

Is France a Broadband Nirvana? A Look at the Data

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Introduction

A familiar refrain in the broadband debate are allegations that broadband offerings abroad are cheaper and better than those found in the United States. Usually, most point to the Scandinavian countries or to Asia as evidence. Now it is France's turn.

For example, Thomas Philippon, an economist and author of the new book *THE GREAT REVERSAL: HOW AMERICA GAVE UP ON FREE MARKETS*, speaks of his parents' ability to purchase a plan in France that includes broadband, cable, and two cellphone plan which costs about \$100 per month, well below what a similar package of services would cost here in the United States.¹ And Chris O'Brien, a reporter for *VentureBeat*, recalls similar price differences based on his personal experience when living in Toulouse.² Both Philippon and O'Brien attribute the price difference to France's larger government role in regulating the communications sector.

I have not purchased broadband service in France so am in no position to challenge these anecdotal price comparisons; I'll take them at face value. What is puzzling, however, is that lower prices are typically accompanied by higher adoption by the law of demand. Yet, as detailed here, the availability of high-speed broadband (≥ 30 Mbps) and its adoption are remarkably low in France; the country ranks at or near the bottom of availability and adoption in the European Union ("EU"). Plainly, the issue is more complex than simple price comparisons suggest. Regulation

that keeps prices low reduces the incentives for deployment, which may explain part of France's situation. Low adoption, accounting for availability, suggests low demand, which is another factor that may result in low prices.

[B]efore jumping too quickly on the "greener grass" narrative, it is essential to get a firmer grasp on France's sub-standard broadband performance, which may in fact be the result of its praised regulatory policies.

In this PERSPECTIVE, I analyze the European Union's ("EU's") latest data on high-speed broadband availability and adoption for its 28 member nations. In part of the analysis, I attempt to account for some differences across nations, such as income and population density, to determine if France's poor performance can be explained by its economic and demographic circumstances. It is not. In fact, France is one of the wealthiest and most densely populated nations in the EU.

Next, I use Ookla data on broadband speeds to compare the relative performance of Internet networks in the U.S. and France following the surge in Internet use from COVID-19 shelter-in-place policies. I find that France's average fixed speed declined by 6.4% (a statistically-significant effect) in April-2020, despite Netflix and Amazon

throttling video services there. In contrast, no meaningful change in speed was observed for the United States. For mobile services, France’s average download speed fell by a statistically-significant 6.8%, while mobile speeds in the U.S. rose by a statistically-significant 2.5%.

France’s high-speed networks are, relative to other EU members and the U.S., is under-deployed and under-subscribed. Also, France’s broadband networks have slowed under the weight of rising traffic caused by behavioral changes caused by the COVID pandemic, though the networks in the U.S. have proven resilient. As such, before jumping too quickly on the “greener grass” narrative, it is essential to get a firmer grasp on France’s sub-standard broadband performance, which may in fact be the result of its praised regulatory policies.

Data

Data on the coverage and penetration of fast broadband connections for year 2018 are obtained from the Digital Scoreboard provided by the EU’s Digital Economy and Society.³ “Fast Broadband” is defined as a service have a download speed equal to or greater than 30 Mbps.⁴ A broadband price index is also available in this data, though the price variable is for year 2015 and covers only broadband services at speeds less than fast broadband. If prices are relatively stable over time, then the lagged price index is unproblematic.

Data on Gross Domestic Product (“GDP CAP”) and population is obtained from the World Bank.⁵ Population density is measured by “built up” density, which includes only one-kilometer square areas with people living in them.⁶

To evaluate network performance following the surge in Internet use from the shelter-in-place policies related to COVID-19, I obtain weekly data from Ookla on average download speeds for fixed and mobile connections for the weeks beginning December 16, 2019 through April 27, 2020.⁷

Descriptive Statistics

Table 1 summarizes data on fast broadband coverage and adoption for the EU’s 28 member nations. France is at or near the near the bottom of both. Of the 28 member countries, France ranks dead last (28th) in coverage and 23rd in adoption. In France, about 60% of homes have access to fast broadband, well below the EU average 85% coverage rate. By comparison, over 94.4% of U.S. households have access to broadband at those speeds (measured at 25 Mbps) and 85% have access to speeds of over 250 Mbps.⁸ Only 28.4% of homes in France subscribe to fast broadband, or about one-half of homes for which the service is available.

