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# THE EVOLUTION OF INNOVATION AND THE EVOLUTION OF REGULATION: EMERGING TENSIONS AND EMERGING OPPORTUNITIES IN COMMUNICATIONS \*

By

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## I. INTRODUCTION

The disruption of an industry's core technologies inevitably creates tension for regulatory institutions. This is especially true for sectors experiencing persistent disruptive innovation -- the defining feature of the communications industry for at least the last two decades.<sup>1</sup> In very short order, a century of switched voice communication networks have been supplanted by new, packet-based networks transporting voice, video and data interchangeably, rendering the legal and regulatory framework of the switched-voice era increasingly strained.<sup>2</sup>

In particular, the simultaneous transition and convergence of computing and communications networks to Internet Protocol (IP) – based technologies has created a robust new network architecture that continues to sow radical disruption among long-standing business models in the communications sector.<sup>3</sup> Of course, the IP revolution, still in progress, has drastically improved the quality and value of communications goods and services that consumers demand.<sup>4</sup> But at the same time, not surprisingly, it has fundamentally changed the economics of the industry.<sup>5</sup> By virtually all accounts, the innovations spawned by this remarkable new platform for economic growth and consumer surplus is also warping both the structure and value proposition of existing regulatory systems.<sup>6</sup> Substantive public policy challenges arise because rules and rulemaking processes fashioned in the monopoly era of telephony contemplate a set of regulatory trade-offs and consumer choices that are no longer accurate, or in

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<sup>1</sup> Gillaume Villon de Benveniste, *Disruptive Innovations are Undermining the Business Model of Telecommunications Companies, According to Gilles Negrel*, THE INNOVATION AND STRATEGY BLOG, <http://bit.ly/1sM5pww>.

<sup>2</sup> See generally LARRY DOWNES & PAUL NUNES, *BIG BANG DISRUPTION: STRATEGY IN THE AGE OF DEVASTATING INNOVATION* 28-29 (Portfolio Hardcover, 2014) (comparing traditional taxi businesses attempts to have regulators ban the new technology-based dispatching taxi businesses, such as Lyft, SideCar and Uber, rather than competing with the new services).

<sup>3</sup> See *id.* at 2 (claiming the source of disruption is the “programmable smartphone, a hybrid computing and communications device”).

<sup>4</sup> Zack Christenson, *FCC: Get With the IP Revolution*, ACI (Dec. 2, 2013), <http://bit.ly/16oy1BN>.

<sup>5</sup> *Id.* Stating that:

[L]everaging the power of IP (or internet protocol), systems like Skype, Vonage and a host of others have left consumers wondering why exactly they still pay for a legacy phone system. Major Internet service providers like Comcast have been offering their version of IP-based telephone as part of basic packages. Telephone industry giants like Verizon and AT&T have been pouring billions of dollars into infrastructure investment to keep pace.

*Id.*

<sup>6</sup> See generally WILLIAM J. BAUMOL, *THE FREE-MARKET INNOVATION MACHINE: ANALYZING THE GROWTH MIRACLE OF CAPITALISM 199-200* (Princeton University Press, 2002) (applying standard tools of microeconomic analysis to the innovation process).

many cases necessary.<sup>7</sup>

This incongruity has created tangible regulatory asymmetries. For example, wireline telephony provided by a “telco” is regulated by the Federal Communications Commission (FCC) under Title II of the Communications Act,<sup>8</sup> while the same communication carried by a cable-telephony provider or over-the-top Internet service using IP technology is not subject to Title II.<sup>9</sup> For backward-looking reasons, mobile, wireline, satellite and cable services are subject to different regulations enforced by different regulators and bureaus.<sup>10</sup> Video and data services are subject to entirely different rules and rule makers, often depending on the technology of delivery even as those networks converge.<sup>11</sup>

The resulting systems of regulatory governance are incontrovertibly complex. This complexity substantially raises the economic and social costs of regulation both to the producers and consumers of hundreds of billions of dollars worth of modern communications services.<sup>12</sup> If the benefits generated by the complex system of regulatory controls exceed their corresponding costs, then exporting these regulations into the future for new and emerging services may be warranted. If not, however, then there is no economic justification for extending them.<sup>13</sup>

The weight and import of this fundamental question, posed at a defining moment in the history of the communications industry, has correctly provoked calls for a serious reassessment of legacy communications governance structures, and specifically whether they continue to provide a sound foundation for advancing fundamental policy goals: “to make available, so far as possible, to all the people of the United States a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges.”<sup>14</sup>

Accordingly, it is essential to establish a logical and dispassionate framework to evaluate whether the existing governance structure both provides a robust platform for maximizing consumer value and promotes continued innovation. In this article, we seek to advance such a discussion in two important respects. First, we describe the changing nature of innovation in the communi-

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<sup>7</sup> Christenson, *supra* note 4.

<sup>8</sup> Federal Communications Act of 1934, 47 U.S.C. § 201 (2012).

<sup>9</sup> *Id.*

<sup>10</sup> *Id.* §§ 201, 543-44, 701-57, 1021-1205.

<sup>11</sup> *See id.* § 151 (Sec. 1105 (5)(D) Definitions).

<sup>12</sup> Nicholas Economides, *Telecommunications Regulation: An Introduction*, in, *THE LIMITS AND COMPLEXITY OF ORGANIZATIONS* 48, 52-53 (Richard R. Nelson ed., 2005).

<sup>13</sup> For a compelling case for the consideration of benefits and costs to determine the scope of regulation, *see* CASS R. SUNSTEIN, *SIMPLER: THE FUTURE OF GOVERNMENT* 8 (2013) (section V *infra* describes the relationship between our framework and the tools of benefit cost analysis).

<sup>14</sup> Communications Act of 1934, Pub. L. No. 416, § 1, 48 Stat. 1063, 1064 (1934).

cations sector, which we believe provides critical background information for policy deliberations. Understanding disruptive innovation is critical, as it is now the defining feature of this sector. Any serious 21st century communications policy must envelop, embrace and act to encourage this innovation.

Second, we offer a policy framework capable of guiding sound regulatory policies in a world of continuing and accelerating technological innovation.<sup>15</sup> Importantly, this framework, referred to as Results-Based Regulation (RBR), is divorced from mercurial ideological drivers that have too often directed policy changes in the past. It constructs neither a regulation-free altar at which stakeholders can worship, nor does it reflexively embrace ritualistically extending existing regulatory structures into the future simply because they have historical precedent.

Rather, the RBR approach recognizes the imperfections, in practice, of all governance institutions – both markets and regulatory. To minimize the costs of these imperfections, RBR relies on principles that weigh the factual consideration of when and where more - or less - regulatory intervention in the industry will increase economic welfare. This determination requires empirical, not ideologically-driven, analysis. It also requires disciplined deliberations that are firmly rooted in economically sound principles.

While a complete application of the RBR approach to the wide range of substantive communications issues before policymakers today is beyond the scope of this article, we seek here to provide a “proof of concept” of the applicability of the framework. Whether the issue is ensuring universal service, the relative value of adapting Title I or Title II of the Communications Act to Internet-provided services, establishing the appropriate policy path for the transition to an all-IP industry, net neutrality, spectrum management, transaction review or any number of other salient issues before the Commission, the application of RBR principles provides a platform for improved decision making by policymakers.<sup>16</sup>

The remainder of the paper is structured as follows. Section II describes the evolution of disruptive technological innovation, for which the communications sector regularly serves as a petri dish. Section III turns to a high-level discussion of the evolution of regulation in the communications industry and the growing strains on regulatory institutions caused by the fast-changing technology of communications services. This discussion is not meant to be comprehensive, but rather highlights some of the incongruities and tensions that

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<sup>15</sup> See John W. Mayo, *The Evolution of Regulation: Twentieth Century Lessons and Twenty-First Century Opportunities*, 65 FED. COMM. L.J. 119, 136-45 (2013) (introducing the framework for twenty-first century policymaking for the first time).

<sup>16</sup> See *id.* at 147 (stating the RBR principles are “likely to be a useful guide to policymakers today” in deciding how much regulations is necessary).

affect the industry today as a result of rapid disruptive change. Section IV provides a description of the economic principles-based framework (RBR) we propose to guide the sound evolution of regulation in the industry going forward. This section will also highlight “results-based” lessons from communications policy that provide guidance as policymakers consider next steps to evolve the current regulatory apparatus for communications. Importantly, application of the framework has the potential not only to accommodate exogenous innovation but also to evolve over time to complement and enhance that innovation without substantial policy gridlock. In Section V, we briefly compare our approach with a sampling of other frameworks that have recently been advanced. Section VI concludes.

## II. THE EVOLUTION OF INNOVATION

For millennia, economic growth in the world was approximately zero.<sup>17</sup> Beginning with the Industrial Revolution, however, dramatic increases in economic welfare occurred in a number of countries around the world.<sup>18</sup> While scholars debate the *relative* contributions of a variety of sources for this economic growth, that innovation is a substantive, if not primary, driver is beyond doubt.<sup>19</sup> But innovation is, by its very nature, disruptive, proceeding, in the famous formulation of Joseph Schumpeter, in “perennial gale of creative destruction,” which Schumpeter saw as capitalism’s “essential fact.”<sup>20</sup> It changes, often dramatically, both the way firms do business and the way that consumers consume goods and services. These changes strain the economic and regulatory institutions designed around business models and patterns of consumption as they existed prior to the arrival of the disruptors.

