PERSPECTIVES

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES

Do Municipal Networks Offer More Attractive Service Offerings than Private Sector Providers?

A Review and Expansion of the Evidence

George S. Ford, PhD*

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Introduction

The role of municipally-owned and operated networks in the provision of broadband service in the United States is an issue of considerable interest and debate. At one extreme, some argue that broadband services should be supplied ubiquitously by the government.[1] At the other, some contend that the government should not be in the broadband business at all because municipal broadband crowds out private sector investment and wastes taxpayers' money.[2] This latter view has made significant headway—many state legislatures now prohibit a municipality from offering broadband services, and many other states place non-trivial limitations on such offerings.[3] That said, a number of municipalities have deployed broadband networks of various scales and technologies—including the fiber deployments in Chattanooga, Tennessee, and Lafayette, Louisiana[4]—and proponents of municipal broadband continue to argue that not only does municipal broadband lead to expanded coverage of fiber networks, but also produces lower prices for consumers for similar services.

For example, a recent report released by the Consumer Federal of America ("CFA") authored by Mark Cooper entitled *Comparing Apples to Apples: How Competitive Provider Services Outpace the Baby Bell Duopoly* (hereinafter "*CFA Report*"), concludes that "[m]unicipal wireline broadband service providers offer much more attractive triple play services than other wireline broadband service providers in the U.S."[5] Indeed, the *CFA Report* reports a large triple-play price differential, and on that ground concludes that the government should "intervene to protect the public" by building more municipal networks to compete with private-sector providers.

Unfortunately, the large price differentials reported in the CFA Report are illusory. While the CFA Report claims to make an apples-to-apples comparison, the service offerings of broadband providers included in CFA's analysis are noticeably dissimilar, rendering its price comparisons invalid and misleading.

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In this PERSPECTIVE, I correct the errors of the *CFA Report* and its source data so that a more meaningful comparison can be made between the prices of triple-play offerings across municipal and privately-owned broadband providers. My work demonstrates that the price differentials reported in the *CFA Report*—and in the New America Foundation's *Cost of Connectivity Report 2013* (hereinafter "*NAF Report*")[6] upon which CFA's analysis relies upon for its pricing data—are the direct and sole consequence of improperly comparing the prices of unlike bundles. In actuality, for very similar triple-play offerings, municipal systems typically charge consumers substantially more than their private-sector rivals. My analysis also suggests that the competitive price for a fairly standard triple-play service is about $100 in the United States, and the expansion of municipal provision of broadband service won't alone alter that reality.

Comparing Triple-Play Prices

In order to make meaningful price comparisons across public and private-sector broadband providers, it is first essential to collect prices on nearly identical services, since there is no expectation that prices for different things will be similar. In a triple-play package, broadband speeds may differ, the number and types of video channels may differ, and the number of included voice minutes may differ, among other things. Accordingly, in order to make meaningful price comparisons, an effort must be made to ensure product offering comparability—an effort never made by either New America or Consumer Federation.[7] As neither New America nor Consumer Federation undertook the requisite leg-work, in this PERSPECTIVE I do it for them.

In particular, I mimic the NAF and CFA *Reports* by focusing my attention on comparing the triple-play offerings of municipal systems in Bristol (VA), Chattanooga (TN), and Lafayette (LA) to private-sector services in these and, in some cases, other cities. The triple-play package consists of three services: a data, a multichannel video, and a voice service. My goal is to ensure that the bundles I compare are very similar across all three components. For data services, I look for comparable download speeds.[8] For multichannel video, I pick packages with a similar number of channels and included equipment. Finally, the triple-play bundle I include a fully-featured (e.g., voicemail, Caller ID, etc.) voice service with unlimited calling.[9] I look for the lowest priced, comparable bundle, but comparability takes precedence over a low price. My results are presented below.

