

Reclassification and the Availability of “Broadband” Service: A Counterfactual Check on Recent Claims

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While there were many valid reasons for the Federal Communications Commission (“FCC”) to reverse the 2015 *Open Internet Order*, a key justification for doing so set forth in the 2018 *Restoring Internet Freedom Order* was the detrimental effect of the Commission’s 2015 decision on broadband investment.¹ In a series of papers, the Phoenix Center’s analysis of publicly-available data using modern empirical methods demonstrated a sizable, negative investment effect attributable to reclassification, measured both from the first proposal of reclassification in 2010 and the reclassification order of 2015.² Employment in the telecommunications sector was also down in response to the reclassification of Internet services, likely reflecting to a large extent the contemporaneous decline in investment.³ There was no meaningful rebuttal of this body of work.⁴ Empirical studies trying to show the absence of an investment effect of reclassification were shown to be seriously flawed, as acknowledged by the Commission in its 2018 *Restoring Internet Freedom Order*.⁵

Despite strong evidence of investment effects and none to the contrary, the argument over investment effects continues.⁶ In testimony this week before the House Energy & Commerce Communications and Technology Subcommittee, Free Press’s Policy Director Matt Wood claims that “the 2015 Net Neutrality rules did not slow down deployment, speed upgrades, or overall investment by ISPs.”⁷ Two of these three claims are demonstrable false. On the

question of broadband speeds, a thorough statistical treatment of the data offers compelling evidence that speed growth declined after the 2015 *Open Internet Order*.⁸ This finding contradicted previous claims made by Free Press (among others), so the group appears reluctant to incorporate strong evidence into its policy positions. On investment, the FCC carefully reviewed the evidence and concluded investment is down, and down by a lot.⁹ Evidence of an investment effect is indeed compelling.

My analysis reveals that the number of homes without 25/3 Mbps is above expectations following the 2015 Open Internet Order. During 2015 and 2016, we may reasonably attribute a lack of 25/3 Mbps broadband to approximately 6.5 million Americans to the 2015 Open Internet Order.

Empirical evidence on the deployment of broadband services, which may be sensibly measured as the availability of broadband speeds of certain levels, is unavailable. Mr. Wood uses the increased availability of 25/3 Mbps service since the 2015 to support his “no effect” argument. Yet, the availability of higher-speed

services is constantly on the rise.¹⁰ As such, the relevant question is whether the observed increases in availability of high-speed broadband after the *2015 Open Internet Order* are a mere continuation of the trend or are unusual in some respect, either much more or much less than expected. Answering that question requires a counterfactual—that is, what would the availability of 25/3 Mbps been in the absence of the *2015 Open Internet Order*?

In this PERSPECTIVE, I construct such a counterfactual based on forecasts from an exponential decay function. My analysis reveals that the number of homes without 25/3 Mbps is above expectations following the *2015 Open Internet Order*. During 2015 and 2016, we may reasonably attribute a lack of 25/3 Mbps broadband to approximately 6.5 million Americans to the *2015 Open Internet Order*. Consequently, Free Press is wrong on all three counts: as a consequence of reclassification, broadband deployment is down, broadband speeds are slower, and investment is below expectations.

Analysis

Broadband speeds are ever increasing, leading the FCC to report statistics on varying broadband speeds over time. The 25/3 Mbps definition of broadband service is relatively new, so the FCC has reported availability statistics on this speed level for only a few years. Consequently, there is very little data on the percent of homes without (or with) 25/3 Mbps. Nonetheless, an effort should be made to construct a counterfactual (even if crude) before drawing conclusions about the effect of reclassification on broadband availability.