The accident-prone intersection of innovation and regulation is poorly understood.<sup>21</sup> Indeed, while comprehensive literatures have developed on both regulation and innovation, their nexus has drawn relatively little scholarly attention.<sup>22</sup> Yet, it is clear that regulatory design has the potential both to enable

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<sup>17</sup> GREGORY CLARK, A FAREWELL TO ALMS: A BRIEF ECONOMIC HISTORY OF THE WORLD 1-2 (Joel Mokyr ed., Princeton University 2007).

<sup>18</sup> *See id.*

<sup>19</sup> BAUMOL, *supra* note 6, at 11-13.

<sup>20</sup> JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 83-84, 87, (1942).

<sup>21</sup> *See generally* DOWNES & NUNES, *supra* note 2, at 71-72 (discussing governmental oversight resulting in delays of innovation or not reaching the potential of “more efficient, technology-driven alternatives”).

<sup>22</sup> *See* Luke Stewart, *The Impact of Regulation on Innovation in the United States: A Cross-Industry Literature Review*, INFO. TECH. & INNOVATION FOUND. 8 (2010), <http://bit.ly/1wTkXzL> (surveying the existing literature); *see also* John W. Mayo & Joseph E. Flynn, *The Effects of Regulation on R&D: Theory and Evidence*, 61 J. OF BUS. 321, 323 (1988), *available at* <http://bit.ly/1BPZSaP> (stating that regulatory effects on innovation has received limited attention).

and accelerate innovation or to deter it, and that these effects may be intentional or unintentional.<sup>23</sup> In mature industries where core technologies have stabilized, the risk that regulatory design will impede innovation is relatively modest.<sup>24</sup> In other industries that risk is more profound. To get a feel for the relevance of the innovation/regulation tension in the communications industry as it transitions from a set of siloed products and services and distinct technologies to a single dynamic IP-platform, we highlight foundational innovations whose pervasive and disruptive impacts are often taken for granted.<sup>25</sup>

Our analysis derives from a recent and ongoing multi-industry study of disruptive innovation conducted by one of the authors in collaboration with the Accenture Institute for High Performance.<sup>26</sup> That study reveals that in a growing number of industries, innovation has fostered a new era of ultra-competitiveness, driven not by static academic approaches to strategic planning but by the largely uncontrollable force of technologies that continuously generate dramatic, if not fully exponential, improvements in price and performance.<sup>27</sup>

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 semiconductor manufacturing, along with miniaturization of components, would for the foreseeable future allow chip producers to market processors with twice the computing capacity every twelve to eighteen months, while holding price constant.<sup>28</sup> (See Figure 1)

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<sup>23</sup> Edward Glaeser & Cass R. Sunstein, *Moneyball for State Regulators*, NAT'L AFFAIRS 1 (forthcoming 2014); Stewart, *supra* note 22.

<sup>24</sup> See Stewart, *supra* note 22 (discussing the easing of burden on innovation within the genetically engineered microorganism industry).

<sup>25</sup> DOWNES & NUNES, *supra* note 2, at 3.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.* at 2.

<sup>28</sup> Gordon E. Moore, *Cramming More Components onto Integrated Circuits*, 86 PROC. OF THE IEEE 82, 83 (1965), <http://bit.ly/1GIDVsm>

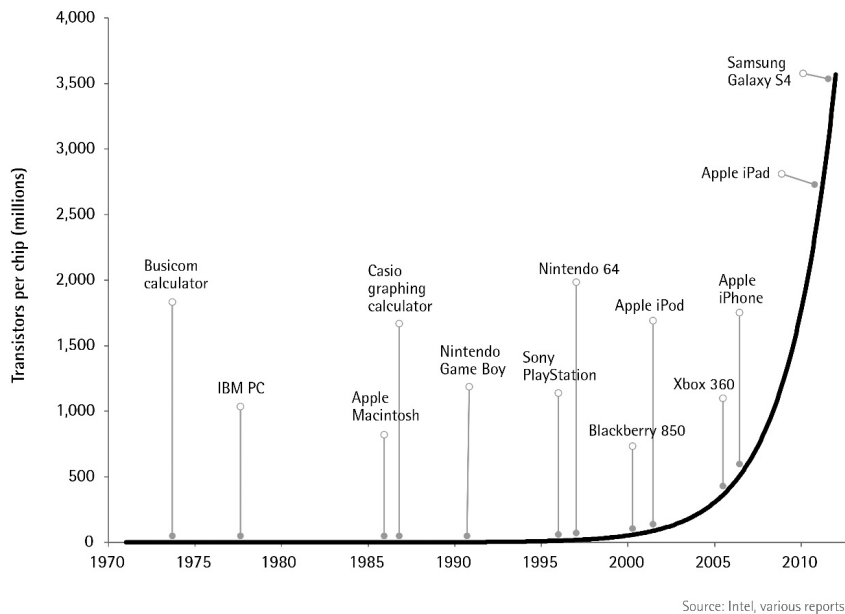


Figure 1 – Moore’s Law (Source: Downes & Nunes, “Big Bang Disruption”)

Fifty years of continued application of the faster-cheaper-smaller principle of Moore’s Law has created the information revolution experienced by consumers in much of the world.<sup>29</sup> 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.<sup>30</sup> Consumers now expect the phenomenon to continue and even punish industry leaders if they feel any hesitation on the part of suppliers to cannibalize existing products and markets with new and better products.<sup>31</sup> In that environment, today’s market dominator can quickly become tomorrow’s also-ran.

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,

<sup>29</sup> Raj Sabhlok, *Moore’s Law is Just the Beginning (For Apps)*, FORBES (Apr. 25, 2013, 10:00 AM), <http://onforb.es/1DCfJvA>.

<sup>30</sup> DOWNES & NUNES, *supra* note 2, at 1.

<sup>31</sup> *Id.* at 28.

and health care—the digital revolution is becoming a central driver of economic performance, growth, and wealth creation for an ever-widening array of goods and services in the economy, and for both developed and developing nations.<sup>32</sup>

Of central importance to regulators, the introduction of new goods that are both better and cheaper right from the beginning is changing the nature of competition. 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.<sup>33</sup> In goods including games, electronics, and 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.<sup>34</sup>

Beyond these traditionally hypercompetitive industries, the dramatic explosion of mobile broadband devices and networks has given software and hardware based companies new opportunities to exploit inefficiencies in more stable industries.<sup>35</sup> Innovators are now using that platform to introduce more consumer-friendly interfaces that are disrupting services,<sup>36</sup> 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 category five storm of “creative destruction.”<sup>37</sup>

Nowhere is the better and cheaper transformation of industry, known as “Big Bang Disruption,” more visible than in the industries overseen directly

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<sup>32</sup> *Id.* at 48.

<sup>33</sup> Julia Hanna, *What Loyalty? High-End Customers are First to Flee*, HARV. BUS. SCH. (May 16, 2011), <http://hbs.me/1vSFGwK>.

<sup>34</sup> *Improving FCC Process: Hearing Before the H. Subcomm. on the Comm’n. and Tech. Comm. On Energy and Commerce*, 113th Cong. 19-20 (2013) (testimony of Larry Downes, Internet Industry Analyst and Author).

<sup>35</sup> *Emerging Devices for Mobile Broadband*, AT&T, <http://soc.att.com/1BLcH3c> (last visited Oct. 21, 2014); see, e.g., *Mobile Hotspots*, NETGEAR, <http://bit.ly/1wTqCGj> (last visited Oct. 21, 2014) (“AirCard devices turns wireless connection into a mobile hotspot that supports any WiFi enabled device. Not only laptops, but also digital cameras, PDAs, tablets, printers and game consoles can now connect to the Internet through high speed mobile broadband networks whenever and wherever.”).

<sup>36</sup> See Jamie Scheu, *Download Your Next New Car*, HILL HOLIDAY, <http://bit.ly/1wTqLcz> (last visited Oct. 4, 2014); on car insurance services:

Relative newcomer Automatic provides similar functionality with a slick smartphone-app display layer. At the heart of all of these services is a hardware accessory that plugs directly into a vehicle’s on-board diagnostic port. And as such, these offerings can soon be replaced by software apps in modern vehicles whose APIs provide access to the very same information through a much more consumer-friendly interface.