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Bristol, Virginia

For U.S. cities, the lowest-priced triple-play service cited in NAF's *Cost of Connectivity 2013 Report* was for Bristol, Virginia. BVU, the municipal provider in Bristol, is listed in the *Report* as offering a triple-play service for $54.39 monthly. (I believe this price excludes the $3.30 retail fee for the transmission of local broadcast signals, but I'll leave that off for now.) Its private-sector rival, Charter Communications, is listed as offering a triple-play service for $99.97. This near $45 difference is sizeable. Upon inspection of the service offerings, however, it is immediately apparent that the services to which

these prices are attached aren't plausibly comparable.

First, consider the triple-play offer of the municipal provider, BVU. For the $55 price tag,[10] BVU offers the customer a broadband service of 6 Mbps, 27 channels of video (8 in High Definition ("HD")), and a fully-featured phone service but without unlimited calling. BVU also offers a somewhat limited local calling area. No long distance minutes are provided; the customer is charged $0.08 per minute interstate and $0.10 per minute in-state rates for long-distance calls.

Now let's compare that offer to Charter's triple-play. Charter's current offering of service in Bristol, Virginia, indicates the lowest triple-play price of $89.97 (a $35 difference from BVU, or $10 less than that reported earlier by the *NAF Report*. This differential may simply be the consequence of price reduction occurring between surveys).[11] For this fee, the customer gets a 30 Mbps broadband connection (5 times faster than BVU), at least 125 channels of video (60 HD signals), and a fully-featured, unlimited-calling voice service.

Plainly, these two services are in no sense comparable. Thus, NAF's attempt to contrast the prices of the two services is senseless and misleading.

With a little effort, it is possible to get a meaningful comparison by pricing a BVU service package more comparable to that of Charter (the latter of which does not offer a bare-bones service comparable to the BVU package discussed above). Looking across the various offerings of the two companies, I found a good match.

For $109.97, Charter offers a triple-play bundle consisting of a 30 Mbps data connection, about 175 channels of video, and a fully-featured, unlimited calling voice plan. BVU's price for the same 30 Mbps broadband connection, about 180 channels of video, and a fully-featured phone service with unlimited calling, is $149.95. In this comparison, the (download) broadband speeds are the same, the number of video channels is essentially the same, and the voice service is essentially identical. This service match is a good one.

When comparing these very similar service offerings, the municipal provider's price is about $40 higher than its private-sector rival ($150 versus $110). NAF's and the CFA's argument that municipal providers often similar service at lower prices than do their private-sector rivals for a similar service is demonstrably false, at least in Bristol, Virginia. Now let's turn to Lafayette to see if the result holds there.

[F]or comparable triple-play bundles, the prices of municipal broadband networks are not lower, and in most cases higher, than the prices of their private-sector rivals.

Lafayette, Louisiana

The second lowest-priced domestic triple-play service listed in the *Cost of Connectivity 2013 Report* was for Lafayette, Louisiana, and again the price is that of the municipal provider in that market (LUS). NAF listed the price of the municipal provider as $65.39 per month. One of LUS's competitors, AT&T, was also listed, and offered a triple-play service at a price of $79.

Again, let's review the details of the service offering to see how well they match up. Looking at the LUS website, I was unable to replicate the $65.39 price (I believe the price for phone service has risen $5 since the NAF survey). The lowest price offered by LUS for the triple-play is today $71.39, which is close to (but not identical to) the value reported by NAF. For this monthly fee the customer gets a 15 Mbps broadband connection, a television service

including only 20 channels of service, and a phone service with a few enhanced features and without unlimited calling. Long distance calls are priced at $0.05 per minute.

In contrast, the $79 AT&T package includes a 6 Mbps broadband service, 130 channels of video, a free HD DVR, and a fully-featured telephone service with 200 minutes of included calling.

Are these two services comparable as NAF and the CFA would have the reader believe? Obviously not.

