A Pragmatic Framework for 21st Century Communications Law:

From Intelligent Design to Digital Darwinism

WORKING PAPER

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March 28, 2014

Introduction[1]

So far, those proposing new policy frameworks for communications law in an all-IP world follow the unfortunate pattern of decades of earlier academic treatment of regulatory policy across industries. Authors begin with an ideological bias that assumes all regulation is objectionable as an encumbrance on private property or, on the opposite side, that catastrophic market failures, such as the 2008 meltdown of the financial services sector, provide sufficient evidence to justify the re-regulation of industries back to early 20th century standards.

For the emerging broadband ecosystem, this paper rejects both approaches as elevating ideology over methodology. It offers instead a framework based on a more pragmatic view of dynamic communications markets, whose core technologies and attendant business models continue to evolve rapidly, following an emerging model of business and product innovation that has recently been termed "Big Bang Disruption."[2]

In the fast-changing broadband ecosystem, the abundance of successful and failed business and technological experiments, as well as the unintended negative consequences of antiquated legacy regulation, offer profound opportunities for the development of a new policy framework based on the principles of what John Mayo has called Results-Based Regulation (RBR).[3]

As technological disruption increases, desired policy outcomes become more difficult to design and engineer. Yet commentators continue to overstate the limits of the FCC's technical, economic and

[1] This paper draws on new research at the Georgetown Center for Business and Public Policy and its recently-announced Evolution of Regulation and Innovation Project. The Project is aimed at developing fact-based policy recommendations to encourage the continued development of broadband networks in a world where voice, video and data have converged into a single ecosystem of infrastructure, content, and service providers using all-IP networking technology.

[2] Larry Downes and Paul Nunes, BIG BANG DISRUPTION: STRATEGY IN THE AGE OF DEVASTATING INNOVATION (Penguin Portfolio 2014).

[3] John W. Mayo, *The Evolution of Innovation: Twentieth Century Lessons and Twenty-First Century Opportunities*, 65 FEDERAL COMMUNICATIONS LAW JOURNAL 119 (2013).

business expertise. Implicitly and explicitly, they encourage the agency to continue a failing strategy that could be thought of as a form of "intelligent design": a bankrupt idea that complex and fast-changing information markets can be shaped by deliberative regulatory bodies operating under a statutory framework that has changed little from the days of early radio.

This paper evaluates the danger of such proposed policy frameworks and their failure to consider empirical evidence of market dynamism as a natural source of skepticism both about the potential for regulators to keep pace and for the strong possibility that market forces will more efficiently and quickly resolve unpredictable future failures.

This paper proposes an alternative framework, one based on overwhelming data demonstrating that industries undergoing dramatic transformation at the hands of disruptive technologies correct their own failures faster and more cost-effectively than regulators can, and with fewer undesirable side-effects. In contrast to the "intelligent design" approach, the proposed framework might be thought of as pursuing instead in a kind of "digital Darwinism"—letting the ecosystem heal itself until such time it is clear a narrowly-tailored intervention can do better.

As with its biological counterpart, digital Darwinism is a pragmatic theory based on directly-observed phenomenon, rather than an article of religious dogma in either the power of government or of capitalist systems. It is rooted not in absolute faith in market mechanisms but in the realities of hundreds of years of technological change.

To be clear, even markets experiencing constant disruption are by no means perfect regulators of anti-consumer behavior. But they can be shown to be more likely to resolve failures than ex ante outcome-determinative interventions, and do so without the high risk of imposing unintended negative consequences.

For failures that are not resolved quickly and effectively by a next and fast-approaching generation of technology disruptors, regulators including the FCC can still play a valuable role, not by trying (and often failing) to shape outcomes but rather by crafting targeted remedies to specific consumer harms, whether through adjudication of complaints or through rulemakings with limited scope and duration.

In this context, existing antitrust and anti-competitive laws provide the ultimate backstop to protect against market failure, especially when applied with what FTC Commissioner Maureen Ohlhausen has referred to as "regulatory humility."[4] Rather than directing regulation as an omniscient first mover in industry evolution, such an approach approximates the goals of modern genetic engineering, operating under strict scientific controls to minimize the potential of unforeseen consequences and environmental damage.

This paper concludes with a review of key touchstones in the history of communications policy, both those that did and did not rely on RBR approaches in both design and execution. Failures of "intelligent design" include the long-running proceeding on set top box standards, the 2010 Open Internet order, recent spectrum auctions (including the 2008 C Block auction and the 2014 H Block auction), and the dangerously ad hoc spectrum "screen" applied in the FCC's review of license transfers.

By contrast, successes in "digital Darwinism" include the balanced approach of Section 332 of the Communications Act, the incentives for competition inherent in the FCC's 1999 draft strategic plan, the vision and stretch goals offered in the 2010 National Broadband Plan and the general approach toward the Internet of both the Clinton and Bush Administrations encapsulated in the 1996

[4] "The Internet of Things: When Things Talk Among Themselves," Remarks of Commissioner Maureen K. Ohlhausen, FTC Internet of Things Workshop, November 19, 2013, *available at* http://www.ftc.gov/sites/default/files/documents/public_statements/remarks-commissioner-maureen-k.ohlhausen-ftc-internet-things-workshop/131119iotspeech.pdf .

Communications Act, recently summarized by Clinton Senior Advisor Ira Magaziner as "first do no harm."

Time for a Change

The Communications Act, the FCC's governing statute, has not been significantly reformed since 1996, at the dawn of the consumer information revolution and the emergence of the Internet as the central networking technology across communications technologies and applications. While most commentators consequently agree on the need for a general reconsideration of core communications law, few understand the underlying engineering and business realities that have long since taken over as the de facto regulator of today's dynamic and fast-changing information industries.

Communications technologies and their associated industries are now in the midst of their most profound technological transformation in over a century of evolution. The old public-switched telephone network (PSTN) is joining other obsolete networking technologies in converting to the packet-switched network protocols of the Internet. Analog equipment is being replaced with digital; copper is being replaced or supplemented with fiber optic cable. Voice, video and data are converging onto a single standard, and moving over a single global network infrastructure.

