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Written Statement of

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Studies**

Before the

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Committee on Energy and Commerce

Subcommittee Telecommunications and the Internet

Hearing on

Digital Future of the United States:

Part IV: Broadband Lessons from Abroad

April 24, 2007

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I. Introduction

Mr. Chairman, Ranking Member Upton, and members of the Subcommittee, good morning and thank you for inviting me to testify today.

My name is Dr. George S. Ford, and I am the Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies. I hold a Ph.D. in Economics from Auburn University, and the economics of the communications industry has been the focus of my career – starting with my Ph.D. dissertation on competition in the cable television industry. Prior to my joining the Phoenix Center full time, I worked at several companies in the industry, as well as doing a stint at the Federal Communications Commission’s Competition Division. I have authored numerous research studies that explore this industry, and many of these studies have been published in peer-reviewed academic journals, books and other academic outlets. A copy of my current curricula vitae is attached to my Testimony. I am pleased that the Subcommittee has asked for my insight on this topic.

By means of introduction, the Phoenix Center is a non-profit 501(c)(3) organization that studies broad public policy issues related to governance, social and economic conditions, with a particular emphasis publishing academic-quality research on the law and economics of telecommunications and high-tech industries. Among other activities, the Phoenix Center publishes a PUBLIC POLICY PAPER SERIES, a POLICY BULLETIN SERIES, and a POLICY PERSPECTIVES SERIES. We also sponsor Congressional briefings, Policy Roundtables at the National Press Club, educational retreats, as well as our Annual U.S. Telecoms Symposium. Our research agenda is consistently targeted at providing policymakers information about the important role that pro-entry policies must play in the communications industry. We have written over thirty papers on telecommunications policy in the last nine years, many of which have been published in academic journals. Moreover, we make all of our research – as well as rebuttals by those who do not agree with us – available for free at our website, www.phoenix-center.org.

Before beginning my testimony today, I wish to make it clear that the Phoenix Center makes it a policy not to endorse or support any particular piece of federal or state legislation or proposed regulation. Our mission is not to tell policymakers *what* to think about an issue but *how to think* about it. As such, our contributions to communications policy are decidedly more analytical than most, and we refuse to ignore the institutional realities and economic constraints of the communications business.

At the core of much of our research is a formal recognition that competition between integrated voice, video and broadband networks is costly, expensive and risky. Phoenix Center and other academic research show that because it is costly to build and

operate communications networks, even in a “best case scenario,” only a few firms will be able to provide the complete package of voice, video and data services over their own network.¹ The number of firms that a market can sustain is directly related to the size of potential addressable market and the cost of entering that market. This simple and perhaps obvious observation tells you that if you want more “facilities-based” competition, which is the chosen path of communications policy today, then you need to do what you can to either *increase* the size of the addressable market and to *lower* the cost of entering that market. Importantly, having only a few providers does not, however, imply poor economic performance.² Indeed, a small number of providers may very well be the result of intense competition, rather than an indicator of a lack of price competition.³ We believe that recognizing the actual economic conditions of communications markets makes for better policy decisions, by correctly focusing interventions and removing unproductive ones.

The topic today is broadband communications and “lessons from abroad.” There is no question that the nation’s broadband infrastructure is, and should be, a top priority for policymakers. The communications industry has always played a vital role in the economy, and broadband communications is no exception. It is possibly only a

¹ G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Competition After Unbundling: Entry, Industry Structure and Convergence*, PHOENIX CENTER POLICY PAPER NO. 21 (July 2005); and reprinted in 59 FEDERAL COMMUNICATIONS LAW JOURNAL 331 (2007).

² *Id.*, 59 FEDERAL COMMUNICATIONS LAW JOURNAL at 339-40, 346-50.

³ *Id.*, 59 FEDERAL COMMUNICATIONS LAW JOURNAL at 346-50.

mild overstatement that from now on the ability of information technologies to communicate quickly and reliably will be the distinguishing factor between modern and antiquated economies, and between economic growth and decline. Indeed, an article I co-wrote two years ago was one of the first studies that demonstrate an empirical link between the availability of broadband capacity and economic activity, and there have been several studies since confirming the important role of broadband communications in the modern economy.⁴ In my view, developing and implementing a national broadband strategy is perhaps *the* key issue for modern communications policy, particularly as Internet usage explodes exponentially and massive additional infrastructure investment is required to keep pace.⁵ President Bush has made broadband deployment a national concern, and I suspect that many members of this Subcommittee understand that the increasing global nature of our economy forces us to carefully consider whether our national infrastructure can support our global competitiveness.

But before considering the details of any specific policy strategy to improve our nation's broadband infrastructure, the first step is to ask whether or not we need any

⁴ G. Ford and T. Koutsky, *Broadband and Economic Development: A Municipal Case Study from Florida*, 17 REVIEW OF URBAN AND REGIONAL DEVELOPMENT STUDIES 216-229 (2005); S. Gillett, W. Lehr, and M. Sirbu, *Measuring the Economic Impact of Broadband Deployment*, Final Report, Economic Development Administration, Dept. of Commerce, Evaluation Project No. #99-07-13829 (2006).