As before, I can make a better price comparison by closely matching up (to the extent possible) the service offerings of the two providers. For AT&T, I chose its $119 service that includes an 18 Mbps broadband service, about 370 channels of video (the U300 service) with an HD DVR, and a fully-featured, unlimited-calling voice plan. I matched that to the LUS offering of a 15 Mbps broadband service, a 290 channel video service, a HD DVR, and a fully-featured, unlimited-calling voice service. These are very similar packages. LUS's price for its triple play is $172.88, a big jump from AT&T's $119 price tag. Again, when comparing apples-to-roughly-apples, the municipal provider's prices are significantly higher than its private-sector counterparts (about $50—or 40%—more in this instance).

Cox Cable also offers service in Lafayette. For $129.99 per month, the customer gets a 25 Mbps broadband connection, more than 230 channels (including, at no extra charge, HBO, Cinemax, and Starz), and a fully-featured, unlimited-calling telephone service. This package is a little different than that offered by LUS, but is in nearly all ways superior—yet cheaper.

Another interesting point of comparison is Verizon's triple-play offerings. (Verizon does not offer service in Lafayette.) A similar triple-play offering by Verizon includes a 15 Mbps broadband connection, about 215 channels of video, and a fully-featured, unlimited-calling phone service. This offer is nearly identical to that selected above for LUS. All of this is only $79.99 from Verizon, or less than one-half the price charged by LUS. Again, the municipal's prices are not lower.

Chattanooga, Tennessee

Chattanooga is the third and final market in the *Cost of Connectivity 2013 Report* that includes a municipal provider of a triple-play service (EPB). According to the *Report*, EPB offers a triple-play service at a price of $81.82. The *Cost of Connectivity 2013 Report* compares this price to the triple-play offerings of AT&T at $133 and of Comcast at $150.85.

Are the services linked to these prices comparable? I suspect you know the answer to that question by now.

While I am unable to replicate a triple-play offering for a price of $82, I was able to put together an EPB triple-play service for $90.81 (which is close to the *NAF Report's* number). This service included a nice 100 Mbps broadband service, but a paltry 12 channels of video service, and while the phone service was fully-featured it did not include unlimited calling ($0.06 per minute of long distance).

NAF's claim that municipals offer lower prices is purely the result of comparing the prices of unlike things, which is improper and, if not qualified, misleading.

For comparison, consider Comcast's services. While the NAF reports Comcast's best price is about $150, Comcast's website lists a triple-play offering at $79.85, including a 3 Mbps broadband service, more than 45 channels of video, and a fully-featured, unlimited-calling

telephone service. For about $160, Comcast offers a 50 Mbps broadband service, more than 200 channels of video, and a fully-featured, unlimited-calling voice plan. Neither of these Comcast plans is sufficiently similar to that offered by EPB to allow a meaningful price comparison. So, as before, I'll try to produce closer comparables.

EPB's lowest speed offering is 100 Mbps. Comcast does not, at this time, offer a 100 Mbps service, so I picked its 50 Mbps service for comparison. (I doubt most consumers could tell the difference between the two.) For $139.99, Comcast offers a 50 Mbps broadband service with about 170 channels of video and fully-featured, unlimited-calling voice service.

For a comparable EPB triple-play, I include a 100 Mbps broadband connection, its largest programming tier of about 150 channels, and a fully-featured, unlimited-calling voice service. The price for this service is $139.38. So, it appears that for comparable services, EPB and its private-sector rival are charging roughly equal prices.

While not serving the Chattanooga market, Verizon also offers across its FiOS footprint a 50 Mbps service as part of a triple-play. Verizon's bundle also includes about 215 video channels and a fully-featured, unlimited-calling voice service for the price of $89.99. Verizon's price is much lower than is EPB's price, again leading to the rejection of the claim that municipal providers offer lower prices than do their private-sector counterparts, at least for comparable bundles of services.