*Id.*

<sup>37</sup> Peter Cukor, et al., *Telecoms in Transition: Survival and Success in the Global Internet Economy*, 24 FLETCHER F. WORLD AFF. 103, 106 (2000) (discussing economist Joseph Schumpeter’s argument known as “creative destruction”).



and indirectly by the FCC—communications, computing, entertainment and other forms of information creation, distribution and consumption.<sup>38</sup> As prices for voice, video and data transmission continue to plummet at a pace that approximates Moore’s Law,<sup>39</sup> (see Figure 2) incumbents have scrambled to reinvent their businesses from within what are often closely-regulated constraints.<sup>40</sup> As content providers, device manufacturers, and operating system developers 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.<sup>41</sup>

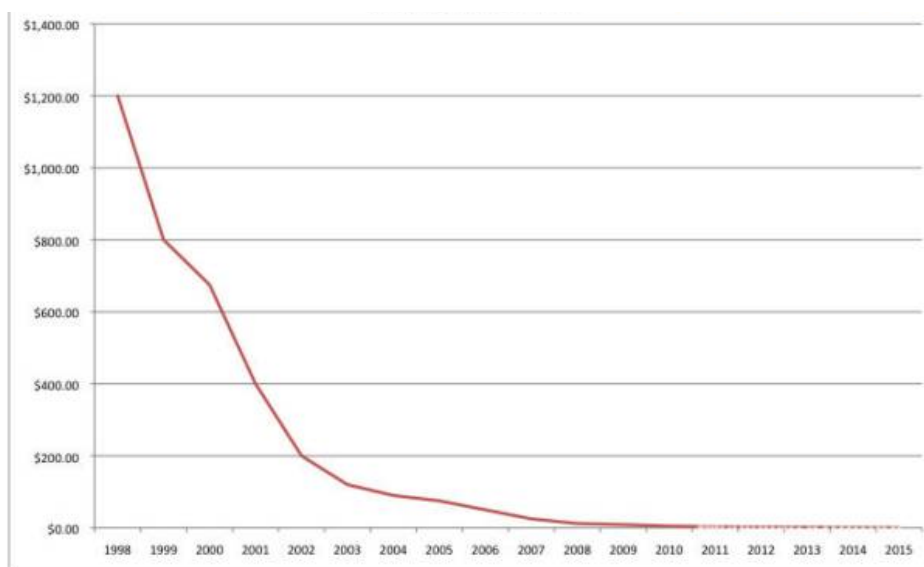


Figure 2 – Price per Mbps: The Collapsing Price of Internet Transit  
(Source: Bill Norton, Peering Playbook, 2011)

<sup>38</sup> DOWNES & NUNES, *supra* note 2, at 23-24.

<sup>39</sup> See *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions*, Sixteenth Report, WT Docket No. 11-186 (Terminated) 28 F.C.C. Rcd. 3700, paras. 265-66 (Mar. 21, 2013) (reporting declines in services) [hereinafter *Sixteenth Annual Competition Report*].

<sup>40</sup> Charles H. Fine & John M. de Figueiredo, *Can We Avoid Repeating the Mistakes of the Past in Telecommunications Regulatory Reform?* 8 (Mass. Inst. of Tech. Commc’ns Futures Program, Working Paper No. 2005-001, 2005), available at <http://bit.ly/1IUUpwgz>.

<sup>41</sup> Robert Frieden, *The Impact of Next Generation Television on Consumers and the First Amendment*, 24 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 61, 62, 80 (2013).

As Figure 2 shows, the price of Internet transit fell from \$1,200 in 1998 to less than a dollar by 2013. While consumers do not see this deflation directly, the impact on their behavior has been dramatic and unmistakable.<sup>42</sup> Information consumption has exploded by orders of magnitude, particularly in mobile applications, the source of a virtuous cycle of continued innovation.<sup>43</sup> Since the 2007 introduction of Apple's iPhone and the subsequent release of Google's Android operating systems, smartphone penetration in the U.S. has risen rapidly to over fifty-eight percent of all adults, with most consumers acquiring and using the device not as phones but as data devices (see Figure 3).<sup>44</sup> With U.S. leadership in 4G LTE deployment, mobile networks are fast becoming substitutes for wired voice, video, and data services.<sup>45</sup>

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<sup>42</sup> See *IP Transit Prices Declines Steepen*, TELEGEOGRAPHY (Aug. 02, 2012), <http://bit.ly/1sw7a0x> (showing how prices for wholesale IP transit service continue to decline throughout the world); see also Nick Bilton, *Part of the Daily American Diet, 34 Gigabytes of Data*, N.Y. Times, Dec. 10, 2009, at B6.

<sup>43</sup> Sarah Perez, *Majority of Digital Media Consumption now Takes Place in Mobile Apps*, TECH CRUNCH (Aug. 21, 2014), <http://tcrn.ch/1ABeHuJ>.

<sup>44</sup> *Mobile Technology Fact Sheet*, PEW RESEARCH INTERNET PROJECT, <http://pewrsr.ch/OotDJE> (last visited May 21, 2014).

<sup>45</sup> See *Sixteenth Annual Competition Report*, 28 F.C.C. Rcd. 3700, para. 87.

### Smartphone owners in 2014

*Among adults, the % who have a smartphone*

	<b>Have a smartphone phone</b>
<b>All adults</b>	<b>58%</b>
<b>Sex</b>	
a Men	61
b Women	57
<b>Race/ethnicity*</b>	
a White	53
b African-American	59
c Hispanic	61 <sup>a</sup>
<b>Age group</b>	
a 18-29	83 <sup>bcd</sup>
b 30-49	74 <sup>cd</sup>
c 50-64	49 <sup>d</sup>
d 65+	19
<b>Education level</b>	
a High school grad or less	44
b Some college	67 <sup>a</sup>
c College+	71 <sup>a</sup>
<b>Household income</b>	
a Less than \$30,000/yr	47
b \$30,000-\$49,999	53
c \$50,000-\$74,999	61 <sup>a</sup>
d \$75,000+	81 <sup>abc</sup>
<b>Community type</b>	
a Urban	64 <sup>c</sup>
b Suburban	60 <sup>c</sup>
c Rural	43

Figure 3 – U.S. Smartphone Penetration by Demographic Category (2014) (Source: Pew Research Center Internet Project). Note: Percentages marked with a superscript letter (e.g., <sup>a</sup>) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g., age).

Communications technologies and their associated industries are now in the

midst of their most profound technological transformation in over a century.<sup>46</sup> The old public-switched telephone network (PSTN) is joining other obsolete networking technologies in converting to the packet-switched network protocols of the Internet.<sup>47</sup> Analog equipment is being replaced with digital; copper is being replaced or supplemented with fiber optic cable, satellite, cable and cellular technologies.<sup>48</sup> Voice, video and data are converging onto a single standard, and moving over a single global network infrastructure.<sup>49</sup>

The emerging communications infrastructure is exponentially more efficient, extendable, and powerful than the separate, aging networks it is or has replaced.<sup>50</sup> 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.<sup>51</sup> It is generating profound economic growth and new competitive advantages for businesses that are leading the revolution.<sup>52</sup>

The nature of data, voice and video communications has changed utterly.<sup>53</sup> Wireline voice networks that were once isolated as a matter of technology, application, and law, increasingly provide services and functionality that appear to the consumer to be the same as services provided by mobile, cable and other broadband networks.<sup>54</sup> The result is that American consumers are enjoy-

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<sup>46</sup> See DOWNES & NUNES, *supra* note 2, at 2-3.

<sup>47</sup> See *Sixteenth Annual Competition Report*, 28 F.C.C. Rcd. 3700, para. 25.

<sup>48</sup> See *id.* at n.416, paras. 216, 333, 335 Appendix A.

<sup>49</sup> See *id.* para. 6.

<sup>50</sup> See Patrick McLaughlin, *Why the Copper-vs.-Fiber War is Over*, CABLING INSTALLATION & MAINTENANCE (July 1, 2001), <http://bit.ly/1BLc7S> ("every manufacturer in our industry sees where we are headed...optical fiber is the only medium that will handle 10-Gigabyte Ethernet."); see *Sixteenth Annual Competition Report*, 28 F.C.C. Rcd. 3700, para. 87.

<sup>51</sup> Albert Costil, *7 Video Chat Apps You Should Have on Your Smartphone*, SEARCH ENGINE J., <http://bit.ly/1wywfc> (last visited Oct. 23, 2014); *X1 On Demand Menu – Watch TV Shows and Movies*, COMCAST, <http://bit.ly/1AdUmuA> (last updated Oct. 7, 2014, 2:48 PM); Todd Hixon, *Why is Telemedicine Suddenly Hot?*, FORBES (Oct. 22, 2014, 6:00 AM), <http://onforb.es/1wtyrjf>; *Distance Education at Harvard Extension*, HARV. EXTENSION SCH., <http://bit.ly/1hg4UoE> (last visited Oct. 23, 2014); *Smart Grid*, ENERGY.GOV, <http://1.usa.gov/1qiT80s> (last visited Oct. 23, 2014); *Connected Machines. Unlocked Potential*, VERIZON, <http://vz.to/1mIWXdK> (last visited Oct. 23, 2014); see Shirley Siluk, *Samsung Develops Tech to Boost Wi-Fi Speeds Fivefold*, TOP TECH NEWS (Oct. 13, 2014, 9:33 AM), <http://bit.ly/1xLZh3> Samsung is planning to implement newly developed technology to boost Wi-Fi speeds "as early as next year." *Id.*

<sup>52</sup> Telecom industries that invest in the expansion of technology, updated infrastructure, and rapid innovation will see profits and value creation. See *2014 Outline on Telecommunications: Interview With Craig Wigginton*, DELOITTE, <http://bit.ly/1nLezpA> (last visited Oct. 23, 2014).

<sup>53</sup> Larry Downes, *FCC refuses to state the obvious: Mobile market is competitive*, CNET (Apr. 3, 2013, 7:57 AM), <http://cnet.co/1yUcsj7>.

<sup>54</sup> *Id.*

ing the benefits of intensely competitive providers for all manner of communication and information services.<sup>55</sup>

While phone companies once dismissed the Internet as an inferior communications protocol for voice, carriers large and small have now embraced it.<sup>56</sup> 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.”<sup>57</sup> 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.<sup>58</sup>

These disruptors are unique in economic history in that they emerge both better and cheaper than established products and technologies.<sup>59</sup> As a result, in a matter of months or even weeks, consumers can abandon the old for the new, leaving their current providers little time or opportunity to respond.<sup>60</sup> The result is often the decimation of long-standing industry supply chains.

