



# The Informed Policy Maker's Guide to Regulatory Impacts on Broadband Network Investment

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In the most recent of a continuing series of commentaries on net neutrality, Free Press recently released a policy brief that it asserted provided The Truth about Network Neutrality & Investment.<sup>1</sup> The brief is a mélange of facts, factoids, assertions, rhetorical flourishes, and supposed policy analysis of relationships between regulation (not otherwise specified), net neutrality regulations (also unspecified), and assorted numbers purporting to measure network investment.

I emphasize at the outset my full agreement with two prominently featured Free Press admonitions.

- “Policymakers should look at the data themselves.”
- “The FCC must be guided by evidence, not rhetoric.”

The Truth does not satisfy either and the intelligent policy maker can safely ignore its principal conclusions. This note explains why.

## Executive Summary

As its title suggests the Free Press paper addresses investment in broadband networks. It zeros in on an important and surprisingly contentious issue, namely whether restrictive economic regulations have an impact on the incentive to invest in capital intensive broadband networks.

Free Press asserts many different conclusions, but in what follows, I will take issue with four of them.

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<sup>1</sup> S. Derek Turner, “Finding the Bottom Line: The Truth About Network Neutrality & Investment,” Free Press, October, 2009. (Free Press). Online at:  
[http://www.freepress.net/files/Finding\\_the\\_Bottom\\_Line\\_The\\_Truth\\_About\\_NN\\_and\\_Investment\\_0.pdf](http://www.freepress.net/files/Finding_the_Bottom_Line_The_Truth_About_NN_and_Investment_0.pdf).

- “...network neutrality rules do not deter ISP investment.”
- “Most U.S. ISPs are actually disinvesting in their networks by depleting more in asset value than they spend on new capital equipment.”
- “Lack of competition in the broadband sector depresses investment and boosts profits.”
- Absence of net neutrality rules will “...badly undercut the current investment in applications and services.”

There is no reasoned, factual and analytical basis for concluding that network neutrality rules will not impact the rate of investment in existing broadband networks. Some rules will have more impact than others, but any rule that constrains the ability of firms to pursue business activities that may increase shareholder value will almost certainly affect their allocation of cash to different uses, including domestic network investment. I explore below the basis for this conclusion and also note elementary logical fallacies in the Free Press analysis of investment behavior over time and of selected policy “events.”

Secondly, the Free Press conclusion that broadband providers are in fact disinvesting reflects a surprising lack of understanding of the nature of accounting depreciation (a noncash cost) and its relationship to capital investment (a real cash outlay). The two are not economically related and comparing them is meaningless.

Third, consistent with Free Press’ admonitions, I present evidence and data to refute its assertion that the “Lack of competition in the broadband sector depresses investment and boosts profits.” The discussion will confirm the absence of any evidence that network market power is the source of profit or that profits are excessive. I also provide data illustrating the high rate of investment by network operators.

Finally, I call attention to flawed reasoning and lack of analysis behind the suggestion that net neutrality rules are needed to ensure investment in applications and services. Indeed, since the value of investment in applications and services is directly and critically dependent on the presence and quality of networks, rules that suppress network investment will also reduce the value of investment in applications and services.

## Impact of Economic Regulation on Broadband Network Investment

State and local regulators have long believed that economic regulation of rates and services of telecom network providers has an impact on their opportunity and incentives to invest. The belief reflects countless empirical studies as well as generally accepted theories of finance and investment. According to Free Press, all prior work is wrong. Rather, Free Press insists: “Investment decisions are driven by a variety of factors, but in the telecom sector, regulation plays only a minor role.”<sup>2</sup> More pointedly in Free Press' view: “It is simply wrong to suggest that network neutrality, or any other regulation, will automatically deter investment.”<sup>3</sup> These statements lack foundation in investment theory, principles or practice.<sup>4</sup> They also fly in the face of common sense.

