



Impact of “Title II” Regulation on Communications Investment

A Comparison Between the United States and the European Union

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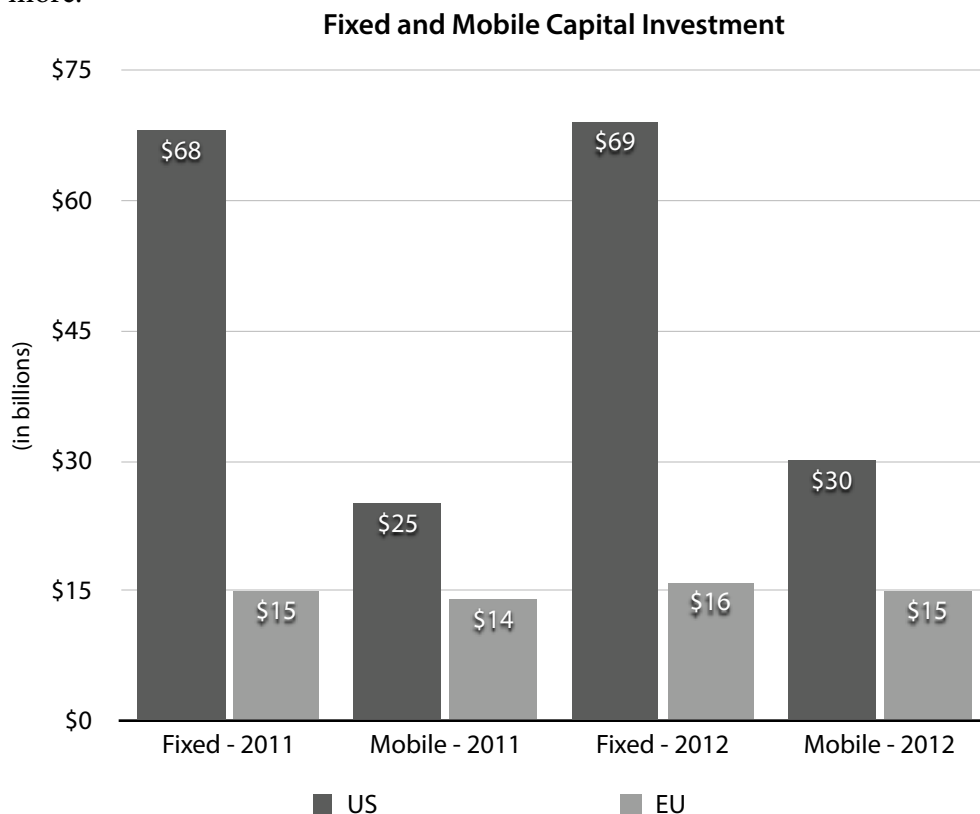
Executive Summary

Title II advocates have long argued that the Title II-style approach to broadband policy adopted by the European Union (EU) in 2002 is superior to the deregulatory approach the United States (US) adopted that same year. “If only our broadband markets could be like Europe’s,”¹ they yearn. They may get their wish next month, when many expect the Federal Communications Commission (FCC) to adopt Title II regulations like those applicable in the EU.

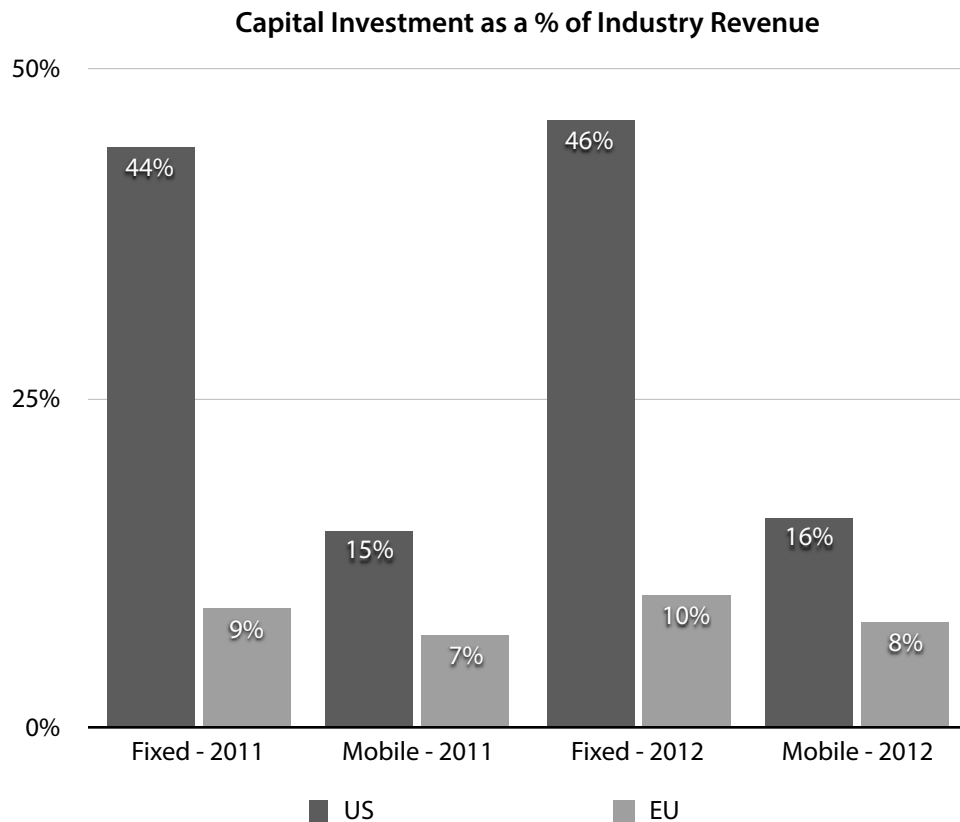
That would be a mistake. Comprehensive data covering 2011 and 2012 reveal that *the deregulatory approach has produced significantly more capital investment, competition, and broadband coverage in the US*. Even the European Commission (EC) has acknowledged its Title II-style regulatory approach is the reason European broadband networks have fallen behind those in the US.

More Capital Invested in the US

The data show that fixed (e.g., wireline) operators in the US are investing four times more capital in their networks as their counterparts in the EU and that US mobile operators are investing up to two times more.



These enormous disparities in total capital investment cannot be explained by differences in revenue. EU network operators have generally produced more revenue than their counterparts in the US while investing less in their networks. As a result, the relative magnitudes of investment disparities between US and EU operators are essentially the same when capital investment is measured as a percentage of industry revenue.



US Has More Competition and Next Generation Broadband Coverage

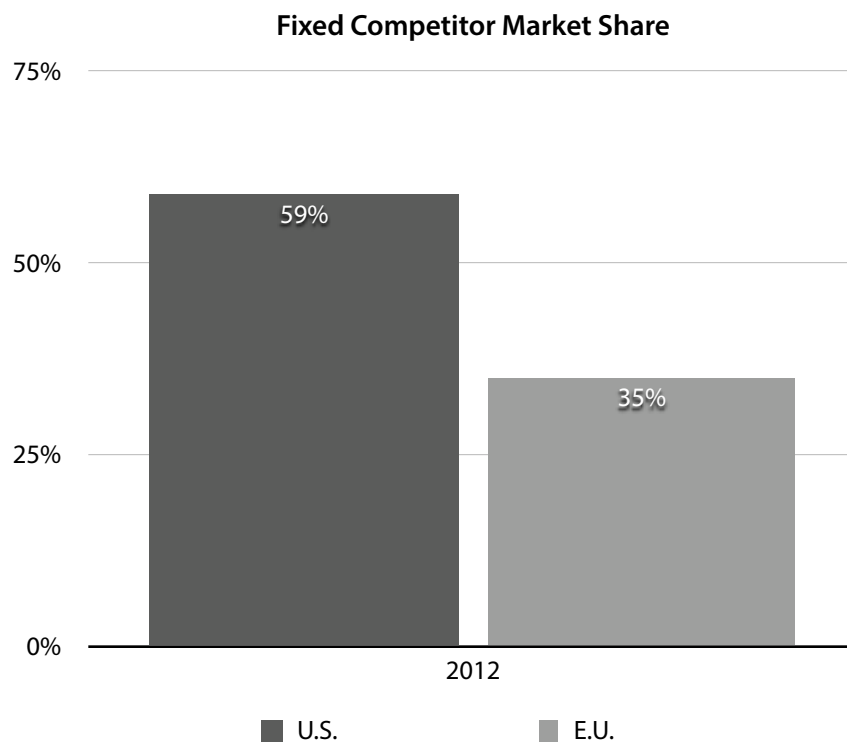
Higher levels of capital investment in the US correlate with higher levels of competition and next generation broadband coverage.

Fixed

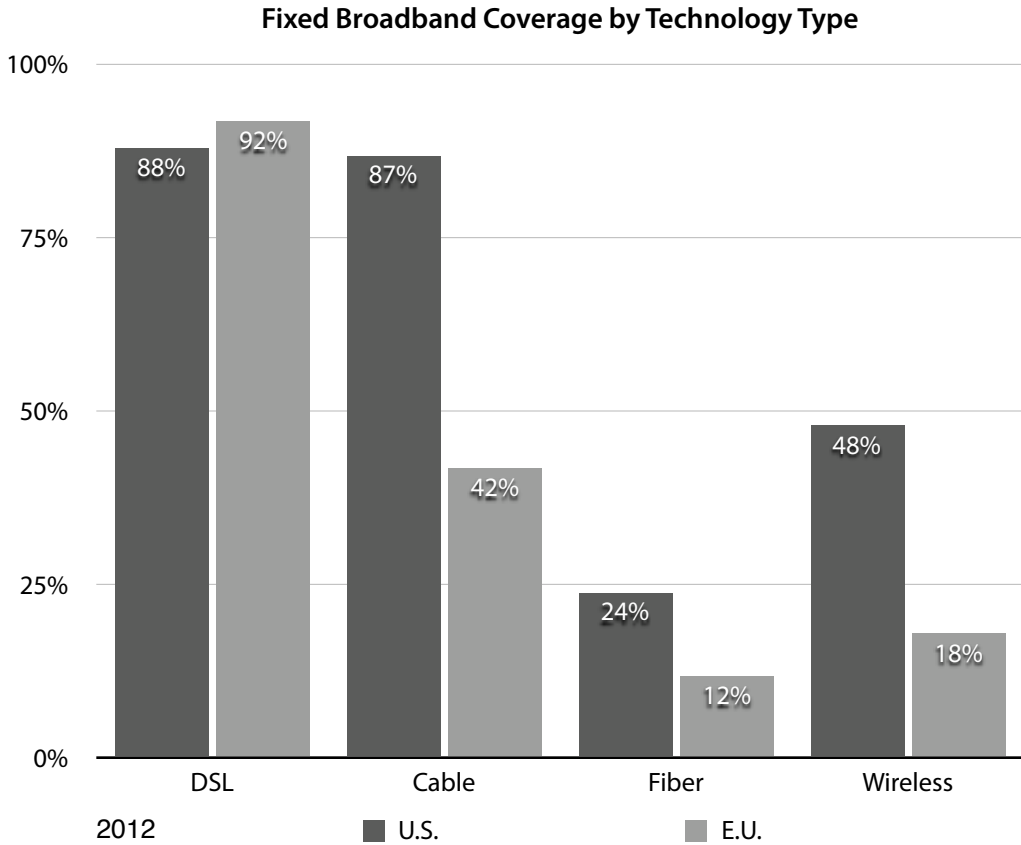
Wholesale access regulations are integral to the EU's Title II-style regulatory approach. These regulations are intended to promote telephone competition by lowering economic barriers to entry. Regulatory proponents have long theorized that this government subsidized approach to compet-

itive entry would result in greater competition than the deregulatory approach implemented in the US.

