Research

The Real History of Title II and Investment

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Recently the Federal Communications Commission (FCC) issued a new set of regulations for the Internet reclassifying broadband as a utility under Title II in order to achieve "network neutrality." In part, the change was supported by the view that it would "not have a negative impact on investment and innovation in the Internet marketplace as a whole."[1] But the logic and the record that the FCC lays out is filled with egregious errors.

Even though no economic analysis was conducted, the agency asserts telecommunications companies would not suffer because investment increased from 1996 to 2005 when Title II was applied. Yet, the agency doesn't even mention the Dotcom bubble era, let alone control for the capital buildup from other Internet players leading up to 2001 bubble. AAF's economic analysis finds that $7.1 billion of investment is missing from this industry, in part to regulation.

Because the agency falls short on financial theory and skips over the history, the broader economic trends are misunderstood. Most importantly, the real benefit to consumers occurred in the post Title II world when investment hit its pre-boom levels.

Why Finance Is Important for the Network Neutrality Order

Understanding how investment and regulation interact in the broadband industry is key to detailing the impact of the FCC's action. Near the beginning of the section on investment, the agency claims that "the key drivers of investment are demand and competition." Although they are related concepts, neither demand nor competition drives investment. Investment is actually driven by the expectation of a return, a nuance that causes confusion later in the Report and Order.

Every financial manager is fundamentally pressed with two separate questions: where to

invest, and how the funds should be raised. The first question is called the investment decision, or capital budgeting decision, while the second is the financing decision. When a business decides to invest for future benefits, it is marked as a capital expenditure (capex for short) and can be directed to either maintain the current business (maintenance capex) or build out new projects (growth capex). Wholly separate from this decision is the financing decision, which is driven by investors and other market actors looking for returns.

Thus the FCC muddles core concepts when they claim that, "Major infrastructure providers have indicated that they will in fact continue to invest under the [Title II utility-style] framework we adopt, despite suggesting otherwise in their filed comments in this proceeding." As many have estimated, these new rules are likely to have a destructive effect on returns, which is different than an internal company level decision to invest. While the major infrastructure providers will continue to invest to maintain current networks, new and potentially disruptive projects with thinner margins both within the company and within the same industry will find it harder to get off the ground. But more importantly, the small infrastructure players will be hit the hardest since their already thin returns will make it harder for them to expand to take on the big guys. As AAF recently concluded, at least 90 percent of the businesses that will be burdened by the new utility-style network neutrality regulations will be small businesses.[2]

In his roadshow to drum up support for the new rules, FCC Chairman Tom Wheeler said that "AT&T, Verizon, and Qwest actually increased their capital investments as a percentage of revenue immediately after the Commission expanded Title II requirements pursuant to the '96 Telecom Act." Wheeler is right; capital expenditures as a percentage of revenue increased from 21 percent in 1992 to 27 percent in 2001 only to fall back down after 2005.

However, Wheeler's statements, which are echoed in the Report and Order, actually hint at a serious problem. Even though hardly a word is mentioned of it in either the report or his speeches, the Dotcom Bubble is located squarely in the middle of Wheeler's Title II timeline. Leading up to the burst in 2001, investment far outpaced actual consumer demands, which is why capex as a percentage of revenue increased so dramatically. In other words, if Wheeler wants to claim that Title II caused the rise in investment, then he is actually suggesting that Title II caused the Dotcom Bubble, which threw 200,000 people out of jobs and wiped $2 trillion of wealth off the books.

As actual data from the period attest, the Dotcom Bubble seriously complicates the simple story laid out by supporters of Title II, including the FCC. As basic economic analysis will show, the positive case for Title II ultimately doesn't lie on empirical ground.

The History of the Dotcom Bubble

Most think of the 2001 bubble as driven by the meteoric rise in the stock evaluations of companies like Pets.com and Startups.com. But the Dot-com bubble was actually comprised of over-evaluations in two groups of companies.