*Free Press Mischaracterizes the Drivers of Investment.* Analyses of capital budgeting (decisions about whether or not and how much to invest in alternative undertakings available to firms) have been a staple of undergraduate Financial Management and Investment textbooks for decades.<sup>5</sup> The goal of investing in real assets is generally taken to be the maximization of shareholder value as reflected in rates of return by investors who own the assets. Free Press correctly notes that investment depends on several variables, but its list omits the main drivers of shareholder value. Shareholder value, like the value of a specific investment in plant and equipment, is widely regarded as dependent on four variables: a) risk, b) estimated future cash flows or earnings attributable to the capital expenditure, c) growth over time, and d) real options or future opportunities that may be opened by the investment, but which are not assured or cannot currently be valued with certainty.<sup>6</sup>

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<sup>2</sup> Free Press, p. 2.

<sup>3</sup> Ibid.

<sup>4</sup> Addition of the qualifying term, (“automatically”) makes the sentence a truism, but also irrelevant to the current policy debate. One can conceive of a regulation that would not influence investment, but those currently proposed under the banner of net neutrality do not qualify.

<sup>5</sup> Details are available in any finance textbook and in selected economics texts. See for example, Zvi Bodie and Robert C. Merton, *FINANCE*, Prentice Hall, Saddle River New Jersey, 2000, ch. 6, “The Basics of Capital Budgeting,” or Donald A. Hay and Derek J. Morris, *INDUSTRIAL ECONOMICS AND ORGANIZATION*, Oxford University Press, New York, 1991 ch. 12, “Investment Expenditure.” The analysis and critique presented here are consistent with these sources. See also an excellent online site -- <http://campus.murraystate.edu/academic/faculty/larry.guin/FIN330/CapBudTechniques.htm> -- provided by Professor Larry Guin (Ph. D and Certified Financial Analyst) of Murray State University. I have written extensively on the relationship between regulation and incentives for firms to take risks and invest. See, for example, Larry F. Darby and Joseph P. Fuhr Jr., “Investment Incentives and Local Competition at the FCC”, *Media Law & Policy*, Vol. IX, No 1, Fall 2000, in particular the discussion at pp. 12-15 and accompanying reference in footnotes 17-23; Larry F. Darby, “Regulation Matters in Investment and Efficiency in Telecommunications”, 1 *Telecommunications Reports Journal*, No. 2 (September October, 1997), at page 10 for a matrix linking classes of regulatory action and impacts on investment incentives (risk, return, growth and real options).

<sup>6</sup> Examples of “real options” include the opportunities to defer, differentiate, change the pace of investment, adopt new business strategies, adopt new business models for pricing services, expand into new lines of business, to adopt new management techniques or generally to adapt or “innovate” in ways not currently foreseeable. These notions are expressed more rigorously, but with fundamentally the same

*Regulation Influences Investment Drivers.* It is easy to show that each of the variables identified in textbooks is likely to be influenced materially by regulations being considered in the FCC proposed net neutrality rules.<sup>7</sup>

Risk comes in a variety of forms and depends on the specific firm, market and regulatory circumstances. Market risk is the result of competition and other market elements beyond the control of an individual supplier. Financial risk derives from capital structures. And, of course there is risk associated with any kind of future uncertainty, including possible regulatory changes that cannot reasonably be forecasted or estimated at the present.

A major source of uncertainty goes by the name of regulatory risk, which might be defined as the prospect that government action may at some future time alter the value or risk of the lines of business to which the capital expenditure is devoted. The logic of regulatory risk is straightforward. Capital expenditures are for plant and equipment with long lives. Their value depends on the present value of future cash flows, which are dependent on, and may be changed by, future rule changes. There are several sources of potential regulatory impact: regulatory delay, regulatory ambiguity, regulatory taking of opportunities of value, lack of reliable regulatory commitments, lack of transparency, regulatory gaming by powerful stakeholders, and others. One can easily find examples and likely sources for each of these in almost every FCC Notice or Rulemaking, including the recent Net Neutrality NPRM. If past is prologue, the rules emerging from the NPRM will very likely be defined serially and take years to establish through judicial review by the Courts.