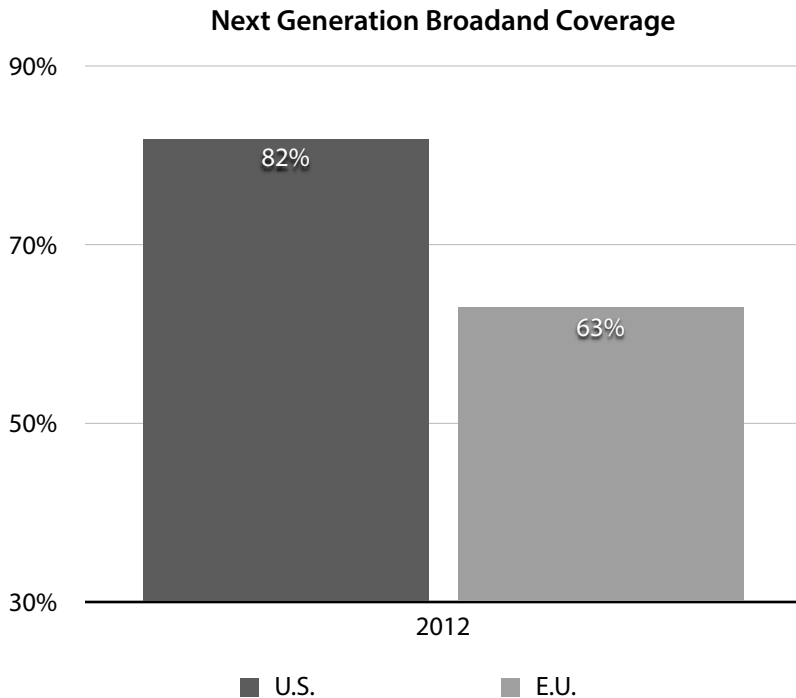
Reality, however, has produced different empirical results. In 2012, competitors held a larger share of the local telephone market (59%) in the US than incumbents (41%), and 92% of US households are in zip codes with access to ten or more non-incumbent telephone service providers. In contrast, EU incumbents retained a presumptively dominant 65% share of the local telephone market with competitors holding only 35%.



Facilities-based broadband competition is also greater in the US than in the EU. The vast majority of US households have access to multiple facilities-based fixed broadband operators. The data show that, in 2012, 76% of US households were located in census tracts with access to three or more providers of fixed broadband access offering download throughput of at least 3 Mbps. A majority of households in the EU lack access to any facilities-based broadband alternative to the incumbent network operator, because competitive cable, fiber to the home, and fixed wireless networks operators in the EU have deployed significantly less infrastructure and provide less broadband coverage than their counterparts in the US.



The US also has significantly greater access to fixed next generation broadband networks — i.e., networks that offer downloads speeding exceeding 30 Mbps (EU) to 50 Mbps (US).



Based on its own analysis of these data, the EU government concluded that “*investments in high speed broadband are taking place more quickly in parts of Asia and in the United States.*”²

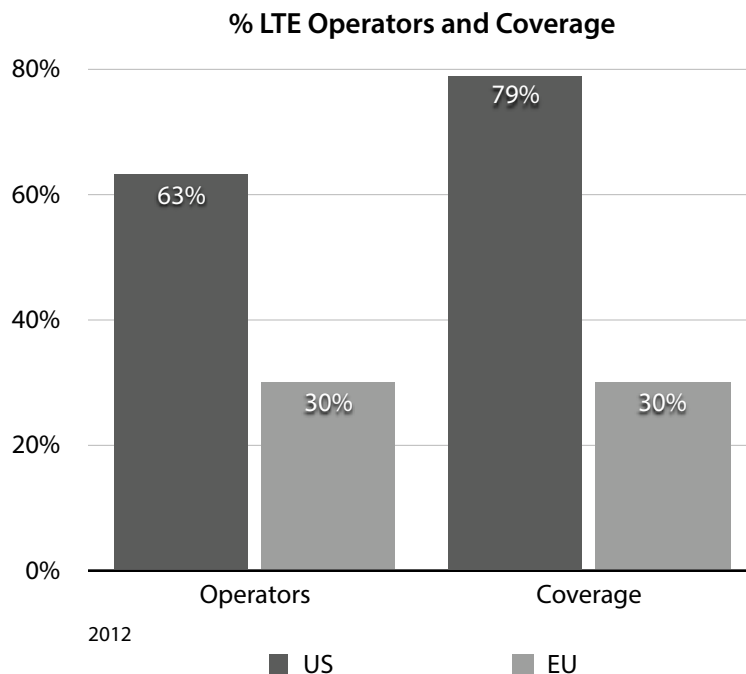
Mobile

The data also reveal similar disparities in competition and coverage between US and EU mobile networks.

The EU averages fewer than four facilities-based mobile operators per market (typically 3-4) while the US has five or more facilities-based mobile operators in most markets.

US mobile operators have been much more aggressive in upgrading their networks to the LTE (long term evolution) standard, a fourth generation (4G) technology that enables next generation mobile networks to provide voice, video, and high speed data services. As late as 2012, nearly half of EU states (twelve) had no LTE coverage, and only 30% of EU mobile operators had begun deploying LTE. During that time, half of the nationwide mobile operators and three of the four multi-regional mobile operators in the US (63% overall) had begun deploying LTE.

LTE coverage in the US was also more than double that in the EU, with LTE covering at least 79% of the US (population) compared to only 30% of the EU (households).



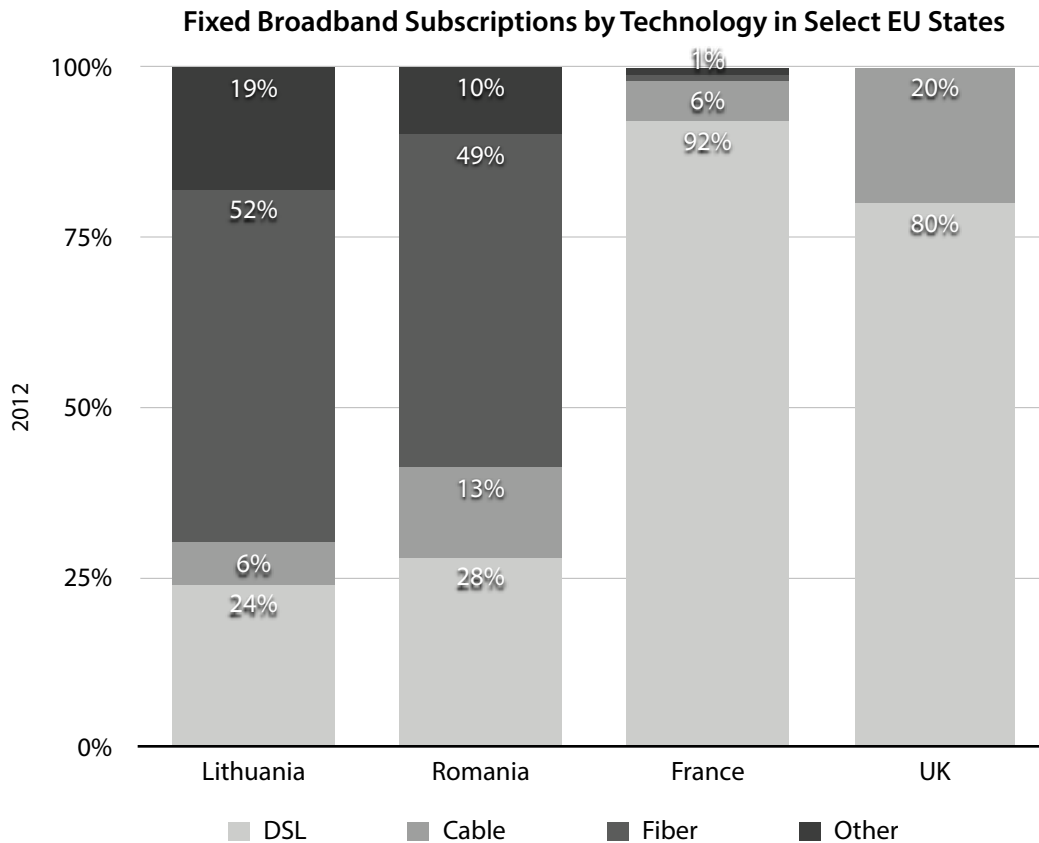
The gap was smaller, however, for older third generation (3G) network coverage, with the EU at 96% and the US at 99.5%.

Title II-Style Regulation Is the Reason the EU Fell Behind in Broadband

The lower levels of capital investment, competition, and broadband coverage in the EU are directly attributable to its Title II-style regulatory approach. In 2013, the EC acknowledged that its regulatory policies are the reason that investments in high speed broadband are taking place more quickly in the US and noted that Europe must adopt investment-friendly broadband policies in order to maintain its global competitiveness. To encourage greater investment in next generation broadband networks, the EC recommended that national regulatory authorities stop imposing regulated wholesale access prices on next generation networks. It concluded, “If wholesale access price obligations were imposed on the access to fibre networks the scope for reaching these win-win [private investment] solutions would be severely reduced”³ — the same conclusion the US reached back in 2002, when it exempted cable broadband services from Title II regulation.

A comparison of EU states illustrates the point. The EU notes that facilities based competition is strongest where new entrants’ presence in the wholesale access market for DSL is marginal. In Bulgaria, Romania, Latvia, Malta, Estonia and Lithuania, there is virtually no competition in the DSL market, but there is strong facilities-based competition. However, in states that have embraced aggressive wholesale access regulations — e.g., France and the UK — new entrants have the majority of DSL subscriptions and there is virtually no facilities-based competition. The vast majority of new entrants’ DSL subscriptions are provided by companies who have chosen to lease incumbent telephone facilities at regulated rates rather than build their own network infrastructure.

For example, 92% of French broadband subscribers have basic DSL (the French government is the largest shareholder in the incumbent DSL network) while 52% of Lithuanian broadband subscribers enjoy high-speed fiber to the home connections.



It is particularly ironic that, shortly after the EC recommended relaxing its Title II-style approach to broadband regulation in order to be more like the US, the FCC began considering whether to impose Title II regulations in the US like those that failed the EU.

The FCC should continue the successful US approach to broadband regulation first adopted in 2002, not reverse course. The EU experience has demonstrated that Title II regulation is an anathema to investment in next generation broadband networks — and that the US had it right all along.

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Introduction

Advocates for regulating broadband Internet access under Title II have relied heavily on the emotional pull of a mythical narrative to generate enthusiasm for public utility regulation.⁴ In this broadband myth, the Federal Communications Commission (FCC) fell from grace in 2002, when it exempted broadband services from common carrier regulation under Title II.⁵ The myth makers say we can return to our broadband Shangri-La only if the US applies Title II to broadband.⁶

It is an appealing, but false, narrative. Its falsity is demonstrated by empirical evidence comparing the development of broadband in the US with the EU. This comparison is particularly enlightening, because the EU embarked on applying Title II-style common carrier regulation to broadband services the very same year the US began deregulating them.

The most recent comprehensive data produced by the EU and US governments reveals the truth: *The deregulatory approach to broadband adopted by the US has produced significantly more capital investment, compe-*

titution, and broadband coverage than the Title II-style approach adopted by the EU.

The data indicate that the significantly lower levels of capital investment, competition, and broadband coverage in the EU are attributable to its Title II regulatory approach. Last year, the EU government itself acknowledged that investments in high speed broadband are taking place more quickly in the US and concluded that EU regulatory policy was to blame.⁷ The EU determined that Europe must adopt investment-friendly broadband policies in order to maintain its global competitiveness.

Ironically, the US is poised to go in the opposite direction. The FCC is expected to impose Title II regulation on broadband providers when it votes on net neutrality rules in February.⁸

This paper concludes that the US should maintaining its current, deregulatory approach to broadband. The European experience with Title II-style regulation demonstrates that imposing common carrier obligations on broadband would slow investment in

next generation networks, harm competition, and limit coverage.

This paper presents a more detailed analysis in three primary parts: (1) The first part provides an overview of Title II-style common carrier regulation and the primary differences between the US and EU approaches to broadband regulation; (2) part two analyzes data regarding demographics, capital investment, competition, and broadband coverage in the US and EU during the years 2011 to 2012; and (3) part three discusses the relationship between the data and the different regulatory approaches in the US and EU.