⁵ See, e.g., J. Chambers, *Guts and Glory*, FORBES.COM (May 7, 2007) (Cisco Chairman and CEO John Chambers noting that "In a little more than two years worldwide Internet traffic will hit 9 exabytes per month. That is the equivalent of 9 quintillion typed characters, enough for 4 trillion novels. It is nearly two times the letters you'd need to write down all the words ever spoken.")

policy at all. Several countries around the world have adopted detailed and aspirational national broadband strategies. Whether the United States should take a similar step is hard to say without looking at what other nations are doing and how they are doing relative to us. We inevitably benchmark ourselves to others, most notably by comparing the rankings of broadband subscriptions across the OECD or the world. These OECD broadband rankings purportedly provide us a signpost as to “how well we are doing” among industrialized nations. Are we ranked too low, too high, or are we just right? Are we doing something wrong, or do our policies promote investment and broadband deployment? Are our competitor nations doing something better? Are we disadvantaged or handicapped in some way?

These questions are nagging ones and no doubt inspire a lot of hand-wringing, and I suspect that these ranking are a root cause of this hearing today, given the interest of this Committee in the specific policy choices for broadband made in other countries.

The use of the rankings data as an important element of the policy debate is, in my opinion, unfortunate and unduly distracting. The OECD broadband rankings are most often employed in a manner that presents a grossly inadequate and highly misleading yardstick of our broadband infrastructure and the problems with it. There is no shortage of lobbying in the telecom industry, and the OECD’s broadband rankings probably top the list of statistics that are mis-used in these efforts. That is no fault of the OECD, or the ITU, which publishes similar information. Both groups work very hard to provide policymakers and researchers with useful and detailed information on communications markets across the globe. I do not intend to criticize the OECD or its

reports, but rather those who use the data irresponsibly to support one policy agenda or another. The broadband ranking is everyone's favorite statistic—it is used simultaneously to promote more regulation and less regulation, fewer mergers and more mergers, less subsidies and more subsidies. A cite to the current rank of the United States is now boilerplate for any argument, and that fact alone suggests a serious defect in the analytical foundations of the present debate.

My efforts in this testimony today are modest. There are only three important points that I seek to make.

First, broadband rankings across countries are exceedingly crude measures of relative performance, and I encourage you to think more deeply about broadband policy than what the rankings tell us. I implore the members of this Subcommittee—and the telecommunications industry in general—to shed themselves of debate over “Who’s Number 1” and one-upsmanship between countries and instead get down to the serious business of developing a broadband policy for this nation. Integrating broadband into our economy is not a contest, and there is no prize for who has the most subscriptions per capita to some inconsistently and vaguely defined service. Rather, broadband is an essential component of our nation’s infrastructure, and we should seek to deliver the best communications opportunities and services possible.

Second, I encourage you to recognize the limitations of public policy in determining broadband subscription. There are many factors that determine broadband subscription, including age, household size, income, and so forth. Thus, variations across countries in subscription rates are, in large part, a product of factors outside the

realm of communications policy. I do not mean to suggest policy is irrelevant; it is not. But, a healthy respect for what policy can and cannot do is important.

Finally, I propose a very simple, economics-based framework for evaluating the elements of an effective and sensible broadband strategy for this country. This approach is exceedingly straightforward and I believe that this framework will substantially improve the quality of the debate over what is good, and bad, broadband policy for this nation. Having a national broadband strategy does not imply that regulation or intervention is required. Indeed, a legitimate strategy may be no regulation of broadband at all, and it is probably the case that this should be the starting point of the discussion. The market system serves this country well, but that does not preclude instances of legitimate intervention. Investment tax credits, for example, might be helpful. Intervention to remove government created or sponsored impediments to infrastructure improvements are an obvious first step for any sensible broadband strategy. It is necessary to keep in mind that while regulation may have plausible benefits, regulation inevitably includes costs as well. Keeping that in mind, any intervention no matter how big or small should undeniably move us closer to our broadband goal, and the policy framework I recommend will help ensure the debate is framed in a way that helps this happen.

II. Background on the OECD Rankings

As the global economy grows and becomes more competitive, national leaders are increasingly and appropriately focusing on broadband subscriptions in their countries as a way to benchmark themselves against other nations and identify areas of

concern. The Organization for Economic Cooperation and Development (OECD) releases every six months a ranking of broadband subscription rates for each of its thirty country members, including the United States and most other major industrialized nations of the world.⁶ This event sparks collective hand-wringing of leaders around the globe.⁷ In the latest OECD rankings for June of 2006, the United States ranked 12th among the 30 OECD countries. The International Telecommunications Union (ITU) presents similar ranking for a larger collection of countries, and the United States ranks similarly in these rankings as well.⁸

⁶ For the latest release of the broadband subscription statistics, see OECD Broadband Statistics, June 2006 (available at http://www.oecd.org/document/9/0,2340,en_2649_201185_37529673_1_1_1_1,00.html#TimeSeries).