Skeptics about the existence of regulatory uncertainty and its conversion to regulatory risk should consider the glacial pace of regulatory decision making in the context of the rapid pace of technological and market circumstances. In the wireless space, it is not inconceivable for decision lags to span two, three, or more generations of handsets. Administrative procedures requirements dictate fairly long pleading cycles, while the resulting long records contribute to review and analysis lags. Even more important are decision lags. Regulatory history establishes clearly that the greater the economic stakes and the greater the financial or political strength of stakeholders, the slower will be regulatory processes, and the less definitive will be any particular

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meaning, in Lenos Trigeorgis and Scott P. Mason, "Valuing Managerial Flexibility" in Eduardo S. Schwartz and Lenos Trigeorgis, *Real Options and Investment under Uncertainty: Classical Readings and Recent Contributions*, The MIT Press, Cambridge MA, 2001, Chapter 2.

<sup>7</sup> The relationship between regulation and these four variables is spelled out briefly in this note. A more complete discussion, in the context of the FCC's Unbundling Obligations and the Commission's implementation of provisions of the Telecommunications Act of 1996, is available in comments authored by Randolph J. May and myself, filed by the Progress and Freedom Foundation: *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers (CC Docket No. 01-338); Implementation of the Local Competition Provisions of the Telecommunications Act of 1996 (CC Docket No. 96-98); and Deployment of Wireline Services Offering Advanced Telecommunications Capability (CC Docket No. 98-147)*, April 5, 2002 (especially pp. 15-32).

regulatory outcome.<sup>8</sup> Capital budgetors and investment managers within firms, and financial market investors alike, will regard such uncertainty as undermining efforts to forecast operating costs and revenues, increasing investment risks, and raising capital costs.<sup>9</sup>

Regulatory risk is not the only source of regulatory impact on investment. Also material is the extent to which the proposed net neutrality regulations on broadband network operators' can be expected by investors to affect their earnings, growth, and real options. Just posing the question suggests the answer to it. It is inconceivable that regulations designed to keep firms from pursuing market activities they would otherwise pursue will have no impact on shareholder value or the incentives of firms and investors to provide risk capital.

To illustrate, consider the following restriction on a broadband network operator's business model recently proposed in the FCC net neutrality NPRM:

...a broadband Internet access service provider may not charge a content, application, or service provider for enhanced or prioritized access to the subscribers of the broadband Internet access service provider...<sup>10</sup>

The practical effect, and clear intent, of the proscription is to prevent broadband network providers from adopting "two-sided" business models that are widely used throughout the economy in general and by Internet content and applications providers in particular. That single regulatory constraint has negative impacts on all the drivers of operator investment – risk, earnings, growth prospects and the ability to explore new and innovative business models and market strategies.

There is much more in the NPRM that will influence directly one or more of the commonly recognized, direct determinants of broadband network investment. The rules will do so through their impact on network costs, revenues, or both; through the

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<sup>8</sup> Dockets at the FCC relating to universal service reform and modifications to intercarrier compensation rules have been "ripe for decision" for several years. "Big Issues" at the FCC like Carterfone interconnection rules, competitive market entry into telephony, regulatory forbearance of new entrants, the Computer Inquiries, regulatory reform of intercity telecom, network element unbundling and pricing, for example, took years to resolve through the courts and successive FCC processes.

<sup>9</sup> Several security analysts have expressed their reservations about the business case for broadband investment as well as the potentially negative role of government regulation of broadband networks. See Full Senate Committee Hearing on Net Neutrality, Wall Street's Perspective on Telecommunications", March 14, 2006. <http://commerce.senate.gov/hearings/witnesslist.cfm?id=1705> A hearings summary and commentary is available at: Ted Hearn, "Analysts Question Bell Investments", *Multichannel News*, March 14, 2006. Online at: (<http://www.multichannel.com/article/CA6316081.html?display=Breaking+News>). It is notable that the financial and investment experts chosen by the FCC and appearing at its recent Hearing on Capital Formation in the Broadband Sector were uniformly of the view that FCC regulations were capable of either enabling and encouraging investment or suppressing it through the impact of the rules on incentives and expected payoffs. [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-293691A1.doc](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293691A1.doc).