Common Carrier Regulation

Common carrier regulations (known as Title II in the US) are typically applied to one or more communications market segments:

1. **Retail** services provided to end users (e.g., residential or business telephone services).
2. **Wholesale** services provided to other carriers. This category includes (1) unbundled access to network elements (in which an incumbent carrier is required to lease its infrastructure to competitors on an *à la*

carte basis) and (2) resale of communications services (in which an incumbent carrier must sell its complete service to competitors who can then repackage it under their own brand and offer it to consumers).

3. **Interconnection** services related to the interconnection of networks and exchange of traffic between carriers. This category includes (1) payments between carriers for the origination or termination of traffic (intercarrier compensation); and (2) collocation (in which an incumbent carrier is required to permit competitors to place their equipment on the incumbent's property).

During the monopoly era (1930s to 1980s), common carrier regulations were aimed primarily at retail communications services. The goal was to promote telephone subscribership (or “universal service”) while ensuring that retail telephone rates were reasonable and non-discriminatory. Government price regulation through tariff filings (in the US) or government ownership of the telephone system

(in the EU) were the chosen means of accomplishing this goal.

After competition in communications markets proved sustainable and capable of producing reasonable rates without price regulation or government ownership,⁹ policymakers shifted their focus toward promoting competition by removing regulatory and economic barriers to new entry in communications markets with dominant incumbents (which included the privatization of government owned networks in the EU).¹⁰

This new, competitive approach to common carrier regulation removes most regulatory barriers outright and attempts to reduce economic barriers to entry by imposing wholesale access and interconnection regulations on incumbent operators.¹¹

In the 1990s, both the US and the EU embraced competition as the primary way to protect consumers while promoting investment and innovation in communications networks. And, at least initially, both embraced interconnection and wholesale access regulations as a way to promote competition

in local telephone and broadband markets. Their approach remained similar until 2002, a watershed year in which US and EU broadband policies diverged.

US Experience

The US pioneered the wholesale access approach to telephone regulation in the Telecommunications Act of 1996,¹² which created a “novel ratesetting [methodology] designed to give aspiring competitors every possible incentive to enter local retail telephone markets, short of confiscating the incumbents' property.”¹³ At the time, policymakers believed that mandating unbundled network access at “forward looking” rates would accelerate the construction of new facilities by competitors.¹⁴

By 2002, however, the US experience had disproved this hypothesis.¹⁵ “At the local level, relatively little new facilities investment by CLECs took place.”¹⁶ Government inducements to market entry had instead encouraged excessive market speculation and outright accounting fraud.¹⁷

Former Chairman Michael Powell recounted the “devastating results” of this speculation in his testimony before Congress after WorldCom, once the second largest telecommunications company in the world,¹⁸ declared bankruptcy:

Talk of the internet doubling every 100 days, infinite bandwidth, and ‘Internet time’ dominated the pages of magazines. Investors, too, bought into and fed the hype—literally—as they flooded the market with cheap capital that was consumed by thousands of companies.¹⁹

When this unsustainable bubble popped, approximately \$2 trillion of market value was erased, the communications sector was saddled with nearly \$1 trillion in debt, and 500,000 people in the US lost their jobs.²⁰

The US response to this catastrophe was swift and decisive. In a series of competition and classification decisions beginning in 2002, the FCC exempted all broadband services from Title II regulation.²¹

The US had learned a valuable lesson from the failure of its wholesale access regulations: A “minimal regulatory environment”²² is the best way to “encourage investment in next-

generation network architecture”²³ and promote facilities-based competition in broadband services.²⁴

EU Experience

When the EU revamped its communications policies in 2002,²⁵ it took the opposite approach: It decided to apply Title II-style regulations to broadband and telephone services alike, including wholesale access regulations.²⁶

The EU adopted a Title II-style approach, despite its failure in the US, because European policymakers and incumbent telephone companies were often one and the same.

In the US, the largest telephone monopoly (i.e., the “Bell System”) was privately-owned. When the US sought to introduce competition in the telephone market, the government simply filed an antitrust lawsuit against the private company in court.²⁷ Because the US government did not have an ownership interest in the company, it had little incentive to protect the Bell System from facilities-based competition.

In Europe, however, most telephone monopolies had traditionally been owned by their na-

tional governments and were often integrated into governmental administrative systems.²⁸ Though some European states had fully privatized their telephone monopolies by the 2000s,²⁹ several of the largest states had not. For example, the German government owned a 60% voting interest in Deutsche Telekom AG (the German telephone incumbent) as late as 2001,³⁰ and the French government is still the largest shareholder in Orange SA (the French telephone incumbent).³¹

Government ownership posed formidable political and legal barriers to introducing facilities-based competition in Europe: National governments viewed the public telephone monopoly as an important revenue source, and antitrust authorities lacked the ability to sue their own administrations to force government divestiture.³² In many EU states, this created “a situation which allowed for hardly anything else than service based competition in this field.”³³

EU policymakers also believed that DSL provided through existing copper telephone lines would “play a key-role in the years to come in the development of broadband services.”³⁴

This belief focused European broadband regulation on incumbent telephone networks rather than the deployment of next generation network facilities.

For these reasons, the EU concluded that mandating wholesale access to telephone networks would be “the most appropriate means to deliver broadband services relatively cheaply, rapidly and efficiently” in 2002³⁵ — the same year the US determined that deregulation would better accomplish the same result.

Broadband Regulation

As a result of their divergent experiences and views with respect to next generation networks, the US and EU approaches to interconnection and wholesale access regulations have differed significantly over the last decade.³⁶

Retail Price Regulation

During the period covered by the data in this report, both the US and EU generally regulated retail rates for local telephone service.³⁷

Interconnection Regulation

With the notable exceptions of rural areas, national interconnection was generally un-

regulated during the monopoly era. In the absence of competition, there were no other carriers with whom the monopolist could interconnect and exchange traffic.³⁸

During the competitive era, the US imposed stringent regulation on intercarrier compensation rates and collocation with respect to incumbent local telephone operators only.³⁹

The US requires that long distance and mobile carriers pay incumbent telephone operators for originating and terminating long distance calls (payments known as “access charges”) and regulates these payments through tariff filings.⁴⁰ The FCC does not require long distance or mobile carriers to pay access charges to mobile carriers.⁴¹ Payments between telephone carriers for the exchange of local calls (known as reciprocal compensation) are generally negotiated by carriers in the US.⁴² Finally, broadband providers exchange data traffic through private agreement — they are exempt from intercarrier compensation regulation.⁴³

Intercarrier compensation is regulated more extensively in the EU than in the US. In Europe, intercarrier compensation is based on a “calling party network pays” principle, which

means that a termination rate is set by the called network and paid by the calling network.⁴⁴ In 2009, the EU imposed cost-based price regulations on mobile termination charges for the first time.⁴⁵ This move created regulatory uncertainty with respect to mobile capital investment, yet has failed to provide the expected benefits.⁴⁶

Wholesale Regulation

The US has always recognized that wholesale network unbundling “is not an unqualified good,” for it “comes at a cost, including disincentives to research and development by both [incumbents] and [competitors] and the tangled management inherent in shared use of a common resource.”⁴⁷ Under US law, unbundling is available only when “necessary” and a lack of wholesale access would “impair” a competitor’s ability to provide service.⁴⁸ The role of this “necessary and impair” standard is to balance the “advantages of unbundling (in terms of fostering competition by different firms, even if they use the very same facilities) and its costs (in terms both of ‘spreading the disincentive to invest in innovation and creat-

ing complex issues of managing shared facilities’).⁴⁹

Under the necessary and impair standard, the US has exempted most communications services from wholesale access obligations, including (1) residential telephone services (from unbundling local switches only),⁵⁰ (2) mobile services (from unbundling and resale), and (3) broadband services (from unbundling and resale).⁵¹

Until recently, however, policymakers in the EU generally did not recognize the costs of wholesale access regulations. They embraced

service-based competition — the “synthetic competition”⁵² enabled by unbundling — for old telephone infrastructure and new broadband networks alike.⁵³ Unlike the US, the EU decided that, when an incumbent operator deploys fiber, national regulatory authorities “should in principle mandate unbundled access to the fibre loop” at regulated, cost-based rates.⁵⁴ Only mobile networks have generally been exempted from wholesale network access obligations in the EU, though mobile roaming is subject to price regulation in Europe.⁵⁵

Status of US and EU Common Carrier Regulation

	UNITED STATES			EUROPEAN UNION	
		REGULATED (Y/N)			
		Residential	Business	Residential	Business
TELEPHONE	Retail	Y	Y	Y	Y
	Wholesale	N	Y	Y	Y
	Interconnection	Y	Y	Y	Y
MOBILE	Retail	N	N	N	N
	Wholesale	N	N	N	N
	Interconnection	N	N	Y	Y
BROADBAND	Retail	N	N	N	N
	Wholesale	N	N	Y	Y
	Interconnection	N	N	Y	Y

A summary of the primary differences between the US and EU approaches to Title II-style regulation during the relevant time period is provided in the table above.

Comparative Data

Both the US and EU governments have published extensive data regarding their communications markets. In most cases, the datum measures are the same or similar, which facilitates comparison.

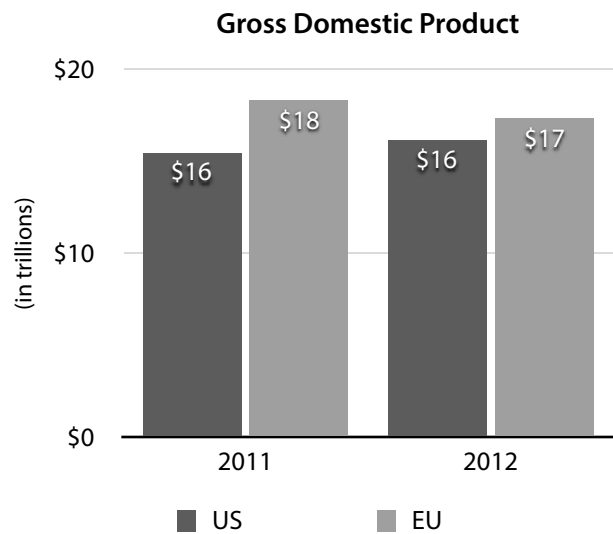
This paper analyzes data regarding capital investment and competition during the years 2011 to 2012 — the most recent two-year period with complete government datasets. The data are comprised primarily of official US and EU governments statistics.⁵⁶

The data clearly demonstrate that capital investment in broadband infrastructure, competition, and broadband coverage in the EU are all lower than in the US.

Demographic Data

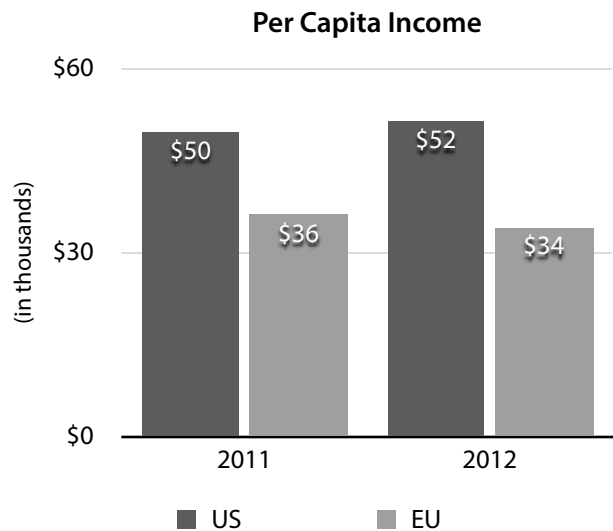
These disparities in investment, competition, and coverage cannot be adequately explained by demographic differences between the US and Europe.

