Consumer Federation of America

RESEARCH NOTE:

COMPARING APPLES TO APPLES:
HOW COMPETITIVE PROVIDER SERVICES OUTPACE THE BABY BELL DUOPOLY
Municipal Wireline and Non-Baby Bell Wireless Service Providers Deliver Products that are More Consumer-Friendly

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NOVEMBER 21, 2013

INTRODUCTION

Last month, the New America Foundation's Open Technology Institute (NAF) released the data of The Cost of Connectivity 2013, its second annual best-effort survey of rates offered by individual broadband service providers in dozens of cities across the U.S. and the globe. This research is an effort to fill the need for more provider-specific data on cost and other service characteristics.[1] The release triggered a response from critics who trotted out old complaints about the comparisons being too simplistic as well as, pointing to the absence of important variables.[2] Playing the Washington game of "criticize first, ask questions later," their criticism provided a few simplistic examples of things that might affect the analysis, but they did not actually try to conduct the analysis they called for, even though the necessary data is readily available.

This research note introduces many of the control variables identified in the response to the publication of the data and tests many of the key claims in the ongoing debate. To test the hypotheses we examine six service characteristics in the NAF data that we believe define the consumer experience:

- monthly bill
- cost per megabit (calculated)
- download speed
- upload speed
- presence of a data cap
- type of data cap (a three point scale were no cap=1, throttling =2 and overage fees=3, as well as individual dummy variables for each).

In all analyses we control for a basic set of factors:

- service type (e.g. broadband only, triple play, wireless),
- population density of the municipality,
- number of competitors, and
- nature of competitors (municipals, Baby Bells, other).[3]

For cross-national comparisons, in addition to the above variables, we also control for

- national income per capita,
- level of wireline or wireless broadband penetration, and
- national population densities.

The New America argument fares quite well when careful comparisons are made about wireline broadband:

- Municipal wireline broadband service providers offer much more attractive triple play services than other wireline broadband service providers in the U.S.
- Non-U.S. wireline broadband service providers offer much more attractive triple play and broadband-only services than U.S. service providers.

Additional analysis was conducted to augment the USB dongle wireless broadband data collected by the New America Foundation which is generally supportive of their conclusions. Above all, comparing the wireless services offered by the Baby Bells (AT&T and Verizon) to the other wireless service providers (Sprint and T-Mobile) we find that:

- Non-Baby Bell U.S. wireless broadband service providers offer much more attractive service than services offered by Baby Bell wireless broadband providers.
- Non-U.S. wireless broadband service providers offer much more attractive service than Baby Bell U.S. wireless service providers.

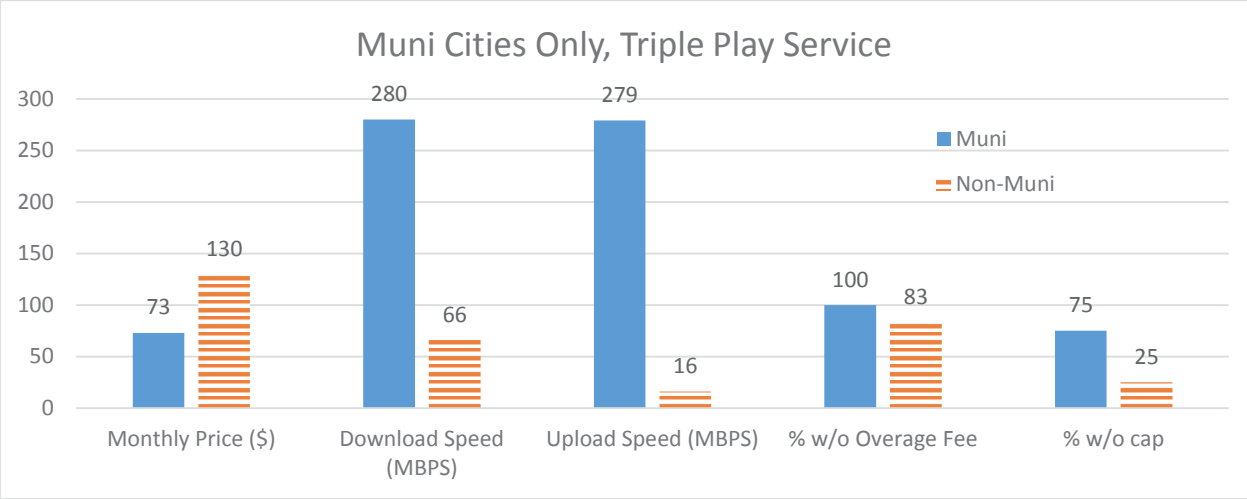
WIRELINE BROADBAND SERVICE COMPARISONS

Throughout this paper, the results are organized as follows. We present a simple graph that reflects the basic issue being analyzed. Beneath the graph we present the key statistics. The sample size (n) is the number of cases used in the multiple regression analysis. We present the simple averages for the entire sample. We then present the results of the multiple regression analysis with the B-coefficients and statistical significance. As is common practice with hypothesis testing, we list, but do not report the statistics for the control variables. We report the results for the primary independent variables being tested as well as the results for the competition variable, since that is an issue that cuts across all of the analyses. As is common practice, we report only B-coefficients that are larger than their standard error. Finally, we highlight those results that contradict the hypotheses. For example, the hypothesis is that municipal providers or competition is expected to deliver services at lower prices with higher quality and more consumer friendly terms. If the result contradicts the hypothesis, it is highlighted.