The emerging communications ecosystem, which includes broadband networks using fiber, cable, satellite and mobile technologies, is exponentially more efficient, extendable, and powerful than the separate, aging networks it is or has replaced. It offers new services that were unimaginable just a few years ago, including real-time video chat, entertainment programming on demand, telemedicine, distance education, smart grids, and machine-to-machine communications--and promises to accelerate its offerings in the coming decade. It is generating profound economic growth and new competitive advantage for businesses that are leading the revolution.

The nature of data, voice and video communications has changed utterly, and will continue to evolve as technology industries complete their conversion to Internet standards. Wireline voice networks that were once isolated as a matter of technology, application, and law, increasingly compete not only with each other but with providers of mobile and other broadband networks, as well as cloud hosting and digital commerce services, content providers, consumer electronics device manufacturers, and operating system and other software developers.[5] Already, American consumers are enjoying the benefits of highly competitive, integrated markets for all manner of communication and information services.

While phone companies once dismissed the Internet as an inferior communications protocol for voice, carriers large and small have now embraced it. As switched network technology matured, IP has zoomed ahead, supporting exploding demands from consumers, small businesses, cloud-based services, and the coming deluge of machine-to-machine communications known as "the Internet of Things." This new ecosystem is emerging organically from the deployment of robust, global broadband IP networks, a dividend from over $1 trillion in private funding invested in IP-based technologies in the first decade of the commercial Internet.[6]

These disruptors are unique in economic history in that they emerge both better and cheaper than established products and technologies. In a matter of days or weeks, as a result, consumers can abandon the old for the new, leaving incumbent providers little time or opportunity to respond. The result is often the decimation of long-standing industry supply chains, a sudden and violent version of

[5] Larry Downes, *FCC Refuses to State the Obvious: Mobile Market is Competitive*, CNET NEWS.COM, April 3, 2013, *available at* http://news.cnet.com/8301-1035_3-57577630-94/fcc-refuses-to-state-the-obvious-mobile-market-is-competitive/.

[6] *See* Reed Hundt & Blair Levin, THE POLITICS OF ABUNDANCE: HOW TECHNOLOGY CAN FIX THE BUDGET, REVIVE THE AMERICAN DREAM, AND ESTABLISH OBAMA'S LEGACY 9 (2012).

what economist Joseph Schumpeter famously characterized as the "perennial gale of creative destruction" of modern capitalist economies.[7]

The smartphone alone has already spawned many such disruptors. Consider just a partial list of the products and services already or soon-to-be retired by mobile devices, including: address books, video cameras, pagers, wristwatches, maps, books, travel games, flashlights, home telephones, Dictaphones, cash registers, Walkmen, day timers, alarm clocks, answering machines, yellow pages, wallets, keys, phrase books, transistor radios, personal digital assistants, dashboard navigation systems, remote controls, newspapers and magazines, directory assistance, travel and insurance agents, restaurant guides and pocket calculators— just to name a few.

As these examples suggest, the communications industry itself is being affected more profoundly than any other by disruptive technologies. It perfectly fits the pattern of gradual then sudden industry transformation Paul Nunes and I refer to as "Big Bang Disruption." Based on an on-going multi-industry study of disruptive innovation conducted in collaboration with the Accenture Institute for High Performance, Big Bang Disruption argues that the nature of innovation has entered a new era of ultra-competitiveness, driven not by old-fashioned static approaches to strategic planning but by the largely uncontrollable force of technologies that continue to experience exponential improvements in price and performance.

Chief among these disruptive platforms are computer processors and related technologies including storage, memory, displays, sensors and broadband networks. Digital technologies continue to follow the radical prediction of Intel co-founder Gordon Moore, who wrote in 1965 that economies of scale in manufacturing, along with miniaturization of components, would for the foreseeable future

[7] Joseph A. Schumpeter, CAPITALISM, SOCIALISM, AND DEMOCRACY (Harper 3d ed. 2008) (1942).

allow semiconductor manufacturers to produce chips with twice the computing capacity every twelve to eighteen months, while holding price constant.[8] (See Figure 1)