For example, the EU has a higher gross domestic product (GDP) than the US.⁵⁷

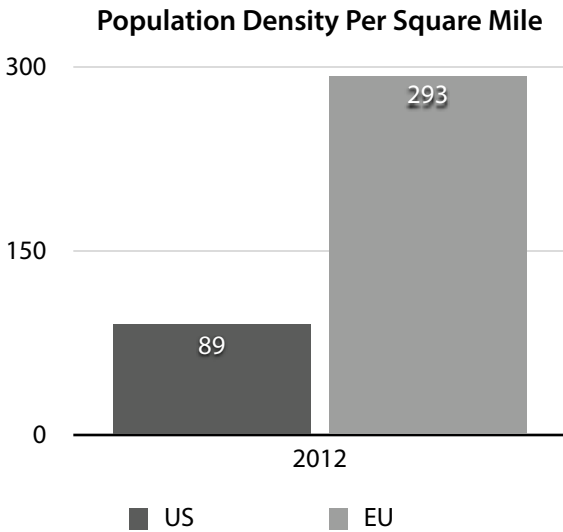


All else being equal, the EU's greater productivity suggests that it should have similar or greater capital investment and next generation broadband subscriptions than the US.

The US has a higher per capita income than the EU, however, which would suggest the opposite, all else being equal.⁵⁸



On the other hand, the EU's population density (293 per square mile) is much higher than that in the US (89 per square mile).

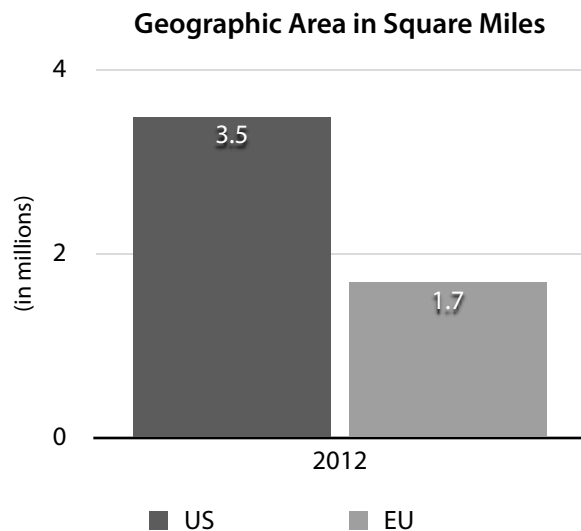


The higher population density in the EU suggests that it would require less capital investment to achieve the same broadband coverage that is available in the US and that operating costs in the EU would be lower, all else being equal.

Though some have noted that the degree of urbanization within a given geographic area may be more relevant to deployment costs than population density,⁵⁹ the overall size of the geographic area is also relevant. It generally costs more to interconnect far-flung urban areas than it does to connect similarly dense urban areas that are separated by shorter distances. This may be especially true for mobile

networks, which often provide continuous, coast-to-coast service along highways even in largely uninhabited areas.

The US has a much larger geographic area than the EU, which suggests that broadband deployment is more costly in the US than in the EU, all else being equal.⁶⁰



It is more difficult to compare the relative degree of urbanization in the US and the EU because they measure it differently. In the US, “rural” areas are defined as areas with population densities of less than 500 people per square mile or fewer than 2,500 people.⁶¹ The EU defines a “thinly populated area” (i.e., a rural area) as an area where more than 50% of the population live outside “urban clusters,” which are areas comprised of contiguous square kilometer grid cells with a population

density of at least 300 inhabitants per km² (777 per square mile) and a minimum population of 5,000.⁶²

These methodologies are too dissimilar to allow for accurate comparisons between the US and the EU with respect to the degree of urbanization. Based solely on their respective measurement methodologies, the Census Bureau reports that 19.3% of US inhabitants live in “rural” areas, and the EU reports that the 29% of Europeans live in “thinly populated areas,” a difference of about 10%.⁶³ Because these methodologies rely on different area sizes, however, the Census Bureau and EU results are not directly comparable.⁶⁴

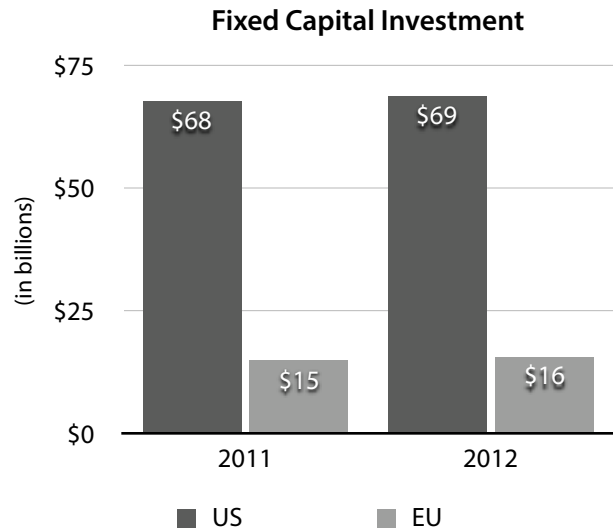
When considered as a whole, these demographic differences do not appear sufficient to account for the levels of disparity between broadband capital investment, competition, and coverage in the US and the EU.

Capital Investment

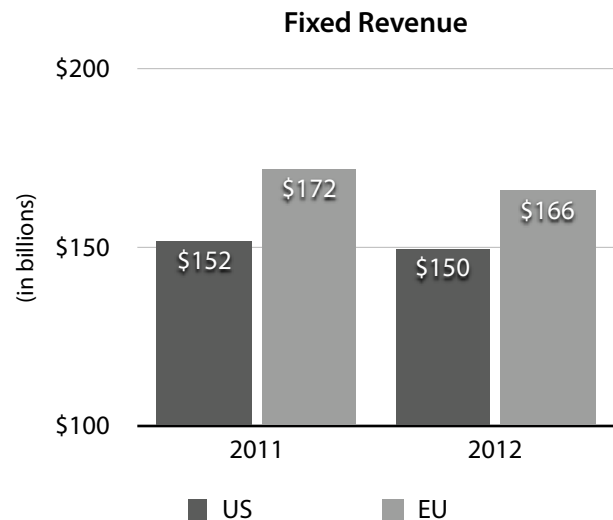
Fixed Investment

The data shows that fixed (e.g., wireline) operators in the US have invested *four times more capital in their networks* than their

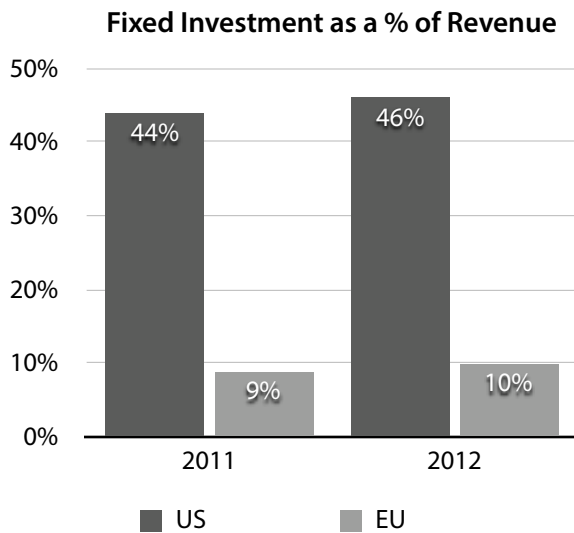
counterparts in the EU. Operators in the US are investing nearly \$70 billion in their networks annually while European operators are investing only about \$15 billion.⁶⁵



This enormous disparity in fixed capital investment cannot be explained by differences in industry revenue. Despite having a significantly lower level of investment, the fixed market segment in the EU actually produces more revenue than in the US — \$15 to \$20 billion more each year.⁶⁶

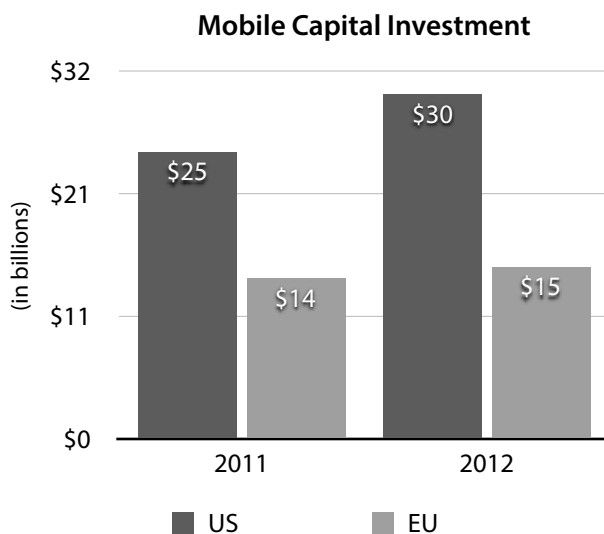


As a result, the relative magnitudes of the investment disparities between US and EU operators are similar even when capital investment is measured as a percentage of industry revenue.

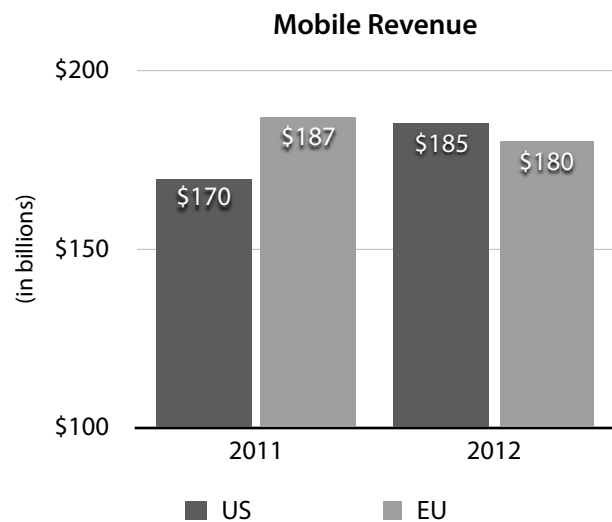


Mobile Investment

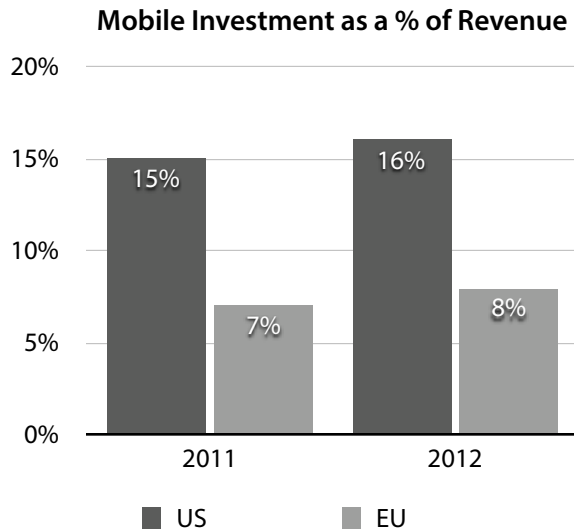
The data also shows a large disparity in capital investment between the US and EU mobile industries. US mobile operators have invested *twice as much capital* in their networks as mobile operators in the EU.⁶⁷



As with the fixed market segment, revenue differences did not drive the disparity in mobile capital investment. The mobile industry produced similar revenue totals in the US and the EU. In 2011, Mobile operators in the EU earned more than their counterparts in the US (\$187 and \$170 billion, respectively), but EU operators earned slightly less than US operators in 2012.⁶⁸



The magnitudes of the investment disparities between US and EU mobile operators are thus virtually the same when measured as a percentage of industry revenue. US mobile operators are reinvesting 15% to 16% of their revenue in their network infrastructure while mobile operators in the EU are reinvesting only 7% to 8%.⁶⁹



Competition and Coverage

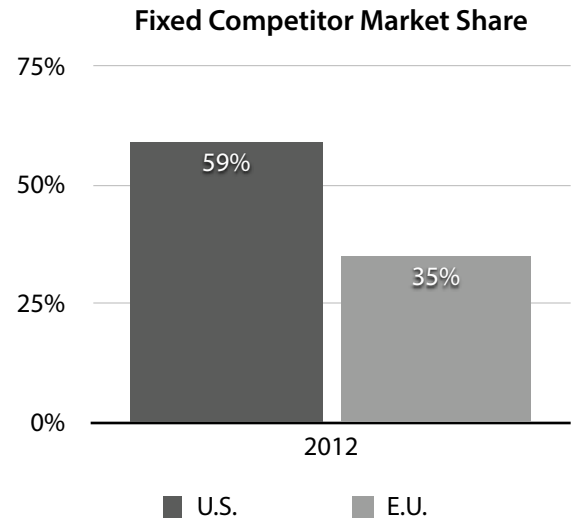
The higher levels of capital investment in the US correlate with higher levels of competition (both facilities- and service-based) and broadband coverage.