⁷ For example, in 2004, when the United States ranked tenth, President George W. Bush is quoted as saying, "Tenth is 10 spots too low as far as I'm concerned." See Ashlee Vance, *Bush demands Net Access Tax Ban*, THE REGISTER (Apr. 26, 2004)(available at: http://www.theregister.co.uk/2004/04/26/bush_says_nonetax). The release of the OECD broadband rankings sparks a flurry of press releases around the world. But even a curiosity – like Ireland dropping one place to the Czech Republic “passing” Ireland in the June 2006 rankings, despite the fact that the two countries have been in a virtual dead heat – are taken seriously and spark policy debate. See Emmet Ryan, “Czech mate for Irish broadband,” ELECTRICNEWS.NET (Oct. 14, 2006)(available at: <http://www.enn.ie/news.html?code=9830016>); IrelandOffline, *IrelandOffline Slams Ineffective Government Broadband Policies, Ireland falls a place in OECD Broadband Rankings, 14 countries gain more than Ireland* (Oct. 14, 2006)(available at: <http://www.irelandoffline.org/2006/10/13/irelandoffline-slams-ineffective-government-broadband-policies/#more-285>) (quoting chairman of an Irish advocacy group in response that “[n]othing short of a complete slash and burn of current telecoms policy will make a dent on our international position for broadband.”).

⁸ See International Telecommunications Union, *Broadband Goes Mobile* (Dec. 6, 2006) (ranking the United States 21st in broadband connections per capita among a larger set of countries)(available at: <http://www.itu.int/osg/spu/newslog/CategoryView,category,Mobile.aspx>). The OECD data is more recent and, therefore, I focus my testimony today on the OECD figures. Because the ITU reports broadband rankings based on a similar calculation (broadband connections per capita), many of my observations about the shortcomings of the OECD data are equally applicable to the ITU rankings.

The policy relevance of these rankings is, while not irrelevant, very limited. Many others have questioned the usefulness of the data, and these criticisms are often compelling. Some observe, and I agree, that it is a little odd to compare our nation to Iceland, a country the size of Virginia with no military, and a population of about 300,000—93% of which live in urban areas and 60% of which live in the capital city.⁹ Others focus on relative geographic size. By my calculations, excluding Canada and Australia, we could fit all the other countries in the OECD within the geographic boundaries of the United States.

Some correctly claim that there are some meaningful differences in the way broadband connections are counted across countries that could skew the OECD rankings.¹⁰ Others note that many of the subscription rate numbers are so close as to be indistinguishable from a statistical perspective. For example, compare the subscriptions rates of the United States at 0.192 to the United Kingdom at 0.194, Japan at 0.190, and Belgium at 0.193. Given that both connections and population are estimates and subject to error, it is unlikely that these countries can be legitimately ranked on subscription, though it is obviously possible to do so using the point estimates of subscription. In fact,

⁹ Not to mention the fact that Icelanders pay (US) \$10 for a glass of beer and pay (US) \$7.50 for a gallon of gas. G. Eichhorn, *Iceland: Land of Fire and Ice* (visited Apr. 23, 2007) (available at: <http://gei.aerobaticsweb.org/iceland.html>).

¹⁰ For an interesting discussion, see *Researcher Debunks Global Broadband Rankings*, COMMSDAY (Apr. 4, 2007). Such differences certainly appear in the counting of wireless telephone subscribers, for example, with many countries reporting more wireless telephones than people—an undeniably peculiar result. See In the Matter of Section 6002(b) of the Omnibus Reconciliation Act of 1993, WT Docket No. 06-17, Eleventh Report, FCC 06-142 (rel. Sep. 29, 2006) (available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-06-142A1.pdf) (“11TH CMRS COMPETITION REPORT”) at App. A, Table 12.

with just a 5% error in measurement, the United States could be ranked 10th rather than 12th. With a 10% error, we could be ranked 8th.

Most commonly, people attribute our rank to differences in population density, and it is the case that those ranked higher than the United States are often more densely populated along some dimension. All of these criticisms are worthy of consideration, and some seriously force us to question the legitimacy of the rankings data.

Comparing apples-to-oranges is a serious indictment of the broadband rankings. But even if these problems did not exist, it is my position that interpreting the broadband rankings remains problematic. Indeed, I believe that the broadband rankings are fundamentally flawed for two reasons, at least in the way they are interpreted by participants in the arguments over broadband policy. First, there is an interpretation problem. Second, there is a relevance problem.

From the perspective of interpretation, let me demonstrate what I mean through a simple thought experiment. Let us assume that you and every other policymaker in the OECD are successful in achieving complete broadband penetration in *every home* and *every business* in every country in the OECD. You could consider this a "Broadband Nirvana." In this thought experiment, all countries are equally successful. No OECD economy would be advantaged or disadvantaged in relation to broadband availability and subscription.

In this Broadband Nirvana, where do you think the United States would rank among OECD countries? Where would the UK rank, or Iceland?

You would think all of these countries would be “Tied for First”, right?

Well, no.

Table 1 provides the current OECD rankings and the rankings the OECD would publish if all OECD economies achieved 100% penetration of all homes and businesses.¹¹ In the Broadband Nirvana—with total and complete broadband penetration to every home and business throughout the OECD—the United States **would rank twentieth!** That is actually eight spots lower than where we are ranked today—a position that has been described by FCC Commissioner Michael J. Copps as a “Broadband Ditch” and evidence that “something has gone dreadfully wrong.”¹² Furthermore, on a penetration basis, we would be further from 1st position than we are today—we would be 16 percentage points (0.54 versus 0.38) behind the leader where today we are only behind by 10 percentage points (0.29 versus 0.19). Of course, there is no catching up, since everyone had a broadband connection already.