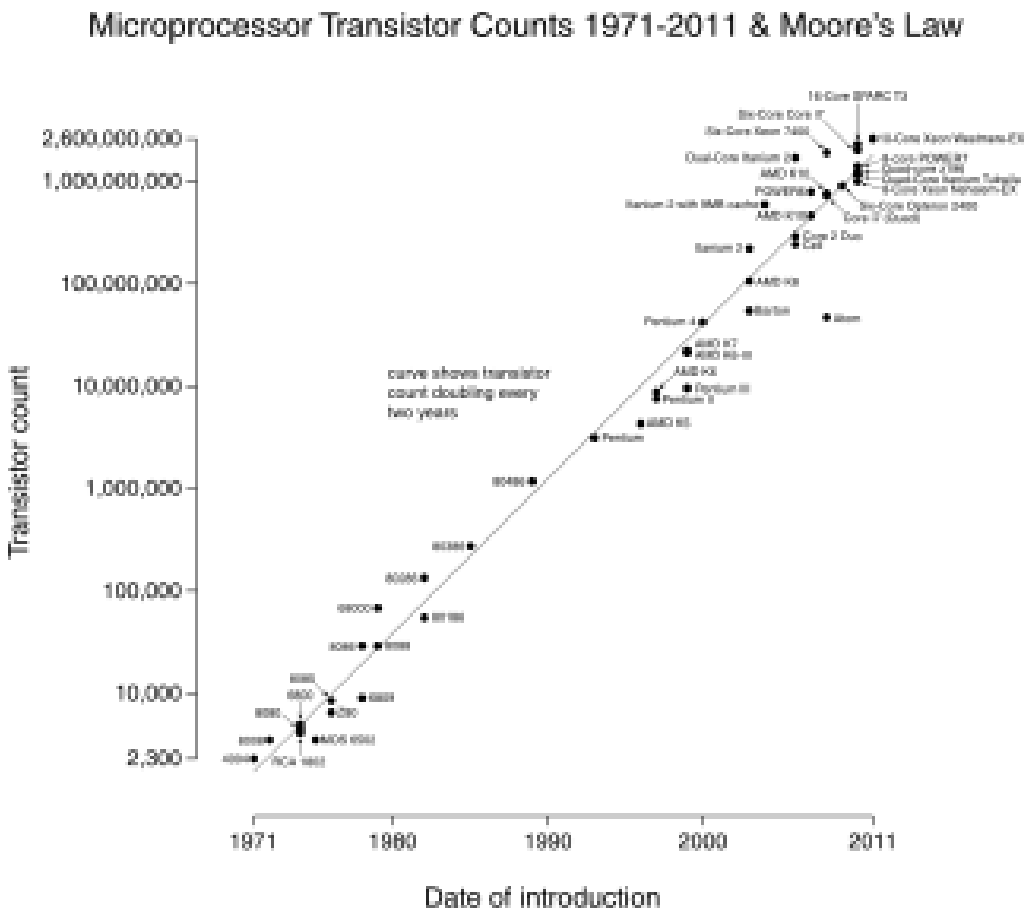


Figure 1 – Moore's Law

Fifty years of continued application of the faster-cheaper-smaller principle of Moore's Law has created the information revolution experienced by consumers around the world. Even without adjusting for inflation, computer-intensive products and services, encompassing much of the computing, consumer electronics and entertainment industries, continue to become better ***and*** cheaper in each of increasingly short new product cycles. Consumers now expect the phenomenon to continue and punish

[8] Gordon E. Moore, *Cramming More Components onto Integrated Circuits*, Electronics, pp. 114–117, April 19, 1965.

even industry leaders if they feel any hesitation to cannibalize existing products and markets. Today's market dominator can quickly become tomorrow's also-ran, or worse.

As embedded computing capacity becomes an increasingly important component of products and services far from traditional electronics markets—including automotive, manufacturing, agriculture, consumer products, energy, and health care—the digital revolution is becoming the central driver of economic performance, growth, and wealth creation for every sector of the economy, and for both developed and developing nations.

The introduction of new goods that are both better and cheaper right from the beginning is changing the nature of competition across industries. Incumbents who could once rely on scale and high switching costs to produce only incrementally improved products while comfortably maintaining profit margins now find that life-cycles have become shorter and customers defiantly disloyal. In goods including games, electronics, smartphones, the jump to better and cheaper alternatives, even from new entrants, can be sudden, crossing all traditional marketing segments from early adopter to laggard.

Beyond these traditionally hypercompetitive industries, the dramatic explosion of mobile broadband devices and networks has given software-based companies new opportunities to exploit inefficiencies in more stable industries. Innovators are now using that platform to introduce more consumer-friendly interfaces that are disrupting services including hotels, taxicabs, professional services, energy and even health care. It is no exaggeration to say that the very idea of industry is now under extreme pressure, a kind of "creative destruction" on steroids.

Nowhere is the better and cheaper transformation of industry, the driving force of Big Bang Disruption, more visible than in the industries overseen directly and indirectly by the FCC—communications, computing, entertainment and other forms of information creation, distribution and consumption. As prices for voice, video and data transmission continue to plummet at the pace

predicted by Moore's Law,[9] incumbents have scrambled to reinvent their businesses from within what are often closely-regulated constraints. As content providers, device manufacturers, and operating system providers increase their competitive leverage, traditional voice, video and data carriers have diversified into new businesses and new technologies, now offering digital voice and multi-channel video services, for example, and some of the most robust mobile broadband networks in the world. (See Figure 2)

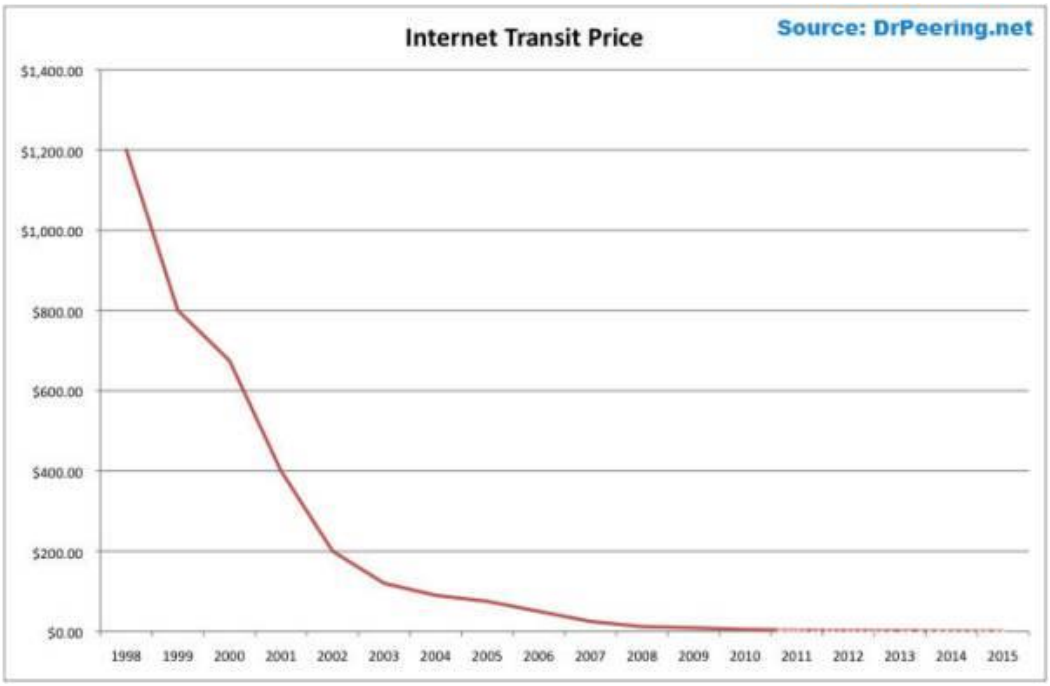


Figure 2 – Collapsing Price of Internet Transit

This accelerating pace of industry change has profound implications for the regulatory process, particularly for agencies operating at the center of Big Bang Disruption. Dynamic, technology-driven markets, for example, increasingly remedy their own harms more quickly and far more efficiently than regulators can. As change accelerates, on the other hand, the deliberative pace of regulation

[9] See FCC, *16th Mobile Competition Report,* WT Docket 11-186, Section 5.E at ¶¶ 265-275 (2013).

increasingly means that by the time laws are passed and rules are made, consumers, markets, and providers have long since moved on.