The first group included all the upstream firms like Google, Yahoo!, eBay, and Amazon, that ultimately survived this crucible. The first .com was registered in 1985, but it took the privatization of the Internet backbone ten years later to actually spark the Dotcom rush. Coincidentally, just a year after the commercialization of the Internet, Congress passed the Telecommunications Act of 1996 overhauling the legal regime for telephone while leaving the Internet lightly regulated. The primary focus of the act was to create a more stable telecommunications regime, but it came just as the Internet was developing, complicating many of the current folk theories about Title II and investment.

The second group of firms affected by the Dotcom Bubble were the downstream infrastructure players like WorldCom and Global Crossing. Even though many companies were racked with scandals afterwards, far less importance has been paid to the real investments that went to build out the infrastructure for the new economy. Far and away the biggest recipients of this cash were the variety of companies that built fiber networks including telecommunication firms regulated under Title II, cable companies not regulated under this law, and a whole range of other providers.[3]

Optimism marked this period of the Internet's development typified by Bill Gates' claim in PC Mag that, "We'll have infinite bandwidth in a decade's time."[4] Everyone knew consumer behavior was fundamentally changing. At the time it was apocryphally said that Internet traffic was doubling every 100 days, a trend that seemed to follow a hyped Moore's law.[5] Throughout the late 90s, then-FCC Chair Reed Hunt repeated this claim, making an impassioned case for its implications in his 2000 book.[6] In March of that same year, the next FCC chairman, Bill Kennard, reiterated the notion, saying that, "Internet traffic is doubling every 100 days. The FCC's 'hands–off' policy towards the Internet has helped fuel this tremendous growth." At the height of the bubble in 2000, the New York Times cited the stat approvingly five times; the heads of AT&T, Global Crossing, and Level 3 all made similar growth projections; and traders were investing according to the estimate.[7] Moreover, countless business plans in Silicon Valley based their business models on the 1998 Department of Commerce "The Emerging Digital Economy" report, which teased out the implications of the rising demand for broadband.[8]

There was logic to this new bolder investment cycle. Upstream firms, like the ill-fated Broadcast.com, would provide video and online products while network providers would

build out the Internet connections to serve that content to consumers. The FCC has long called this the virtuous cycle, but the term that has been used in economics for over a hundred years is complementary good. Goods that complement each other, like razor blades and razor handles, are worth more in total. Similarly, as more content flows over Internet infrastructure, Internet access itself becomes more valuable. On the investment side, the firm thus receives a higher return due to this complementarity, which is then partially invested to build out more robust pipes.

In expectation of these higher returns, at least $100 billion was dumped into the construction of new fiber to satiate the perceived need.[9] Nearly overnight, massive companies like Global Crossing and Level 3 sprang up to provide network services. Soon fiber was being strung up in cross country networks. The pace of development was so feverish that the amount of fiber sold would not recover from its 2001 high until 2012. The enthusiasm also extended into undersea cables; nearly $12 billion was invested in 2001 at the height of the market, compared to just over $1 billion in 2013 and 2014.[10]

According to the last fiber report released by the FCC, the Regional Bell Operating Companies increased their deployments of fiber by nearly 47 percent between 1995 and 1998.[11] While there are no official reports on the total fiber deployed after 1998 by the FCC, estimates place the industry wide increase at 46 percent from 1998 to 2001.[12]

As everyone learned, expectations were out of line with the fundamentals, especially lower consumer demand.[13] Level 3 lost significantly, and only survived via a $500 million cash infusion from Warren Buffett. Global Crossing, which managed to build one of the largest fiber backbones and was once worth billions, went bankrupt.[14] Worldcom became mired in an accounting scandal after they tried to cover up losses. E.spire Communications, XO Communications, Velocita, and McLeod all filed for Chapter II as well.

The downturn was abrupt, but the fiber was still there. A year after the crash, just 2.7 percent of the fiber capacity was being used.[15] As analyst Jonathan Lee points out, the market was still so low in 2006 that it was cheaper for Level 3 to buy capacity via other companies rather than use their own dormant capacity because operational and replacement costs were that much higher.[16] Over the next decade, ISPs would buy up these systems to extend their footprint.

An Economic Survey of the Damage

Only with the 2001 Dotcom Bubble as background can investment changes be properly understood.