<sup>10</sup> Net Neutrality NPRM at para. 106.

obligations they put in place; and through the constraints they impose on the ability of network owners to take advantage of emerging opportunities to create value from innovative network services and management practices.

*Free Press Misreads History to Delink Regulation and Investment.* In addition to ignoring or denying the existence of regulatory impacts on investment, Free Press further undercuts its position by claiming that the timing of events and historical investment data buttress its conclusion that net neutrality will not harm investment.<sup>11</sup>

Thus, Free Press first calls attention to the agreement by AT&T in late 2006 to adhere for two years to the four principles of the FCC's Internet Policy Statement as a condition for FCC approval of its consolidation with BellSouth. It then points out that AT&T's capital expenditures increased (albeit very modestly) during the term of the agreement. It offers the two phenomena as evidence that: "...that a strict network neutrality rule did not in any way deter investment."<sup>12</sup> The value of this "event analysis" as a guide to policy is destroyed by three glaring defects.

The fact that investment went up following the agreement proves nothing. Nobody argues that net neutrality rules will shut down investment entirely. The prospect is that such rules will suppress investment that otherwise would be made, and that the differences might be substantial. Increases in AT&T's investment during the cited period were relatively small by historical standards and it might very well have increased more, but for the net neutrality conditions. Further, the behavior of AT&T investment during that period was subject to myriad sources of incentives and constraints that very likely surpassed the merger conditions in their impact on capital expenditures. The short, two-year duration of the constraint was much shorter than the expected useful economic life of the assets in which it was investing and, also, of less duration than the presumably permanent applicability of any new net neutrality rules that the current FCC is now considering. With economic lives of 6-7 or more years, a two-year restriction on deployment of the assets was not likely to have been taken as an especially burdensome constraint on market conduct. Finally, the restrictions suggested in the current NPRM appear far more onerous than the constraints in the AT&T merger agreement.

If the first event study attempting to link an AT&T concession to the FCC with its subsequent investment is not compelling, the second offered by Free Press is even less so. The Free Press paper includes a table showing *investment as a percent of revenue for Bell Operating Companies over the period 1994-2008*. The table also shows a time line of five events – four of which Free Press characterizes as a "regulatory" or "deregulatory" event. By eyeballing the graph, Free Press concludes that investment increased after passage of the 1996 Telecom Act, which it characterizes as a period of "substantial regulation," only to decrease after 2000 which it characterizes as a period of "substantial deregulation." Free Press concludes that this shows the flaws in the theory that network neutrality regulations will reduce investment. And, indeed, Free Press declares: "In fact, during this period, which saw the imposition of substantial regulation followed by

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<sup>11</sup> Free Press, pp. 5-8.

<sup>12</sup> Free Press, p. 5.

equally substantial deregulation, we see that regulation may have actually encouraged investment -- and that deregulation and consolidation may have decreased investment.” That is pure conjecture.

Event studies attempt to relate the statistical significance of an event or series of events as a cause of subsequent events hypothesized to be effects. The requirements for successfully establishing “cause and effect” are rigorous and the subject of an enormously vast and complex literature.<sup>13</sup> At a minimum, the event(s) hypothesized as cause(s) must unequivocally surpass in importance all other events and forces at work during the time frame; they must not be correlated with other events; and, even if correlations are found, they must be subjected to assorted statistical tests for causation. Simply eyeballing a graph of a time series of investment in the context of highly stylized event characterizations is not acceptable methodology. The Free Press analysis ignores changes in interest rates, the DotCom Boom and Bust, expectations that the 1996 Act would lessen regulation and free up the Bell companies from the constraints of the anti-trust action that broke up the old Ma Bell monopoly, widespread expectations (subsequently disappointed) borne of the widely held assumption that Internet traffic would double every 100 days, the Netscape IPO in late 1995, and on and on. Similarly, the period 2001-2008 cannot without ambiguity be so easily broken down into periods of regulation or deregulation as if nothing else of consequence for network investment was taking place.