Municipal Service Providers

The results of the wireline analysis examining the impact of municipal service provision are presented in Exhibit 1. The table shows all the results starting with the comparison of triple play and broadband only service offerings from municipal providers and other providers only in cities where municipal providers are present. It then compares municipal providers to all non-municipal providers nation-wide.

EXHIBIT 1: WIRELINE BROADBAND: MUNICIPAL V. OTHER U.S. PROVIDERS



Statistical Evaluation

	n	Averages Munis	Averages Non-Muni	Multiple Regression Coefficient Muni B	Muni p<	Competition B	Competition p<
U.S. Muni Cities Only							
Triple Play							
Monthly Fee ($)	17	73	130	-64	.003	41	.013
Cost/MB ($)	17	3.6	4.2	-5.1	.001		
Download Speed	17	280	66	258	>se	166	>se
Upload Speed	17	279	66	237	>se	186	>se
Cap Index	17	1	2.7	-1.4	.022	1.1	>se
% w/o Overage Fee	17	100	83	43	.019	28	>se
% w/o Cap	17	75	25	51	.045	-70	.011
Broadband Only							
Monthly Fee ($)	32	160	77	151	>se		
Cost/MB ($)	32	1.7	2.6	-2.2	.011		
Download Speed	32	239	87	277	.062		
Upload Speed	23	154	40	262	.09	299	.09
Cap Index	32	1	2.8	-1	.083	.79	>se
% Overage Fee	32	3	1	50	.001		
% w/o Cap	32	75	25	23	.048	-68	.000
National U.S.							
Triple Play							
Monthly Fee ($)	70	74	143	-67	.001	-13	.054
Cost/MB ($)	70	3.6	4.9	-3.9	.048	-1.3	.003
Download Speed	70	280	50	256	>se	23	>se
Upload Speed	57	279	16	274	>se	13	>se
Cap Index	51	1	1.6	-1.25	.000	-.5	.000
% w/o Overage Fee	70	25	50	40	.001	19	.000
% w/0 Cap	70	75	50	55	.076		
Broadband Only							
Monthly Fee ($)	124	161	73	117	.074	13	>se
Cost/MB ($)	124	1.7	2.8	-1.5	.003	-13	>se
Download Speed	124	239	77	178	.087		
Upload Speed	109	154	40	101	>se		
Cap Index	124	1	1.33	-.8	.000	-.2	.001
% w/o Overage Fee	124	31	40	24	.000	7	.002
% w/o Cap	124	69	60	24	>se	7	>se

Control variables include density and number of competitors. Linear regression in STATA with robust standard errors.

Coefficients that are not larger than their standard errors are not shown.

Probit analysis with categorical dependent variables (presence of a cap, presence of an overage fee) yields stronger results.

Hypotheses:
Municipal providers have
- Lower prices
- Higher speeds and
- More consumer-friendly cap policies
  - Lower Cap Index
  - Fewer caps
  - Less Reliance on Overage Fees

Competition has effects in the same directions as municipals.

We find that municipal service providers deliver much more attractive triple play wireline broadband services. They are lower in cost, with faster speeds and are less likely to have caps.[4] The differences are all statistically significant, even though the number of observations is small. Statistical significance under these conditions suggests large differences and small standard errors, which reflects that fact that the analysis is city specific.

The results for the broadband-only plans are somewhat different. Municipal service providers have higher monthly costs for the lowest speed plans they offer, but more attractive speeds, cap policies, and pricing on higher-speed plans. The cost issue is easy to explain: municipal systems were built as high capacity systems precisely because the incumbents had failed to upgrade their systems or to price attractive products of comparable quality. Having incurred the costs of the building high capacity systems, the municipalities must work to recover those.

Expanding the comparison to the national level, the municipal versus non-municipal comparison yields similar results.

In their criticism of municipal broadband providers, The Information Technology and Innovation Foundation (ITIF) cherry picked the one and only number in the data set that fit its preconceived notion (as highlighted in Exhibit 1) to write the headline, "municipal broadband providers gouging consumers."[5] A careful look at the data shows this headline to be dead wrong; over 95 percent of the comparisons show that municipal operators have the more consumer-friendly service. They fill the gap left by non-muni service providers.

U.S. v. Non-U.S. Services

Exhibit 2 presents the results of the comparisons between the U.S. (excluding municipal providers) and non-U.S. wireline services. The exhibit shows that the services of the U.S. providers are less attractive on every measure. They are more costly and provide slower service. They are more likely to have a cap as well as more likely to use overage fees.