Consider the smartphone and the havoc it has wrought. A single device category has disintermediated products and services such as 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, magazines, directory assistance, travel and insurance agents, restaurant guides and pocket calculators— just to name a few.<sup>61</sup> As these examples suggest, the communications industry is being affected more profoundly than any other by disruptive technological innovation. It perfectly fits the

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<sup>55</sup> *Id.*

<sup>56</sup> *AT&T VoIP Services*, AT&T, <http://soc.att.com/1wUCwiX> (last visited Oct. 23, 2014) (“VoIP from AT&T converts your voice into data and uses your high speed Internet connection to send and receive calls.”); *VoIP Growing Statistics*, SIPNOLOGY, <http://bit.ly/1GK0Ymu> (last visited Oct. 23, 2014) (“Although many operators have so far resisted the use of VoIP services over mobile phones, it has been suggested that such a stance will not last long and in the years to come VoIP will be widespread on mobile phones.”).

<sup>57</sup> *See Internet of Things (IoT)*, CISCO.COM, <http://bit.ly/1neRisN> (last visited Sep. 15, 2014); *see also* CREATING THE INTERNET OF YOUR THINGS, MICROSOFT WHITE PAPER 3 (2014), *available at* <http://bit.ly/OdHUs5>.

<sup>58</sup> *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).

<sup>59</sup> *See* DOWNES & NUNES, *supra* note 2, at 7-8.

<sup>60</sup> *See id.* at 1-3.

<sup>61</sup> *See id.* at 1; *see also* *Sixteenth Annual Competition Report*, 28 F.C.C. Rcd. 3700, paras. 5-6 (discussing the mobile wireless ecosystem of voice, messaging, and data services offerings now available on mobile wireless devices).

pattern of gradual then sudden industry transformation called Big Bang Disruption.<sup>62</sup>

The disruptive nature of innovation in the communications sector is exciting for consumers and anxiety-inducing for regulators. In this regard, the case for policy realignment is made all the more compelling by the emerging reality that disruptive innovation is not a series of “one-off” developments but rather has become routinized. In Big Bang Disruption, innovation has itself become “one of the primary weapons of competition” among rivals in modern high-tech industries.<sup>63</sup> The result is that competition among firms to innovate on product and service rivalry benefits consumers, who capture much of the surplus value of better and cheaper offerings.<sup>64</sup> “Routinized” disruption, as William Baumol calls it, has the effect of constraining individual firm profits just as with more traditional forms of price competition.<sup>65</sup> According to Baumol

If entry into innovative activity is absolutely free, then *ex ante*, the representative firm must expect no more than the rate of profit currently earned in other competitive industries from its routine inventive/innovative activity, no matter how rapid the rate of technological progress it is able to achieve ... Routinized innovation in such circumstances, promises no more profit than similarly routinized outlays on machinery or marketing.<sup>66</sup>

### III. THE EVOLUTION OF REGULATION

In striking contrast to the explosion of innovation that defines the communications markets, the corresponding regulatory structures generally change at near-glacial pace.<sup>67</sup> This is, of course, partly unavoidable. The regulatory process by its very nature is a public, deliberative and inclusive process.<sup>68</sup> The result is that regulatory policymaking will typically involve numerous time-

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<sup>62</sup> See DOWNES & NUNES, *supra* note 2, at 111-12.

<sup>63</sup> BAUMOL, *supra* note 6, at 4, 7, 11.

<sup>64</sup> Anna-Marie Kovacs, Ph.D., *Telecommunications Competition: The Infrastructure-Investment Race*, INTERNET INNOVATION ALLIANCE 5 (Oct. 8, 2013), <http://bit.ly/1zj5kAI>.

<sup>65</sup> See generally, BAUMOL, *supra* note 6, at 31 (introducing Baumol’s theory of routinized innovation).

<sup>66</sup> *Id.* Note that while, the relationship between innovation and competition was first famously described by Joseph Schumpeter, the routinized innovation in modern high-tech industries is quite different than the extra-ordinary returns envisioned by Schumpeter to flow to a sole innovator. *Id.*

<sup>67</sup> Economides, *supra* note 12, at 52-53.

<sup>68</sup> See Administrative Procedure Act, Pub. L. No. 79-404, 60 Stat. 237, 238-39 (1946) (outlining the procedural process of regulating); see also 5 U.S.C §§ 551-59 (2012) (outlining the procedural rule making process for federal agencies including, requirements for public notice and input).

consuming steps. Under the Administrative Procedure Act, a Notice of Inquiry is followed by a Notice of Proposed Rulemaking, followed by a Public Comment period, followed by an Order, Requests for Reconsideration, legal challenges and, finally, implementation.<sup>69</sup>

Despite these procedural constraints, policymakers still have considerable discretion and ability to evolve regulation to match the changing dynamics of industries and the ecosystems they spawn.<sup>70</sup> Indeed they must do so, or face the prospect that as technological change accelerates, the likelihood similarly increases that slower-moving regulators will unintentionally harm rather than promote consumer and economic welfare. Both Democratic and Republican leaders dating back at least as far as Jimmy Carter have recognized the risk associated with different clock speeds of innovation and regulation.<sup>71</sup> More recently, then Senator Barack Obama observed that “[t]he problem is we still have a[n] archaic, 20<sup>th</sup>-century regulatory system for 21<sup>st</sup>-century...markets.”<sup>72</sup>

Examples of economic harm resulting from regulatory inertia are not difficult to identify either in general, or specifically within the communications sector. For instance, even as technological improvements are creating remarkable opportunities for consumers and businesses to maximize the utilization of expensive capital assets in what is known as the “sharing economy,” state and local regulators struggle to determine how, if at all, new services including Uber and Airbnb fit within their jurisdiction and regulatory corpus.<sup>73</sup> Encouraged by regulated incumbents, some local regulators have called on the innovators to slow down, or even stop, while the system tries to catch up.<sup>74</sup> The communications sector is not immune to this inertia. For example, in 1984, AT&T was divested from the Bell Operating Companies and in a stroke the economic rationale for regulating AT&T as a monopoly provider – the ownership of a monopoly bottleneck access to the local loop – ended.<sup>75</sup> Yet it was

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<sup>69</sup> See §§ 551-59.

<sup>70</sup> See generally Mayo, *supra* note 15, at 120-21 (discussing how ideological motivation of regulators has shaped policy in the last fifty years); see also Downes, *supra* note 53 (discussing the discretionary powers left to the Commission).

<sup>71</sup> See, e.g., President Jimmy Carter, Staggers Rail Act of 1980 Statement on Signing S. 1946 into Law (Oct. 14 1980), available at <http://bit.ly/1vTZjVd> (advocating for the elimination of unnecessary regulations that hampered the ability of the U.S. railroad industry to evolve).

<sup>72</sup> *The Second Presidential Debate of 2008: Between Senators John McCain and Barack Obama*, N.Y. TIMES (Oct. 7, 2008), <http://nyti.ms/1sxGBBs> (statements by then Sen. Barack Obama).

<sup>73</sup> Larry Downes, *Uber's Battle in Seattle Highlights the Irony in Regulation Hurting the Consumers it was Designed to Help*, WASH. POST (Mar. 24, 2014), <http://wapo.st/1roxWUH>.

<sup>74</sup> *Id.*

<sup>75</sup> Howard Shelanski, *Adjusting Regulation to Competition: Towards a New Model for Telecommunications Policy*, 24 YALE J. ON REG. 55, 59, 62 (2007).

fully eleven years before the FCC ended its price regulation of AT&T's long-distance services.<sup>76</sup>

There are several sources for regulatory inertia.<sup>77</sup> We highlight three of particular relevance for the communications sector. First, the mismatch between FCC regulations and the realities of the markets it oversees are increasingly driven by the innovations that have become routine in communications.<sup>78</sup> For example, federal policies designed to promote universal service were largely crafted in the 1980s in the wake of the divestiture of AT&T.<sup>79</sup> Today, those policies generate billions of dollars of annual expenditures to promote universal voice service directed largely at the household level.<sup>80</sup>

Yet household-level wireline connectivity has been rapidly marginalized by over 335 million mobile subscriptions in the United States.<sup>81</sup> Mobile technology provides virtually all “of age” members of nearly every household access to communications capabilities on a 24 hour-a-day basis regardless of location.<sup>82</sup> Connectivity today is massively higher today than even a decade ago.<sup>83</sup> But while rapid cycles of innovation have led to widespread deployment of mobile devices with increasing versatility, regulatory reform of universal service programs continue to progress incrementally.<sup>84</sup>

More broadly speaking, even as the FCC has shifted its focus in recent years toward policies that enhance competitiveness and markets that discipline themselves, much of the FCC's regulatory structure is a vestige of an era that believed communication services fit the definition of a natural monopoly.<sup>85</sup> Thus, despite substantial substitution away from legacy PSTN service, the FCC has

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<sup>76</sup> *Id.*

<sup>77</sup> *See, e.g., id.* at 59-60 (2007) (discussing the objectives of regulation).

<sup>78</sup> Economides, *supra* note 12.

<sup>79</sup> *See, e.g., Shelanski, supra* note 75, at 62 (giving background on the AT&T divestiture).

