



December 19, 2013
The Hon. Tom Wheeler
Chairman
Federal Communications Commission
445 12th Street S.W.
Washington, DC 20554

Re: Economic Evidence on Competition in Communications Markets and Implications for Key Policy Issues

Dear Chairman Wheeler,

We at Information Age Economics (IAE) offer our congratulations on your confirmation as Chairman of the Federal Communications Commission. We also appreciate the energetic tone that you have established and the optimism that you have generated in seeking the resolution of key issues before the Commission that will have major impacts on the future of the telecommunications-information-entertainment industry in the U.S.

However, in every respect except welcoming your appointment, we disagree with, and would like to draw your attention to the fundamental flaws in, the contents of the recent Economists' Letter of December 11, 2013 addressed to you in Docket WT 12-269 (*Policies Regarding Mobile Spectrum Holdings*)¹. The Letter is a compendium of misleading lobbying messages and propaganda of the largest U.S. operators that are pursuing a persistent strategy with the aim of achieving an essentially unregulated environment for their businesses. In pursuit of this goal, these operators ignore some verifiable facts ("errors" of omission) while they simply make up others ("errors" of commission) to support claims and arguments that fly in the face of real-world evidence.

We can identify major misrepresentations and flaws in the mix of unsupported assertions and claims advanced by these economists that can only be perceived as valid if verifiable facts are ignored. We now present a selection of their direct quotes with rebuttal comments and evidence that exposes why their positions are unjustified and should be rejected as an outcome of an honest, fact-based, transparent debate about the best way forward to ensure the healthy future of the

¹ <http://apps.fcc.gov/ecfs/document/view?id=7520961468>

² In the second footnote of their letter the economists state, "... as individuals we each reserve the right to use different wording or characterize particular points differently and, of course, to change our opinions on the basis of new facts which may present themselves in the future. " We believe that they should change their opinions based on existing facts some of which we present in this letter.

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U.S. broadband market for the benefit of our economy and all members of our society.

This debate is long overdue.

The misrepresentations in the economists Letter² include:

1. “The Communications Sector Is Vigorously Competitive.”

Two other quotes in the economists Letter are especially relevant to this assertion:

1a. *“American wireless networks are unarguably the most advanced in the world, and more than 85 percent of U.S. households are passed by wireline networks capable of download speeds in excess of 100 Mbps. Competition in all of these markets is dynamic and intense. In many areas of the United States, less than one third of all households are still connected to the traditional wireline telephone infrastructure –i.e., the “natural monopoly” the FCC was created to regulate.⁴ Three out of four households, on the other hand, have broadband Internet connections, which have been virtually exempt, up until now, from economic regulation.”*

1b. (in footnote 4) *“We acknowledge that there are pockets of the country where residents have limited choices in wireline broadband networks capable of achieving speeds in excess of 6 Mbps. But with the coming advances in wireless and satellite broadband services, the opportunity for any targeted exercise of market power is remote.”*

If the economists believe 1a then evidently they live on a different planet. There is ample evidence that in terms of performance, prices, and consequently usage of mobile data, the U.S., while not a laggard, is not the leader. Not only widely recognized leaders in Asia (notably South Korea that has a much higher current penetration of LTE than the U.S.), but also several European countries, can be shown to have superior wireless networks to those in the U.S.³ Furthermore, none of these other countries suffer from the anti-competitive effects of LTE non-interoperability, an unauthorized phenomenon initiated by AT&T and Verizon that will be confined to the U.S., Canada, a few Caribbean islands, and a couple of smaller Latin American countries (Nicaragua, Bolivia), but not the

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³ Rewheel - especially the section “Debunking GSMA & ETNO claims (echoed by some Commission officials) that EU is falling behind the US,”

http://www.rewheel.fi/downloads/Rewheel_contribution_EP_ITRE_public_consultation_Nov_2013_Merged.pdf



larger ones such as Brazil, Argentina, Colombia, and even Mexico the southern neighbor of the U.S. As an illustrative example of the obfuscation or disregard of facts that characterize the representations of the largest U.S. operators, the trade association, the CTIA, which they dominate, persists in publishing a metric of spectrum efficiency that purports to demonstrate the superior efficiency of U.S. operators, even though this metric has been shown conclusively to be spurious. This fact has been brought to the attention of the CTIA, and of AT&T and Verizon, on several occasions over at least the past 18 months. They have paid no attention to demonstrations of the need for a different and credible metric of spectrum efficiency founded upon sound network engineering principles. They have continued to update the misleading values of their metric and present them to the FCC⁴.