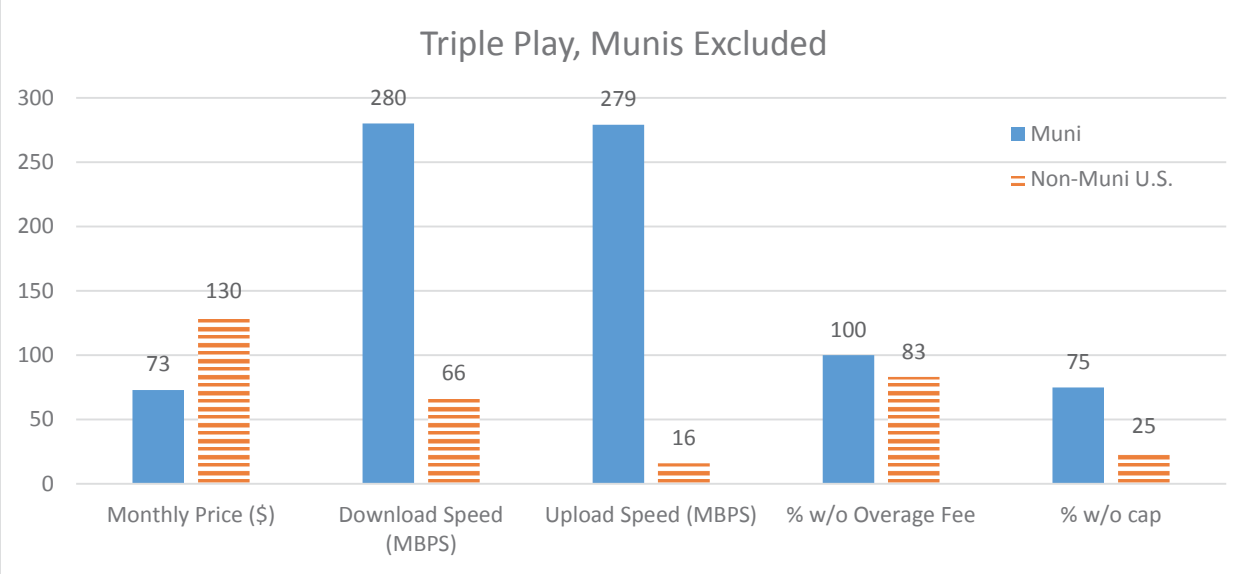
Competition

The Phoenix Center notes that New America argued that consumers need at least three competitors and points out that most U.S. consumers have three or more broadband service providers. We have already noted that competition matters when it involves different types of service providers, like municipal providers for wireline broadband. Both New America and the Phoenix Center are wrong if they think three is enough, as suggested by Exhibit 3. The introduction of the fourth and fifth competitors has a clear impact in lowering prices in the U.S.

It is important to note that the competitive presence in this survey of rates is an in-city presence. That means the competitors are in the vicinity although they may not be serving all consumers. In theory, that presence is a competitive threat that should discipline pricing. In practice it is clear that three is not enough and even five may not be.

Multivariate analysis, reported in Exhibit 1 above, supports this conclusion for triple play service. Larger numbers of competitors in the U.S. are associated with lower prices, faster download speeds and more consumer friendly overage policies, as shown in Exhibit 2, above. Adding competitors in non-U.S. cities does not appear to deliver a competitive benefit. The finding on the effects of competition in wireline are mixed at best.

EXHIBIT 2: COMPARISON OF U.S. NON-MUNICIPAL WIRELINE BROADBAND SERVICE PROVIDERS TO NON-U.S. WIRELINE BROADBAND SERVICE PROVIDERS



Statistical Evaluation

		Averages		Multiple Regression Coefficient			
				US v. Non-US		Competition	
International	**n**	Non-US	US	B	p<	B	p<
Triple Play							
Monthly Fee ($)	312	64	143	2	.001	30	.05
Cost/MB ($)	312	2.4	4.9	.96	>se	.16	>se
Download Speed	312	27	50	-151	.043	-34	.000
Upload Speed	214	109	16	-151	.1	-41	.000
Cap Index	312	1.13	1.44	.37	.034		
% w/e Overage Fee	312	37	50	-8	>se	-2	.003
% w/Cap	312	63	50			-13	.000
Broadband Only							
Monthly Fee ($)	445	45	73				
Cost/MB ($)	445	1.5	2.8	1.1	.002		
Download Speed	445	115	77	-157	.002		
Upload Speed	374	102	40	-169	.000		
Cap Index	445	1.12	1.28			.15	.000
% w/o Overage	445	9	10	-6	>se	.02	.004
% w/o Cap	445	37	40	-2	>se	-17	.000

Control variables include density and number of competitors. Linear regression in STATA with robust standard errors.