From the FCC's *Broadband Reports*, I am able to construct a time series of homes without 25/3 Mbps broadband for years 2011 through 2016.¹¹ Using the data before 2015 (admittedly, only four observations), I construct a forecast of the percent of homes without such broadband service in 2015 and 2016.¹² Since availability data,

especially when near maturity, often follows a regular decay pattern (asymptotically approaching the level at maturity), my forecast is constructed using the standard exponential decay function,

$$y_t = Ae^{kt} \quad (1)$$

where y_t is the percent of homes *without* 25/3 Mbps broadband at time t . A and k are estimated parameters. We may transform Equation (1) to a linear model (in the parameters) with the natural log transformation,

$$\ln y_t = \ln(A) + kt \quad (2)$$

which can be estimated by Ordinary Least Squares.¹³ The estimated equation is,

$$\ln \hat{y}_t = 3.62 - 0.306t, \quad (3)$$

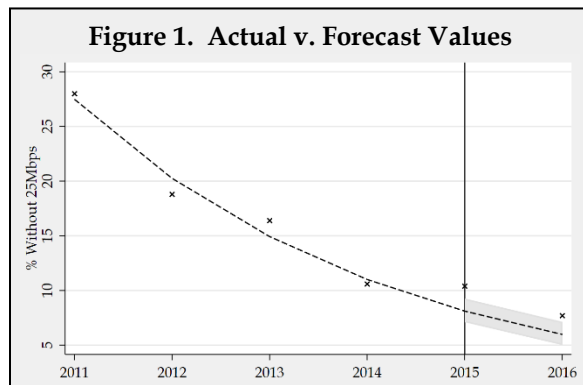
which has an R^2 of 0.97.¹⁴ The functional form provides a good fit to the data. Equation (2) is then used to forecast y for periods 2015 and 2016. This forecast value (\hat{y}) is a counterfactual that can be compared to the actual values. While perhaps not an ideal method for constructing a counterfactual, this is the sort of analysis the limited data permits.

The results of the procedure are summarized in Table 1. The table shows that the actual share of homes *without* access to 25/3 Mbps broadband is considerably higher than predicted from the exponential decay function. That is, the availability of high-speed broadband appears to have slowed after the *2015 Open Internet Order*. The slowed deployment of 25/3 Mbps service is consistent with the empirical evidence revealing that the average download speeds of U.S. broadband connections slowed after the *2015 Order*.¹⁵

Table 1. Actual and Forecast Values

Year	Actual (y)	Forecast (\hat{y})	Diff. $\hat{y} - y$
2011	28.0	27.5	-0.47
2012	18.8	20.3	1.48
2013	16.4	14.9	-1.46
2014	10.6	11.0	0.41
2015	10.4	8.1	-2.3
2016	7.7	6.0	-1.7

Figure 1 illustrates the actual data and the (transformed) forecast. As shown in Figure 1, had the trend in the decline of homes without 25/3 Mbps broadband continued through 2016 the share of homes without 25/3 Mbps broadband would have been a good bit lower than the values actually observed. In fact, as shown in Table 1, the difference between the actual and forecast data has its largest values in the post-reclassification period (as indicated by the vertical line at year 2015).



The shaded area shows the 90% confidence interval of the forecast. For both 2015 and 2016, the actual values are outside the confidence interval.¹⁶ Thus, the change is “statistically significant,” to the extent we may describe them as so with only four observations in the pre-treatment period.

The counterfactual analysis offered here suggests that the rate of speed increases slowed in response to the 2015 Open Internet Order. Approximately 6.5 million Americans are without 25/3 Mbps broadband service as a consequence of the FCC’s reclassification decision.

Conclusion

In this PERSPECTIVE, I evaluate the argument that the 2015 Open Internet Order was unharmed because the availability of 25/3 Mbps service continued to increase after that decision. Given the continuous improvements in broadband service, an increase in service speeds is hardly contestable; instead, it is the pace of improvements that is in question. A counterfactual analysis is required to decipher the true effects of the regulatory treatment of broadband services.