<sup>80</sup> *See Universal Service*, FCC, <http://fcc.us/1yWBGm7> (last updated Oct. 22, 2014) (the Commission's stated goals from October 2011 included, “[e]nsure universal availability of voice and broadband to homes...”, and “[e]nsure the availability of mobile voice, and broadband where Americans live...”).

<sup>81</sup> *CTIA's Wireless Industry Summary Report, Year-End 2013 Results, 2014*, CTIA <http://bit.ly/1yWB0li> (last visited Nov. 8, 2014).

<sup>82</sup> *See, e.g., Jeffrey T. Macher et al., Universal Service: Now It's Getting Personal*, (Sept. 2014) (on file with authors at Georgetown Center for Business and Public Policy).

<sup>83</sup> *See generally* Brian S. Hall, *The Numbers are Clear: Mobile is Taking Over the World*, READWRITE (May 13, 2013), <http://bit.ly/12ZJrJW> (providing a graph showing the growth in mobile-cellular subscribers from since 2005).

<sup>84</sup> *See, e.g., Shelanski, supra* note 75, at 60.

<sup>85</sup> *See, e.g., Kevin Werbach, No Dialtone: The End of the Public Switched Telephone Network*, 66 *FED. COMM. L. J.* 205, 218 (2014) (“For much of its history, its primary role in telecommunications consisted of overseeing AT&T, which was the government-sanctioned monopoly provider of telephone service to most Americans. In recent decades, it has shifted its efforts toward fostering and overseeing a competitive telecommunications marketplace.”).



been slow to transition from monopoly-style public utility requirements over local exchange carriers.<sup>86</sup> For example, the FCC's "Traffic damage claims rules" were established in 1936 to "address issues with claims against telegraph carriers arising from errors in, or delayed delivery or non-delivery of, messages and money orders."<sup>87</sup> Innovation made the telegraph obsolete long ago, yet it took a costly external petition and regulatory proceeding before the FCC acknowledged that "advances in technology such as voicemail, texting, smartphones, and digital payment options are ubiquitous" rendering the regulations unnecessary.<sup>88</sup> The regulations were not retired until 2013.<sup>89</sup>

Second, existing regulatory structures may fail to adapt to changes in the scope and applicability of competing and complementary regulatory institutions.<sup>90</sup> FCC regulation does not operate in a vacuum. The policy decisions and regulatory implementations of related institutions—include state and local regulators, international bodies such as the International Telecommunications Union, NGOs including the Internet Engineering Task Force (IETF) and the Internet Corporation for Assigned Names and Numbers (ICANN) and other federal regulators such as the Federal Trade Commission and the Department of Justice—can trigger the need for reform of FCC policies and rules.<sup>91</sup> The residual value of existing FCC rules and policies must be considered within that larger context. When complementary or substitute governance mechanisms change, so should the FCC's regulatory institutions and rules. But the evolution of one regulatory domain in response to changes in another is rare. The FCC's regulatory scope and rules have proven stubbornly unresponsive to efforts by other regulators to provide consumer protections in overlapping realms.<sup>92</sup>

Third, political forces also contribute to regulatory inertia.<sup>93</sup> By its very nature, regulation institutionalizes a distribution of benefits among economic

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<sup>86</sup> See, e.g., Shelanski, *supra* note 75, at 56 (stating that despite substantial changes in telecommunications markets since the passage of the 1996 Telecommunications Act that "much of the regulatory approach to local telecommunications that arose in the monopoly era remains in place today.").

<sup>87</sup> *In the Matter of United States Telecom Association Petition for Forbearance Under 47 U.S.C. § 160(c) from Enforcement of Certain Legacy Telecommunications Regulations*, Order, WC Docket No. 12-61, 28 FCC Rcd. 2605 para. 9 (Feb. 28, 2013).

<sup>88</sup> *Id.*

<sup>89</sup> *Id.* at paras. 15-17.

<sup>90</sup> *Id.* at paras. 12, 15.

<sup>91</sup> *Cf.*, Shelanski, *supra* note 75, at 101-02 (explaining ex post competition enforcement of the telecommunications industry as analogous to rule-of-reason scrutiny under U.S. anti-trust laws).

<sup>92</sup> See generally Charles Goldfarb, CONG. RESEARCH SERV., RL33034, TELECOMMUNICATIONS ACT: COMPETITION, INNOVATION, AND REFORM 6 (Aug. 12, 2005).

<sup>93</sup> Economides, *supra* note 12, at 49.

actors that is different than would occur under a *laissez faire* regime.<sup>94</sup> These benefits give rise to vested interests to either maintain or eliminate regulation.<sup>95</sup> While political positions of parties championing more, or less, regulation *may* align with sound regulation, quite often industry members will embrace what has been referred to by one FCC Commissioner as a “please regulate my rival” strategy, applying rent-seeking behavior as a substitute for in-market competition.<sup>96</sup> In the face of conflicting and vocal demands by industry players, inertia and a “give everybody a little something” approach to regulation can result.<sup>97</sup> This inertia is considerably more prone to generate unintended negative consequences in rapidly evolving industries such as those overseen by the FCC.<sup>98</sup>

Another political source of regulatory inertia that has been well-documented stems not from the pressures brought by firms but rather from regulators themselves.<sup>99</sup> Indeed, history has shown that it is quite difficult for regulators not to regulate even when it is in the public interest to eliminate unnecessary regulation.<sup>100</sup> As one scholar observed:

It is very difficult for people and organizations to conclude that despite their best efforts their policies or programs are ineffective. ... [T]hose who are deeply involved in the implementation of a particular regulation are likely to see the benefits of such a project far more clearly than the costs.<sup>101</sup>

These sources of inertia in regulatory change are not, of course, unique to the FCC. For example, a study of state-level public utility commission decision-making found that the prospects for state-level deregulation of long-distance price controls were significantly enhanced by external legislative

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<sup>94</sup> See T. Randolph Beard, David L. Kaserman, & John W. Mayo, *A Graphical Exposition of Economic Theory of Regulation*, 41 *ECON. INQUIRY* 592, 593 (2007).

<sup>95</sup> *Id.* at 594.

<sup>96</sup> See Hon. Robert M. McDowell, Comm’r, Fed. Comm’n Comm’n, *Remarks at the Associazione EGO and PuntoIT Italian Parliament Aula dei Gruppi Parlamentari in Rome, Italy, The Siren Call of “Please Regulate My Rival”: A Recipe for Regulatory Failure*, FCC 5 (Jun. 28, 2012), <http://fcc.us/1IVLeKr>.

<sup>97</sup> See generally *id.* at 10.

<sup>98</sup> See *id.* at 9.

<sup>99</sup> See e.g., Thomas M. Burton, *Regulators Faulted for “Inertia” Over Meningitis Concerns*, WALL ST. J. (Nov. 15, 2012), <http://on.wsj.com/1uR06qt> (“A Congressional report on Thursday released details of how federal and state regulators knew nearly a decade ago of serious safety concerns with the pharmacy tied to hundreds of meningitis cases, but failed to act...’ [B]ureaucratic inertia appears to be what allowed a bad actor to repeatedly risk public health.”) (quoting the bipartisan Senate Health, education, Labor and Pensions Committee staff report).

<sup>100</sup> See *Over-regulated America*, THE ECONOMIST (Feb. 18, 2012), <http://econ.st/1sv8sDm> (“Governments of both parties keep adding stacks of rules, few of which are ever rescinded... There are nine codes relating to injuries caused by parrots, and three relating to burns from flaming water-skis.”).

<sup>101</sup> Michael Greenstone, *Toward a Culture of Persistent Regulatory Experimentation and Evaluation*, in *NEW PERSPECTIVES ON REGULATION* 111, 119 (David Moss & John Cisternino, eds., 2009).

measures that acted to break regulatory inertia.<sup>102</sup> Similar tendencies by regulators to maximize regulatory reach are likely to exist at the FCC as well.<sup>103</sup> This creates the risk that new-age IP services will be swept into old and tattered regulatory nets despite an absence of compelling market failures or an assessment that the benefits of such regulation exceed their costs.<sup>104</sup>

The routinization of innovation in the communications sector, together with the inherently incremental nature of regulatory change, generate increasing conflict for both the design and scope of regulation in this rapidly evolving market.<sup>105</sup> These incongruities are generating increasing tension among regulators, ecosystem stakeholders and consumers.<sup>106</sup> But they also provide the opportunity - both the incentive and foundation - for regulation that evolves in a more dynamic, responsive manner. In the next section, we highlight a policy framework that reconciles the tensions between the evolution of innovation and the evolution of regulation, helping the latter to evolve on similar lines as the former.

#### IV. RECONCILING THE INCONGRUITY: A RESULTS-BASED REGULATION APPROACH

Recently one of the authors proposed a framework, known as Results-Based Regulation (RBR), designed to minimize the unintended consequences of the diverging evolutions of regulation and innovation.<sup>107</sup> This framework, rooted in core economic principles, offers regulators general guideposts for assessing the merits of alternative governance choices for dynamic industries. It is particularly apt for the evolving communications sector.<sup>108</sup>

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<sup>102</sup> David L. Kaserman, John W. Mayo & Patricia L. Pacey, *The Political Economy of Deregulation: The Case of Intrastate Long Distance*, 5 J. OF REG. ECON. 49, 54 (1993).