Under laws that date back nearly a century, regulatory agencies such as the FCC continue to tinker with 21st century problems using a 19th century toolkit. They are encouraged to do so by the siren song of competitors who prefer to lobby than to evolve, and by state and local regulators who fear they will play a far smaller role in the broadband future.

But it is simply impossible even for those of us in Silicon Valley and other technology hubs to anticipate how future technology improvements will evolve and the kinds of markets they will both create and destroy. Governments and their cheerleaders who believe otherwise must admit to and correct this institutional hubris. Today's laws and regulatory rules reflect a profoundly dangerous belief that, despite being disconnected from the messy realities of rapid technology change, regulations can nonetheless predict the future and head off consumer harms that haven't yet occurred.

New Approaches to Communications Policy: Now Wait for Yesterday

[N.B. This section will review the growing literature from two largely opposing views of how to rethink communications policy in the 21st Century. Authors begin with an ideological bias that assumes all regulation is objectionable as an encumbrance on private property or, on the opposite side, that catastrophic market failures, such as the 2008 meltdown of the financial services sector, provide sufficient evidence to justify the re-regulation of industries back to early 20th century standards.]

The latter viewpoint reflects a largely academic faith, untested by empirical evidence or market realities even in previous incarnations, in a policy version of "intelligent design": a belief that regulators, given enough jurisdictional power and judicial deference, can shape market outcomes to desired public policy goals even in industries undergoing rapid and even constant transformation. The intelligent

design view relies heavily on the myth of agency expertise and ignores a long history of efforts to create competition or empower consumers that foundered not so much on a failing of the experts so much as the unpredictability of emerging ecosystems with complex interactions and a regular infusion of disruptive technologies, products, services, and entrepreneurs whose behavior and capabilities simply can't be predicted.

In today's hyper-dynamic information ecosystem, the FCC can no more use even an expanded jurisdiction to conform long-term industry structure and practices to general policy goals than the National Weather Service could use expanded authority to change the weather. And like the Weather Service, even with the best experts, the FCC's ability to predict the behavior of industry participants can't hope to extend beyond a few days, at least not with any level of confidence.

Beyond the limits of agency expertise, the FCC is hamstrung by a charter that has become hopelessly anachronistic, leaving the agency with little to ground their decisions and priorities. As a function of its very structure, the FCC still views the world of communications in stovepipes—it has a bureau for broadcast TV and radio, a bureau for wired communications, a bureau for mobile--still called "wireless," as if it were a fad.

The stovepipes were organized for communications technologies in which non-overlapping providers operated at particular frequencies to offer specific forms of communications—voice, television and radio programming, data, cellular service. Technologies, in other words, that pre-date the move to send everything digitally over the combined network assets of everyone, using the open standards of the Internet.

The more blurred the lines, the more difficult it is for the agency is to respond quickly and effectively to changing needs. And the lines have blurred beyond all recognition. The FCC's organization makes it difficult if not impossible for the agency to see what the rest of us see – networks converging at breakneck pace onto the open, global IP standard.

Given its structure, the agency treats every digital innovation as a special case requiring special rules. First there were special rules for Voice over IP, then for television over IP, and now for radio over IP. But these aren't exceptions. They represent the new normal. As Commissioner Kathleen Abernathy presciently observed in 2004, the agency needs to stop making exceptions and reorganize itself for a future version of communications technology and applications based on "everything over IP."

We've long-since arrived at that future. Digital convergence has erased distinctions between voice and data, between broadcast and telephone, between television, radio, and "other," between wired and wireless, between modes of transit whether copper, cable, satellite, radio, fiber, power line, between carriers private or public, single mode or intermodal. We use computers to watch television and make phone calls; we use phones and televisions to process data. It's a brave new world, populated by wondrous creatures.

But compare that world—the world in which consumers live—to the FCC's 2011 organization chart,[10] with separate bureaus for separate technologies and local offices to handle local requirements. The bureaus and offices reflect, in structure and law, the pre-IP world, where these differences mattered, where consumers had single-purposes devices that worked with particular content over particular communications technologies, where available content differed dramatically in different parts of the country, and where industries were separate and companies offered only one mode of communications, either of infrastructure or content.

The mismatch between the real world and the agency's organizational view of it is the real problem here. Every time a new problem (in Silicon Valley, we call it an "innovation") comes up—Voice over IP, cable Internet, mobile broadband--the Communications Act and the structure it imposes on the FCC offers the agency's staff no guidance. Political forces want the FCC to take partisan positions. Entrenched players want the agency to stop the upstarts, or force them to abide by the same

[10] See http://www.fcc.gov/bureaus-offices.

obsolete regulations that constrain legacy providers. With little else to fall back on, the FCC is left, more and more frequently, to improvise, falling back dangerously on the undefined and chameleon-like "public interest" provision of the law as justification.

And as soon as it does, the agency becomes untethered from it engineering, economic, and expert staff, leaving nothing but the shifting winds of political and interest-group change to blow it around, like a plastic bag, from one tree to another. Thus arises the myth of intelligent design: that, absent real data and real authority, the agency nonetheless has the expertise, capacity, and the imperative to intervene at its own pace in markets that have long-since moved on to new destinations and new challenges.

As an example of the dangers of intelligent design, consider the agency's current practice with regard to spectrum license transfers associated with merger and acquisition transactions. Under the FCC's "public interest" review, the agency has backed itself into a crabbed and dismal view of the mobile marketplace, more 19th century than 21st century. It reviews each transaction as if mobile technologies were stagnant, demand were flat, and the only competitive pressure on licensees comes from other "national carriers." The FCC gives no consideration to the vital role played by nearly a dozen distinct forms of technology-driven market discipline (described below) that the agency dutifully catalogs and tracks in its reports.

