom.org/research/us-eu-broadband-trends/>.
 27. For example, this paper acknowledges the negative or nonexistent relationship between unbundling requirements and incumbents’ investment, and then conducts a study whose findings suggest that service-based entry doesn’t lead to facilities-based entry. Paola Garrone and Michele Zaccagnino, “A Too Short Ladder? Broadband Investments and Local Loop Unbundling in EU Countries” (July 2012), Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2109423.
 28. “US. vs. EU Broadband Trends 2012 to 2020.”
 29. Michal Grajek and Lars-Hendrik Röller, “Regulation and Investment in Network Industries: Evidence from European Telecoms,” ESMT Working Paper, 2009, ISSN 1866-3494, <http://static.esmt.org/publications/workingpapers/ESMT-09-004.pdf>.
 30. European Court of Auditors, “Special Report: 5G roll-out in the EU: delays in deployment of networks with security issues remaining unresolved,” Europa, 2022, https://www.eca.europa.eu/Lists/ECADocuments/SR22_03/SR_Security-5G-networks_EN.pdf.
 31. Aswath Damodaran, Operating and net margins by industry, 2015, telecom (wireless) and telecom services (wireline), http://people.stern.nyu.edu/adamodar/New_Home_Page/dataarchived.html#company.
 32. Ibid.
 33. ICT industry analyst Howard Rubin gave ITIF permission to cite his research comparing operating margins of telecom companies in the U.S. and Europe at year-end 2021.
 34. U.S. Bureau of Labor Statistics, Occupational Employment and Wages, May 2020, 49-2022 Telecommunications Equipment Installers and Repairers, Except Line Installers, https://www.bls.gov/oes/2020/may/naics4_517000.htm.
 35. For Germany, wage with inflation factored in calculated as \$94,119. Destatis, Genesis – Online, 62411-0003: Labor costs per full-time unit: Germany, years, company size classes, economic sectors, types of labor costs; <https://www-genesis.destatis.de/genesis/online?operation=abruftabelleBearbeiten&levelindex=2&levelid=1651009320734&auswahloperation=abruftabelleAuspraegungAuswaehlen&auswahlverzeichnis=ordnungsstruktur&auswahlziel=werteabruf&code=62411-0003&auswahltext=&nummer=6&variable=6&name=WZ08D3&werteabruf=Werteabruf#astructure>;

For the UK, wage calculated as \$47,184. See SIC2007 Table 16.1a Weekly pay - Gross (£) - For all employee jobs: United Kingdom, 2019 <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>; For Italy, wage calculated as \$34,171.19. See Average hourly earnings for employee jobs in the private sector, <https://www.istat.it/en/labour?data-and-indicators>. Calculated using Average annual hours actually worked per worker, (OECD) from <https://stats.oecd.org/viewhtml.aspx?datasetcode=ANHRS&lang=en>; For Spain, wage calculated as \$47,945. Annual Labor Cost Survey by divisions of the CNAE-09, 61: Telecommunications, <https://www.ine.es/jaxiT3/Tabla.htm?t=9126>.

36. 2019 company annual reports and respective BLS equivalents for the wage values (see footnotes 34-35).
37. States Government Accountability Office, 20-535, “Broadband: Observations on Past and Ongoing Efforts to Expand Access and Improve Mapping Data,” (GAO, June 2020), <https://www.gao.gov/assets/gao-20-535.pdf>.
38. European Telecommunications Network Operators’ Association, “The State of Digital Communications 2019: Ideas, facts and figures on the sector,” <https://etno.eu/datas/publications/annual-reports/ETNO%20Annual%20Economic%20Report%202019%20final%20web.pdf>.
39. Federal Communications Commission, Auctions Summary: Completed Spectrum Auctions, <https://www.fcc.gov/auctions-summary>.
40. Ofcom, “Spectrum: Awards Archive,” <https://www.ofcom.org.uk/spectrum/spectrum-management/spectrum-awards/awards-archive>.
41. Eurostat: Data Browser, General government expenditure by function (COFOG), updated 2022, https://ec.europa.eu/eurostat/databrowser/view/GOV_10A_EXP__custom_1745802/default/table?lang=en.
42. Telecommunications revenue in the OECD area, OECD Key ICT Indicators [[oecd.org/internet/broadband/oecdkeyictindicators.htm](https://www.oecd.org/internet/broadband/oecdkeyictindicators.htm)].
43. USASpending.gov, Spending Over Time, NAICS 51 – Information (all telecom related), Fiscal year 2018, <https://www.usaspending.gov/search>.
44. Aswath Damodaran, “Effective tax rate by Industry.”