Obviously, in this Broadband Nirvana, there is nothing left for policymakers to do because every household and every business has a broadband connection. Yet, by

¹¹ I use data on business establishments reported by the OECD to measure businesses. OECD, STRUCTURAL AND DEMOGRAPHIC BUSINESS STATISTICS: 1996-2003 (2006). In a few cases, statistical procedures are used to estimate missing observations. Since the definition of establishment may vary across countries, the exact numbers in the tables should be considered primarily as illustrative rather than precise.

¹² M. J. Copps, Disruptive Technology ... Disruptive Regulation, 2005 MICHIGAN STATE LAW REVIEW 1, 7-8 (2005); Federal Communications Commission, Availability of Advanced Telecommunications Capability in the United States, Fourth Report to Congress, 5 (Sep. 9, 2004) (Statement of Commissioner Michael J. Copps, Dissenting)(available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-208A1.pdf).

today's rhetorical standards, in which every six months we lament our middling place among the OECD, we would be considered a failure, eight steps deeper into the "broadband ditch."

But there is, of course, an explanation for the ranking. The reason we would rank 20th in this Broadband Nirvana is because the OECD measures "broadband connections per capita." In other words, it adds connections purchased by both businesses¹³ and households (as reported by the respective countries) and divides by population. As a result, a country's OECD broadband ranking is a function not only of broadband subscription but also the result of such simple demographic and economic factors like household size and average business size.

This simple experiment shows clearly that the metric used to rank countries makes comparing countries difficult, and certainly suggests that strong statements made regarding the implications of such rankings are inappropriate.

Consider a simple analogy. If a perfect broadband score is 0.38 in the United States but 0.54 in Sweden, then how can we compare the two on a single scale? It is akin to a college admissions officer who has to compare applications from students from high schools with a four-point scale to students with schools with five-point scales. The admissions officer would not conclude that a student with a 3.9 grade point average

¹³ There is some dispute about how well business connections are measured.

from a five-point scale school is as smart as a student with the same grade from a four-point scale school. The admissions officer would adjust the scores to be on a similar scale. We can and should do the same for broadband subscriptions—and measured as deviations from a Broadband Nirvana, the United States is doing well relative to other OECD countries.

Let me be clear. My criticisms of the numbers are not an indictment of the OECD or ITU. To compare broadband connections across countries that vary so drastically in size, some form of normalization is required. Choosing population for such

**Table 1. Actual OECD Rank v. Broadband Nirvana
Broadband Connections per Capita**

Country	OECD Data, June 2006		Broadband Nirvana	
	Subscr. Rate	Rank	Subscr. Rate	Rank
Denmark	0.293	1	0.478	4
Netherlands	0.288	2	0.437	7
Iceland	0.273	3	0.489	2
Korea, South	0.264	4	0.254	28
Switzerland	0.262	5	0.429	8
Finland	0.250	6	0.477	5
Norway	0.246	7	0.403	15
Sweden	0.227	8	0.541	1
Canada	0.224	9	0.419	10
United Kingdom	0.194	10	0.389	19
Belgium	0.193	11	0.410	12
United States	0.192	12	0.380	20
Japan	0.190	13	0.390	18
Luxembourg	0.179	14	0.378	21
Austria	0.177	15	0.406	13
France	0.177	16	0.424	9
Australia	0.174	17	0.315	27
Germany	0.151	18	0.449	6
Spain	0.136	19	0.338	26
Italy	0.132	20	0.404	14
Portugal	0.129	21	0.392	17
New Zealand	0.117	22	0.398	16
Czech Republic	0.094	23	0.478	3
Ireland	0.092	24	0.347	24
Hungary	0.078	25	0.411	11
Poland	0.053	26	0.341	25
Turkey	0.030	27	0.212	30
Slovak Republic	0.029	28	0.351	23
Mexico*	0.028	29	0.247	29
Greece	0.027	30	0.362	22

normalization is a common and a sensibly crude approach when making such comparisons across countries or even across states. Unfortunately, those commenting on the data fail to realize that normalization is not an innocuous procedure, and different normalization choices can present substantially different results, particularly when comparing ranks.

For example, in Table 2, I normalize broadband connections by households rather than population.¹⁴ In my opinion, because a household generally needs no more than one broadband connection, households is a sensible and probably better metric by which to normalize connections, though admittedly still crude.

Measured as connections per household, the United States remains in its 12th position. However, there is considerable shifting among other countries. To the extent policymakers want to emulate countries that are “above us,” the changes from this restatement are extensive. Sweden, for example, falls from 8th to 16th—someone now could claim that Sweden is no longer a success story but instead a fairly average performer. Denmark falls from 1st to 6th, and while still ranking high, there is an obvious and meaningful difference in its position.

Several countries move up as well. South Korea is now 1st, up from 4th, and Norway moves up substantially too. Australia moves from 17th to 4th in the rankings. So, while we outperform Australia on a per-capita basis, it is a country to emulate on a per-household basis. Without this level normalization, Australia would not have been on the radar screen of countries from which we should attempt to learn. These dramatic changes are due to nothing more than altering the normalization criterion from population to households.