Fixed Competition and Coverage

As noted above, the EU imposes unbundling obligations in the residential telephone markets whereas the US does not. Net neutrality advocates have theorized that the EU's approach to wholesale access regulation results in greater service-based competition.⁷⁰ But reality has produced different results.

In 2012, competitors held a larger share of the local telephone market (59%) in the US than incumbents (41%), and 92% of US "households" had access to ten or more non-incumbent telephone service providers.⁷¹ In con-

trast, EU incumbents retained a presumptively dominant 65% share of the local telephone market with competitors holding only 35%.⁷²

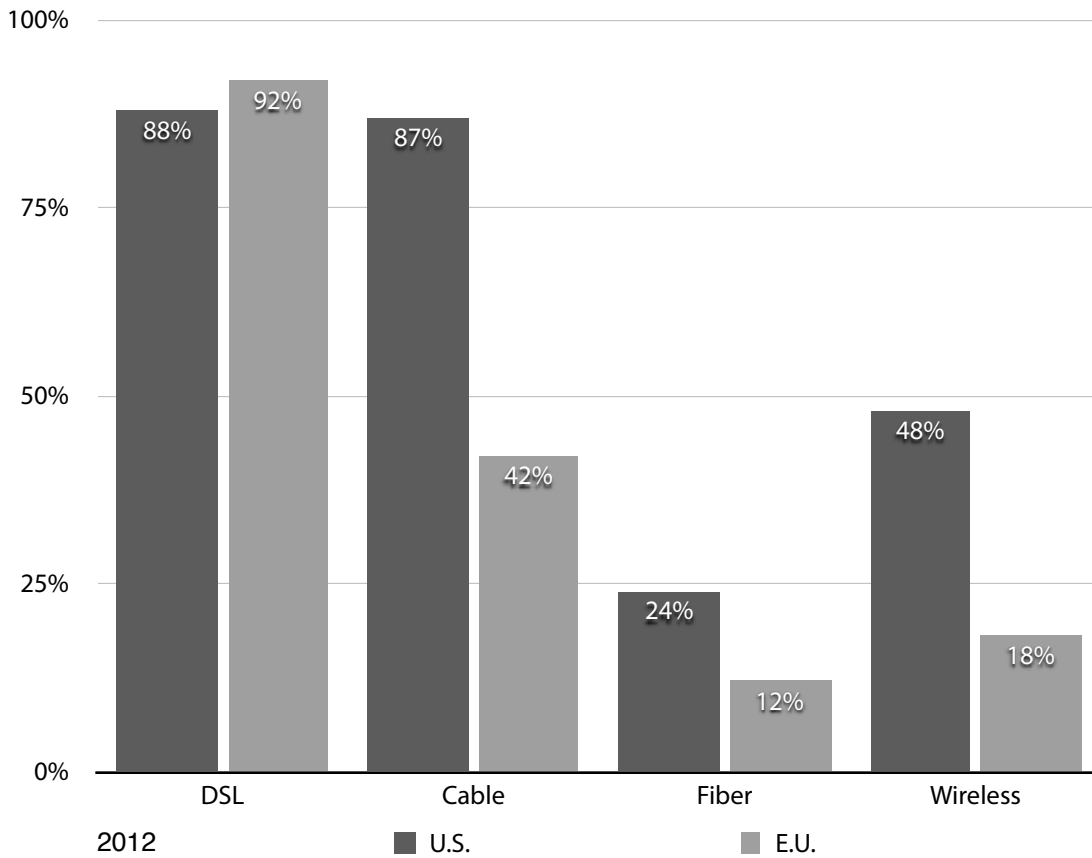


Broadband competition was also greater in the US than in the EU. The vast majority of US households have access to multiple facilities-based fixed broadband operators. According to the FCC, in 2012, 76% of US households were located in census tracts with access to three or more providers of fixed broadband access offering download throughput of at least 3 Mbps.⁷³ In contrast, a majority of households in the EU lack access to a fixed facilities-based broadband alternative to the incumbent network operator, because competitive cable, fiber to the home, and fixed wireless networks in the EU have provided

significantly less coverage than their counterparts in the US.⁷⁴

Nearly half of DSL subscriptions (46%) in the EU are provided by new entrants, but these

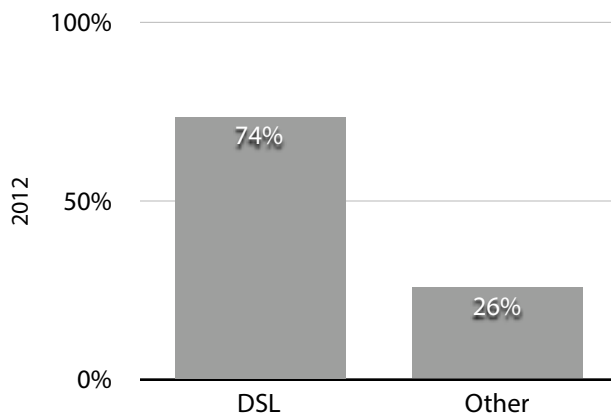
Fixed Broadband Coverage by Technology Type

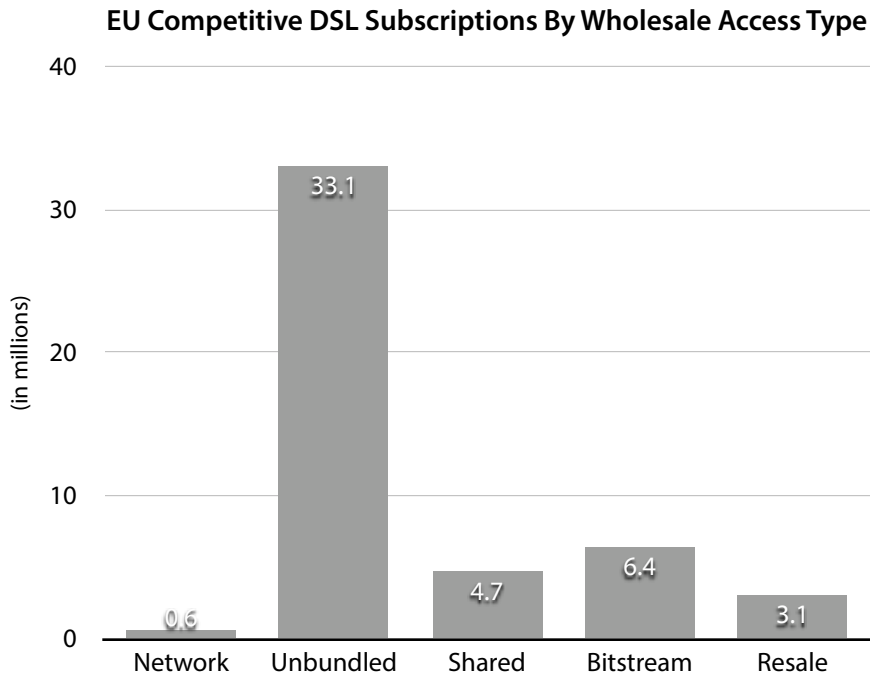


DSL broadband provided over incumbent copper-based telephone facilities is the dominant form of fixed broadband in the EU.

competitors rely almost exclusively on wholesale access to incumbent facilities, rather than their own infrastructure, to provide broadband services to their subscribers. In 2012, competitors in the EU used their own networks to provide DSL access to *fewer than 1 million* subscribers.⁷⁵

EU Broadband Subscriptions





holds in the EU were covered by broadband networks offering speeds of at least 30 Mbps.⁷⁷

Mobile Competition and Coverage

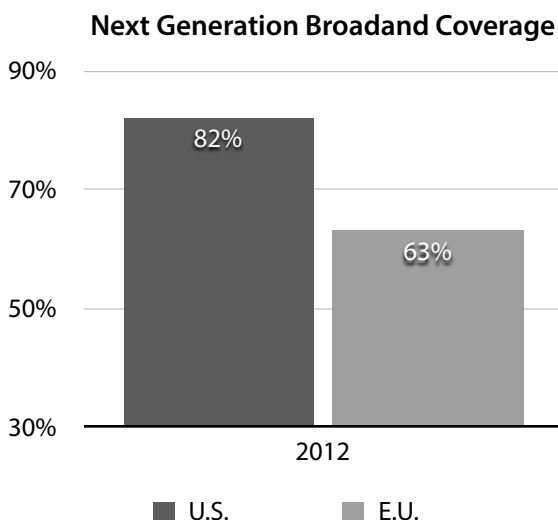
Facilities-based competition among mobile operators in the US is more robust than in the EU. The EU averages fewer than four facilities-

The US also has significantly greater access to fixed next generation broadband networks — i.e., networks that offer download speeds exceeding 30 Mbps (EU) to 50 Mbps (US). In the US, 82% of households were covered by next generation broadband offering download speeds of 50 Mbps or more as of the end of 2012.⁷⁶ In comparison, only 63% of house-

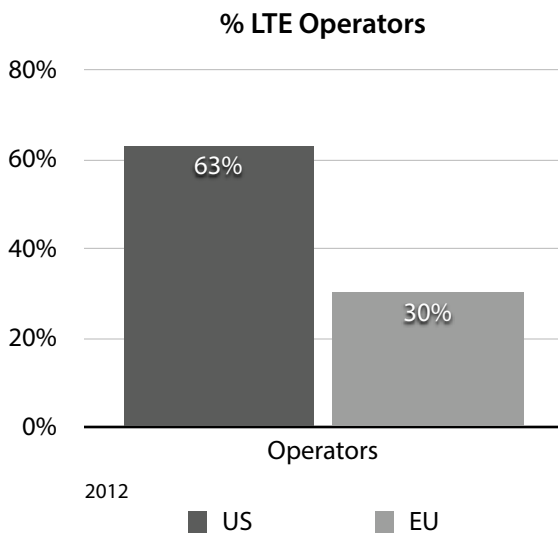
based mobile operators per market (typically 3-4). In the US, there are *five or more* facilities-based mobile operators in most markets.

Mobile operators in the US have been much more aggressive in upgrading their networks to the LTE (long term evolution) standard, a fourth generation (4G) technology that enables next generation mobile networks to provide voice, video, and high speed data services.

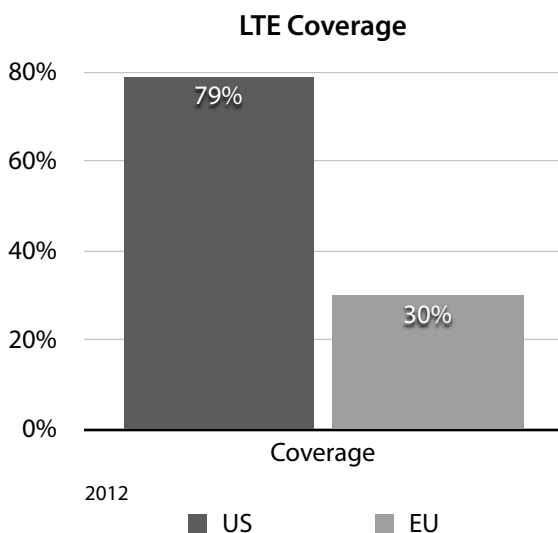
As late as 2012, nearly half of EU states (twelve) had no LTE coverage, and only 30% of EU mobile operators had begun deploying LTE.⁷⁸ During that time, half of the nationwide mobile operators and three of the four



multi-regional mobile operators in the US (63% overall) had begun deploying LTE.⁷⁹



LTE coverage in the US was also more than *double* that in the EU, with LTE covering at least 79% of the US (population) compared to only 30% of the EU (households).⁸⁰



The gap was smaller, however, for older third generation (3G) network coverage, with the EU at 96% and the US at 99.5%.⁸¹

Regulatory Impact

It is difficult to see how a rational policymaker faced with this empirical evidence could conclude that a Title II approach would improve the state of broadband in the US. Nevertheless, it appears that the FCC is poised to just that⁸² in response to a speech by President Obama.⁸³

It is particularly ironic that the US is poised to adopt the European approach to broadband regulation now that its failure has become clear.