Comparability and the *CFA Report*

As shown plainly above, for comparable triple-play bundles, the prices of municipal broadband networks are not lower, and in most cases higher, than the prices of their private-sector rivals. This result contrasts sharply with the conclusions reached in the *CFA Report* and in NAF's *Cost of Connectivity Report*. However, these earlier reports make no attempt to compare like bundles. As a consequence, NAF's and CFA's claims that municipals offer lower prices are purely the result of comparing the prices of unlike things, which is improper and, if not qualified, misleading.

So while the CFA Report argues the material differences across service offerings aren't enough to explain the price differential, the claim is not supported by the facts.

Oddly, the *CFA Report* recognizes that the comparisons it makes are in no way apples-to-apples comparisons, despite the fact the *CFA's Report* has "applies-to-apples" in the title. The acknowledgement is buried in a footnote, stating "the programs delivered as part of the municipal triple play bundle [are] fewer and less costly."[12] My analysis above confirms this fact. The *CFA Report* attempts to argue around this acknowledged difference by claiming "the difference in price … is much larger than the cost of programming, so even adjusted for programming, the difference would remain." No demonstration of this claim is provided—probably because it isn't true.

Take, for example, BVU in Bristol. The price difference between the municipal provider and Charter Communications is today $35 (or $45 in the earlier survey by NAF). BVU's bundle includes only 27 channels of video and did not offer unlimited calling. Charter, in contrast, offered at least 125 channels (60 in HD) and unlimited calling. For BVU, an increase in channels from 27 to 181 channels (59 in HD) adds about $35 to the monthly bill, eating up the entire difference between the municipal and private-sector price. So, the CFA's claim that "even adjusted for programming, the difference would remain" is simply not true. The BVU customer will pay an additional $25 per month

for unlimited calling, pushing the municipal price well above Charter's bundled price.

The same goes for LUS in Lafayette. To go from a paltry 20 to a likewise paltry 80 channel video service, the LUS consumer will dish out another $40 per month—swamping the *NAF Report's* muni/private price differential of about $15 in that market. Even so, this video service remains well below the channel count from AT&T's service in that same market (at 120 or more channels). For about $50 more per month, the LUS customer could get about 210 channels, making the service more comparable, but significantly more expensive, than AT&T's bundled offering.[13] For a fully-featured, unlimited calling plan, as offered by AT&T in that market, the LUS consumer will dish out another $28 per month above the price reported in the *Cost of Connectivity 2013 Report* and used in the *CFA Report*. So while the *CFA Report* argues the material differences across service offerings aren't enough to explain the price differential, the claim is not supported by the facts. Eliminating the service differential leads to a $78 price increase by LUS—an increase that causes the LUS price to substantially exceed the prices of private-sector alternatives. Plainly, the *CFA Report's* claim that differences in the bundles do not explain the price differentials is patently false.

Welfare Implications

My analysis, and that of NAF and the CFA, focuses on prices. As detailed here, however, the triple-play offerings of various providers differs along many dimensions, not just price. As such, it is not possible to conclude that a lower price implies greater consumer welfare. Some consumers may prefer the meager triple-play bundle of the municipal provider. Historically, however, consumers have not shown much interest in basic cable tiers with small channel counts.

The *CFA Report* makes a similar argument in an effort to explain away its total failure to address the comparability issue.[14] The *CFA Report* states, that some consumers may prefer "a 'skinny' package at very attractive rates … since, consumers on average watch fewer than one-fifth of the programming that is crammed into the typical video bundle." With respect to price comparisons, this excuse falls flat.

First, the question being addressed in the *CFA Report* (and here) is a comparison of prices. To compare prices, the analyst must be sure to compare prices across services that are as alike as possible. The question is not what price-quality combinations consumers prefer, which is an interesting question but it is not the focus of the CFA's analysis.