¹⁴ One could normalize using any measure of relative “size,” including Gross Domestic Product, labor force, and so forth.

I do not want to suggest that Table 2 is the “correct ranking,” because both population and households render crude estimates of the statistic of interest. The problem with very crude normalization procedures is that our interest is not in broadband subscriptions *per se*, but on the influence of broadband infrastructure on economic activity. It is certainly possible, if not to be expected, that the economic output per connection varies across countries. For example, broadband subscriptions may be more important in a service economy than in an agrarian economy. In other words, a single broadband connection in the United States may produce more economic output than two connections in another country, or maybe half as much relative to another. The commingling of business and residential connections in the OECD data makes this distinction especially important. Since our real interest in how broadband subscription is converted into economic growth, then we need not only information on subscription counts but these counts must be adjusted by some type of connection-to-growth factor to render a truly meaningful statistic. At present, we assume that this conversion rate is equal across countries, but there is no general reason to expect that this is true. Thus, this implicit assumption should be recognized to render exceedingly crude estimates of the relative position of countries in terms of broadband infrastructure.

Table 2. Broadband Connections Per Capita and Per Household

Country	OECD Data, June 2006 (Connections per Capita)		OECD Data, June 2006 (Connections per Household)	
	Subscr. Rate	Rank	Subscr. Rate	Rank
Denmark	0.293	1	0.645	6
Netherlands	0.288	2	0.691	2
Iceland	0.273	3	0.655	5
Korea, South	0.264	4	1.162	1
Switzerland	0.262	5	0.629	7
Finland	0.250	6	0.550	9
Norway	0.246	7	0.664	3
Sweden	0.227	8	0.454	16
Canada	0.224	9	0.582	8
United Kingdom	0.194	10	0.524	10
Belgium	0.193	11	0.502	14
United States	0.192	12	0.518	12
Japan	0.190	13	0.513	13
Luxembourg	0.179	14	0.519	11
Austria	0.177	15	0.460	15
France	0.177	16	0.443	18
Australia	0.174	17	0.661	4
Germany	0.151	18	0.347	21
Spain	0.136	19	0.449	17
Italy	0.132	20	0.370	19
Portugal	0.129	21	0.361	20
New Zealand	0.117	22	0.328	22
Czech Republic	0.094	23	0.226	24
Ireland	0.092	24	0.276	23
Hungary	0.078	25	0.211	25
Poland	0.053	26	0.170	26
Turkey	0.030	27	0.150	27
Slovak Republic	0.029	28	0.084	29
Mexico*	0.028	29	0.123	28
Greece	0.027	30	0.081	30

Related to this point, a count of connections entirely ignores the intensity and purpose of use. In wireless communications, for example, consumers in the United

States use the service with significantly greater intensity than in other countries. In the United States, each phone is used on average 800 minutes per month, where in many other countries the usage levels are more in the 150-to-300 minute range.¹⁵ Therefore, while our mobile telephony subscription rate may lag that of other countries,¹⁶ our use and integration of that technology into our economy is perhaps more significant.

From the perspective of forming a national broadband strategy, there is even a deeper problem with this data. Given the variation in the definition of “broadband” across countries including the United States, the count of broadband connections in the OECD and ITU data is typically for a very low speed service. Thus, the count is unlikely to provide an accurate portrayal of the relative superiority of broadband infrastructure across countries. In my opinion, increasing the subscription rate in this country to a 200 kilobit service is not a legitimate goal of a national broadband strategy, but that is all a focus on the broadband rankings data gets you.¹⁷ In fact, if we could magically convert every broadband connection in this country to at least a 100 megabit fiber optic circuit offered by 10 different facilities-based providers, then we would still rank 12th in the

¹⁵ 11TH CMRS COMPETITION REPORT, *supra* note 10, at App. A., Table 12.

¹⁶ In 2003, the United States ranked 26th among the OECD in cellular mobile subscribers per 100 inhabitants. OECD Information and Communications Technologies, OECD COMMUNICATIONS OUTLOOK 2005, 109, Table 4.8 (2005). There is some substantial skewing in this OECD calculation particularly with regard to small European nations, where individuals may subscribe to several mobile carriers in order to meet their needs. Luxembourg, for example, in 2003 had 119.8 mobile subscriptions per 100 inhabitants, indication a substantial rate of double or triple subscribership.

¹⁷ In the United States, the FCC defines 200 kilobits per second as the threshold for “broadband” service. *Local Telephone Competition and Broadband Reporting*, WC Docket No. 04-141, Report and Order, 19 FCC Rcd 22340 (2004) at n.7, ¶¶ 14-19.

OECD rankings. Clearly, that's a problem. Rather than focus on rank, our strategy should be to augment the geographic coverage, increase productive use, and expand network capacity and enhance network capabilities of our broadband infrastructure. This strategy will require massive investments in our communications networks, and policymakers must recognize that such investments are unlikely to occur in an overly burdensome regulatory environment.