<sup>103</sup> See Beard et al., *supra* note 95, at 593 (discussing the incentive for regulators to optimize their own influence in affecting the policy process).

<sup>104</sup> See *id.*

<sup>105</sup> See generally Mayo, *supra* note 15, at 138 (stating the principle that regulators must be vigilant in responding to the innovation and evolution of industries and institutions).

<sup>106</sup> *Id.* at 136

<sup>107</sup> Mayo, *supra* note 15, at 121.

<sup>108</sup> Several students of the industry have observed the absence of a general framework for guiding policy as the communications sector transitions to IP-based services. See, e.g., Werbach, *supra* note 85, at 236 (“For much of its history, its primary role in telecommunications consisted of overseeing AT&T, which was the government-sanctioned monopoly provider of telephone service to most Americans. In recent decades, it has shifted its efforts toward fostering and overseeing a competitive telecommunications marketplace.”) (“The FCC has not adopted principles for what forms of regulation should remain in the shift from TDM to IP, and what may be abandoned.”); see also Jodie Griffin & Harold Feld, *Five Fundamentals for the Phone Network Transition*, PUBLIC KNOWLEDGE app. 23 (Jul. 2013), <http://bit.ly/1AfwqXJ> (addressing the need for a policy framework for the IP transition); This absence of a consistent framework for guiding policy is not new. In fact, John Stuart Mill

While the general case for adoption of the RBR framework has been argued elsewhere,<sup>109</sup> application of the framework is all the more compelling in industries defined by routinized disruptive innovation.<sup>110</sup> As shown in Sections II and III, the accelerating pace of disruptive innovation in the communications sector presents special challenges for policymakers. In this section, we provide a sketch of RBR with a special focus on its applicability and implications for the FCC in the transition to a converged IP-based communications ecosystem.

RBR is grounded in five guiding principles.<sup>111</sup>

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noted that as early as 1859 “[t]here is, in fact, no recognized principle by which the propriety or impropriety of government interference is customarily tested.” JOHN SUTART MILL, ON LIBERTY AND OTHER ESSAYS 9 (1859). For an extended discussion on this point, see Mayo, *supra* note 15, at 131-32 (2013) (introducing this framework for the first time).

<sup>109</sup> Mayo, *supra* note 15, at 121 (introducing this framework for the first time); see, e.g., *Regulatory White Paper: Results-Based Regulation: A Modern Approach to Modernize the Grid*, GEN. ELECTRIC DIGITAL ENERGY, <http://bit.ly/11VMfZx> (last visited Oct. 4, 2014).

<sup>110</sup> See JAMES MANYIKA ET AL., DISRUPTIVE TECHNOLOGIES: ADVANCES THAT WILL TRANSFORM LIFE, BUSINESS, AND THE GLOBAL ECONOMY 14 (2013), available at <http://bit.ly/1cSsdLV>.

<sup>111</sup> See generally Mayo, *supra* note 15, at 137-45.

**Principles of the Results-Based Regulation Framework**

**Principle 1: RECOGNIZE THE INEVITABILITY OF IMPERFECTION**

All market governance mechanisms are, in practice, imperfect.

**Principle 2: SMARTLY EVOLVE POLICY WITH TECHNOLOGY AND OTHER INSTITUTIONS**

In the presence of disruptive technological innovation and the evolution of complementary and/or competing regulatory structures, regulators must be vigilant to the increased likelihood of a corresponding imperative to reform existing regulatory or deregulatory policies and practices.

**Principle 3: BENCHMARK AND EXPERIMENT RELENTLESSLY**

Wherever possible, regulators should engage in empirical counterfactual scrutiny of, and experimentation with, alternative market governance mechanisms.

**Principle 4: USE EMPIRICAL ANALYSIS, NOT ABSTRACT THEORY**

In assessing the merits of alternative market governance mechanisms, regulators should heavily weight granular empirical evidence collected from actual markets over abstract and formulaic tests and theoretical models.

**Principle 5: FOCUS ON END-STATE ECONOMIC MEASURES**

In choosing among alternative governance structures for a market, regulators should focus on tangible, end-state measures of economic value.

At face value, Principle 1 is both obvious and profound, yet it is all too often ignored in policymaking. Once removed from textbook cases that assume away unavoidable economic and political realities, all governance mechanisms – both markets and regulation – are imperfect.<sup>112</sup> Accordingly, policy choices that weigh a more market-oriented solution against a more regulatory-oriented approach should be decided on pragmatic grounds after careful consideration of the costs and benefits of all proposed alternatives. While this is important in relatively static industries, it is especially true in industries, such as communications, that are evolving rapidly.<sup>113</sup> Innovation is bringing consumer services to the marketplace at a dizzying pace.<sup>114</sup> As explained in Section II, it is myopic to continue treating this innovation as a series of accidental “one-offs” that have fortuitously benefited society.<sup>115</sup> Rather, these innovations are the “new normal.”<sup>116</sup> Their continuation is virtually certain, permitting — indeed mandating — that policymakers incorporate this essential characteristic into policy design.

In dynamic environments, the relative costs and benefits of alternative governance mechanisms are often dramatically different from more static industries.<sup>117</sup> In an environment of rapid innovation, for example, the costs of regulatory fine-tuning are increased.<sup>118</sup> Even the most well-intentioned regulators will be challenged to produce and keep current detailed rules that maximize consumer benefits and minimize consumer harms when innovators are changing their technology platforms, services offered and business models at break-neck speed.<sup>119</sup> Turning up the “regulatory volume” in this environment will

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<sup>112</sup> See *Market Structures: Imperfect Competition*, POLICONOMICS, <http://bit.ly/1cSsdLV> (last visited Dec. 15, 2014) (virtually all real world markets are imperfect); see also *Over-regulated America*, *supra* note 100 (discussing the complexity of Dodd-Frank as illustrated by hundred of pages of clarifications and thousands of questions offered to help understand the regulations within).

<sup>113</sup> See Tom Wheeler, *Net Effects: The Past, Present, and Future Impact of Our Networks* 28, FCC (Nov. 26, 2013), available at <http://bit.ly/1BRuvwo> (discussing the importance of government regulation continuously adapting in the same way that private business does).

<sup>114</sup> See *id.* (explaining various symptoms and reactions to the speed which innovation has altered the global marketplace).

<sup>115</sup> *Supra* Section II.

<sup>116</sup> *Id.*

<sup>117</sup> See e.g., Michael Powell, *The FCC and Competition*, Nat'l. J. (Oct. 2, 2014), <http://bit.ly/1vU1KXI> (addressing the Clinton Administration's warning that the Internet is “unique” and therefore the traditional regulatory model imposes several adverse costs on the future of broadband).

<sup>118</sup> *Id.* (statement of Federal Communications Commission Chairman Tom Wheeler).

<sup>119</sup> Heavy regulation and the regulatory machinery cannot keep pace with advances and often kills innovation. See *id.*

lead to “regulatory drag” on the industry, increasing the risk of unintentionally retarding welfare-enhancing innovation.<sup>120</sup>

This point is directly relevant to a number of specific regulatory decisions emerging at the FCC.<sup>121</sup> For example, debates have emerged recently on the prospect of extending legacy Title II regulation to Internet-based services.<sup>122</sup> Yet, it is the development and largely unregulated adoption of IP technology that is enabling the continuous flow of innovative consumer services.<sup>123</sup> The fact of this transition and the consumer welfare-enhancing aspects of that innovation argue strongly against extending inherently more static Title II regulation in whole or in part to the Internet.<sup>124</sup> Routine innovation substantially raises the cost of regulation in this space.<sup>125</sup> A continuing policy of light-touch, ex post market correctives has worked exceptionally well for IP technologies. Meanwhile, state and federal common carrier rules have retarded the ability of the PSTN network to adapt and compete.<sup>126</sup>

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<sup>120</sup> See Michael Powell, *supra* note 117.

<sup>121</sup> See *id.* (on the Net Neutrality debate).

<sup>122</sup> Daniel A. Lyons, *The Challenge of VoIP to Legacy Federal and State Regulatory Regimes*, 8 PROSPECTIVES FROM FREE ST. FOUND. SCHOLARS 2 (2013), available at <http://bit.ly/1vU1ZSJ>.

<sup>123</sup> See Fred Campbell, *America’s Internet Transformation Demands an All-IP Future*, THE TECH. LIBERATION FRONT (Oct. 31, 2012), <http://bit.ly/1sxIPHM>

If telephone companies must continue to maintain outdated and inefficient switched networks while their unregulated broadband competitors reap the benefits of modern network technologies, telephone companies will continue to lack incentives to invest in all-IP networks. In the long run, they would be unable to compete with cable operators and other providers of IP-based services who are not required to maintain inefficient, duplicative networks.

*Id.*

<sup>124</sup> See John W. Mayo, *Beyond Ideology: A Results-Based Approach*, DEMOCRACY J., 21-27 (Fall 2014), <http://bit.ly/1GpNM8d> (stating that the fact of an existing regulatory authority does not support the economic argument for exercising it).

<sup>125</sup> Scott McGrath, *Net Neutrality and Title II: Increased Cost and Decreased Innovation?*, AEI (Jul. 24, 2014, 3:32 PM), <http://bit.ly/1wAvDRW>, quoting Bret Swanson, a visiting fellow at the American Enterprise Institute’s Center for Internet, Communications, and Technology Policy:

The substance of Title II common carrier regulation, however, is very real, and it could deal a huge blow to the Internet economy. Title II means price regulation. It means asking Washington and the state utility commissions for permission to launch new products, change existing ones, or deploy new technology, and to approve marketing and advertising programs. It means hundreds of other rules that were written for the monopoly telephone network 80 years ago but that would now apply to the vastly different Internet environment.