As for 1b, the “pockets’ referred to dismissively by the economists include areas such as Boston proper, and Albany, Syracuse, and Buffalo in upstate New York, among others, where there is effectively a cable multiple system operator (MSO) monopoly for the supply of fixed broadband services at speeds above basic DSL levels. The economists notably make no mention of the sales and marketing agreements between Verizon and major cable MSOs that erode the idea that broadband competition will be assured through rivalry between powerful telephone and cable companies. Furthermore, the non-expert reader might easily be misled into thinking that wireless broadband is an effective and acceptable substitute for fixed broadband in the same way (as the economists point out) that wireless or mobile voice services are truly substitutes for fixed voice services. However, the inherent limits of shared wireless capacity make this impossible (wireless and fixed access broadband are more complementary to each other than substitutes) since their limited spectrum cannot deliver enough capacity, expressed as Mbps (megabits per second) per unit area, in order to meet the needs and demands of users in any but the less densely populated areas of the country. Wireless users experience degradation rapidly as the number of simultaneous users in the same cell increases. In other words, the presence of mobile operators in most areas does not provide competitive alternatives to a fixed broadband operator.

2. “...the communications sector has now converged so thoroughly with the rest of the Internet ecosystem that it has become difficult to draw clear boundaries.”

⁴ We have demonstrated for example that according to the CTIA metric China Mobile is more than three times as efficient as Verizon, a comparison that is (conveniently?) omitted from those that the CTA chooses to publish - see for example, Martyn Roetter and Alan Pearce, “The Mystery of the Spurious Spectrum Efficiency Metric: Why Are America’s Wireless Leaders Promoting a Meaningless Measure?” Bloomberg BNA Daily Report for Executives, May 31st, 2013. The latest update of the CTIA’s misleading metric of which we are aware is included in a June 2013 submission to the FCC in Docket WT 13-135 at <http://apps.fcc.gov/ecfs/document/view?id=7520920372> (the so-called flag chart on p. 67).



This statement is nonsensical! If accepted, which is the motivation behind it, then the legitimate idea that the development of Internet applications and services should not be subject to substantive, sector-specific regulation would be justifiably extended to cover and include the communications sector and network operators.

However, even a cursory examination of the Internet ecosystem reveals that the supply structure and constraints of network transport services, especially at the access level, are different from those of Internet applications and services. The one (network transport) is still an inherent oligopoly because the scarcity and limitations of key resources or inputs (such as the public resources of rights-of-way and spectrum, as well as space within buildings) and enormous capital intensity apply equally to digital broadband IP (Internet Protocol) networks (wireless and fiber-based) as they have to analog narrowband, circuit-switched copper-based access networks. In contrast other services and applications delivered over the Internet have been and remain a rich field for innovation and start-ups, characterized by a large number and diversity of participants. The barriers to entry for many of these opportunities are much lower than they are for the launch of a new network. In any generation a handful of these hopeful entrants may grow into world leaders in their respective and sometimes overlapping spheres, as Google, Amazon, Facebook and Twitter have done. We note also that the majority of valuable innovative network-dependent applications and services, from voice mail in the previous era of narrowband communications, to the services offered by Google, Apple, Facebook, Netflix, etc., have come from sources other than the small community of network operators⁵. These innovations have been able to flourish because third parties enjoyed access to networks that, thanks primarily to the actions of the FCC and the Department of Justice (DOJ) in the 1970s and 1980s, was guaranteed by regulation and was not under the control or subject to the “voluntary” discretion or commitments of the leading network operators.

Remember that the basis of today’s Internet was created outside the purview of these network operators and owes much of its success to the U.S. Government. Indeed, AT&T turned down the opportunity to take over the Internet’s technological predecessor the ARPAnet. The historical record, or the “real-world” experience cited by the economists, does not justify giving the largest network operators full discretion over the direction of the uses of their networks, such as would be the situation and their prerogative in the unregulated environment that they urgently seek to create.

The economists also ask a series of questions in their Letter as if the answers should be self-evident, *“Where does a content delivery network stop and the “telecommunications infrastructure” begin? What is a “telecommunications service” in a world in which more traffic travels over Skype and FaceTime than over the Public*

⁵ Traffic generated by these services constitutes the majority of today’s traffic over their networks from which operators drive their revenues.



Switched Telephone Network⁶? How much monopoly power does a wireless carrier have in a world in which consumers' choices are driven at least as much by devices, operating systems and applications ecosystems as by coverage and pricing plans?"

Their respective answers are presumably: (a) Impossible to tell, so telecommunications services should not be regulated since these other services (e.g., content delivery platform providers such as Akamai) are not; (b) Should not be classified as a telecommunications service subject to FCC regulation; and (c) None.