The counterfactual analysis offered here suggests that the rate of speed increases slowed in response to the 2015 Open Internet Order. Approximately 6.5 million Americans are without 25/3 Mbps broadband service as a consequence of the FCC’s reclassification decision. These results add to the already sizable body of evidence demonstrating the harmful effects of reclassification on broadband consumers. As demonstrated here, once again, advocates for a Title II regulation of broadband services continue to offer inaccurate and misleading testimony on the effects of the FCC’s 2015 Open Internet Order.

NOTES:

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¹ *Protecting and Promoting the Open Internet*, REPORT AND ORDER ON REMAND, DECLARATORY RULING, AND ORDER, FCC 15-24, 30 FCC Rcd 5601, 80 Fed. Reg. 19738 (rel. Mar. 12, 2015) (hereinafter “2015 Open Internet Order”), *aff’d* *United States Telecom Association v. FCC*, 825 F.3d 674 (D.C. Cir. 2016), *pet. for rehearing en banc denied*, 855 F.3d 381 (2017); *In the Matter of Restoring Internet Freedom*, FCC 17-166, DECLARATORY RULING, REPORT AND ORDER, AND ORDER, __ FCC Rcd __ (rel. January 4, 2018) (hereinafter “Restoring Internet Freedom Order”). Another valid reason for reversing the 2015 decision was its dismissal of due process rights for regulated firms. See, e.g., G.S. Ford and L.J. Spiwak, *Tariffing Internet Termination: Pricing Implications of Classifying Broadband as a Title II Telecommunications Service*, 67 FEDERAL COMMUNICATIONS LAW JOURNAL 1-19 (2015) (available at: <http://www.fclj.org/wp-content/uploads/2015/02/Tariffing-Internet-Termination.pdf>); L.J. Spiwak, *UStelecom and its Aftermath*, PHOENIX CENTER POLICY BULLETIN NO. 42 (June 2017)(available at: <http://www.phoenix-center.org/PolicyBulletin/PCPB42Final.pdf>), and forthcoming FEDERAL COMMUNICATIONS LAW JOURNAL (Spring 2018).

² G.S. Ford, *Reclassification and Investment: A Statistical Look at the 2016 Data*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-08 (July 13, 2017) (available at: <https://ssrn.com/abstract=3138865>); G.S. Ford, *Net Neutrality, Reclassification and Investment: A Further Analysis*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-04 (May 16, 2017) (available at <https://ssrn.com/abstract=2982413>); G.S. Ford, *Net Neutrality, Reclassification and Investment: A Counterfactual Analysis*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-02 (April 25, 2017) (available at <https://ssrn.com/abstract=2982436>).

³ G.S. Ford, “Regulatory Revival” and Employment in Telecommunications, PHOENIX CENTER POLICY PERSPECTIVE No. 17-05 (June 12, 2017) (available at <https://ssrn.com/abstract=2989333>).

⁴ G.S. Ford, *In Response to Criticisms of Phoenix Center Research on Net Neutrality...*, @LAWANDECONOMICS BLOG (September 14, 2017) (available at: <http://www.phoenix-center.org/blog/archives/2250>).

⁵ G.S. Ford, *A Review of the Internet Association’s Empirical Study on Network Neutrality and Investment*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-09 (July 24, 2017) (available at: <https://ssrn.com/abstract=3138864>); G.S. Ford, *A Further Review of the Internet Association’s Empirical Study on Network Neutrality and Investment*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-10 (August 14, 2017) (available at <https://ssrn.com/abstract=3138862>); G.S. Ford, *Below the Belt: A Review of Free Press and the Internet Association’s Investment Claims*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-06 (June 20, 2017) (available at <https://ssrn.com/abstract=2989968>); G.S. Ford, *Reclassification and Investment: An Analysis of Free Press’ “It’s Working” Report*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-04 (May 22, 2017) (available at <https://ssrn.com/abstract=2982440>).