*Id.*

<sup>126</sup> See Jeff Pulver, *Freedom to Innovate Key to Internet Future*, USA TODAY (Sept. 16, 2014 7:34 PM), <http://usat.ly/1ARnwio> (stating that Light-touch approach has been the prevailing wisdom for VoIP since 2003); see also Larry Downes, *The End of the Wired Telephone Network is Coming...But Not Soon Enough*, FORBES (Oct. 30, 2013, 6:00 AM), <http://onforb.es/1DE8AKY>.

In short, the routinization of innovation in the communications sector raises the costs of regulatory intervention even as it lowers the cost of market forces to evolve quickly to reduce market failures that harm consumers.<sup>127</sup> This, of course, does not mean that regulators should necessarily fold up their tents and go home. However, it does mean that they should approach the communications sector cautiously. As Federal Trade Commission (FTC) Commissioner Maureen Ohlhausen recently noted:

The success of the Internet has in large part been driven by the freedom to experiment with different business models, the best of which have survived and thrived, even in the face of initial unfamiliarity and unease about the impact on consumers and competitors. It is thus vital that government officials, like myself, approach new technologies with a dose of regulatory humility, by working hard to educate ourselves and others about the innovation, understand its effects on consumers and the marketplace, identify benefits and likely harms, and, if harms do arise, consider whether existing laws and regulations are sufficient to address them, before assuming that new rules are required.<sup>128</sup>

Principle 2 explicitly recognizes the impact on existing governance structures of both routinized technological disruption and the evolution of other regulatory institutions. In the case of the communications sector, both forces are clearly visible.<sup>129</sup> As noted, rapid and sustained technological disruption alters the relative merits of market vs. command-and-control governmental regulation.<sup>130</sup> Fundamentally, constant innovation points toward a general principle of “regulatory humility.”<sup>131</sup>

Technological innovation shifts the balance not only for the optimal regulatory “volume” but also the form such rules should take. Much of the FCC’s regulatory structure was devised in an era in which telecommunications was widely believed to function as a natural monopoly, with competitors seen as “fringe” economic actors operating in the shadow of a “dominant” incumbent.<sup>132</sup> Today, students of the communications sector have rightly discarded

<sup>127</sup> McGrath, *supra* note 125.

<sup>128</sup> Maureen K. Ohlhausen, *The Internet of Things: When Things Talk Among Themselves*, FED. TRADE COMM’N 1 (Nov. 19, 2013), <http://1.usa.gov/1AAJWVZ>.

<sup>129</sup> See Emilien Moyon & Xavier Lecocq, *Co-evolution between Stages of Institutionalization and Agency: The Case of the Music Industry’s Business Model*, 14 MGMT INT’L 37-38, 51 (2010), available at <http://bit.ly/1zjbQHS>.

<sup>130</sup> See Matthew Robinson & Tim Cooper, *Regulation Struggles to Keep Pace With Digital-Driven Disruption*, RE/CODE (July 3, 2014, 8:00 AM), <http://bit.ly/1zjbQHS> (“It is just that disruptive service providers, by their very nature, innovate at a speed that makes it harder than ever for regulators to balance the needs of value-seeking and innovation-hungry consumers with the needs of the very industries they regulate.”).

<sup>131</sup> See Ohlhausen, *supra* note 128, at 1.

<sup>132</sup> See Frank Darr, NAT’L REG. RES. INST., A REGULATORY PERSPECTIVE ON DOMINANCE IN NETWORK MARKETS 1, 2 (2000); see also Bob Latta, *Regulation Would Stifle Internet Innovation*, U.S. NEWS & WORLD REP. (Jun. 23, 2014, 8:00AM), <http://bit.ly/137ZiGa> (predicting that the reclassification of broadband would impose 80 years of regulatory baggage and would substantially restrict providers).



the idea of natural monopoly as the driving policy rationale for this sector.<sup>133</sup> The market has long ceased to resemble your mother's (Ma Bell's) natural monopoly. While one can debate the optimal design of regulatory governance in this new era, there can be little doubt that legacy institutions and the regulations they enforce must evolve accordingly.

The largely organic emergence of a fully competitive IP platform has given firms vast opportunities to cross traditional industry boundaries, effectively challenging rivals that were formerly securely entrenched.<sup>134</sup> That innovation has produced companies like Google, Skype, Netflix, Amazon, Twitter, and Uber that rely on the digital infrastructure of the Internet is not in dispute.<sup>135</sup> Consumers, hooked on ever-better and ever-cheaper information goods and services, demand rapid innovation and dissemination of voice, data and video services.<sup>136</sup>

Principle 2 speaks not only of the impact on governance structures of rapidly-evolving technologies but also of other legal and regulatory institutions in response to the same stimuli. Scholars have observed that the rise of the 20<sup>th</sup> century "regulatory state" occurred at a time of weak legal institutions.<sup>137</sup> These institutions, however, have since evolved and matured. For example, while both the Federal Trade Commission (FTC) and the Antitrust Division of the Department of Justice were immature at the time of the FCC's founding, they have now developed into fully-functioning agencies that collectively act to prohibit "contract[s], combination[s] and conspiracy[ies] in restraint of trade," "monopoliz[ation] and attempts to monopolize"<sup>138</sup> and "unfair methods of competition."<sup>139</sup>

Principle 2 argues that the maturation of these alternative institutions should lead policymakers to reconsider the need for extending, or even maintaining,

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<sup>133</sup> *Contra* Susan Crawford, *The Communications Crises in America*, 5 HARV. L. & POL'Y REV 245, 246 (2011)

<sup>134</sup> *Id.* at 256, 258 (explaining how the "TV Everywhere" model is shaping market access for cable viewers and how alternate content providers like Netflix are steering clear of direct challenges to cable networks).

<sup>135</sup> *See, e.g., Google Products*, GOOGLE, <http://bit.ly/1fCVCvE> (last visited Sept. 16, 2014); *Skype Features*, SKYPE, <http://bit.ly/1uzieaK> (last visited Sept. 16, 2014); *Netflix Overview*, NETFLIX, <http://nflx.it/1uR5sSC> (last visited Sept. 16, 2014); *AMAZON*, <http://amzn.to/1cVi8Qn> (last visited Dec. 15, 2014); *TWITTER*, <http://bit.ly/1G7tGQT> (last visited Dec. 15, 2014); *Uber Features*, UBER, <http://bit.ly/1yPipDH> (last visited Sept. 17, 2014).

<sup>136</sup> *See* Seth Priebatsch, *5 Consumer-Driven Technologies That Will Reshape Society*, FASTCOMPANY (Jan. 31, 2013, 6:02 AM), <http://bit.ly/1GK5Fgc>.

<sup>137</sup> *See* Edward L. Glaeser & Andrei Shleifer, *The Rise of the Regulatory State*, 41 J. OF ECON. LIT. 401, 407-08 (2003) (discussing the rise of regulatory responses to perceived social harm in the first half of the 20<sup>th</sup> century and the notion that the administrative had replaced the judiciary).

<sup>138</sup> Sherman Antitrust Act, 15 U.S.C. §§ 1, 2 (2012).

<sup>139</sup> Federal Trade Commission Act, 15 U.S.C. § 45 (1912).

sector-specific regulation in the communications industries. For instance, as the PSTN transitions from regulated common carriage services to non-common carriage IP services, the consumer protection oversights afforded by the FTC Act become operative.<sup>140</sup> There may be a positive role for the FCC to play in the inter-agency governance of a new IP-based, post PSTN, industry, but this role must not be assumed to be the same as in a very different past where other regulators with other kinds of expertise were absent from the field.

Principle 2 also requires that as technologies evolve, the legacy structure of existing regulatory bodies must also change in response. 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 including copper, cable, satellite, radio, fiber, power line, between carriers private or public, single mode or intermodal.”<sup>141</sup> We use computers to watch television and make phone calls; we use phones and televisions to process data. Yet despite the substantial IP-based convergence of mobile, wireline video, data and voice communications in the last decade, the FCC is statutorily designed to maintain separate bureaus for the regulation of broadcast TV and radio, wired communications, and wireless services.<sup>142</sup>

Continuing to force-fit increasingly round technologies into stubbornly square regulatory pegs creates the profound risk of deterring effective and efficient policymaking. Principle 2 argues against continuing this stovepipe structure, a relic from the era when these services were only distantly related from both a technical and economic standpoint.<sup>143</sup> The failure to evolve the structure of the agency leads to anachronistic and increasingly meaningless assessments of competition for “wireline” services and “wireless” services as though those services were not meaningful substitutes in the minds of consumers.<sup>144</sup>

Similarly, absent the evolution of its structure, the Commission will continue to treat 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.<sup>145</sup> But these aren’t exceptions. Continued IP-

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<sup>140</sup> See § 45(a)(2).

<sup>141</sup> Larry Downes, *A Strategic Plan for the FCC: The Future Ain’t What it Used to Be*, FORBES (Dec. 5, 2011, 8:07 AM), <http://onforb.es/1AAKPgY>.