We offer the following alternative questions, *"If people are communicating with each other remotely by exchanging voice signals (real-time dialog or non-real time voice mail), text messages, and video images or moving video pictures, using a range of network technologies, does it matter for the purpose of defining a communications service, what transport technology is use? In other words, does the technology used to transport content make the difference between what is a communications service and what is not, or is it the content, purpose and role of the service that counts? Are the economists aware of the increasing prevalence of carrier-specific LTE devices in the U.S. market and the problems encountered by small operators in securing devices for their 700 MHz frequencies because of non-interoperability introduced into the 700 MHz band by the two largest operators AT&T and Verizon⁷ – and might these phenomena be indications of their duopoly power in the wireless world?"*

Our answers are that (a) The classification of a telecommunications service is independent of the technology platform over which it is delivered and remains distinguishable from other services delivered over or associated with the network, even if there are legitimate differences of opinion about where the boundaries lie, or should be drawn, and (b) The large wireless operators have substantial market power which they can - and do - assert in anti-competitive and customer-hostile actions and behavior.

We conclude that the economists are confusing convergence at the network layer (all forms of traffic are carried over the same network, a phenomenon of the broadband IP world in contrast to service-specific networks) with vertical convergence, in which the different layers in the OSI (Open Systems Interconnection) Model (Table 1) from physical media to services become so

⁶ Skype is now owned by Microsoft and FaceTime is Apple's video call application that can be used between users with Mac computers, iPads, iPhones, or iPod Touch devices over Wi-Fi connections or over cellular mobile broadband networks with iPhones or iPads.

⁷ The impact of 700 MHz non-interoperability – coupled with spectrum assignments that lead to globally unusual outcomes in the U.S. of one-carrier bands - in creating increasingly isolated customer silos based on carrier-specific devices will be extended very soon (in 2014) into other bands for LTE deployments. For example AT&T is about to introduce inter-band carrier aggregation technology between 700 MHz (its unique Band 17) and its AWS and PCS spectrum (both interoperable bands), and will do so later with its WCS (2.3 GHz) frequencies, a band that no other U.S. operator has in its portfolio.



intertwined with each other that it is not possible to distinguish meaningfully between them for the purposes of regulation or the analysis of business models.

Table 1: OSI Model

THE 7-LAYER MODEL	DATA UNIT	LAYER
HOST LAYERS	Data	<i>Application (network process to application)</i>
	Data	<i>Presentation (data representation and encryption)</i>
	Data	<i>Session (inter-host communication)</i>
	Segments	<i>Transport (end-to-end connection and reliability)</i>
NETWORK LAYERS	Packets	<i>Network (path determination and logical addressing (IP))</i>
	Frames	<i>Data Link (physical addressing)</i>
	Bits	<i>Physical (media, signal and binary transmission)</i>

Just because network operators also offer higher level services and some networks are being deployed by non-traditional operators (i.e., examples of vertical integration) does not mean that there are no reasonable and sensible distinctions that can, and indeed must, be drawn between facilities-based transport services and other major parts of the Internet ecosystem.

There are legitimate questions and differences of opinion about where and how best to draw these distinctions, but the extreme proposition that there are no distinctions that are feasible or justifiable is an abdication of responsibility and common sense. One logical but ridiculous extension of the economists’ characterization of the Internet ecosystem is that the cultures and priorities of companies as diverse as AT&T and Verizon on one hand, and Google, Twitter, and Apple on the other, are so similar that there should be no distinction between the ways in which they are perceived and treated by the FCC and DOJ, as well as the Federal Trade Commission (FTC).

5. “POTS-style Interconnection Regulation Should Not Be Imposed on IP Networks.”

We agree that the specifics of interconnection regulation should take account of network technologies. Yet concerns about the fairness of interconnection agreements between entities of vastly different sizes, and the consequences of interconnection for competition, are as relevant in the Internet era, if not more so,



given the description of the Internet as a network of networks, as they have been in the previous era of circuit-switched telephony. The economists find the idea of any mandatory aspect of IP interconnection to be abhorrent and to open the door to involvement by foreign regulators, who are allegedly naturally inclined to favor mandates. It is easy to paint a horror scenario of incompetent regulators imposing innovation-stifling interconnection rules, and setting inappropriate prices. It is also possible to paint an equally terrible scenario of major operators imposing outrageous prices, i.e., costs, on some other operators and services providers in a discriminatory and innovation-inhibiting fashion. Real world examples of this behavior can be found in the wholesale roaming charges, levied by the largest U.S. wireless operators on some of their roaming partners, as well as by several of their European and other foreign counterparts with respect to international roaming.

The issue of IP interconnection deserves and requires serious attention. In this context, there are legitimate questions, and differences of opinion, about how, and to what extent, IP interconnection should be regulated. Nonetheless, the idea that IP Interconnection should be left up to the discretion of the largest operators, or their “voluntary” commitments, is naïve and unrealistic. It ignores these operators’ DNA and their long pattern of anti-competitive behavior in the real world, whenever it lies in their financial interest.

6. “The Commission Should Continue to Expand the Role of Markets in Allocating Spectrum.”