Are the broadband rankings useless? Not completely, perhaps, but close to it. Even so, it is the exaggerated importance and naïve application of them that is most problematic, not simply that they are available. There are obviously more important issues than simply pumping up subscription to low speed Internet services, and that's about the only issue the rankings data implicate. Nevertheless, the numbers can clearly be included as one element in a portfolio of evidence regarding our broadband infrastructure, and they have encouraged us to take broadband policy seriously – in that alone they serve a purpose. My point is to merely caution you that to interpret the ranking as implying this country is in a “broadband ditch” or that our existing policies are grossly misguided takes it much too far.

III. Using OECD Data to Determine the Sources of Broadband Penetration

Absent from much of the discussion of OECD rankings data is the obvious point that broadband is a good or service that is purchased by consumers and businesses just like other goods and services. In effect, there is a demand for broadband service and that demand is likely driven by the typical set of factors such as prices, income, education, age, and so forth. There is also the supply of these broadband network

services, and the networks that provide this service may vary considerably across countries due to geography, embedded technologies, regulation, subsidies, general economic conditions, and so forth.

Recently, I performed a statistical analysis in an effort to better understand the demographic and structural determinants of the OECD's subscription numbers.¹⁸ This analysis provides insight into the relative importance that demographic and other factors may play in determining an OECD country's broadband subscription rate, and I believe the findings are interesting. My findings are summarized in relation to a 10% increase in each relevant factor as follows:

- A 10% increase in Gross Domestic Product Per Capita *increases* broadband subscription by 8.4%.
- A 10% increase in Household Size increases broadband *increases* subscription by 8.3%.

¹⁸ The reported effects are based on an econometric model using the OECD subscription rate data for the first and second half of 2005 and the first half of 2006, the latest data available. All variables except for dummies are expressed in natural log form. The bulk of the data is provided by the OECD FACTBOOK 2006 and the Worldbank's WORLD DEVELOPMENT INDICATORS 2006. Price is provided by the OECD, Working Party on Telecommunication and Information Services Policies, BENCHMARKING BROADBAND PRICES IN THE OECD (June 2004), and is measured as the introductory rate for broadband service assuming the customer generates 1GB of traffic per month (since some prices are metered). Most regressors are three-year lags, due to data limitations and concerns about simultaneity bias. Of all the variables, price is the most difficult to measure since quality data on prices is scant. Not surprisingly, heteroscedasticity was a problem with the model, but this was resolved using the weighted least squares method prescribed in G. S. Maddala, LIMITED DEPENDENT AND QUALITATIVE VARIABLES IN ECONOMETRICS (1983), at 29. All variables are statistically significant at the 5% level or better. The R² of the (unweighted) regression is 0.83.

- A 10% increase in Number of Wireline and Wireless Telephones Per Capita *increases* broadband subscription by 7.0%.
- A 10% increase in Tax Revenue as a Percent of GDP *increases* broadband subscription by 5.3%.
- A 10% increase in Percent of Population with Tertiary (that is, post-secondary) Education *increases* broadband subscription by 1.6%.
- A 10% increase in Percent of Population in the Country's Largest City *increases* broadband subscription by 1.4%.
- A 10% increase in Population per Square Kilometer *increases* broadband subscription by 0.5%.

In contrast:

- A 10% increase in Percent of Population Age 65 or older *reduces* broadband subscription by 3.7%.
- A 10% increase in Price Index of Broadband Service *reduces* broadband subscription by 4.0%.
- A 10% increase in Percent of Broadband Connections provided by the Dominate Broadband Technology *reduces* broadband subscription by 4.2%.
- A 10% increase in Income Inequality (the GINI coefficient) *reduces* broadband subscription by 8.4%.

There are very few surprises here. The subscription rate is positively related to income, education, telephone consumption, household size, and population density. Subscription rates are negatively related to price, income inequality, and age.¹⁹ Of the more interesting findings, the statistics reveal that subscription rates are lower in markets with a highly dominant technology for broadband. Thus, more competition and a greater diversity of technological options is a good thing for subscription. Compared to other OECD countries, the United States, by the way, ranks favorably in this factor.

I encourage you to recognize that there are many significant determinants to broadband subscription that have nothing to do with broadband policy *per se*. Policy is not irrelevant, because an effective broadband policy may be able to offset many of the factors that discourage subscription.²⁰ In some cases, however, intervention may make matters worse by exacerbating the impacts of our handicaps such as unequal incomes and relatively low population density.

¹⁹ It is not possible to describe the price effect as an elasticity of demand, since I did not estimate a demand curve.

²⁰ For example, numerous organizations across the country provide computers and connectivity for poorer people, which might dampen the role of income inequality as a determinant of subscription. Likewise, there are programs that help finance the funding of network deployment in rural areas, offsetting the impact of population density.

IV. How to Establish a National Broadband Policy

When I opened my testimony today, I mentioned that the Phoenix Center exists not to tell policymakers *what to think* but *how to think* about communications policy. Hopefully, my discussion today on broadband rankings has triggered some interest beyond the undue focus on “which country is doing better than the United States and why.” Instead of fixating on rankings, I propose that you begin your deliberations with little more than the baseline proposition that we, as a nation, need to better geographic coverage, more see the productive use, and expand network capacity and enhance network capabilities of our broadband infrastructure in order to accommodate the rapidly growing demand for broadband communications.²¹ Armed with this simple proposition, we can return to basic economics for guidance.