⁶ *Free Press Files Suit Against the FCC’s Unpopular Repeal of Net Neutrality Safeguards* (March 1, 2018), Statement of Matt Wood (“Chairman Pai and his Republican colleagues at the FCC failed to assemble a shred of credible evidence against classifying internet-access providers as common carriers under the law. *** Broadband investment and deployment continued under the Title II-based protections the Pai FCC struck down, and the FCC has no proof to support its claims to the contrary.”) (available at: <https://www.freepress.net/news/press-releases/free-press-files-suit-against-fccs-unpopular-repeal-net-neutrality-safeguards>).

⁷ Testimony of Matt Wood, before the Congress of the United States House of Representatives Committee on Energy and Commerce Subcommittee on Communications and Technology regarding *From Core to Edge: Perspective on Internet Prioritization* (April 17, 2018) (available at: <http://docs.house.gov/meetings/IF/IF16/20180417/108168/HHRG-115-IF16-Wstate-WoodM-20180417-U41.pdf>), at p. 10.

⁸ G. Ford, *Broadband Speeds Post-Reclassification: An Empirical Approach*, PHOENIX CENTER POLICY PERSPECTIVE No. 17-07 (June 27, 2017) (available at: <https://ssrn.com/abstract=3138866>).

⁹ *Restoring Internet Freedom Order*, *supra* n. 1 at ¶¶95-98.

¹⁰ *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 2015 BROADBAND PROGRESS REPORT AND NOTICE OF INQUIRY ON IMMEDIATE ACTION TO ACCELERATE DEPLOYMENT, FCC 15-10, 30 FCC Rcd 1567 (rel. February 4, 2015) (hereinafter 2015 Broadband Progress Report (available at: https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-10A1.pdf) at Table 7; *In the Matter of Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018

NOTES CONTINUED:

BROADBAND DEPLOYMENT REPORT, FCC 18-10, __ FCC Rcd __ (rel. February 2, 2018) (hereinafter “2018 Broadband Deployment Report”) (available at: https://apps.fcc.gov/edocs_public/attachmatch/FCC-18-10A1.pdf) at Table 4.

¹¹ *Id.*

¹² While the effects of reclassification have been shown to arise after the 2010 announcement that Internet service may be defined as a Title II service, I embrace here the Free Press’ proposal to measure the effects after the 2015 *Open Internet Order*. Reclassification of broadband as a Title II service was nearly certain after President’s Obama’s YouTube video in November 2014 directing FCC Chairman Tom Wheeler to reclassify. T. Johnson and C. Littleton, *President Obama to FCC: Reclassify Broadband Service as Title II to Protect Net Neutrality*, VARIETY (November 10, 2014) (available at: <http://variety.com/2014/digital/news/president-obama-to-fcc-reclassify-broadband-service-as-title-ii-to-protect-net-neutrality-1201352336>); B. Fung, *FCC Chair has all but Confirmed He’ll Side with Obama on Net Neutrality*, WASHINGTON POST (January 7, 2015) (available at: https://www.washingtonpost.com/news/the-switch/wp/2015/01/07/the-fcc-has-all-but-confirmed-itll-side-with-obama-on-net-neutrality/?noredirect=on&utm_term=.89d3624fb730). The 2015 *Open Internet Order* was released in February of 2015, only three months after the President’s statement. Data collection methods by the FCC have changed over time as does company reporting requirements and methods. The most consistently reported data (years 2012-2016) is provided in the 2018 *Broadband Deployment Report*, though the data includes a shift from the State Broadband Initiative to the Form 477 data between 2013 and 2014. I use the most aggregated data to minimize the influence of smaller providers and the changes in source data.

¹³ The estimated parameters are, after transformation, essentially identical between Equations (1) and (2). Equation (1) must be estimated by Non-Linear Least Squares.

¹⁴ The exponential decay function fits the data well. Other functional forms were evaluated, but the decay function has a good theoretical justification and fit the data best.

¹⁵ *Supra* n. 8.

¹⁶ The confidence interval is constructed using Newey-West errors. The forecast interval is constructed by multiplying the forecast error by the critical t-statistic at the 5% level for 4 observations (2.13). A crude approximation of the forecast error using a bootstrapping analysis offered similar results.