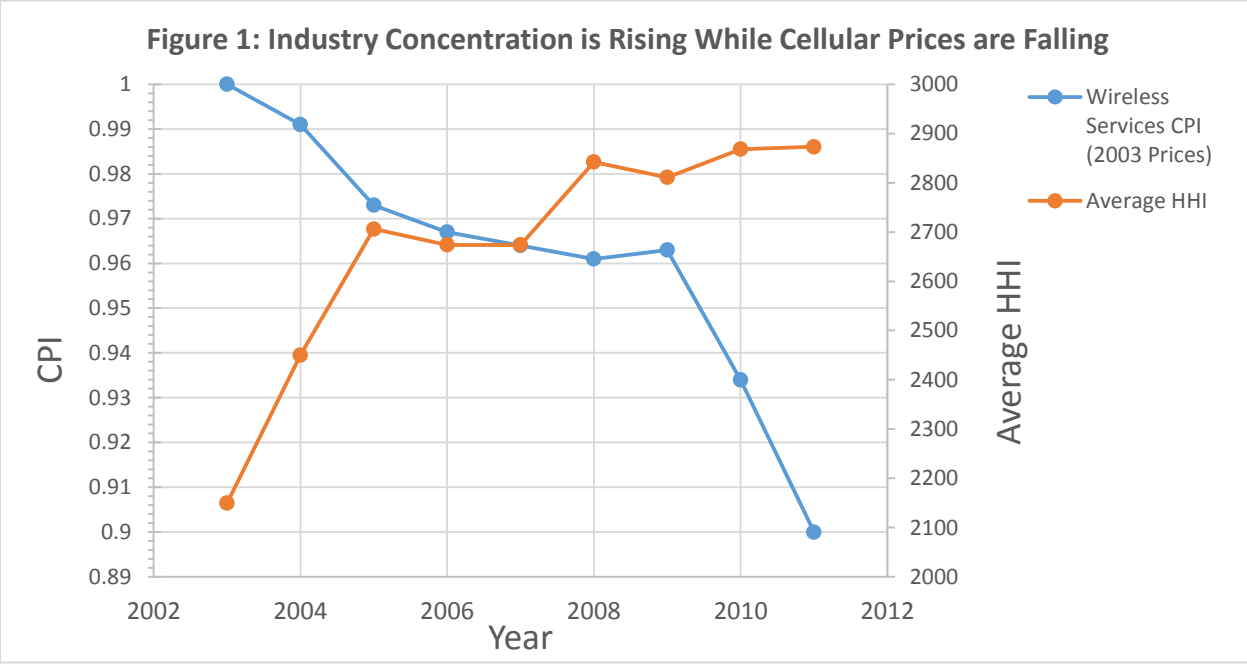
Today, the absence of basic technological or economic rigor in transaction reviews is masked by page after page of detailed data analysis that is then ignored. The FCC then obscures this failure with the misapplication of obsolete and inapplicable pseudo-measures of market concentration, notably the Herfindahl-Hirschman Index (HHI) and the so-called "spectrum screen."

The HHI, a 1940's era calculation that estimates the level of concentration in a given industry, mechanistically sums the squares of market share for each direct competitor in whatever the agency

decides is a relevant local market. The FCC then assumes without evidence that arbitrary numerical ranges predict "concentrated" or "highly concentrated" conditions that would result from a merger.

The agency next takes a dangerous leap of faith, assuming that such concentration is likely to lead to anti-competitive behavior the market would not correct on its own, and that such behavior would result in higher prices and other consumer harms.

Yet measured simply by HHIs, the overall mobile industry has been "highly concentrated" since 2005, at levels the FCC has recently said, without any evidence, trigger a "presumption" of "harm to competition."



Source: HHI from 16th Wireless Report Table 14; Wireless CPI from 16th Wireless Report Table 37.
Notes: Population-weighted average HHI of 172 Economic Areas as computed by the Commission. Cellular CPI is denominated in 2003 prices.

As every consumer knows, the untortured data tell a very different story. Despite those levels of concentration, prices for voice, text, and data have continued to plummet.[11]

The HHI calculation, in any event, is of no value. As the FCC explains in all of its reports, competition in the mobile ecosystem is much more complex and sophisticated than simplistic market concentration might infer, affected in critical ways by a wide range of factors beyond the customer base or spectrum holdings of direct competitors. According to the FCC's most recent Mobile Competition reports,[12] for example, these include:

1. **Regional and local competitors** – Despite the FCC's focus on national market share, most consumers choose their carrier based on local alternatives; they don't buy based on the strength of nationwide coverage. At the local level, 90% of U.S. consumers can choose from five or more carriers for voice; 80% have three or more choices for mobile broadband.

2. **Device manufacturers** – The availability of particular tablets and smartphones on a network plays a significant role in which carrier a consumer chooses. From 2008-2009, for example, 38 percent of those who switched carriers did so because it was the only way to obtain the particular handset that they wanted. If anyone has market power, it is the device manufacturers—and that power rises and falls with each new model and the changing market share of different operating systems and app stores.

3. **Operating system developers** – Consumer decision-making is also highly influenced by the availability of a particular operating system (iOS, Android). Android captured 20% of the mobile O/S market in the first six months, giving Google considerable leverage in the market overall.

4. **Apps** – Consumers also make choices based on the availability of preferred apps, including music, video, geolocation, and social networking services. The most popular activity by far for today's smartphone users is games, some of which are only available on some devices or operating systems.

5. **Enhanced spectrum** – Technology has continued to make more bands of spectrum usable for more types of communications. Clearwire now offers mobile broadband using spectrum in the >1 GHz range; Dish Networks has proposed the use of satellite spectrum to offer 4G service.

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[11] *See also* Gerald R. Faulhaber, Robert W. Hahn & Hal J. Singer, *Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports* (July 11, 2011), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1880964.

[12] *See* 16th Annual Mobile Competition Report*, supra* note 7. *See also* Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services, Fifteenth Report (June 27, 2012), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-103A1.pdf.

And the LTE protocol is dramatically more efficient in its use of spectrum than earlier generations.