The Free Press argument suffers from the “bias of omitted variables” and the well known fallacy of assuming that correlation implies causation -- the so-called “Ex post, ergo post propter hoc fallacy.”<sup>14</sup>

## **Free Press’ Frivolous Claim that Network Companies are Disinvesting**

The paper’s conclusion that “Most U.S. ISPs are actually disinvesting in their networks...” will come as quite a surprise to company managers, investors and financial analysts. The evidence? Free Press explains that companies are disinvesting by “...depleting more in asset value than they spend on new capital equipment.” This suggests that companies are tearing out, scrapping, or taking out of service plant and equipment faster than they are building it with the result that, over time, if the process continues, plant and equipment in service will simply disappear.

The evidence and analysis offered by Free Press calls attention to the fact that firms not only invest in new plant and equipment by buying assets, but they also depreciate those assets in subsequent time periods. No problem with that observation. But, in a remarkable display of lack of awareness or understanding of business fundamentals, Free Press equates accounting depreciation -- the way firms recover over

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<sup>13</sup> See for example the list of citations included in an “Event Study” WebPage from MIT, online at: <http://web.mit.edu/doncram/www/eventstudy.html>.

<sup>14</sup> For some comical examples of the fallacy, not unlike the present one, see *Post Hoc Fallacy*, on line at: <http://www.nizkor.org/features/fallacies/post-hoc.html>.

time their original cash outlays from operating revenues – with “depletion” of assets in actual service.<sup>15</sup> The Free Press argument and explanation below is instructive as to Free Press bias, but both misleading and wrong.

Free Press writes:

While at first glance it may seem impressive that a company like Qwest made \$6.7 billion in capital expenditures between 2005 and 2008, this figure loses its luster when you consider that during the same period, Qwest depreciated \$10.7 billion in assets. That is, during the time when Qwest was receiving substantial deregulatory FCC treatment, the company depleted \$4 billion more in assets than it made in new capital investments. Put another way, during the 2005-2008 period, for every dollar of assets Qwest depleted, it only spent \$0.63 replacing those depleted assets. This pattern of disinvestment is industry-wide. (Emphasis added.)

The clear (and intended) implication of this passage is that Qwest and other broadband platform companies were disinvesting in the 2005-2008 time frame and taking network assets out of production (“depleting assets”). Nonsense!<sup>16</sup>

The accounting charge for depreciation has nothing to do with assets being utilized to provide services. Assets are depleted by wear and tear and age; their value is reduced by technological change; but, they are no way physically depleted by depreciation charges. Capital expenditures are real cash outlays. Firms pay for (invest in) labor, materials, equipment and the like to construct or improve networks. They do so in anticipation of receiving revenue in subsequent periods from sale of services availed

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<sup>15</sup> The term “depreciation” refers to loss of value of an asset from age, wear, obsolescence or other forces. It also refers to the accounting treatment in subsequent periods of outlays for plant and equipment. Capital assets are long lived. While the initial investment is made in a single time period and in a lump sum, the cash outlay is not charged fully to operations during that period, but is recovered over time from subsequent operating revenues in amounts and timing given by accounting depreciation schedules. There are a variety of accounting conventions but most involve estimate of an asset’s economic life and then expensing a share of the capital expenditure each subsequent year over the asset’s life. Depreciation in this sense is a charge (involving no cash outlays in the current period) against current revenues that has no impact on plant in service. The charge against current operations is designed to recover the initial investment over the accounting life of the asset. The value an asset loses each period is subjective, thus depreciation schedules reflect convention. Accounting depreciation need not bear any resemblance to economic depreciation (which measures the loss in value from using the asset). US firms may and do use different depreciation methods for tax and financial reporting purposes. For tax purposes, they tend to use accelerated depreciation (since it reduces taxable income and taxes). For reporting purposes, they tend to use straight line depreciation. In no case are the assets depleted in any real sense by the selection of depreciation method. See Aswith Damadoran, A Primer on Financial Statements. Online at: [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/AccPrimer/accstate.htm](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/AccPrimer/accstate.htm).