While the economists do not make this point explicitly, their use of language in favor of a greater role for “markets” in allocating spectrum is typical of the largest wireless operators when they argue that they should be allowed to acquire as much spectrum as they want thanks to their enormous financial resources. They assert that under no circumstances will unrestricted spectrum aggregation have an adverse impact on competition in the wireless sector. This assertion disregards the laws of physics (electromagnetic propagation) that both limit the capacity that can be delivered by a given amount of scarce bandwidth, and entail substantial variations in the costs of coverage of rural areas as a function of the frequency band(s) in which an operator is able to deploy its networks. In other words, if some operators are unable to obtain a reasonable portfolio of frequencies (in quantity and across low and high bands) then, due to that circumstance alone, regardless of any other possibly superior merits and capabilities, they will be unable to compete.

Many regulators across the world recognize this inescapable reality. The laws of physics apply everywhere. Hence these regulators strive to achieve outcomes in which no one or two operators hold disproportionately large quantities of bandwidth overall and/or dominate the critical sub 1 GHz region in which spectrum is less abundant or more scarce than it is in high bands.

It is also noteworthy that the largest U.S. operators are happy to claim that their



performance is superior to that of foreign operators, allegedly because the latter labor under stricter (i.e., more effective) regulation. But they are also quick to dismiss or disparage any unfavorable comparisons between the U.S. and foreign countries on the grounds that these comparisons are either based on merely “anecdotal” information, or that conditions in the U.S. are so different from other countries that the comparisons are irrelevant or unfair.

7. “The Internet Should Not Become a “Regulated Industry”.”

We agree with this sentiment and recommendation, but as explained above under Quote 1, this is neither the intent nor the inevitable consequence of ensuring intelligent, effective regulation of the communications sector. To the contrary, innovative competition at the level of Internet applications and services – that benefits from there being no or only minimal regulation of the Internet at these levels – will be threatened if there is no effective regulation of the communications sector, while it will be protected and preserved if there is regulation.

Absent regulation, network operators of bottleneck access facilities will be in a powerful position, and will have powerful motivation, especially but not solely because they are vertically integrated, to manage the conditions of third parties’ usage of, or even access to, their networks in ways that reflect their own interests. They will do so even when these interests conflict with those of other stakeholders, including customers and other non-facilities-based providers of services. Indeed, it may be argued that, as for profit companies, network operators have a fiduciary responsibility to act in this manner on behalf of their shareholders, even if their actions should also be influenced by their roles as stewards of significant public resources, such as spectrum and access to rights-of-way, while they are in addition subject to public interest obligations included in the franchises they have been awarded that accompany the rights thereby granted to them. Therefore, these conflicts of interest must be “refereed” by a regulatory body such as the FCC, which is legislatively required to promote policies that are in the public interest.

8. Vertical Practices Should Be Addressed on a Case-by-Case Basis

The economists argue that, *“The Open Internet Order applies an ex ante approach to the regulation of vertical conduct by effectively prohibiting priority delivery arrangements. A better approach would be to permit new forms of contracting, and to police any abuses after the fact.”*

The problem with this approach lies in the proven observation that, “Justice delayed is often justice denied.” In the real world, it can take years for abuses of power to be corrected and, as the economists rightly note, communications technologies and markets are evolving rapidly. By the time regulators and the legal system can respond to a potential abuse, irrevocable damage has been done and new opportunities for abuse have arisen.



The devil or hopefully the genius of *ex ante* approaches lies in their construction. It is neither the purpose nor the place in this submission to present an exhaustive review or recommendations about how an Open Internet Order should be constructed or modified. However, this can be done in several ways (for example not necessarily prohibiting all priority delivery arrangements) that avoid the perils of trying to micromanage allowable conduct, and thereby possibly frustrating initiatives that improve consumer welfare, while still also laying the basis for preventing harmful abuses of power. We are aware of examples of approaches in this context in some foreign jurisdictions that may provide useful insights for the U.S. By arguing that there should be no *ex ante* restrictions on the actions and behavior of the largest U.S. operators, the largest operators and their supporters, such as the economists who signed the Letter, are in effect arguing that the Government should pick them – the current winners – as the future winners.

We agree that it is neither the job nor within the competence of Government to pick some companies as winners over others. It is, however, within the Government's purview to create and sustain an environment in which new winners can emerge while some of today's winners may decline or even disappear. This flow and ebb of companies in the U.S. has been one of its strengths and sources of innovations that have, in multiple instances, truly led the world. Effective and intelligent regulation of the communications sector is an essential contributor to sustaining this competitive, pro-innovation environment.

The need and opportunity for revising and reformulating regulations originally promulgated in, and for, a different technological and market environment to be more intelligent and suited to the broadband IP era, is self-evident. But the answer or desirable outcome does not reside, as the economists advocate, in the abandonment of existing regulations with, for all practical purposes, no effective replacement.

Respectfully,

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and

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