Second, while some consumers may prefer fewer channels, they prefer fewer channels of their choosing, not just fewer channels. It is true that consumers typically watch very few of the huge variety of programming they are offered over a typical multichannel video service, but the preferred channels are not identical across all consumers. In my house, a video package without the Food Network is darn near worthless. In other homes, it may be ESPN, or Bravo, or any other particular sets of channels. Fewer channels are not what people want—they want the channels they want to watch. This observation is no way justifies comparing the prices of unlike things, as both the CFA and NAF *Reports* do.

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Municipal Broadband and the Price Issue

As demonstrated here, the research by the CFA and NAF comparing prices between municipal and private-sector broadband providers is

meaningless and misleading. In reality, when comparing like bundles, the prices offered by municipal networks are no better, and typically higher, than those offered by the private sector. While these facts are interesting, they are also critically important to forming reasonable expectations of broadband pricing in the United States.

Private firms are, by law, profit maximizers. Municipal systems, however, are presumably not, but arguably are engaged in a break-even financial model. The prices charged by municipal systems, therefore, tell us something about how low prices can go. As I have demonstrated above, the prices of municipal providers, whether for a scaled-back or fully-featured bundle of services, are both comparable to private offerings and in the $70-130 range.

Another interesting factoid is that profit maximization, under competition, also produces a break-even financial model (zero economic profits). The fact that the prices of private-sector broadband providers are in line with, if not below, the municipal systems suggests that competition in the broadband market is effective, or that the private sector is much more efficient than the municipal systems.

Based on this evidence, it appears that the competitive price for a triple-play bundle in the U.S. hovers around $100, with a plus-or-minus depending on the particular "quality" level of services the consumer prefers. Plainly, a third wire to the home, *even if owned and operated by the government*, is not going to lead to radically lower prices for broadband services.

Technical Errors

My analysis thus far has focused on the measurement for comparison purposes of triple-play prices. Notably, the *CFA Report* does not conduct its own survey of prices, but merely adopts the price information from the *NAF Report*. Using these prices, the *CFA Report* conducts a regression analysis in an effort to control for some factors that may partially explain the variation in prices across markets (both international and domestic). For the domestic markets, the control variables are population density in the relevant city, the number competitors in the city (presumably counted from the *NAF Report*), and what appears to be a dummy variable for municipal systems. (Thorough descriptions of neither the variables nor the model are provided.)

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The *CFA Report's* regression analysis is inexpertly performed; right off the bat, a fundamental error is made. Let me explain. A statistical test is applied to a hypothesis (called the null hypothesis), and a large test statistic leads to the rejection of that null hypothesis. Normally, the null hypothesis is that the difference between two things is zero. Thus, the computed difference from the regression (the estimated coefficient) measures the size of the difference, and the test statistic on that coefficient tells us the probability that this difference could occur at random due to the normal variability in the data. If the test statistic is large, then the chance the difference is just random noise is low, and we thus reject the null hypothesis that the difference is zero. Testing that two things are equal is a lot more direct than testing that they are different, since the latter requires the researcher to specify in the null hypothesis exactly how different the two things are, and this difference could be anything.

Dr. Cooper states his hypothesis as follows: "the hypothesis is that municipal providers or competition is expected to deliver services at lower prices with higher quality and more consumer friendly terms."[15] The hypothesis is backwards—Dr. Cooper has not hypothesized that the difference is zero, but non-zero, though he does not provide the details on how large the difference is, which is required for such a hypothesis. Given his hypothesis, a large t-statistic would support the hypothesis that there is either *no effect* of municipal provision or competition, since the large statistic implies a rejection of the null hypothesis.[16] Dr. Cooper, however, states that a large test statistic supports his hypothesis, which is precisely backwards.

In fact, the real hypothesis Dr. Cooper intends to test is that there is "no effect," as is standard, and thus the large test statistic permits him to reject that hypothesis is favor of their being an effect. Dr. Cooper is just confused and has stated the opposite hypothesis by mistake. Such a fundamental error suggests a lack of experience and knowledge, or simply carelessness, none of which is helpful for empirical work.