<sup>16</sup> Free Press concedes that “Depreciated assets can still earn revenues...” But, the paper goes on to declare that in “...competitive markets such a practice is infeasible.” The proof relies on an anecdote to the effect that, because of competition, automobiles cannot be used for hire or lease after they have been fully depreciated – a revelation that will surprise users of taxi cabs in any US city.

by those capital assets. Depreciation charges are accounting entries with no connection to actual cash flows or the state of a company's physical assets in the current period. Firms have discretion in how to depreciate assets, but are constrained by tax laws and by accounting rules imposed in some cases by regulators.

Much is made by Free Press of the ratio of capital expenditures in a given year to the depreciation charge in the same year, despite the fact that such a ratio has absolutely no economic or financial meaning or policy relevance. The ratio certainly has no bearing on judgments about the level or adequacy of current capital spending and the impact thereon of net neutrality regulations. Nevertheless, Free Press presents a comparison of noncash, discretionary, accounting charges in the depreciation account to the actual cash outlays made by some broadband network firms in the ISP sector. On that basis, Free Press warns ominously and incorrectly: "Thus, a company could make billions in so-called 'replacement investments' and still be letting its network fall apart." Hogwash! For reasons discussed above.

The Free Press analysis and conclusion has no bearing on the behavior of telcos during this time period, when in fact capital expenditures were for the most part dedicated to digitizing formerly analog networks and expanding their data communications capacity. Concurrently, the book value of older plant and equipment was being "written down" via the depreciation adjustment as a means of reflecting fairly on the firms' balance sheets the impact on the value of assets in continuing use of technological change, innovation and plant modernization.

In short, the use by Free Press of "investment ratios" formed by dividing Cap Ex by depreciation expense, as indicators of "asset depletion" and disinvestment has no economic meaning or policy relevance whatsoever.

## **Mischaracterization of Network Competition and Firm Profits**

Free Press compounds its error and magnifies its policy misdirection by comparing meaningless investment ratios with an equally meaningless measure of company "profits."<sup>17</sup> There are several different measures of profit – revenues minus cost. Each has its use and each depends on how revenue is calculated and which costs are or are not deducted. Free Press uses a ratio called the "operating profit margin" which is an odd choice, since it excludes a large chunk of costs incurred by network providers -- interest payments and taxes paid. Operating profits are not a useful measure in the current context. Moreover, use of that measure introduces a bias in the comparison with DJIA companies on average, since incumbent telco and cable companies are capital intensive and are capitalized with substantial amounts of debt on which interest must be paid. They are also taxed more heavily, especially at the state and local level, than the

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<sup>17</sup> See Free Press Figure 5 (p. 9) calculated in an effort to show that network providers disinvest in a noncompetitive market in order to earn extraordinary profits: "The Lack of Competition in the Broadband Sector Depresses Investment and Boosts Profits"(p. 8).

average DJIA Company.<sup>18</sup> Excluding them from the profit calculation leads to dramatic overestimates of network providers' profits. A more useful and accurate picture is reflected by the data in Table 1 below.

Table 1

**Investment, Profit and Rates of Return  
 For Selected Internet Value Creators**

	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
	<b>Net Profit Margin (5 year)</b>	<b>Return on Capital (5 year)</b>	<b>Capital Expenditures 2007-July 2009</b>	<b>Cap Ex share of Operating Cash Flow</b>
<b>S &amp; P 500</b>	11.4%	10.7%	NA	NA
<b>AT&amp;T</b>	10.7	5.0	\$44.4 B	.58
<b>Verizon</b>	7.1	4.7	42.9	.65
<b>Qwest</b>	2.4	1.8	4.1	.61
<b>Comcast</b>	7.0	1.8	14.2	.61
<b>Time Warner Cable</b>	(negative)	(negative)	8.5	.67
<b>Google</b>	22.9	19.7	5.1	.30
<b>Amazon</b>	3.7	21.8	.7	.19

*Source: Based on data in company financial reports and data available online at: <http://moneycentral.msn.com/home.asp>*