6. **Available spectrum and cell tower infrastructure** – Carriers continue to invest billions every year in enhanced infrastructure. But the quality of service network operators can provide is still highly constrained by the lack of available spectrum. At the local level, delays and even corruption in approving applications to add towers or antennas makes it difficult for network operators to make the best use of the limited spectrum they have. At the end of 2009, over 3,000 applications to add or modify cell towers and antennae had been pending for over a year; many for over three years.

7. **Off-the-charts demand for capacity** – Carriers are also pressured by incredible increases in demand for mobile broadband. Since the introduction of the iPhone in 2007, AT&T reported an increase of over 8,000% in data traffic.

8. **No-contract carriers** – As capacity constraints push contract carriers to curtail unlimited data plans, competition from no-contract or "pre-paid" providers has intensified. The distinction between pre- and post-paid networks is increasingly meaningless, yet the FCC gives little to no weight to the discipline such providers exert in reviewing transactions.

9. **Inter-modal competition with wired networks** – By 2010, 25% of all U.S. households relied exclusively on mobile connections for home voice service ("cutting the cord."). As high-speed, high-capacity LTE networks (and whatever comes after LTE) are deployed, mobile carriers will increasingly compete with wired carriers for the same customers, including traditional phone and cable companies. The pool of competitors is expanding, not contracting.

Thanks to these varied forms of market discipline, even a mobile ecosystem that is "highly concentrated," at least as measured by HHIs, doesn't seem to have harmed consumers. To the contrary. As every measure of market performance collected by the FCC makes clear, the broadband ecosystem is providing consumers with a phenomenal range of new products and services, at the most competitive prices of any industry.

That's because there are plenty of other sources of competition in the market beyond direct competitors, sources well documented by the FCC itself. Put more simply, concentration measured by HHI concentration has become a worthless tool in evaluating mobile competition.

Backing up the HHI analysis is the voodoo of the spectrum screen, a remarkably elastic and utterly unscientific tool that purports to test the competitive impact in local markets of proposed license transfers.

The spectrum screen was introduced to simplify the review of license transfers,[13] but in recent reviews it has morphed into a presumption of harm in markets where the screen is exceeded.

In either case, the spectrum screen is a poor proxy for several reasons. It includes only some frequencies licensed for mobile services and leaves out others more or less randomly, often modifying that list in different markets — as if radio technology worked differently in California than it does in Virginia.

Worse, the screen treats all the included frequencies as if each band, whether above or below 1 GHz, whether complementary or not to the parties' existing holdings or those of its competitors, were of identical value to each network operator. The FCC's own data collection amply reveals the technical and economic fallacy of such a gross simplification.

The screen is also modified from transaction to transaction on an *ad hoc* basis, based on no established or even articulated criteria, leaving the strong impression that the adjustments are made simply to get the numbers to come out the way a majority of the Commissioners wants them to come out, for reasons that can only be guessed. Even the appearance of post hoc rationalization undermines the integrity of the FCC's transaction reviews.

The spectrum screen's failings as an analytic tool are legion. Since its invention, it has never been the subject of any formalization subject to notice-and-comment; the screen simply lumbers, like Frankenstein's monster, from one transaction review to the next. To its credit, the FCC recently issued a Notice of Proposed Rulemaking aimed at making some sense of it, or perhaps to put it to a much-

[13] Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation For Consent to Transfer Control of Licenses and Authorizations, WT Docket No. 04-70, Memorandum Opinion and Order, 19 FCC Rcd 21522, 21552 ¶¶ 58, 106-112 (2004), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-255A1.pdf.

needed demise.[14] But the Commission's true intentions are unclear. As Commissioner Pai pointed out, the NPRM did not, in fact, propose any rules.[15]

There is, in fact, no sense to be made of the screen, beyond its stated purpose to quickly eliminate those local markets that clearly require no competitive review. All that can be said in support of the screen as a measure of harm, on the other hand, is that it is marginally less arbitrary and open to manipulation than the previous *per se* spectrum cap, which, incredibly, the Commission is now considering reinstating.

Digital Darwinism

[N.B. This section details an alternative framework for communications policy, which rejects the religious dogma of regulatory and deregulatory absolutists—both forms of "intelligent design." The alternative framework, based on fact-based observation of fast-changing ecosystems, constitutes what might be thought of as "digital Darwinism:" a theory based on the actual behavior of current and historic markets undergoing profound and accelerating disruption and transformation driven by exponential improvements in core technologies.]

Digital Darwinism is built on the principles of Results-Based Regulation (RBR). RBR methods employ detailed empirical analysis of counterfactual alternative governance mechanisms as guideposts for regulatory and deregulatory policymaking. Such methods have arguably provided the most successful vehicle to date for determining when policy should move more toward regulatory, or more toward deregulatory market governance mechanisms.

[14] *In the Matter of Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, Notice of Proposed Rulemaking (Sept. 28, 2012), http://www.fcc.gov/document/mobile-spectrum-holdings-nprm.
[15] Concurring Statement of Commissioner Ajit Pai, *In re Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, at 49 (Sept. 28, 2012) ("[T]oday's Notice of Proposed Rulemaking contains no notice of proposed rules."), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-119A1.pdf#page=49.

A core element of such a regulatory approach asks whether proposed, or extant, regulations affirmatively can be shown to benefit economic welfare relative to the alternative of resource allocation that relies more heavily on market-based transactions.

This paper proposes an alternative framework based on overwhelming data demonstrating that industries undergoing dramatic transformation at the hands of disruptive technologies are much more likely to correct their own failures faster and more cost-effectively than regulators can. As with its biological counterpart, digital Darwinism is a pragmatic theory based on directly-observed phenomenon, rather than an article of religious dogma in either the power of government or of capitalist systems.

To be clear, even markets experiencing on-going disruptions are by no means perfect regulators of anti-consumer behavior. But they can be shown to be more likely to resolve failures than outcome-determinative interventions, and do so without the high risk of imposing unintended negative consequences.

For failures that are not resolved quickly and effectively by a next and fast-approaching generation of technology disruptors, regulators including the FCC can still play a valuable role, but not in designing outcomes. Rather, the regulatory role of expert agencies undergoing high-speed evolution should be the development targeted remedies to specific consumer harms, whether through adjudication of complaints or through rulemakings with limited scope and duration. Think of these as genetic engineering—carefully planned and limited interventions to address specific failings of the functioning ecosystem.