Table 1. Broadband Statistics (2018)
(≥ 30 Mbps)

Member	Cover	Rank	Adopt	Rank
Austria	0.911	9	0.227	24
Belgium	0.990	3	0.670	2
Bulgaria	0.752	23	0.431	16
Croatia	0.827	20	0.188	25
Cyprus	0.900	11	0.152	27
Czech Rep.	0.898	12	0.368	18
Denmark	0.954	6	0.577	7
Estonia	0.829	19	0.335	21
Finland	0.746	24	0.291	22
France	0.585	28	0.284	23
Germany	0.879	14	0.439	15
Greece	0.659	26	0.114	28
Hungary	0.868	15	0.517	12
Ireland	0.959	5	0.539	11
Italy	0.902	10	0.170	26
Latvia	0.930	8	0.452	14
Lithuania	0.627	27	0.489	13
Luxembourg	0.976	4	0.586	5
Malta	1.000	1	0.614	3
Netherlands	0.998	2	0.802	1
Poland	0.663	25	0.345	19
Portugal	0.756	22	0.580	6
Romania	0.756	21	0.545	9
Slovak Rep.	0.861	17	0.340	20
Slovenia	0.859	18	0.384	17
Spain	0.882	13	0.541	10
Sweden	0.861	16	0.594	4
U.K.	0.951	7	0.564	8

Conditional Rank

EU member nations vary by income, population density, and other factors. Accounting for these factors to create a conditional rank, least squares

regression is used. The regression model takes the general form:

$$\ln Y_i = \beta_0 + \sum_{j=1}^k \beta_j \ln X_j + e_i, \quad (1)$$

where Y_i is the outcome of interest, X is a set of explanatory variables with coefficients β , β_0 is a constant term, and e_i is the normal disturbance term. The predictions from this model are exponentiated to construct the expected value of the outcome \hat{Y}_i . The ratio of the observed to the expected outcome, Y_i/\hat{Y}_i , is then ranked.

Given the small sample size, the statistical models are parsimonious. Included in X for the coverage equation are the natural logs of GDP-per-capita and density, and a dummy variable for year 2018. For the adoption equation, the regressors include the natural log of GDP-per-capita, the broadband price (see caveats above), a one-period lag of fast broadband coverage, and the 2018 dummy variable.

Of the 28 member countries, France ranks dead last (28th) in coverage and 23rd in adoption. In France, about 60% of homes have access to fast broadband, well below the EU average 85% coverage rate. By comparison, over 94.4% of U.S. households have access to broadband at those speeds (measured at 25 Mbps)....

The models are estimated using Ordinary Least Squares (“OLS”) with robust standard errors. Given the interdependence of the outcomes, Seemingly Unrelated Regression was applied but the null hypothesis of zero correlation between the residuals was not rejected at anywhere near standard significance levels (prob = 0.69).

Results

Coefficients and their robust t-statistics for both outcomes are provided in Table 2. The sample includes 56 observations (28 nations for two years). Coverage is positively related to per-capita GDP and density, as expected. Coverage increased slightly in 2018, though the coefficient is not statistically different from zero at standard levels.

Table 2. Regression Results

Regressor	Coverage	Adoption
lnGDPCAP	0.120*** [5.21]	0.129 [1.36]
lnDENSITY	0.071*** [3.47]	...
lnCOVER _{t-1}	...	1.633*** [3.92]
lnPRICE _{t-3}	...	-0.613** [-2.49]
2018	0.058 (1.52)	0.079 [0.64]
Constant	-1.843*** [-6.38]	-0.190*** [-0.24]
Obs.	56	56
R ²	0.315	0.339
F-Stat	11.45***	4.95***

Sig. Level: 1% ***, 5% **, 10% *.