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Dr. Cooper also reports the results from a regression with only 17 observations, and given the inclusions of explanatory variables, probably only 12 or so degrees of freedom. This sample is too small to appeal to the standard (asymptotic) statistics reported by statistical packages. Again, the error is a sign of inexperience.

Additionally, Dr. Cooper concludes that the "introduction of the fourth or fifth competitors [sic] has a clear impact in lowering prices in the U.S.," and "it is clear that three is not enough and even five may not be." Yet, Dr. Cooper's own evidence is incompatible with his conclusion. The *CFA Report* contains 52 statistical tests on the effect of competition for the wireline portion of the analysis. Of these, the results of only 37 tests are reported (the t-stats being arguably too low for the other 15). Of the reported results, 19 of the tests contradict his hypothesis that competition improves performance. For example, Dr. Cooper's analysis states that competition raises prices both domestically and internationally for triple-play services; both results are statistically-significant at the 5% level. Thus, about half the tests are in direct conflict with his hypothesis, but this fact does not temper Dr. Cooper's conclusions about the benefits of competition. In essence, by his analysis, the effect of competition on communications price and non-price dimensions is as likely to be favorable as unfavorable. It's a coin toss.

[A]bout 75% of Dr. Cooper's tests on the effect of competition contradict his claim that competition is good a thing.

In fact, it's a little worse than that. There are 52 tests conducted, but 15 results are not reported. So, the real total is 34 of 52 tests (65%) are inconsistent with the claim that competition improves market performance. Going further, limiting attention to statistical test that exhibit statistical significance at the 5% level or better (33 tests), 24 tests contradict and 9 support the claim that competition improves market outcomes. That is, about 75% of Dr. Cooper's tests (with statistically-significant results) on the effect of competition contradict his claim that competition is good a thing.[17]

To be clear, it is not my intent to argue that competition is bad. Rather, my intent is merely to demonstrate how badly Dr. Cooper performed his statistical analysis. His regression models are poorly conceived and improperly interpreted. Moreover, his willingness to make strong claims about competition, despite his own contradictory evidence, suggests Dr. Cooper is perhaps swayed more by predilection than evidence.

Finally, and perhaps most importantly, the "garbage in, garbage out" condition applies to regression analysis. As I've demonstrated above, the price information used by the *CFA Report* is fundamentally defective. Including a population density variable in a regression will not aid in accounting for price differences resulting from a difference of a few hundred video channels. Including variables for channel count, speed, voice features, and so forth, might very well improve the analysis, however.[18] That said, there's little reason to engage in such a sophisticated approach when, as shown above, it is possible to get good comparables across municipal and private-sector providers so that a simple and direct comparison of prices is feasible.

Conclusion

Do municipal broadband providers offer lower prices than private firms for similar triple-play bundles as has been claimed? No. The evidence is clear. If anything, it appears that the prices of municipal providers are higher than that of their private-sector rivals for similar triple-play bundles. This evidence supports the notion that triple-play prices offered by commercial broadband service providers are today consistent with competitive outcomes.

NOTES:

[*] **Dr. George S. Ford** ***is the Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies. The views expressed in this*** **PERSPECTIVE** ***do not represent the views of the Phoenix Center or its staff.***

[1] *See, e.g.,* S. Crawford, CAPTIVE AUDIENCE, THE TELECOM INDUSTRY AND MONOPOLY POWER IN THE GILDED AGE (Yale University Press 2013).

[2] *See, e.g.,* A. Moylan and B. Mead, *Municipal Broadband: Wired to Waste,* NATIONAL TAXPAYERS UNION POLICY PAPER #129 (April 9, 2012) (available at: http://www.ntu.org/news-and-issues/ntu-pp-128-municipal-broadband-wired-to-waste-1.pdf).