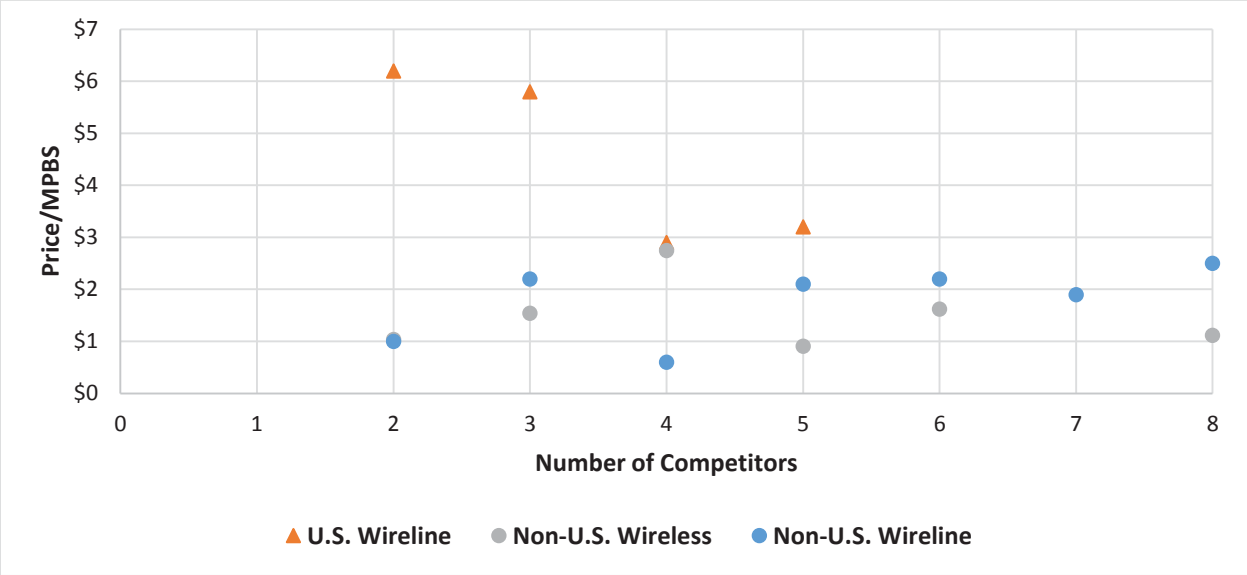
Coefficients smaller than their standard errors not shown.

Probit analysis with categorical dependent variables (presence of a cap, presence of an overage fee yields strong results.

Hypotheses:
U.S. providers have
- Higher prices
- Slower speeds and
- Less consumer friendly cap policies
  - Higher Cap Index
  - More caps
  - More Reliance on Overage Fees

Competition has effects in the opposite direction from U.S. providers

EXHIBIT 3: NUMBER OF BROADBAND COMPETITORS AND PRICE



Partial Correlations,	U.S. Only		Non-US Only	
	r	p<	r	p<
Triple Play				
Monthly Fee ($)	-.21	.09)	-.08	.12
Cost/MB ($)	-.31	.01)	.14	.006
Download Speed	.19	.13)	-.20	.003
Upload Speed	.19	.17)	-.19	.001
Cap Index	-.51	.000	.36	.000
BB Only				
Monthly Fee ($)	-.19	.05		
Cost/MB ($)	-.1			
Download Speed	.01		-18	.004
Upload Speed	-.08		-18	.009
Cap Index	-.51	.000	.32	.000

Simple correlations

Hypotheses:
U.S. providers have
Higher prices
Slower speeds and
Less consumer friendly cap policies
Higher Cap Index
More caps
More Reliance on Overage Fees

Competition has effects in the opposite direction from U.S. providers

WIRELESS BROADBAND SERVICE COMPARISONS

In some ways the wireless comparisons are not as complicated. The question of municipal systems does not arise. Moreover, wireless services tend to be offered on a national basis, so the city-by-city pricing issues do not arise. Since the database includes one city per nation, CFA prepared an analysis based on one observation per service provider for the U.S.[6] Although the service providers offer uniform national rate plans one can argue that the some of the basic factors that affect supply and demand still are relevant. We have preserved all of the variables from the NAF data base and created two density variables – the weighted average density of the cities included in the NAF survey of services and that national average population density.

The Cost of Connectivity data set included information only on mobile data plans that utilize a USB dongle modem. These plans are separate from data plans associated with smartphones. USB

modem plans have their own terms of service, which can include different data cap terms than smartphone plans. In building the CFA price measure we identified advertised prices and caps for Internet service from company websites.

The constrained capacity of wireless broadband makes caps a widespread practice. Pricing primarily varies depending on the cap levels and the treatment of overage fees. For the purpose of the national pricing analysis, we set the usage limit for unlimited services at 10 GB higher than the highest limits observed in the survey of rates.