Based on its own analysis of comparative data, the EU government recently concluded that its Title II-style approach to broadband regulation is to blame for falling behind the US in capital investment, competition, and broadband coverage.⁸⁴

The EU expressly recognized incontrovertible data that Title II advocates in the US attempt to ignore:⁸⁵

- “Investments in high speed broadband are taking place more quickly in parts of Asia and in the United States;”⁸⁶

- “Most of the current NGA broadband connections in the Union are provided through cable networks where no further expansion is expected (only upgrade of current networks);”⁸⁷
- “Investment in Fibre to the Premises (FTTP) networks has been so far very limited;”⁸⁸
- “Europe must step up its investments in broadband in order to keep its global competitiveness;”⁸⁹ and
- “The private sector should play the leading role in rolling out and modernising broadband networks, supported by a competitive and investment-friendly regulatory framework.”⁹⁰

The EU has already begun to relax its approach to wholesale access regulation in order to encourage investment in next generation broadband networks. In 2013, the EU recommended that national regulatory authorities stop imposing regulated wholesale access prices on next generation networks that are subject to non-discrimination obligations and have at least one retail price competitor.⁹¹

Though the EU failed to embrace a truly light-touch regulatory approach like that in the US, the EU recognized that investment in next generation networks is inherently risky, because it requires “large and sunk investment” coupled with uncertainty regarding the potential to obtain an adequate return on those investments.⁹² The EU also recognized that wholesale price regulation shields access seekers from sharing the risk associated with investment in next generation broadband networks.⁹³ The EU thus concluded that, “If wholesale access price obligations were imposed on the access to fibre networks the scope for reaching these win-win [private investment] solutions would be severely reduced.”⁹⁴

Wholesale access regulations deter investment by imposing the highest risk on incumbents while shifting the highest returns to access seekers. Between 2008 and 2012, European incumbents lost nearly \$84 billion in aggregate market capitalization while over-the-top providers, device manufacturers (OEMs), and competitive cable companies gained more than \$240 billion.⁹⁵ In addition, from 2007 to

2011, return on capital for the leading incumbents in four major EU markets – France, Germany, Spain, and the UK – averaged only 9% while the average return on capital for leading access seekers ranged from 13% to 21% percent over the same period.⁹⁶

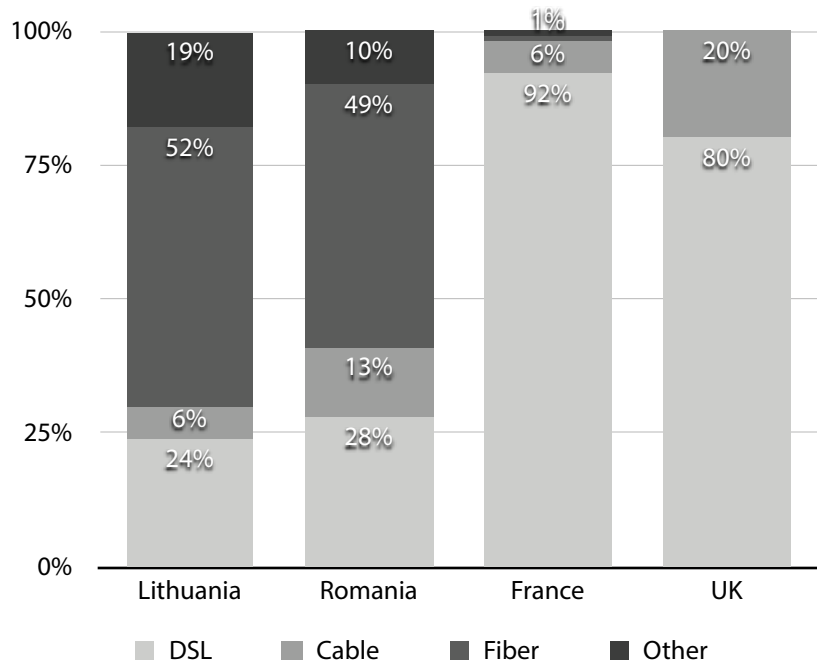
These numbers explain the lower level of capital investment in the EU discussed above. Little incentive to invest in new networks exists when cost-based regulations sever the fundamental link between risk and reward for investment capital in a competitive marketplace.⁹⁷ Under the EU regulatory approach, the companies with the largest return on capital are the same companies that *are not investing* in broadband infrastructure.

Comparison of EU States

A comparison of EU states supports this conclusion. The EC’s Communications Committee has noted that facilities based competition is strongest where new entrants’ presence in the wholesale access market for DSL is mar-

ginal.⁹⁸ In Bulgaria, Romania, Latvia, Malta, Estonia and Lithuania, there is virtually no competition in the DSL market, but there is strong facilities-based competition.⁹⁹ Though DSL had 74% market share when measured on an EU-wide basis, DSL had less than 50% market share in these states, with fiber to the home being the dominant form of access in Romania, Lithuania, and Latvia.¹⁰⁰

Fixed Broadband Subscriptions in Select EU States



At the same time, *in states with the most aggressive wholesale access regulations* — e.g., France and the UK — new entrants have the majority of DSL subscriptions and *there is virtually no facilities-based competition*. In these member states, the vast majority of new en-

trants' DSL subscriptions are provided through mandatory unbundling of local telephone infrastructure owned by the incumbent carrier.

A comparison of the regulatory environments across EU states indicates that their approaches to broadband policy have played a significant role in shaping their markets. A discussion of the differences between broadband regulation and deployment in France and Romania is illustrative.

France

In France, the government is still the largest shareholder in Orange, the incumbent telephone company, and the French regulator maintains a close relationship with it.¹⁰¹

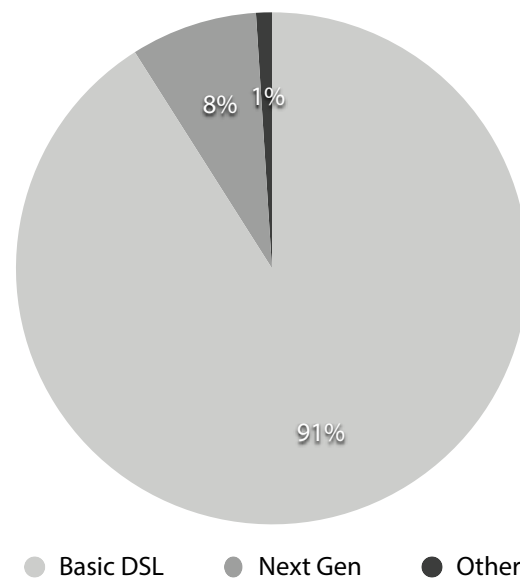
France is a proponent of service-based competition, which it refers to as “infrastructure sharing.” It generally believes that “it can be more efficient for the entire market to allow operators to share existing or future infrastructures,” and a 2008 law requires that operators share their “last mile” network infrastructure, including newly built fiber.¹⁰²

The French regulator has determined that, in areas covering 81% of French households

(roughly 95% of its territory), “optical fiber local loops are to be shared to a very high degree.”¹⁰³

The results of this policy? As of January 2014, 91% of fixed broadband subscriptions in France were for DSL, and only 8% were for next generation access.¹⁰⁴

French Broadband Subscriptions



Romania

In stark contrast to France, the more deregulatory Romanian broadband market is “characterised by platform based competition.”¹⁰⁵

Romania was not subject to the EU’s wholesale access policies until it acceded to the EU in 2007.¹⁰⁶ By that time, however, Romania was already being served by “neighborhood networks” — small, privately owned broad-

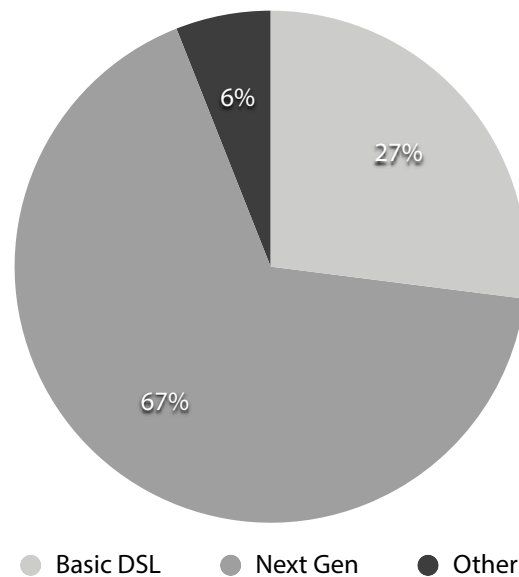
band networks that were launched in areas where the incumbent had not yet launched DSL services.¹⁰⁷ These neighborhood networks developed in a regulatory gray area similar to US cable networks in the 1950s and '60s. For example, neighborhood networks lowered their deployment costs by installing aerial fiber where duct-based network roll-outs are mandatory.¹⁰⁸

After its accession to the EU, Romania has promoted facilities-based competition by adopting deregulatory, pro-investment broadband policies. In 2010, the Romanian regulator imposed wholesale access obligations on the incumbent telephone company's copper network, but did *not* comply with the European Commission's request to impose wholesale access obligations on the incumbent's fiber lines.¹⁰⁹ Romania also determined that it was not necessary to regulate the retail market for broadband Internet access due to the high level of infrastructure-based competition.¹¹⁰

As with the US, the deregulatory approach adopted in Romania has produced more next generation access than the French public utility model. As of January 2014, 67% of Roman-

ian broadband subscriptions are for next generation access.¹¹¹ Only 27% of fixed broadband subscriptions in Romania rely on DSL.¹¹² Nearly half of Romanian broadband subscriptions (48%) are fiber to the home, 14% are cable modem (including DOCSIS 3.0), and 10% rely on other technologies (e.g., wireless).¹¹³

Romanian Broadband Subscriptions



Conclusion

An objective analysis of the data comparing broadband in the US with Europe shows that the US made the right choice in 2002: Broadband deployment, competition, and coverage do better in a deregulatory environment than under the Title II-style regulation the EU adopted in 2002.

Ironically, the US is poised to reenact 2002 in reverse by imposing Title II on US broadband providers shortly after the EU has realized that its Title II-style regulatory approach is the reason it has fallen behind the US.

The FCC should continue the successful US approach to broadband regulation first adopted in 2002, not reverse course. The EU experience has demonstrated that Title II regulation is an anathema to investment in next generation broadband networks — and that the US had it right all along.

¹ See Chris Riley, *If Only Our Broadband Markets Could be Like Europe's*, Free Press (Apr. 22, 2010), available at <http://www.savetheinternet.com/blog/10/04/22/if-only-our-broadband-markets-could-be-europes>.

² Commission Staff Working Document, SWD(2013) 329 at p. 7 (hereinafter "SWD(2013)"), available at http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/swd_2013_0329_en.pdf (accompanying the document Commission Recommendation (2013/466/EU) of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, OJ L 251, 12.9.2013, pp. 13-32 (hereinafter "2013 Recommendation")), available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1417542529933&uri=CELEX:32013H0466>.

³ *Id.* at pp. 44-45.

⁴ For a recent example of the broadband paradise myth told by net neutrality advocates, see Candace Clement and S. Derek Turner, *Reclassification Is Not a Dirty Word*, Free Press (Jan. 17, 2014), available at <http://www.freepress.net/blog/2014/01/17/reclassification-not-dirty-word>.