To begin, think about the decision to subscribe to broadband service. First, a consumer cannot buy what is not available. Thus, it is clearly important to adopt policies that lead to the increased availability of broadband services, including, most critically, expanding service to presently unserved areas.

Secondly, if service is available, then a consumer will subscribe only if the value of the service exceeds its price. So, to increase subscription, we need policies that increase the value of broadband service and policies that do not lead to higher prices.

²¹ This proposition is debatable, but, in my opinion, legitimate.

Finally, the broadband services available to consumers and businesses must be sufficiently robust to handle the growing demands of broadband communications. Just because we define something as “broadband” does not imply that the service is capable of supporting the communications requirements of our economy. 200 kbps is sufficient capacity to handle email and standard web-browsing—applications that were developed five to ten years ago. But as video streaming services like YouTube proliferate, new and different demands will be placed upon communications networks that will render this capacity level insufficient and insignificant.

So, the goal is to modernize our broadband infrastructure in a way that increases availability, increases value, maintains or lowers prices, and improves the capabilities of the networks.

This framework suggests a simple yet powerful approach to evaluating policy proposals. In fact, I believe that policymakers, whether here in Congress or at the relevant regulatory agencies, should require all interested parties to demonstrate with acceptable precision exactly how their various broadband policy proposals will impact the incentives to deploy advanced network or upgrade network capacity, affect consumer value of broadband service, and influence prices. In cases where there are conflicts between the two, a meaningful cost-benefit analysis should be provided.²²

²² G. S. Ford, T. M. Koutsky and L. J. Spiwak, *The Efficiency Risk of Network Neutrality Rules*, PHOENIX CENTER POLICY BULLETIN NO. 16 (May 2006)(calling for a cost/benefit analysis Network Neutrality proposals

Footnote Continued...

Why is a framework for evaluating policy proposals important? Because it happens too frequently that advocates of various positions first observe that we are ranked 12th in broadband subscription only to follow up that observation with a proposal that, without question, would then reduce the supply and/or demand for broadband services. For example, my research has shown that efforts to commoditize broadband transmission will likely reduce the incentive to invest in networks and tend to increase industry concentration.²³ Neither of these outcomes is desirable and both would work to decrease the supply of broadband and drive up its price so that fewer consumers could and would purchase it.

Likewise, hindering the ability of broadband providers to satisfy consumer demands with different price-quality combinations unquestionably reduces subscription, since some consumers are willing or able to purchase the service only at a lower price. If increasing subscription is desirable, then the tiering of service should be encouraged, not discouraged, because such tiers would invite more marginal users to subscribe to broadband services.²⁴

that would limit operators from injecting intelligence into broadband Internet access networks) (available at: <http://www.phoenix-center.org/PolicyBulletin/PCPB16Final.pdf>).

²³ G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Network Neutrality and Industry Structure*, PHOENIX CENTER POLICY PAPER NO. 24 (Apr. 2006), and reprinted as 29 HASTINGS COMMUNICATIONS AND ENTERTAINMENT LAW JOURNAL 149 (2007).

²⁴ See, e.g., B. Hermalin and M. Katz, *The Economics of Product-Line Restriction with an Application to the Network Neutrality Debate*, Unpublished Manuscript (Feb. 9, 2007).

Finally, we should be very wary of calls for legislation that would mandate an inflexible set of rules that would foreclose or severely limit market transactions among consumers, broadband network operators, and content providers. As our recent research reveals, under plausible conditions, rules that prohibit efficient commercial transactions between content and broadband service providers could, in fact, be bad for *all* participants: consumers would pay higher prices, the profits of the broadband service provider would decline, and the sales and number of Internet content providers would also decline.²⁵ That said, we must not allow blatantly anticompetitive actions to go unchecked, and vigorous regulatory and antitrust enforcement oversight remains crucial.

On the positive side, there have been a number of sensible and effective policies proposed and recently implemented.

An excellent example of a public policy that will encourage network upgrades and expansion as well as increased subscription is the Federal Communications Commission's recent efforts to streamline the local franchise process for cable television service, because video is a key driver of broadband network deployment.²⁶ Adding

²⁵ G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Network Neutrality and Foreclosing Market Exchange: A Transaction Cost Analysis*, PHOENIX CENTER POLICY PAPER NO. 28 (Mar. 2007)(available at: <http://www.phoenix-center.org/pcpp/PCPP28Final.pdf>).

²⁶ G. S. Ford, T. M. Koutsky and L. J. Spiwak, *The Impact of Video Service Regulation on the Construction of Broadband Networks to Low-Income Households*, PHOENIX CENTER POLICY PAPER NO. 23 (Sept. 2005), and being reprinted in *I/S: A JOURNAL OF LAW AND POLICY FOR THE INFORMATION SOCIETY* (forthcoming Spring 2007).

multichannel video service capability to a broadband network increases the revenue potential market of that network tremendously. I just read an article a few days ago regarding Verizon's decision to slow its fiber investment in Massachusetts due to the lack of a statewide franchise process, redirecting its capital spending to states where legislation had reduced the costs of entry.²⁷ We predicted that very result in a recent paper, as we showed that investment dollars would move to markets with favorable regulatory environments.²⁸

Moreover, as we showed in PHOENIX CENTER POLICY PAPER 23, adding video services to the mix provides a strong incentive to build these multi-service broadband networks in low-income and minority areas.²⁹ As a result, policymakers interested in increasing broadband subscriptions in the United States should be tripping over themselves to figure out ways to streamline and accelerate the availability of video services on these networks – not fighting against it. Reforming the franchise process is critical to network deployment and it is a good thing that the FCC took those steps last December.