Data in Table 1 convey a picture of profitability and investment of broadband access providers that contrasts, as day to night, with the one provided by Free Press. Derived from audited data filed by the companies with the SEC, the first two columns permit comparison of profits and rates of return for selected broadband network providers with those of net neutrality advocates and application/content providers (Google and Amazon). Using two of the most common indicators of profitability -- net profit margin reflecting deduction of all costs from revenue and return on total capital -- the data indicate that broadband access providers are earning less than the S&P average and substantially less than Google. Column 3 gives lie to Free Press claims that network operators are not investing. The selected network providers have invested over \$100 billion over the past two years. Google and Amazon in contrast have invested less than 5% of that total.<sup>19</sup>

<sup>18</sup> David Turek, Paul Bachman, Steven Titch and John Rutledge, "Taxes and Fees on Communication Services," The Heartland Institute, May 2007, p. 2 and p. 41.

<sup>19</sup> Free Press attempts to buttress its claim that network operators are not aggressively investing by comparing their performance to that of Clearwire, a relatively new company that has yet to achieve much market penetration or build its sales. Thus, Free Press declares: "During the first half of 2009, Clearwire's capital expenditures were nearly 300 percent of revenues. This stands in contrast to the investment levels of the most vocal anti-network neutrality ISPs, whose relative investments during the first half of the year were in the mid-to-low teens." The comparison is of course meaningless, since sales for capital intensive networks typically lag a company's threshold investments. As Clearwire grows and fills its network with traffic, its sales will increase and the ratio of capital expenditure to revenue will approach the industry norm.

Similar data, derived from SEC annual reports, provided by the Communications Workers of America for a larger sample of companies show that investment over the past two and half years for network operators was over \$150B while Cap Ex for the major applications providers (Google, Yahoo, and Amazon) was \$7.3 billion.<sup>20</sup> According to CWA the gap in investment between the network providers and applications providers was reflected as well in a huge employment gap. In 2008, for example, total employment by largest network operators (AT&T, Verizon, Comcast, Sprint, and Time Warner Cable) summed to 625,000 while the total for Google, Amazon and Yahoo was less than 48,000.<sup>21</sup>

Column 4 of Table 1 reports a fair measure of firms' propensity to invest – that is, the share of operating cash flow going to network investment for each of the selected firms. Again, the investment performance of network providers dominates by a wide margin (2 to 3X) that of Google and Amazon.

These facts and my analysis conclusively refute the Free Press conclusion that other companies “have significantly higher levels of net investment but lower profit margins than the ISPs.” The data certainly contradict the Free Press conclusion that the data provide: “...a strong indication that the phone and cable incumbents...abuse market power by delaying investment in order to reap higher short-term profits.”

## Conjectures about Impact on Investment in Applications and Content

Free Press asserts without analysis, argument or data that: “The absence of nondiscrimination protections will have a substantial negative impact on investments made in the content and applications markets.” That of course addresses an important question, but one for which Free Press offers neither facts nor analysis nor evidence. Instead, it merely offers an unsubstantiated opinion. This conclusion is part of a popular mantra of net neutrality advocates who claim that regulation is needed to preserve investment and innovation “at the edge” among applications and content providers. Net neutrality advocates generally, and Free Press here, have offered no empirical or analytical support linking particular net neutrality rules with investment or innovation in applications or content.

A full economic analysis of the impact of NN rules on investment and innovations by applications and content providers is needed, but is beyond the scope of this paper. However, one conclusion is inescapable. The value to consumers and investors of services provided by applications and content firms is fundamentally tied to the existence of high quality networks. Thus, any network investment disincentive from net neutrality rules will reduce the value of applications and content. No network, no complementary values for others in the Internet Value Cluster.

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<sup>20</sup> CWA, “Promote Investment and Good Jobs in the Telecom Industry”, October 2009. Online at: [#http://ow.ly/uNnw%20#CWA](http://ow.ly/uNnw%20#CWA) #neutrality #FCC.

<sup>21</sup> Ibid.

## **Conclusion**

As noted at the outset, we join Free Press in calling for less rhetoric and more facts, while urging policymakers to heed the evidence. The conclusion we draw from the foregoing review and analysis of facts is that the Free Press version in The Truth is not useful as a guide to intelligent public policy.