[3] *See generally* J. Stricker, *Casting a Wider 'Net: How and Why State Laws Restricting Municipal Broadband Networks Must be Modified,* 81 GEO. WASH. L. REV. 589 (2013) and citations therein.

[4] Despite efforts to curtail municipal builds, there appears to be general agreement that using municipal resources to push broadband to the un-served frontier, where the private-sector cannot earn a sufficient return, may be justified. In such cases, the expectation should be that these networks will require continued financial support, since the absence of private investment suggests low (and probably negative) returns. Nevertheless, if broadband offers sufficient social benefit, then the long-term subsidization of the network, whether directly or indirectly, could be justified. Universal Service is an example of such a policy, though this policy subsidizes private firms. Of course, all such efforts should undergo a careful cost-benefit analysis; in some places, the costs of deployment and operation exceed any reasonable measure of benefits. *See, e.g.,* G. Ford and L. Spiwak, *Justifying the Ends: Section 706 and the Regulation of Broadband*, 16 JOURNAL OF INTERNET LAW 1 (January 2013) (available at: http://www.phoenix-center.org/papers/JournalofInternetLawSection706.pdf).

[5] M. Cooper, *Comparing Apples to Apples: How Competitive Provider Services Outpace the Baby Bell Duopoly*, Consumer Federal of America (November 21, 2013) (available at: http://www.consumerfed.org/pdfs/comparing-apples-to-apples-11-2013.pdf), at p. 2.

[6] H. Hussain, D. Kehl, P. Lucey, and N. Russo, *The Cost of Connectivity 2013*, New America Foundation (October 2013) (available at: http://newamerica.net/sites/newamerica.net/files/policydocs/Cost_of_Connectivity_2013_Data_Release.pdf).

[7] As pointed out in earlier critiques, the analytical problems with New America's *Cost of Connectivity Reports* are not limited to the failure to compare comparable service offerings. *See* G. Ford, *New America Foundation Misinterprets International Data (Again)*, @LAWANDECONOMICS (March 7, 2013) (available at: http://phoenix-center.org/blog/archives/1257); G. Ford, *New America Foundation Misinterprets International Data (Round Three)*, @LAWANDECONOMICS (November 1, 2013) (available at: http://phoenix-center.org/blog/archives/1647).

[8] Data caps for fixed-line broadband do not affect most customers, so I ignore them. Still, doing so is a limitation of my analysis.

[9] For private sector providers, this fully-featured, unlimited calling voice service is all that is offered.

[10] www.bvu-optinet.com (last viewed in December 2013, January 2014).

[11] http://www.thecharterbundle.com/Virginia/Bristol-VA-24202 (last visited January 6, 2014).

[12] *CFA Report, supra* n. 5 at n. 4.

[13] This LUS service requires a HD receiver at $7.99 per month.

[14] The *CFA Report* also attempts to use the vertical integration of some cable operations into programming as an excuse to ignore comparability. This argument is also bogus. Most broadband operators are not vertically integrated into programming, and those that are own very few channels. Moreover, it is not clear that operator-owned programming is all profitable. A video provider may incur losses on program creation to stimulate the demand for video subscriptions.

[15] *CFA Report, supra* n. 5 at p. 2.

[16] In fact, to reject the null hypothesis in this instance rejects the specific value stated in the hypothesis. The difference may exist, but merely be smaller than the one hypothesized. Dr. Cooper's hypothesis is simply that there "is an effect," so a

NOTES CONTINUED:

large test statistics reject any effect. Still, Dr. Cooper's null hypothesis is improper, so there's no reason to stay focused on the details of hypothesis testing.

[17] An experience researcher would suspect either a problem with the statistical model or the data. In the *CFA Report's* case, there are problems with both.

[18] Another problem with the statistical models is that Dr. Cooper treats price, speed, caps, and so forth as the dependent variables. In fact, as shown here, price is function of speed, and also of caps, overage charges, and so forth. So, his dependent variables are, in fact, independent variables in the price regression.