⁵ See *id.*

⁶ See Chris Riley, *supra* note 1.

⁷ See SWD(2013), *supra* note 2, at p. 7.

⁸ Todd Shields and James Rowley, *FCC Said to Signal It's Heeding Obama's Call for Open-Web Rules*, Bloomberg (Jan. 7, 2015), available at <http://www.bloomberg.com/news/2015-01-07/fcc-said-to-signal-it-s-heeding-obama-s-call-for-open-web-rules.html>.

⁹ Based on its experience with competitive entry, the FCC found that tariff filings are not necessary to ensure just and reasonable prices or avoid discrimination in competitive markets because non-dominant carriers lack sufficient market power to control prices and are presumptively unlikely to discriminate unreasonably. See Policy & Rules Concerning Rates for Competitive Common Carrier Servs. & Facilities Authorizations Therefor, First Report and Order, FCC 80-629, 85 F.C.C.2d 1, 31, at ¶¶ 88-89 (1980). In competitive markets, tariff filings actually promote strategic behavior and inhibit innovation. See Policy & Rules Concerning Rates for Competitive Common Carrier Servs. & Facilities Authorizations Therefor, Notice of Inquiry and Proposed Rulemaking, 77 F.C.C.2d 308, 315-14, 323-24, at ¶¶ 9, 30 (1979).

¹⁰ See *id.*

¹¹ See generally Telecommunications Act of 1996, Pub. L. No 104-104, 110 Stat. 56.

¹² See *id.*

¹³ *Verizon Commc'ns, Inc. v. FCC*, 535 U.S. 467, 489 (2002).

¹⁴ See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Third Report and Order and Fourth Further Notice of Proposed Rulemaking, FCC 99-238, 15 FCC Rcd. 3696, 3749, at ¶ 112 (1999), *reversed and remanded in part sub. nom. United States Telecom Ass'n v. FCC*, 290 F.3d 415 (D.C. Cir. 2002) (hereinafter "USTA I"), *cert. denied sub nom. WorldCom, Inc. v. United States Telecom Ass'n*, 538 U.S. 940 (2003).

¹⁵ See J. Gregory Sidak, *The Failure of Good Intentions: The Worldcom Fraud and the Collapse of American Telecommunications After Deregulation*, 20 Yale J. on Reg. 207, 216 (2003).

¹⁶ *Id.* at 216.

¹⁷ See Financial Turmoil in the Telcomms Marketplace: Maintaining the Operations of Essential Communs: Before the S. Comm. on Commerce, Sci., Transp., 107th Cong. (2002) (statement of Michael K. Powell, Chairman, FCC (hereinafter "Powell Testimony")), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-224797A1.pdf.

¹⁸ See *In re WorldCom, Inc. Sec. Litig.*, 293 B.R. 308, 312 (S.D.N.Y. 2003).

¹⁹ Powell Testimony at 1.

²⁰ *Id.*

²¹ See Inquiry Concerning High-Speed Access to Internet over Cable & Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, FCC 02-77, 17 FCC Rcd. 4798 (2002) (hereinafter “Cable Modem Order”), *aff’d sub. nom. Nat’l Cable & Telecomms. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967 (2005); Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Report and Order and Notice of Proposed Rulemaking, FCC 05-150, 20 FCC Rcd. 14853 (2005), *aff’d sub. nom. Time Warner Telecom, Inc. v. FCC*, 507 F.3d 205 (3d Cir. 2007); United Power Line Council’s Petition for Declaratory Ruling Regarding the Classification of Broadband over Power Line Internet Access Service as an Information Service, Memorandum Opinion and Order, FCC 06-165, 21 FCC Rcd. 13281 (2006); Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks, Declaratory Ruling, FCC 07-30, 22 FCC Rcd. 5901 (2007).

²² Cable Modem Order, *supra* note 21, at ¶ 5.

²³ Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, FCC 03-36, 18 FCC Rcd. 16978, 17125, at ¶ 241 (2003) (hereinafter “Triennial Review Order”), *vacated in part, aff’d in part sub. nom. U.S. Telecom Ass’n v. FCC*, 359 F.3d 554 (D.C. Cir. 2004), *cert. denied sub nom., Nat’l Ass’n of Regulatory Utility Comm’rs v. United States Telecom Ass’n*, 543 U.S. 925 (2004).

²⁴ Cable Modem Order, *supra* note 21, at ¶ 5.

²⁵ See Directive 2002/21/EC of 7 March 2002 (Framework Directive), available at http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/140framework_5.pdf. The Framework Directive is part of a “Telecoms Package” of five directives adopted in 2002, which also include (1) Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive); (2) Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive), available at http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/140access_1.pdf; (3) Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users’ rights relating to electronic communications networks and services (Universal Service Directive), and (4) Directive 97/66/EC of the European Parliament and of the Council of 15 December 1997 concerning the processing of personal data and the protection of privacy in the telecommunications sector (Privacy Directive). The Telecoms Package was amended in 2009 by two additional directives: (1) Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services (Better Law-Making Directive); and (2) Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users’ rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws (Citizens’ Rights Directive).

²⁶ See Commission Recommendation (2003/311/EC) of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, OJ L 114, 8.5.2003, pp. 45–49 at Annex, pp. 48–49.

²⁷ See *United States v. American Tel. & Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1982), *aff’d sub nom. Maryland v. United States*, 460 U.S. 1001 (1983), *modified sub nom. United States v. W. Elec. Co., Inc.*, 890 F. Supp. 1 (D.D.C. 1995), *vacated* 84 F.3d 1452 (D.C. Cir. 1996), *amended* 714 F. Supp. 1 (D.D.C. 1988), *aff’d in part, rev’d in part* 900 F.2d 283 (D.C. Cir. 1990).

²⁸ See Herbert Burkert, *The Post-Deregulatory Landscape in International Telecommunications Law: A Unique European Union Approach?*, 27 *Brook. J. Int’l L.* 739, 756–58 (2002).

²⁹ See BT, Archives Information, available at <https://www.btplc.com/Thegroup/BTsHistory/Privatisationinfosheetissue2.pdf>.

³⁰ See VoiceStream Wireless Corp., Memorandum Opinion and Order, FCC 01-142, 16 FCC Rcd. 9779, 9784, at ¶ 6 (2001), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-01-142A1.pdf.

³¹ See Amy Thomson and Ruth David, *French State-Owned Bank Selling \$732 Million Orange Stake*, Bloomberg (Oct. 1, 2014), available at <http://www.bloomberg.com/news/2014-09-30/french-state-owned-bank-selling-750-million-stake-in-orange.html>.

³² See Burkert, *supra* note 28, at 756-58.

³³ See *id.* at 738 (noting that Europe had not forced divestiture).

³⁴ See Pierre A. Buigues, Head of Unit, Telecom, Information Society DG Competition-EU Commission, *Benefits for Consumers from Competition in the "New Economy": The Case of Access to the Internet and the Local Loop*, European Competition Day, Madrid, Feb. 26, 2002, available at http://ec.europa.eu/competition/speeches/text/sp2002_004_en.pdf.

³⁵ *Id.*

³⁶ See J. Scott Marcus, Study, *Network Neutrality Revisited: Challenges and Responses in the EU and in the US*, Committee on the Internal Market and Consumer Protection, PE 518.751 at pp. 83-93 (Dec. 19, 2014), available at [http://www.europarl.europa.eu/RegData/etudes/STUD/2014/518751/IPOL_STU\(2014\)518751_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2014/518751/IPOL_STU(2014)518751_EN.pdf).

³⁷ In late 2014, the EU decided that *ex ante* regulation of retail telephone rates was no longer necessary. See Commission Recommendation (2014/710/EU) of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, OJ L 295, 11.10.2014, p. 79-84 (hereinafter "2014 Market Definitions"), available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1417542529933&uri=CELEX:32014H0710>.

³⁸ As noted above, most telephone companies were government owned monopolies in Europe during the monopoly era. In the US, the privately owned Bell System had a monopoly on long distance services nationwide and on local services in most urban markets, but numerous smaller, independent telephone companies served many rural areas. The US subsidized universal service and local telephone rates in rural and residential markets by allowing the Bell System to charge excessive rates for its long distance services (which were used primarily by businesses) in order to offset the costs of providing local services that would otherwise be uneconomic. When the US broke up the monopoly telephone system and introduced competition in the long distance market, this subsidy system was no longer viable. The FCC replaced it with a "transitional" intercarrier compensation system, which required that all long distance providers pay "access charges" to local telephone operators for the origination and termination of long distance calls. See Connect America Fund, Notice of Proposed Rulemaking, FCC 11-13, 26 FCC Rcd. 4554, 4703-706, at ¶¶ 496-501 (2011) (hereinafter "CAF Notice").

³⁹ In 2011, the FCC decided to transition to a "bill and keep" regime that will eliminate terminating access charges over time, primarily to correct market distortions enabled by the "rate averaging" requirement imposed on IXCs. See Connect America Fund, Report and Order and Further Notice of Proposed Rulemaking, FCC 11-161, 26 FCC Rcd. 17663, 17905, 17908, at ¶¶ 741, 745 (2011). The Communications Act prohibits long distance carriers from charging customers in one state a rate different from that in another state. To implement this requirement, IXCs charge averaged long-distance rates (i.e., the same rate on a nationwide basis). In effect, the law prohibits IXCs from directly passing on higher access rates to customers that make calls to or from areas with higher access rates. This means that LEC customers have no incentive to choose a LEC with low access rates, which creates a "terminating monopoly" in access rates. See CAF Notice, *supra* note 38, at ¶ 654.

⁴⁰ See 47 C.F.R. § 69.2.

⁴¹ Today, there are three major forms of intercarrier compensation: interstate access charges, intrastate access charges, and reciprocal compensation. See CAF Notice, *supra* note 38, at ¶ 34, n.26. Access charges apply to long distance calls. See 47 C.F.R. § 69.2(b). The Commission regulates rates for interstate calls and states regulate rates for intrastate calls. See CAF Notice, *supra* note 38, at ¶ 34, n.26. Reciprocal compensation today primarily governs “local” calls, and, with the exception of mobile calls (which are already bill and keep), reciprocal compensation rates are either negotiated by carriers or set by states using the Commission’s pricing methodology. See 47 C.F.R. § 51.705. Intrastate access rates are generally higher than interstate rates, and both are generally higher than reciprocal compensation rates, although large variations exist within each category. See CAF Notice, *supra* note 38, at ¶ 34, n.26.

⁴² See 47 C.F.R. § 51.705.

⁴³ See High Cost Universal Service Support, Order on Remand and Report and Order and Further Notice of Proposed Rulemaking, FCC 08-262, 24 FCC Rcd. 6475 (2008), *aff’d sub. nom. Core Comms., Inc. v. FCC*, 592 F.3d 139 (D.C. Cir. 2010), *cert. denied* 131 S.Ct. 597 (2010).

⁴⁴ See Commission Recommendation (2009/396/EC) of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, OJ L 124, 20.5.2009, p. 67–74, at ¶ (7), available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1417544687818&uri=CELEX:32009H0396>.

⁴⁵ See *id.* See also 2014 Market Definitions, *supra* note 37, at Annex (defining “wholesale voice call termination on individual mobile networks” as a market subject to ex ante regulation).

⁴⁶ See Frontier Economics Ltd, London, *The impact of recent cuts in mobile termination rates across Europe, A Report Prepared for Vodafone Group* (May 2012), available at http://www.vodafone.com/content/dam/vodafone/about/public_policy/articles/mtr_impact_of_ec_recommendation.pdf.

⁴⁷ See USTA I, *supra* note 14, at 429 (citing *AT&T Corp. v. Iowa Utilities Bd.*, 525 U.S. 366, 388, 428-29 (1999)).

⁴⁸ See 47 U.S.C.A. § 251(d).

⁴⁹ See *US Telecom Ass’n v. FCC*, 359 F.3d 554, 563 (D.C. Cir. 2004) (quoting USTA I, 290 F.3d at 425).