Unsurprisingly, adoption is based largely on coverage. The coefficient on price is negative, as it should be. No significant increase in adoption occurred in 2018, other things constant.

Whether for fixed or mobile services, broadband networks in the U.S. proved more resilient than those in France.

Efficiency ranks are provided in Table 3. Predicted values for coverage and adoption can be calculated by multiplying the inverse of the index by the values reported in Table 1. An index exceeding 1.0 indicates the observed value exceeds the prediction.

Table 3. Efficiency Ranks

Member	Cover Index	Rank	Adopt Index	Rank
Austria	1.02	15	0.44	28
Belgium	1.07	8	1.4	5
Bulgaria	1.02	14	1.07	14
Croatia	1.11	4	0.62	24
Cyprus	1.06	9	0.51	25
Czech Rep.	1.11	3	0.71	23
Denmark	1.06	10	0.97	17
Estonia	1.13	2	0.9	19
Finland	0.93	23	0.72	22
France	0.68	28	1.17	12
Germany	0.96	22	0.94	18
Greece	0.79	27	0.49	26
Hungary	1.09	6	1.22	10
Ireland	1.11	5	1.35	7
Italy	1	18	0.49	27
Latvia	1.25	1	0.77	20
Lithuania	0.86	26	1.29	8
Malta	0.96	21	1.16	13
Netherlands	1.05	11	1.48	4
Poland	1.05	13	1.39	6
Portugal	0.87	25	1.05	15
Romania	0.92	24	2.41	1
Slovak Rep.	0.98	19	1.9	3
Slovenia	1.05	12	0.72	21
Spain	1.08	7	1.03	16
Sweden	0.97	20	1.94	2
U.K.	1.01	16	1.23	9

For coverage, France is well below expectations (index = 0.68). It remains ranked last. Adoption in France is slightly above expectations (index = 1.17), so its rank improves from 23rd to 12th place, but this rise in rank reflects, in part, its low coverage. France's broadband price is 18.46, which is close to the mean of 21.93 (it ranks 17th).

COVID-19 and Broadband Speeds

Because of COVID-19, many nations have implemented shelter-in-place policies, where persons are encouraged to stay at home as much as possible. Internet use skyrocketed, causing network congestion, and slowed Internet speeds in some countries. In Europe, but not the U.S., Netflix and Amazon reduced the quality of their streaming videos to avoid network congestion (including France).⁹

Using download speed data from Ookla, I compute the difference in average download speeds before and after the COVID shelter-in-place policies.¹⁰ I define the pre-COVID period

as December-2019 and February-2020, and the COVID period as March 30, 2020, through May 11, 2020 (excluding March as a transition period).

The statistical procedure is a means-difference test implemented for each country by Least-Squares regression:

$$y_t = \beta + \Delta POST + \varepsilon_t, \quad (2)$$

where y_t is the speed (either fixed or mobile) in period t , $POST$ is a dummy variable equal to 1.0 after shelter-in-place policies were implemented, and ε_t is the econometric disturbance term. The estimated coefficient β measure the average speed in the pre-COVID period and Δ measures the change in average speed during the COVID period. Thus, the average speed during the COVID period is $\beta + \Delta$. A t-statistic on Δ is a direct test of the null hypothesis that speeds did not change (that is, $\Delta = 0$).

Plainly, the issue is more complex than simple price comparisons suggest. Regulation that keeps prices low reduces the incentives for deployment, which may explain part of France's situation. Low adoption, accounting for availability, suggests low demand, which is another factor that may result in low prices.

By the Ookla data, the average download speeds in the U.S. and France are comparable. In the U.S., in the pre-COVID period average fixed download speed was 136.9 Mbps and 42.5 Mbps for mobile service. In France, the average fixed download speed was 138.7 and average mobile speed was 46.2.

Between the two sample periods, the average fixed download speed in France fell by 6.4% (to 129.9 Mbps), and this difference is statistically-different from zero at better than the 1% level. In

the U.S., average fixed speeds fell by less than 1% (135.7 Mbps), but the null hypothesis of “no change” is not rejected even at the 10% level. Despite Netflix’s and Amazon’s reductions in video quality, France’s broadband networks performed relatively poorly to U.S. networks.