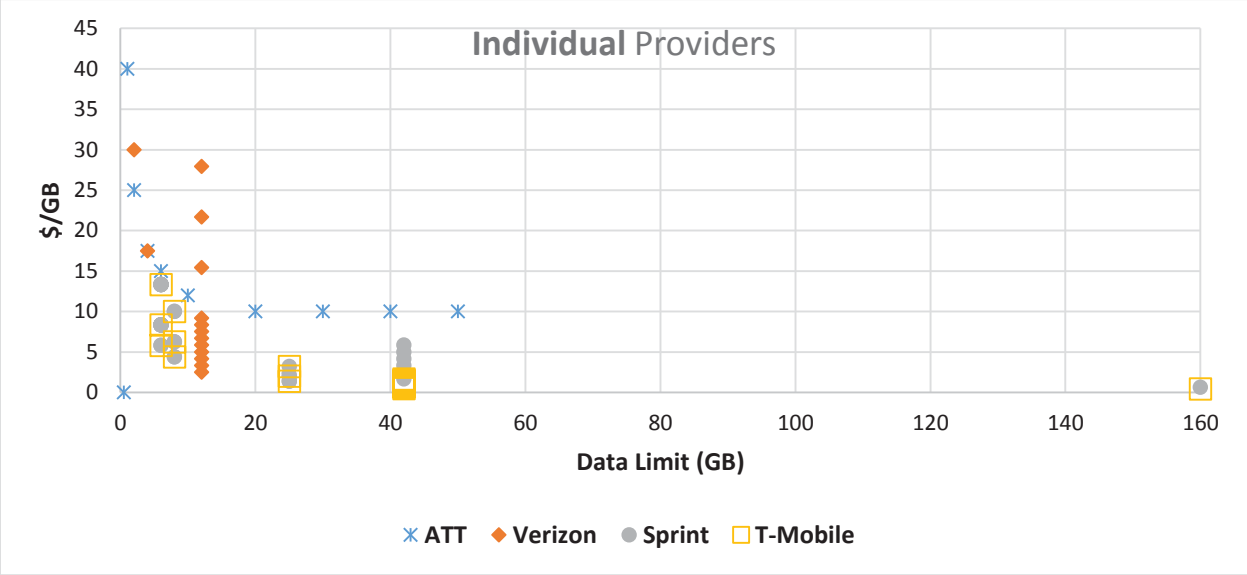
Exhibit 3 shows the national average rates based on the CFA survey of rates from provider web sites. We find that the U.S. Baby Bell wireless service providers have much higher costs and uniformly impose overage charges. In contrast, the Non-U.S. wireless service providers have much lower charges and are much less likely to charge overage fees. The statistical evaluation in Exhibit 3 shows that the rate differences are highly significant. It also shows that the results are similar to the results one obtains by using the complete set of NAF data, rather than taking the CFA approach. The bottom graph combines AT&T and Verizon as dominant incumbents and Sprint and T-Mobile into a non-dominant set. The difference is quite sharp.

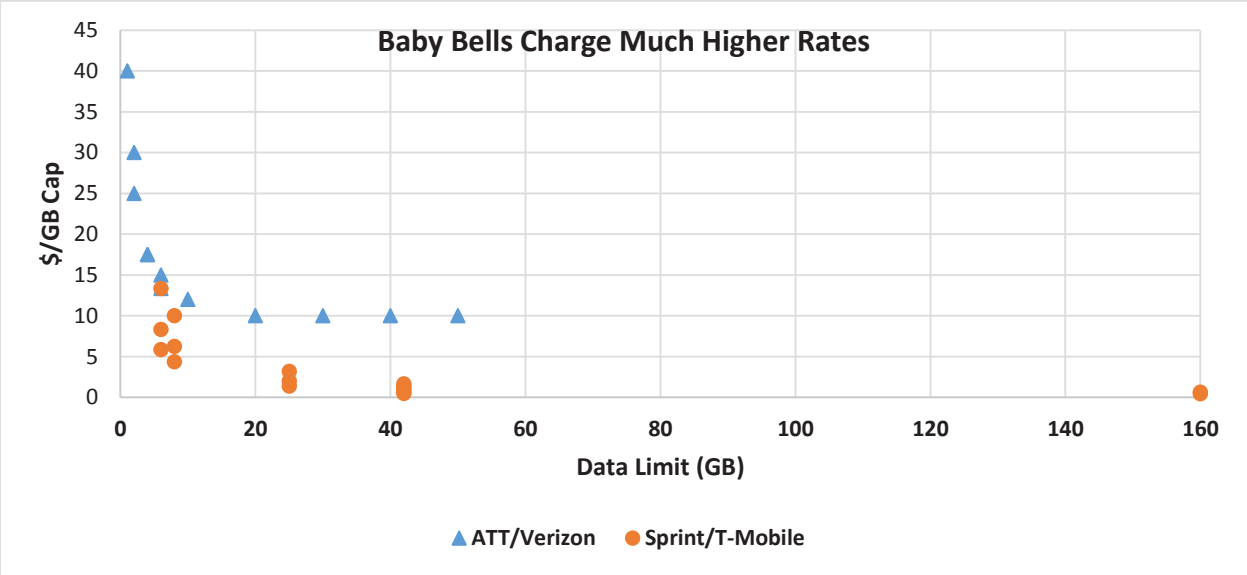
These findings are consistent with our earlier analysis of the rates charged by Baby Bell-based wireless service providers compared to non-Baby Bell providers (see Exhibit 4).[7] Looking at average revenue per month, we found that Baby Bell revenues were $5 dollars higher, equal to their high margins (EBDITA) of $5 per month, which is one of the other statistics the critiques of simple comparisons suggest is useful for reaching conclusions about rates. Here we find that the differences on the broadband part of the wireless bill are much larger.