The table below displays investment data from a number of communication companies from

1996 to 2005 including cable companies and Local Exchange Carriers (LEC), which were regulated most heavily by provisions in Title II. From 1996 to 2001 official FCC ARMIS data is used, thus the designation A, while 2002 on are estimates and thus receive a designation E. The last column includes the percentage change from the 1996 to 2005 time period.

Table 1 Investment in Millions

In millions	1996A	1997A	1998A	1999A	2000A	2001A	2002E	2003E	2004E	2005E	1996-2005 Change
Local Exchange Carriers	$18,138	$20,125	$21,592	$27,446	$30,972	$29,392	$18,500	$15,000	$15,501	$16,516	-9%
CLECs	862	1,471	2,752	5,064	8,528	4,458	1,500	600	500	400	-54%
IXCs	16,634	21,620	26,447	35,097	50,956	39,105	12,800	11,500	11,842	12,134	-27%
ISPs	147	391	1,016	2,135	4,739	2,290	1,000	600	600	500	240%
Cable Companies	6,681	6,484	9,046	12,595	17,920	17,338	14,800	12,500	11,875	12,172	82%
U.S. Total	42,462	50,091	60,852	82,337	113,115	92,583	48,600	40,200	39,958	41,340	-3%

The 2001 Dotcom Bubble is clearly evident in the numbers. In the time period after 2001 until 2005, when the FCC officially placed DSL in a lightly regulated regime of Title II, the largest telecom firms sharply reduced their investment from a high of $30 billion in 2000 to $16 billion in 2005. As for the competitive local exchange carriers (CLECs), who were supposed to benefit from Title II, they too reduced their investments from a high of $8 billion in 2000 to $500 million by 2005. Even after cables broadband were officially recognized as a Title I service in 2002, over the next couple of years, the capital expenditures for cable companies decreased by 18 percent. Under a modicum of scrutiny, the FCC's narrative of investment falls apart.

Taken over the entire period, LECs, which bore the brunt of Title II classification, saw a 9 percent decrease in investment in the time period, which seriously undermines the FCC's positive story about Title II. On the other hand, cable companies, which have never been subject to Title II regulation, saw an 82 percent increase in the amount of capital expenditures spending during the same time period. If the LECs grew at the same rate as the cable companies, then they should have ended up with nearly $33 billion by 2005. In other words, the industry left on the table nearly $1.6 billion every year in investment. It is worth noting that during the 11 years before Title II was applied, the telephone industry's investment grew an average of 5 percent per year.[17]

One method economists use to quantify changes in policy is what's called a difference in difference analysis. It calculates the effect of a treatment like a policy change on an

outcome by comparing the average change over time in the treatment group to the control group.

Comparing the beginning and the end of the regulatory period using a simple difference in difference model, nearly $7.1 billion is missing from the bottom line of the major telecommunications firms by 2005.[18] While not the only cause, regulation likely helped to deter billions in investment. More granular data could help tease out the various causes, but the FCC never conducted such a study, even though Commissioner Pai and Commissioner McDowell before him have both called for rigorous empirical studies.

What About Consumers?

Ultimately, consumers are the most important part of this equation, and they benefited handily after Title II was designated to the trash heap. YouTube, Facebook, and Netflix all became household names in the lightly regulated world we are now leaving behind. More than any other, the development of Content Delivery Networks has been a boon to video watching online and to broadband speeds. Since 2007, average US speeds have increased by 435 percent.[19] Even though it was first dreamed about in the mid-1990s, consumer-led demand during the lightly regulated period is making video over the Internet an actual replacement for TV.

Advocates for Title II reclassification have sold their plan as real network neutrality, even though there are countless ways to ensure an Open Internet. As expressed in the recent Order, one of the positive arguments for reclassification is that it won't be harmful to investment. Sadly, history does not support this rosy view. While the FCC's net neutrality order paints this time period in a good light, it does a very poor job of separating the fever from the facts. Consumers will suffer in the end when the legal dust settles and many of these problems could have been solved had the FCC done its due diligence.

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[1] Federal Communications Commission, *In the Matter of Protecting and Promoting the Open Internet, Report and Order On Remand, Declaratory Ruling, and Order*, http://transition.fcc.gov/Daily_Releases/Daily_Business/2015/db0403/FCC-15-24A1.pdf at 191