A nation’s broadband performance is not unidimensional. Price is important, but quality, availability, and adoption are also relevant aspects of performance, and a broadband nirvana should excel in all respects. Pointing out price differences, no matter how large, is no substitute for a comprehensive assessment.

For mobile services, France’s download speeds fell (on average) by about 6.8% (to 43.1 Mbps), and again this reduction is statistically different from zero at the 1% level. In the U.S., however, mobile download speeds increased by 2.5% (to 43.6 Mbps), and this increase is statistically different than zero at the 10% level. Whether for fixed or mobile services, broadband networks in the U.S. proved more resilient than those in France.

Conclusion

Broadband prices in France appear low relative to American prices, leading some to tout France as a broadband Nirvana. But, relatively few homes in France have access to very-high broadband services (less than 60% in 2018). In fact, France ranks dead last in high-speed broadband availability among EU nations. In turn, its adoption rate for high-speed broadband is also very low – 23rd of 28th EU member nations. France’s broadband networks suffered under the surge in Internet traffic following the COVID-19 outbreak while fixed networks in the U.S. were unphased and mobile network speed increased.

A nation’s broadband performance is not unidimensional. Price is important, but quality, availability, and adoption are also relevant aspects of performance, and a broadband nirvana should excel in all respects. Pointing out price differences, no matter how large, is no substitute for a comprehensive assessment. Prices are determined by supply- and demand-side conditions, including the mix of services consumed with broadband and the regulatory and market conditions affecting each one. Before embracing France as a yardstick, the nation’s relatively poor performance in terms of availability and adoption must be better understood.

NOTES:

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¹ T. Philippon, *THE GREAT REVERSAL: HOW AMERICA GAVE UP ON FREE MARKETS* (Belknap Press 2019).

² C. O'Brien, *What France Has Taught Me: Americans Are Suckers Who Have Themselves to Blame For Crappy Broadband*, VENTUREBEAT (November 12, 2014) (available at: <https://venturebeat.com/2014/11/12/what-france-has-taught-me-americans-are-suckers-who-have-themselves-to-blame-for-crappy-broadband>).

³ Data available at: <https://digital-agenda-data.eu/datasets/desi/visualizations>. Adoption of fast broadband is calculated by multiplying households with broadband service and the percent of connections with speeds of at least 30 Mbps.

⁴ <https://digital-agenda-data.eu/datasets/desi/indicators>.

⁵ Data available at: <https://databank.worldbank.org/home>.

⁶ A. Rae, *Think Your Country is Crowded? These Maps Reveal the Truth About Population Density across Europe*, THE CONSERVATION (January 23, 2018) (available at: <https://theconversation.com/think-your-country-is-crowded-these-maps-reveal-the-truth-about-population-density-across-europe-90345>).

⁷ For a complete description of the analysis, see G.S. Ford, *COVID-19 and Broadband Speeds: A Multi-Country Analysis*, PHOENIX CENTER POLICY BULLETIN No. 49 (May 2020) (available at: <https://www.phoenix-center.org/PolicyBulletin/PCPB49Final.pdf>).

⁸ *2020 Broadband Deployment Report*, Federal Communications Commission (rel. April 24, 2020) at ¶¶ 2, 36 (available at: <https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf>).

⁹ T.W. Hazlett, *The Pandemic That Didn't Break the Internet*, CITY JOURNAL (May 7, 2020) (available at: <https://www.city-journal.org/america-robust-information-infrastructure?fbclid=IwAR3qo75DJt6uQKjKY2ceduQGJTA3wv4wJvVVjsovImEiPvfUOFg6A5H-rE4>); H. Gold, *Netflix and YouTube are Slowing Down in Europe to Keep the Internet from Breaking*, CNN BUSINESS (March 20, 2020) (available at: <https://www.cnn.com/2020/03/19/tech/netflix-internet-overload-eu/index.html>).

¹⁰ For a complete analysis of over 100 countries, see Ford, *supra* n. 7.