This finding that non-Baby Bell wireless service providers offer more attractive product is particularly impressive, since the Baby Bells were given, and have since also acquired, much more high-value spectrum. This finding also has immediate policy implications. It reinforces our earlier conclusion that spectrum auctions should ensure that the dominant, Baby Bell-based service providers should not be allowed to dominate the impending auction of high-value, low frequency spectrum.

Exhibit 5 shows the cross national comparisons. They yield similar results. The dominant U.S. incumbents have higher prices and less consumer friendly cap policies. The non-dominant U.S. providers are provide much more attractive service, but still less so than the non-U.S. providers. Competition has decidedly mixed results with more coefficients have signs that are the opposite of what would be expected.[8]

EXHIBIT 3: CFA NATIONAL WIRELESS DATA SERVICE PRICE COMPARISONS: U.S. (CAPS>1GB)

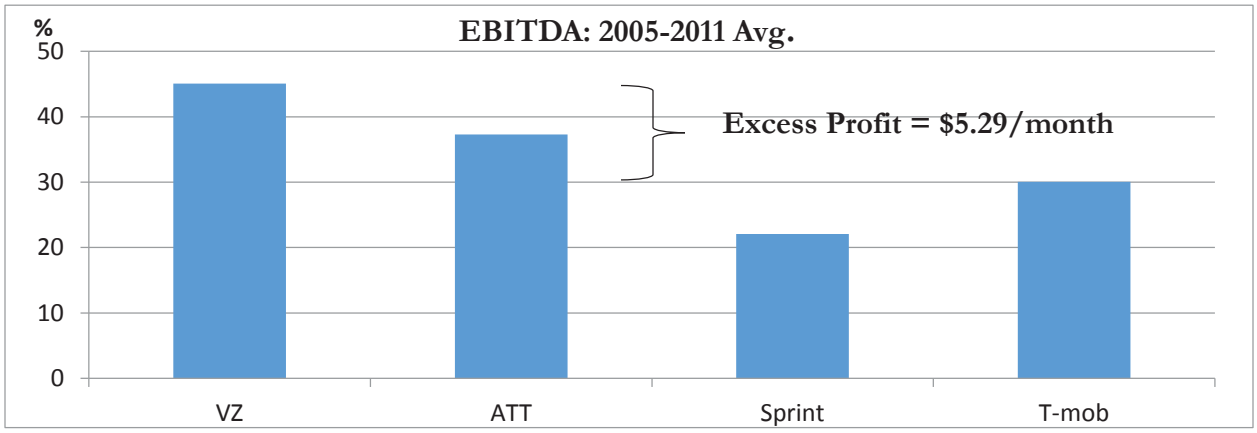


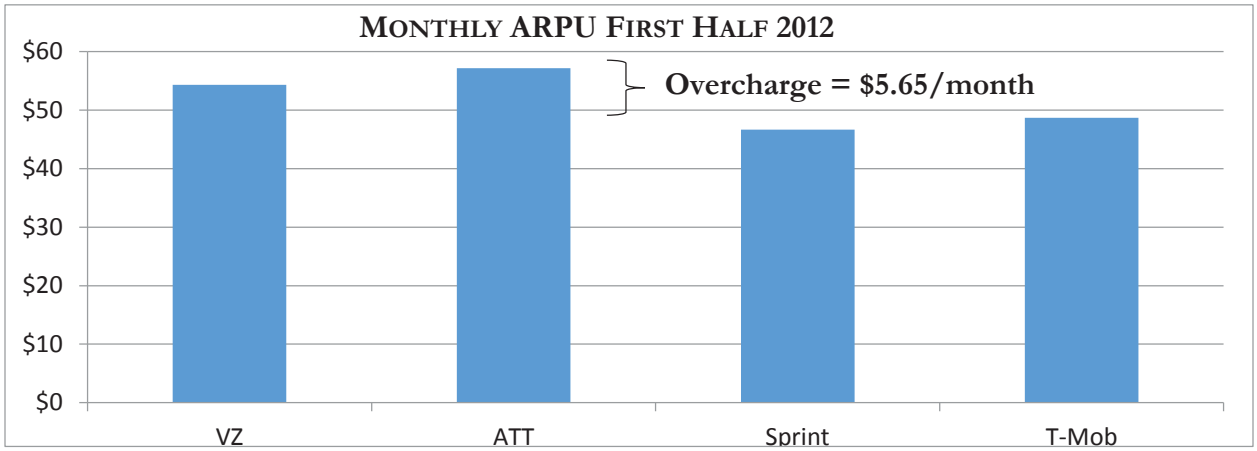


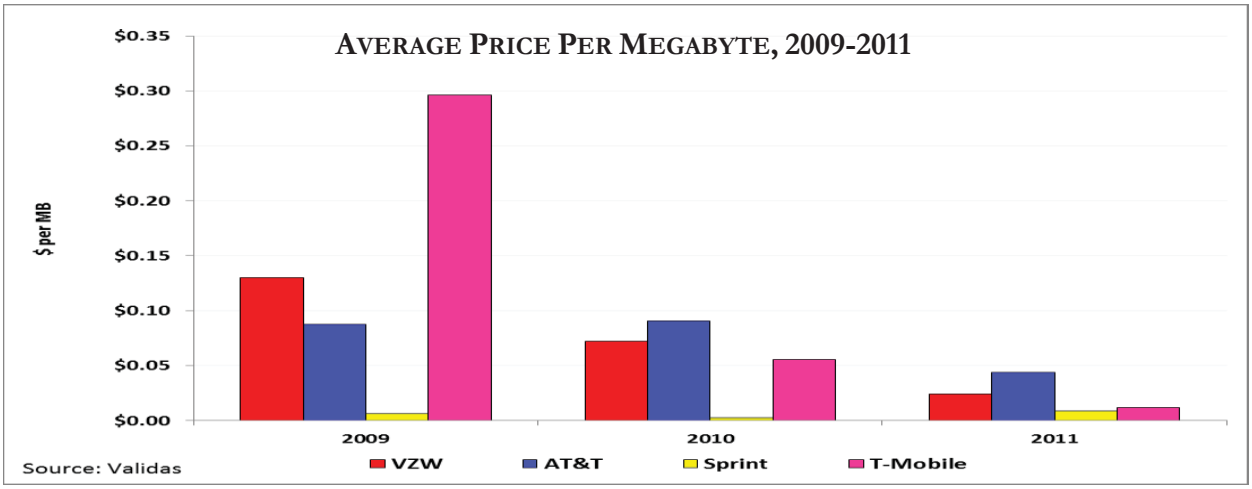
Statistical Evaluations:

		Averages		Multiple Regression Coefficient	
				Non-Baby Bells	
	n	BB	NBB	B-Coef.	p<
CFA Approach					
Monthly Price	298	163	68	-95	.003
Cost/MB	295	19	9	-10	.042
Cap Index	264	3	2.3	-.33	>se
NAF Approach					
Monthly Price	518	104	57	-46	.000
Cost/MB	433	8.6	7.3	-5	.02
Cap Index	479	3	2.3	-72.	.000

Exhibit 4: Indicators of Dominant Firm Market Power

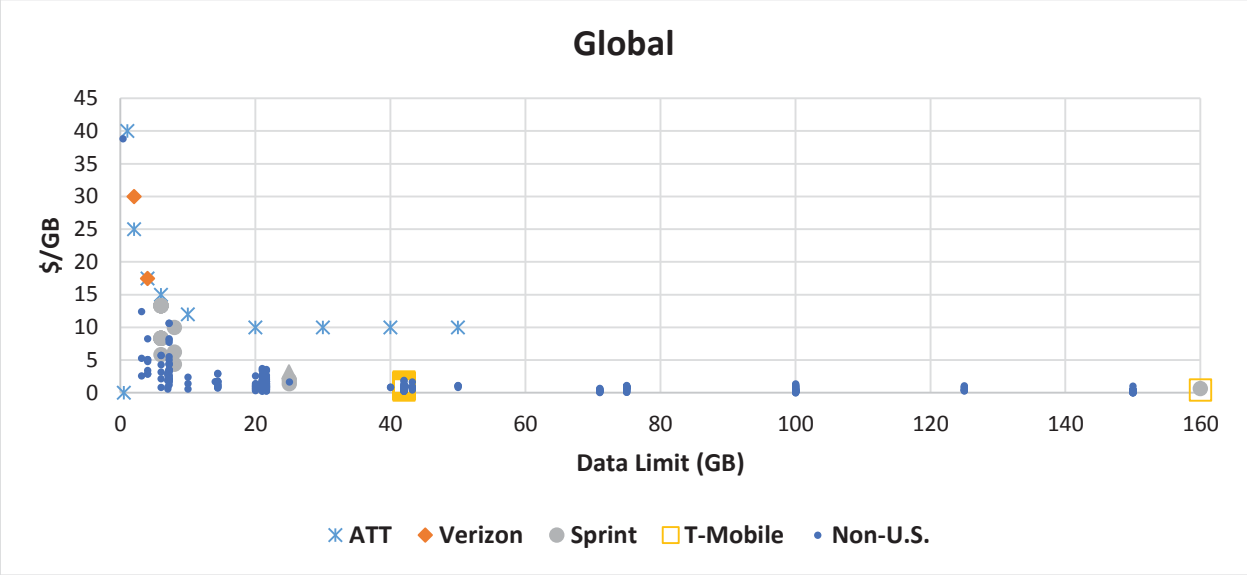






Source: Letter from Mark Cooper, RE: Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions: GN Docket No. 12-268; Policies Regarding Mobile Spectrum Holdings: WT Docket No. 12-269, based on CMRS 16th Annual Report, EBITDA, pp. 17, 21, ARPU, pp. 54, 55; Prices, p. 182