Beyond regulation, the primary job of agencies practicing digital Darwinism is to encourage and even inspire future innovation in the public interest. That goal is supported by continually reviewing and eliminating legacy regulatory obstacles that skew the natural trajectory of technological change and by

liberal use of the agency's bully pulpit and expert-driven credibility to develop and promote stretch goals that challenge industry participants.

A good example of that kind of complementary activity is the FCC's 2010 National Broadband Plan, discussed below. Though the agency thus far has largely failed to actively promote the powerful visions of a connected future detailed in the last several chapters of the Plan, the document itself laid the foundation for what could still be a major public education campaign by the FCC to get both consumers and industry participants focused on those goals the agency has made a strong case for prioritizing.

In this context, existing antitrust and anti-competitive laws provide the ultimate backstop to protect against market failure, especially when applied with what FTC Commissioner Maureen Ohlhausen has referred to as "regulatory humility."[16] Rather than operating as the first mover in industry evolution, such an approach approximates the goals of modern genetic engineering, operating under strict scientific controls to minimize the potential of unforeseen consequences and environmental damage.

In rejecting the intelligent design approach to communications policy, digital Darwinism explicitly disfavors any regulatory proceeding that proceeds on the assumption that regulators can both predict and change the future of industry structure and competitive outcomes. It rejects as both dangerous and overconfident rulemakings that purport to head-off consumer harms that have not yet occurred--that is, regulations that are, to use the FCC's term, "prophylactic" in nature.[17]

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[16] "The Internet of Things: When Things Talk Among Themselves," Remarks of Commissioner Maureen K. Ohlhausen, FTC Internet of Things Workshop, November 19, 2013, *available at* http://www.ftc.gov/sites/default/files/documents/public_statements/remarks-commissioner-maureen-k.ohlhausen-ftc-internet-things-workshop/131119iotspeech.pdf .

[17] Larry Downes, *Unscrambling the FCC's Net Neutrality Order: Preserving the Open Internet, but Which One?,* 20 Comm Law Conspectus 83 (2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2164985. The phrase "prophylactic" appeared nearly a dozen times in the Open Internet order, an acknowledgment that despite

It also cautions strongly against agency action of any kind that is based on hyperbolic but theoretical worst-case scenarios, fact-free hypotheticals, and transient albeit serious interruptions in the smooth performance of the ecosystem--what Adam Thierer refers to as "techno-panics."[18]

In a related constraint, it urges regulators to be particularly cautious of entreaties to act on behalf of protected consumer interests when those interests are being vigorously urged by industry competitors who will themselves benefit directly from agency action, or what former FCC Commissioner Robert McDowell has called the "please regulate my rival" approach.[19]

Finally, it encourages the agency to act whenever possible in a bi-partisan manner, focusing on fact-based determinations and true expertise rather than political expediency—often the source of the most ill-fated actions.

When and how should the FCC act under a framework of digital Darwinism? The short answer is only when it is clear that intervention is necessary to resolve market failures that have not been and are not likely to be corrected by the next generation of Big Bang Disruptors, and where the agency can fashion remedies that do not do more harm than good.

A digital Darwinism framework based on the principles of RBR would require the FCC to identify actual consumer harms before regulating to correct them; to conduct realistic economic analysis; to subject proposed remedies to neutral cost-benefit analysis; to consider more effective alternatives; and to evaluate the performance of rules after they have been put into effect and retire them at the earliest possible moment.

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a vast data collection effort, the agency could find almost no examples of non-neutral behavior in over a decade of commercial ISP services, despite the absence of enforceable FCC rules that prohibited it.

[18] Adam Thierer, *Technopanics, Threat Inflation, and the Danger of an Information Technology Precautionary Principle,* 14 Minnesota Journal of Law, Science and Technology 309 (2013).

[19] See http://www.fcc.gov/document/commr-mcdowells-speech-possible-itu-regulation-internet.

While that approach does not preclude rulemakings, it is strongly biased in favor of adjudications based on general principles of antitrust and anti-competitive law already established by a long history of agency and judicial review.

Specifically, agency action should be limited to situations where each of the following conditions has been satisfied:

1. Market failures have continued long enough to generate a record of demonstrable consumer harm.

2. It is objectively unlikely that an upcoming change in core technology will resolve the harm in a relatively short (less than two years) period of time.

3. The FCC reasonably believes it can fashion a limited remedy to address the consumer harm with limited side-effects elsewhere in the industry or to other ecosystem participants, positive or negative.

4. The costs of developing, implementing, and policing the remedy can be reasonably shown not to exceed simply accepting the continuing harm, until such time as a more acceptable remedy can be developed or technology change ultimately resolves the failure.

5. In developing, implementing, and policing the remedy, the FCC's expertise makes it the least-cost and most effective of possible institutions (including the Federal Trade Commission, the Department of Justice, or public or private litigation based on existing antitrust or anti-competitive law) with authority to intercede.

The foundations for a more productive role for the FCC—a role consistent with the agency's long-stated statutory purposes--are already in place. In preparation for the many reports the agency is required to produce, agency staff have become adept at collecting and reporting vast troves of useful information regarding market conditions, consumer behavior, and competition.

These reports describe an increasingly complex communications ecosystem in which all manner of content is now being delivered on converged IP networks, and in which market discipline comes not just from direct competitors but from every participant in the ecosystem—including device makers,

software developers, service providers, and consumers themselves. In some sense, the agency simply needs to integrate that knowledge into its regulatory activities.

The minimal level of analytic rigor required by RBR has long been mandatory for Executive agencies. As if such confirmation were necessary, in 2011, President Obama made clear that he expected (though could not require) the same basic tools be applied as a matter of course by independent regulatory agencies including the FCC.[20]

But an RBR-based framework for the dynamic communications industry would go farther in the direction of common sense. For rules and amendments that may have a significant economic impact, the RBR approach requires the agency to identify specific market failures, actual consumer harm, the burden of existing regulation and a reasoned determination that the benefits of the adopted rule or amendment justify its costs, taking into account alternative forms of regulation. In deference to the realities of markets involving digital technology, it also sensibly requires that the agency consider the possibility that market forces or changes in technology are unlikely to resolve within a reasonable amount of time the specific market failure or actual consumer harm.