²⁷ C. Johnson, *Verizon Suspends Push for Mass. TV Franchises*, THE BOSTON GLOBE (Apr. 18, 2007).

²⁸ G. S. Ford, T. M. Koutsky and L. J. Spiwak, *The Consumer Welfare Cost of Cable "Build-out" Rules*, PHOENIX CENTER POLICY PAPER NO. 22 (third release, Jan. 2007) (available at: http://www.phoenix-center.org/pcpp/PCPP22_Third_Release.pdf) at 19 ("Communities benefit from defecting from a build-out requirement by increasing their relative attractiveness to entrants.").

²⁹ *The Impact of Video Service Regulation*, *supra* note 26.

The Internet Tax Moratorium is another policy that likely furthers the advancement of broadband infrastructure in this country. Taxes lead to higher prices without affecting value, and, as such, reduce the quantity purchased of broadband service. Unquestionably, consumers will respond to higher prices, so taxing the Internet-related services will lead to reductions in subscriptions.

Another step in the right direction is the FCC's upcoming auction for spectrum in the 700Mhz band for Advanced Wireless Services. Creating diversity in broadband options for consumers and businesses increases value and, in some cases, reduces prices. Also, the FCC's recent decisions to homogenize the regulatory treatment of broadband services—regardless of the underlying technology—reduces uncertainty and, consequently, should encourage productive investments in broadband infrastructure.

There are a number less obvious linkages between policy and broadband deployment and subscription. An example is the video program access rules, which are required by Section 628 of the Communications Act.³⁰ As I discussed above, potential revenues from video is a key driver in broadband deployment. However, many popular cable networks like CNN, The Discovery Channel and HBO are owned, at least in part, by incumbent cable companies. Without access to these programming networks, the services offered by new wireline video competitors would be less valuable, and less

³⁰ 47 U.S.C. § 548.

people would subscribe to their broadband platform as a result.³¹ In this case, a regulatory intervention like the program access rules promotes broadband deployment because it removes a significant barrier to entry by allowing new wireline video competitors the ability to provide their video customers with these popular and unique programming networks.³² These rules are set to sunset this year³³—precisely at the time when the nation appears to be on the cusp of potentially robust, facilities-based wireline video competition.

In my view, every issue in communications should be viewed through this prism—how would this or that policy improve broadband infrastructure and use in the United States? There are no shortages of policy proposals before you, but I believe that if you put each of them to this test, you would begin to see the outlines of a coherent and economically sound approach.

³¹ The incentive for the vertically-integrated cable operator to block access to such content in an effort to deter entry in multichannel video delivery is discussed in J. Farrell & P. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J. LAW & TECHNOLOGY 85, 104-05 (2003).

³² J. W. Olson and L. J. Spiwak, *Can Short-Term Limits on Strategic Vertical Restraints Improve Long-Term Cable Industry Market Performance?* 13 CARDOZO ARTS & ENT. L.J. 283 (1995) (available at: http://www.phoenix-enter.org/library/prog_access.doc).

³³ See In the Matter of Implementation of the Cable Television Consumer Protection and Competition Act of 1992, MB Docket No. 07-29, Notice of Proposed Rulemaking, FCC 07-0 (rel. Feb. 20, 2007)

V. Conclusion

In conclusion, I think we all can agree that the expansion and modernization of our broadband infrastructure is a critical component of the nation's economic growth potential. But to make sound decisions, we must interpret the data available to us soundly. I do not mean to criticize the OECD or ITU for their efforts to provide useful information on communications industries across the globe. But the information they collect must be placed in context and normalized for certain factors—like household size—that have nothing to do with broadband policy and which can lead to a skewing of results. While I have made several observations on the limitations of the OECD ranking data, I confess that inevitably we must compare and benchmark ourselves to other countries. We should do it with care and a healthy dose of skepticism.

What is most needed is for this country to state plainly and with reasonable detail the desired outcome for broadband services and then establish a framework with which to evaluate policy proposals in reference to obtaining that explicit goal. I believe the goal should be to augment the geographic coverage, increase the productive use, and expand network capacity and enhance network capabilities of our broadband infrastructure in order to deal with the ever-growing bandwidth demands of the content and consumer, and make broadband a better value proposition for consumers. We must avoid making it more difficult for network providers to sell different services over multi-use broadband networks. And on the demand-side, beware of policies that would increase end-user consumer prices either directly or through making broadband service more costly to provide. I believe this disciplined approach to broadband policy will

render better results and eliminate the waste of resources devoted to quibbling over bad ideas.

Mr. Chairman, thank you again for the invitation to testify today. I would welcome any questions the Subcommittee might have.

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