EXHIBIT 5: CROSS NATIONAL COMPARISONS OF WIRELESS BROADBAND OFFERINGS



Statistical Evaluations: International Comparisons

		Averages			Multiple Regression Coefficient					
					Baby Bell		Non-Baby Bells		Competition	
	n	BB	NBB	Non-US	B-Coef.	p<	B-Coef.	p<	B-Coef.	p<
CFA Approach										
Monthly Price	298	163	68	37	150	.000	15	>se	-3.5	.000
Cost/MB	295	19	9	1.5	18	.000	8	.000	13	.000
Cap Index	264	3	2.3	2.3	.78	.000	.45	.046	.05	.002
NAF Approach										
Monthly Price	518	104	57	35	46	.000	-30	.000	-2.8	.004
Cost/MB	433	8.6	7.3	1.6	7	.000	5.8	.000	.08	.08
Cap Index	479	3	2.3	2.3	.76	.000	-.49	.000	.06	.007

Control variables include density and number of competitors. Linear regression in STATA with robust standard errors.

Coefficients smaller than their standard errors not shown.

Probit analysis with categorical dependent variables (presence of a cap, presence of an overage fee yields strong results.

Hypotheses: U.S. providers have: Higher prices, Slower speeds and Less consumer friendly cap policies (Higher Cap Index, More caps, More Reliance on Overage Fees) dominant incumbents worse than non-dominant.

Competition has effects in the opposite direction from dominant providers.

CONCLUSION

The ITIF has cherry-picked data to engage in some nasty name calling (which turned out to look more like plain old fashioned red-baiting), declaring a need for "Congressional legislation to prohibiting socialist local governments from getting into the broadband business." Ironically, the Phoenix Center takes a different tack, recognizing at least one circumstance in which government

action might be justified, "in cases where it is unprofitable to privately provide broadband, such preferences may be sensibly exploited."

The issue has nothing to do with socialism and everything to do with the failure of the market to function properly or meet important needs. Our analysis suggests there is at least two other conditions under which municipal broadband can be sensible. When one other circumstance in which local governments may feel compelled to act and the Federal government certainly should, When dominant incumbents use their market power to raise prices, while delivering poor quality service, federal and local authorities can intervene to protect the public. The provision of infrastructure by local government stretches back to the very foundation of the United States. The roots of the policies that helped to build American infrastructure lie deep in local governments of the progressive era. The tradition of local government meeting local needs is as American as apple pie and has nothing to do with socialism.

ENDNOTES

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[1] Hibah Hussain, et al., *The Cost of Connectivity 2013,* (New America Foundation, October 28, 2013).

[2] Atkinson, R., *New America Foundation Report Finds Municipal Broadband Providers Gouging Consumers,* The Innovation Files / Information Technology & Innovation Foundation, November 1, 2013 (available at http://www.innovationfiles.org/naf-broadband-report/); Ford, G., *New America Foundation Misinterprets International Data (Round Three),* Phoenix Center @lawandeconomics Blog, November 1, 2013 (available at http://phoenix-center.org/blog/archives/1647).

[3] The Phoenix Center offers a longer list of factors that should be considered, but some of them are policy choices, rather than control variables. For example, controlling for technology choices misses the point; if a service providers chooses to rely on outdated technology and then delivers lower quality service, that variance should not be removed from the analysis as a control factor. It is part of the outcome.

[4] The critics complain that the programs delivered as part of the municipal triple play bundle fewer and less costly. There are several responses to this. First, the difference in price after all variables are included is much larger than the cost of programming, so even adjusted for programming, the difference would remain. Second, some of the cable operators are also programmers, so they profit from the high cost of programming, which, in a competitive broadband market should be passed back to consumers. Third, by offering a "skinny" package at very attractive rates, municipal providers allow consumers to unbundle their programming costs, something that is very much in their interests. Consumer sovereignty, which the municipal approach supports, is a value that is "unpriced" in the analysis and should be a plus in the municipal column, since, consumers on average watch fewer than one-fifth of the programming that is crammed into the typical video bundle.

[5] Atkinson, R., *New America Foundation Report Finds Municipal Broadband Providers Gouging Consumers,* The Innovation Files / Information Technology & Innovation Foundation, November 1, 2013 (available at http://www.innovationfiles.org/naf-broadband-report/)

[6] The U.S. providers do not offer all their plans in all cities, but they are rapidly building out their networks. [For each of the cities NAF looked at, the US providers all claim to provide service.] Given that the non-U.S. cities are large cities and frequently capitals, they are a good match to the large cities in the U.S., where the rate plans are available. To the extent that non-U.S. providers offer less coverage outside of the major cities (relative to the lack of coverage in the U.S.), this could drive some of the observed differences in prices.

[7] Mark Cooper, Promoting Efficiency and Competition with Spectrum Auction Rules: The Key to Wireless Consumer Benefits, Consumer Federation of America, May 30, 2013.

[8] The market structural characteristics that make sufficient competition unlikely to achieve the goals we normally ascribe to it in the wireless space are discussed in Mark Cooper, "The Central Role of Wireless in the 21st Century Communications Ecology: Adapting Spectrum and Universal Service Policy to the New Reality," *Telecommunications Policy Research Conference*, September 2011.