⁵⁰ See Unbundled Access to Network Elements, Order on Remand, FCC 04-290, 20 FCC Rcd. 2533, 2537 at ¶ 5 (2005), *aff’d sub. nom. Covad Comms Co. v. FCC*, 450 F.3d 528 (D.C. Cir. 2006). The FCC found that unbundled switching access was not “necessary” because competitors had successfully deployed their own switches. *Id.* at ¶ 199. It also found that, “regardless of any limited potential impairment requesting carriers may still face, we find that the continued availability of unbundled mass market switching would impose significant costs in the form of decreased investment incentives, and therefore we conclude not to unbundle pursuant to section 251(d)(2)’s ‘at a minimum’ authority.” *Id.*

⁵¹ See Triennial Review Order, *supra* note 23, at ¶¶ 200, 244.

⁵² See USTA I, *supra* note 14, at 424.

⁵³ See Commission Staff Working Document, SWD(2014) 298 at p. 40, available at <https://ec.europa.eu/digital-agenda/en/news/explanatory-note-accompanying-commission-recommendation-relevant-product-and-service-markets> (accompanying the document 2014 Market Definitions).

⁵⁴ See Commission Recommendation (2010/572/EU) of 20 September 2010 on regulated access to Next Generation Access Networks (NGA), OJ L 251, 25.9.2010, at ¶¶ 22-28.

⁵⁵ See Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile communications networks within the Union, OJ L 172, 30.6.2012, pp. 10–35.

⁵⁶ All of the EU data in this paper is based on all 28 members states. A list of these states is available at http://europa.eu/about-eu/countries/index_en.htm. Euros were converted to dollars using an exchange rate of €1 equals \$1.20 (or \$1 = €0.80).

⁵⁷ This gross domestic product data was produced by The World Bank, and is available at <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

⁵⁸ These per capita incomes are based on The World Bank gross domestic product data. See *id.*

⁵⁹ See Christopher S. Yoo, U.S. vs. European Broadband Deployment: What Do the Data Say?, U of Penn, Inst. for Law & Econ. Research Paper No. 14-35 at p. (Jun. 3, 2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2510854.

⁶⁰ The US geographic data was produced by the Census Bureau, and is available at <http://quickfacts.census.gov/qfd/states/00000.html>. The EU data was produced by Eurostat, and is available at http://europa.eu/about-eu/countries/index_en.htm.

⁶¹ See Urban Area Criteria for the 2010 Census, Department of Commerce, Bureau of the Census, 76 Fed. Reg. 53030, 53039 (2011), available at <http://www.census.gov/geo/reference/pdfs/fedreg/fedregv76n164.pdf>. Rural areas are actually defined by reference to “urban areas.” An urban area is comprised of a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with contiguous territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. To qualify as an urban area on its own, the territory identified according to the criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. Urban areas that contain 50,000 or more people are designated as “urbanized areas,” and urban areas that contain at least 2,500 and less than 50,000 people are designated as “urban clusters.” “Rural areas” are all population, housing, and territory not included within an urban area. *Id.*

⁶² The EU bases its urbanization statistics on the population densities of square kilometers within predefined areas known as “local administrative units level 2” (LAU2). An LAU2 is considered a “densely populated area” if at least 50% of its inhabitants are living in a “high density cluster”, i.e., contiguous one squarer kilometer grid cells with a density of at least 1,500 inhabitants per km² and a minimum population of 50,000. An “intermediate density area (i.e., towns and suburbs) is an LAU2 with less than 50% of its population living in a higher density cluster and less than 50% of its population living in rural grid cells, which are cells outside of “urban clusters.” An urban cluster is a contiguous grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5,000. See Lewis Dijkstra and Hugo Poelman, European Commission Directorate-General for Regional and Urban Policy, *A Harmonized Definition of Cities and Rural Areas: The New Degree of Urbanization*, Regional Working Paper (WP 01/2014), available at http://ec.europa.eu/regional_policy/sources/docgener/work/2014_01_new_urban.pdf.

⁶³ According to the Census Bureau, 19.3% of the US population lives in rural areas. See <https://www.census.gov/geo/reference/ua/urban-rural-2010.html>. According to the EU methodology, 29% of Europeans live in rural areas. <https://www.census.gov/geo/reference/ua/urban-rural-2010.html>.

⁶⁴ See *id.* at p. 2 (noting that urbanization comparisons based on different area sizes produced distorted results that reduce comparability).

⁶⁵ The US fixed investment data was produced by USTelecom, and is available at <http://www.ustelecom.org/broadband-industry-stats/investment/historical-broadband-provider-capex>. The EU fixed investment data was produced by the EU, and is available at <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>.

⁶⁶ The US fixed revenue data was produced by the FCC, and is available at <http://www.fcc.gov/encyclopedia/federal-state-joint-board-monitoring-reports>. See 2014 USF Monitoring Report, Table 1.1. Note that the inclusion of international and satellite revenue in the USF Monitoring report may result in US revenue being overstated in comparison to the EU. The EU fixed revenue data was produced by the EU, and is available at <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>.

⁶⁷ The US mobile investment data for 2011 was produced by the FCC, and is available at <http://www.fcc.gov/document/16th-mobile-competition-report>. See 16th Mobile Competition Report, FCC 13-34 at Table 33 (2013). For the year 2012, the US mobile investment data was produced by CTIA, and is available at <http://www.ctia.org/your-wireless-life/how-wireless-works/annual-wireless-industry-survey>. The EU mobile investment data was produced by the EU, and is available at <http://ec.europa.eu/eurostat>.

⁶⁸ The US mobile revenue data was produced by the FCC, and is available at <http://www.fcc.gov/document/17th-annual-competition-report>. See 17th Mobile Competition Report, FCC 14-1862 at p. 116, Table II.D.i (2014). The EU mobile revenue data was produced by the EU, and is available at <http://ec.europa.eu/eurostat>.

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⁷⁰ See, e.g., S. Derek Turner, 'Shooting the Messenger', Free Press (Jul. 2007) (claiming that Europe is outperforming the US in broadband), available at http://www.freepress.net/sites/default/files/fp-legacy/shooting_the_messenger.pdf.

⁷¹ This data was produced by the FCC, and is available at <http://www.fcc.gov/document/fcc-releases-new-data-local-telephone-competition-4>. See Local Telephone Competition: Status as of December 31, 2012, at Tables 1, 19 (Nov. 2013).

⁷² This data was produced by the EU, and is available at <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>. Note that this data was produced only at mid-year. This report uses the data for July 2013, which may be more favorable to the EU.

⁷³ This data was produced by the FCC, and is available at <http://www.fcc.gov/reports/internet-access-services-reports>. See Internet Access Services: Status as of December 31, 2012, at Figure 5(a), p. 9 (Dec. 2013).

⁷⁴ This data was produced by the EU, and is available at <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>.

⁷⁵ *Id.*

⁷⁶ This data was produced by the National Telecommunications and Information Administration, and is available at <http://www.broadbandmap.gov/analyze>.

⁷⁷ This data was produced by the EU, and is available at http://digital-agenda-data.eu/datasets/digital_agenda_score-board_key_indicators/indicators. The EU defines next generation broadband "coverage/availability" as "a supply indicator defined as the percentage of Households living in areas served by NGA. Next Generation Access includes the following technologies: FTTH, FTTB, Cable Docsis 3.0, VDSL and other superfast broadband (at least 30 Mbps download)." *Id.*

⁷⁸ *Id.*

⁷⁹ The US LTE deployment data for 2011 was produced by the FCC, and is available at <http://www.fcc.gov/document/16th-mobile-competition-report>. See 16th Mobile Competition Report, FCC 13-34 at pp. 7-8 (2013).

⁸⁰ The US LTE coverage data for 2011 was produced by the FCC, and is available at <http://www.fcc.gov/document/16th-mobile-competition-report>. See 16th Mobile Competition Report, FCC 13-34 at p. 7 (2013). This data is based solely on the coverage provided by Verizon Wireless as of November 2012, and thus likely understates LTE coverage in the US. For the EU, see <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>.

⁸¹ For US 3G coverage, see *id.* at p. 7. For the EU, see <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>.

⁸² See Brendan Sasso, *FCC Chief Hints He'll Enact Obama's Net Neutrality Plan*, National Journal (Jan. 7, 2015), available at <http://www.nationaljournal.com/tech/fcc-chief-hints-he-ll-enact-obama-s-net-neutrality-plan-20150107>.

⁸³ See Statement of President Barack Obama, available at <http://www.whitehouse.gov/net-neutrality>.

⁸⁴ See SWD(2013), *supra* note 2, at p. 7.

⁸⁵ See Nick Russo, Robert Morgus, Danielle Kehl, and Sarah Morris, *The Cost of Connectivity 2014*, New America Foundation (Oct. 30, 2014) (comparing cities selected by the authors rather than states), available at <http://www.newamerica.org/oti/the-cost-of-connectivity-2014/>.

⁸⁶ SWD(2013).

⁸⁷ *Id.* at p. 16.

⁸⁸ *Id.*

⁸⁹ *Id.* at p. 17.

⁹⁰ Regulation (EU) No 283/2014 of the European Parliament and of the Council of 11 March 2014 on guidelines for trans-European networks in the area of telecommunications infrastructure and repealing Decision No 1336/97/EC, OJ L 86, 21.3.2014, p. 14–26 at ¶ (21) (hereinafter "2014 Regulation").

⁹¹ SWD(2013) at p. 34.

⁹² *Id.* at p. 44.

⁹³ *Id.*

⁹⁴ *Id.* at pp. 44-45.

⁹⁵ See Boston Consulting Group, *Reforming Europe's Telecoms Regulation to Enable the Digital Single Market* at p. 11 (Jul 2013), available at https://www.etno.eu/datas/publications/studies/BCG_ETNO_REPORT_2013.pdf.

⁹⁶ See *id.*

⁹⁷ See *id.* at pp. 39-40.

⁹⁸ Communications Committee (COCOM) Report, *Trends in European broadband markets* at p. 19 (2014), available at <https://ec.europa.eu/digital-agenda/en/news/scoreboard-2014-trends-european-broadband-markets-2014>.

⁹⁹ *Id.* at p. 19.

¹⁰⁰ *Id.* at p. 14.

¹⁰¹ See generally Regulatory Authority for Electronic Communications and Posts (Autorité de régulation des communications électroniques et des postes), *ARCEP's Annual Report* (2013) (centering broadband deployment plans on the Orange network), available at http://www.arcep.fr/uploads/tx_gspublication/rapport-activite-2013-english-version.pdf.

¹⁰² See *id.* at pp. 111-12.

¹⁰³ See *id.* at p. 112.

¹⁰⁴ CITE broadband indicators data.

¹⁰⁵ See Commission Staff Working Document, SWD(2014) 249, Report on Implementation of the EU regulatory framework for electronic communications at p. 244 (hereinafter "2014 Implementation Report"), available at <https://ec.europa.eu/digital-agenda/en/news/2014-report-implementation-eu-regulatory-framework-electronic-communications>.

¹⁰⁶ See Broadband Commission for Digital Development, International Telecommunication Union, *Strategies for the Promotion of Broadband Services and Infrastructure: A Case Study on Romania* at pp. 3, (2012) (hereafter "Case Study"), available at http://www.itu.int/ITU-D/treg/broadband/BB_MDG_Romania_BBCOM.pdf.

¹⁰⁷ *Id.* at p. 14.

¹⁰⁸ *Id.* at p. 15.

¹⁰⁹ Romania 2011 Telecommunication Market and Regulatory Developments at p. 7 (2012), available at http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/RO_Country_Chapter_17th_Report_0.pdf.

¹¹⁰ See *id.*

¹¹¹ This data was produced by the EU, and is available at <http://ec.europa.eu/digital-agenda/fast-and-ultra-fast-internet-access-analysis-and-data>.

¹¹² See *id.*

¹¹³ See *id.*