In effect, an RBR-based framework replaces the free-ranging and often-opaque intelligent design approach of today's FCC with the reasonable and uncontroversial genetic engineering tool of cost-benefit analysis. Ensuring that the costs of regulation do not exceed their benefits, and requiring the agency to consider alternative rules that could address the same harms more efficiently, has been a goal of "good government" reform for decades. It is an entirely bi-partisan goal.

[20] Exec. Order No. 13579, 76 Fed. Reg. 70913 (July 11, 2011), *available at* http://www.whitehouse.gov/the-press-office/2011/07/11/executive-order-regulation-and-independent-regulatory-agencies.

Indeed, it is a goal shared by the current Administration. In another 2011 Executive Order, President Obama imposed precisely the same rigor on executive agencies.[21] The Executive Order requires executive agencies to

> (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor its regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.[22]

The Executive Order, likewise, requires departments and executive agencies to operate with the same level of transparency mandated by an RBR approach. Specifically, the order called for agencies

> to provide the public with an opportunity to participate in the regulatory process. To the extent feasible and permitted by law, each agency shall afford the public a meaningful opportunity to comment through the Internet on any proposed regulation, with a comment period that should generally be at least 60 days. To the extent feasible and permitted by law, each agency shall also provide, for both proposed and final rules, timely online access to the rulemaking docket on regulations.gov, including relevant scientific and technical findings, in an open format that can be easily searched and downloaded. For proposed rules, such access shall include, to the extent feasible and permitted by law, an opportunity for public comment on all pertinent parts of the rulemaking docket, including relevant scientific and technical findings.[23]

[21] Exec. Order No. 13563, 76 Fed. Reg. 3821 (Jan. 18, 2011), *available at* http://www.whitehouse.gov/the-press-office/2011/01/18/improving-regulation-and-regulatory-review-executive-order.
[22] *Id.*
[23] *Id.*

There is no relevant reason these common-sense requirements should not apply to independent regulatory agencies such as the FCC, which the President made clear in a subsequent Executive Order extending earlier Orders to independent regulatory agencies, "to the extent permitted by law"[24]

Indeed, given the increasingly significant economic impact of FCC decisions affecting the broadband ecosystem, the RBR-based approach is urgently needed to meet what the President defined as the goal of cost-benefit analysis: not to neuter regulatory agencies or deny them flexibility but to "protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation."[25]

The shift to digital Darwinism need not be traumatic. The FCC's expert staff stands ready, willing and able to help the Commission make reasoned, timely decisions based on simple, economically sound principles that are grounded in real data. The agency already has the capacity to operate transparently, involving the public and explaining itself coherently to consumers. But it must be weaned from the inconsistent and dangerous practice of confounding markets with overbroad and misdirected rulemakings, amendments, orders and auction and transaction conditions.

The FCC, as noted, already collects precisely the kind of data it needs to perform meaningful analysis, yet time after time the agency steps back from the brink just before reaching a reasoned decision. Replacing the unstructured processes that have developed in recent decades with the kind of rigorous tools called for in the President's Executive Order would take the FCC far along the road toward the 21st Century, where we urgently need it to be.

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[24] *See* Exec. Order No. 13,579, *supra* note XX.
[25] *See* Exec. Order No. 13,563, *supra* note XX. Congress has already mandated such analysis for regulations that affect small businesses, a requirement largely irrelevant to FCC actions. *See* Curtis W. Copeland, *Economic Analysis and Independent Regulatory Agencies* (April 30, 2013), *available at* http://www.acus.gov/sites/default/files/documents/Copeland%20Final%20BCA%20Report%204-30-13.pdf.

[N.B. This section would apply the RBR framework to several recent and historical examples of FCC action, highlighting both the limits of intelligent design on the one hand and the benefits of digital Darwinism on the other.

Examples of failed "intelligent design" initiatives include:

- The on-going set top box inquiry, hopelessly outrun by unanticipated developments in consumer electronics markets
- The open internet order, highlighting the danger of "prophylactic" rulemaking
- Spectrum auctions for the 700 MHz. C block and the recent H block, highlighting how agency efforts to shape competition in the dynamic mobile ecosystem can easily backfire, generating unintended negative side-effects
- The ad hoc spectrum screen, whose transaction-by-transaction modification increasingly exposes the FCC to credible charges of being outcome-determinative

Examples of successful "digital Darwinism" initiatives include:

- The bi-partisan approach to light-touch regulation of the broadband ecosystem expressed in the 1996 Communications Act, and in a string of supporting policy decisions made by both the Clinton and Bush I administrations.
- The pragmatic, balanced approach to mobile markets embodied in Section 332 of the Communications Act
- The 1999 draft strategic plan prepared under the direction of FCC Chairman William Kennard, which accurately predicted that "In five years....The advent of Internet-based and other new technology-driven communications services will continue to erode the traditional regulatory distinctions between different sectors of the communications industry. ***As a result, over the next five years, the FCC must wisely manage the transition from an industry regulator to a market facilitator."***[26]
- The 2010 National Broadband Plan, which painted a vivid vision of a fully-connected broadband future and established aggressive targets for speed, adoption, spectrum availability and the retirement of the PSTN network, but did not seek to mandate how these goals should be achieved.

Conclusion

From these core principles, future research will develop specific RBR-based recommendations for regulation of broadband networks in the all-IP world, with close attention paid to crucial topics that include:

1. Spectrum auction design and license transfer

[26] FCC, *Strategic Plan: A New FCC for the 21st Century* (draft), 1999, available at http://transition.fcc.gov/21st_century/draft_strategic_plan.pdf.

2. Interconnection and peering
3. Network management and engineering
4. M&A transaction review and the application of “public interest” standards
5. Price regulation and network asset
6. Promoting universal broadband adoption through market and non-market mechanisms