<sup>142</sup> See *Bureaus & Offices*, FCC, <http://fcc.us/1x3xS2o> (last visited Sept. 17, 2014) (providing a brief synopsis of the various bureaus and offices which comprise the FCC).

<sup>143</sup> See Downes, *supra* note 141.

<sup>144</sup> *In the Matter of Petition of Quest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, Memorandum Opinion and Order, WC Docket No. 09-135 25 FCC Red 8622, para. 59 (2010) (stating the FCC’s position that the percentage of households relying exclusively on mobile wireless is insufficient to determine the price impact of mobile wireless services on wireline access services).

<sup>145</sup> See Downes, *supra* note 141.

based innovations are the new normal, and regulatory structures must evolve to recognize this reality. As then-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.”<sup>146</sup> Similarly, Phil Weiser has observed that:

[o]ver time, the FCC will thus need to shift its focus from specific regulatory approaches based on the particular technology platform—say, a distinct regime for satellite, wireless, cable, or telephone networks—to a ‘layered model’ of telecommunications regulation that regulates functionally similar services in the same way regardless of the underlying platform.<sup>147</sup>

Principle 2 also evokes yet another important consideration regarding governance. In particular, *experimentation* lies at the heart of both technological and business innovation.<sup>148</sup> In order to succeed in the rapidly evolving communications environment, firms are driven to experiment with which technological innovations to pursue, which to introduce into the market, and what business models will be most palatable for consumers as new innovations enter the market.<sup>149</sup>

While it is commonly understood and appreciated that new entrants are rich sources of innovations and experimentation, *all* firms (including incumbents) have substantial incentives to engage in experimentation and innovation in a marketplace as dynamic as the modern communications sector. Regulatory restrictions on this experimentation can be a direct impediment to innovation

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<sup>146</sup> *Broadband is Key to the Information Society, Global Symposium for Regulators: Special Report*, INTER-AMERICAN TELECOMMUNICATION COMMISSION, (Feb. 2005), available at <http://bit.ly/1zjeiy6>; quoting Abernathy’s December 2004 statement in Geneva:

The benefit to consumers is that convergence increasingly allows greater competition among all kinds of different providers: incumbent telephone companies, Internet service providers, cable television system operators, direct-to-home satellite providers — even electric power utilities. Through digital transmission and what I call ‘EoIP’ — everything over IP — all of these types of providers can enter each others’ markets, where they will be forced to lower prices, offer innovative service packages and pioneer new products and services in order to attract greater market share. The result will benefit customers of all income scales.

*Id.*

<sup>147</sup> Philip J. Weiser, *Towards a Next Generation Regulatory Strategy*, 35 LOY. U. CHI. L. J. 41 (2003) (footnote omitted); see Daniel F. Spulber & Christopher S. Yoo, *Access to Network: Economics and Constitutional Connections*, 88 CORNELL L. REV. 885, 889 (2003) (noting the technological convergence “has begun to put pressure on the historical regulatory distinction among voice, video, and data communications, in which each type of service was governed by a separate regulatory regime.”).

<sup>148</sup> See, e.g., Stefan Thomke, *Enlightened Experiment: The New Imperative for Innovation*, HARV. BUS. REV. (Feb. 2001), available at <http://bit.ly/1AfAoQ4> (proposing that the systematic testing of ideas is what enables companies to innovate only after refining a solution through thousands of experiments).

<sup>149</sup> See *id.* (describing Toyota’s efforts in the 1990’s to accelerate its product development cycle in order to keep up with rapidly changing consumer tastes).

itself.<sup>150</sup>

Experimentation and the rapid evolution of both services and business models, however, creates the potential of customer confusion and harm. Thus, a natural question arises regarding the most suitable type of regulation in such an environment. Outside the communications industry this tension routinely arises and is successfully dealt with by the *ex post facto* enforcement of contract law and the bedrock consumer protection enforcement of the FTC. Prominent scholars who have studied the communications sector have advocated that the FCC's current rule-based, *ex ante* regime be replaced by a set of *ex post* enforcements.<sup>151</sup> Indeed, as noted as early as 2007, "on dimensions of both pricing and innovation, today's telecommunications firms perform more like competitors than like monopolists whose market power requires *ex ante* restraint."<sup>152</sup> Of course, since 2007 pricing and innovation have only continued to improve, making the case for *ex post* enforcement even stronger today than when it was first advocated.<sup>153</sup> In sum, the emerging role of experimentation in the dynamic communications sector reduces the relative merits of *ex ante* public utility-style regulation while raising the prospect of consumer protections in the form of *ex post* enforcement mechanisms.<sup>154</sup>

Next consider Principle 3. This principle encourages regulators to consider alternative forms of governance through counterfactual analysis and experimentation. The dynamic nature of the communications sector makes the payoffs from adhering to this principle especially high, but also especially challenging. The dynamic nature of the industry translates to a wide range of influences and influencers all of whom can drive different market outcomes, with regulation being only one. In that sense, regulators will find it difficult in their analysis to isolate the effects of a particular regulation or regulatory policy alternative. The solution, again, is carefully designed and measured experiments that generate hard data for analysis. This is perhaps the most significant process improvement the FCC can make in its move to a regulatory model suitable for the 21<sup>st</sup> century.<sup>155</sup>

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<sup>150</sup> Barack Obama, Op-Ed., *Toward a 21st-Century Regulatory System*, WALL ST. J., Jan. 18, 2011, at A17 ("Sometimes, those rules have gotten out of balance placing unreasonable burdens on business—burdens that have stifled innovation and have had a chilling effect on growth and jobs."); see also Shelanski, *supra* note 75, at 65.

<sup>151</sup> See Shelanski, *supra* note 75, at 101.

<sup>152</sup> See *id.* at 86.

<sup>153</sup> See Hong Soonho, *Regulation System Study for Innovative Communication Services*, ECONSTOR 6 (Sept. 21, 2011), <http://bit.ly/1sxL79W> (stating that *ex post* regulation is more beneficial to innovation and quoting a 2010 study entitled Ehrlich et al., "ex ante, one-size-fits-all rules would be an inefficient and potentially very means of exercising such oversight with respect to the wireless communications industry....[r]ather policymakers should adopt a case-by-case approach based on fact-specific inquiry.").

<sup>154</sup> See Shelanski, *supra* note 75, at 57.

<sup>155</sup> See, e.g., Jessica Rosenworcel *Sandbox Thinking* DEMOCRACY: A JOURNAL OF IDEAS 13

Indeed, in a variety of other policymaking venues, randomized trials have made it possible to separate effective from ineffective policy alternatives at relatively low cost and risk.<sup>156</sup> These trials include applications ranging from housing policies to economic development policies to social welfare programs. Prominent economists have embraced such trials in both policy and business applications.<sup>157</sup> They have become the gold standard for designing policies.<sup>158</sup> Principle 3 calls for significantly expanded use of such experiments and other counterfactual analysis to smartly evolve the regulatory process.<sup>159</sup>

Beyond randomized trials, the FCC may benefit from *carefully* drawn benchmark analysis that is cross-sectional in nature (comparing the effects of different policies adopted by different governing bodies) or inter-temporal (comparing the effects of policies adopted by the FCC during one period with the outcomes of policies adopted during a different period).<sup>160</sup>

In the advance of Principle 3, the FCC is to be commended for approving a process for assessing the best policy path for the transition of the aging PSTN network to the all-IP network where consumers are increasingly relocating. As noted in its recent Order authorizing geographically select trials of the implementation of an IP network, “[t]he experiments and initiatives will collect data that will permit service providers and their customers, and independent analysts and commentators – as well as the federal, state, local, and tribal officials charged with oversight – to make data-driven decisions about these technology transitions.”<sup>161</sup>

Principle 4 indicates that the FCC should focus on granular empirical evi-

(Fall 2014), available at <http://bit.ly/1DQJubS>.

<sup>156</sup> Tom Kalil, *Funding What Works: The Importance of Low-Cost Randomized Controlled Trials*, THE WHITE HOUSE OFF. OF SCI. AND TECH. POL’Y. (July 9, 2014, 3:46 PM), <http://bit.ly/1sxL79W> (discussing the Obama Administration’s use of low-cost randomized controlled trials (RCTs) in order to collect evidence and evaluate the effectiveness of government programs).

<sup>157</sup> See, e.g., Hal Varian, *Federalism Offers Opportunities for Casual Experimentation, Are Randomized Trials the Future of Economics?*, ECONOMIST (Apr. 25, 2011), <http://econ.st/13hAZWh> (quoting Varian, the Chief Economist at Google: “I AM a huge fan of randomized trials ...even though controlled economic experiments are costly and time-consuming, they are well worth doing since they are the gold standard for causal inference.”); see also Michael Greenstone, *Towards a Culture of Persistent Regulatory Experimentation and evaluation*, in NEW PERSPECTIVES ON REGULATION 117 (David Moss & John Cisternino eds. 2009) (listing the use of randomized trials in job training programs, education policy, environmental policy, and healthcare policy).

<sup>158</sup> Greenstone, *supra* note 157, at 116; see Gary Burtless, *The Case for Randomizing Field Trials in Economic and Policy Research*, 9 J. OF ECON. PERSPECTIVES 63, 66-67 (1995) (giving an early review of the topic).

<sup>159</sup> Mayo, *supra* note 15, at 140.

<sup>160</sup> Mayo, *id.* at 146 (suggesting that regulators might consider different metrics at different times; and, separately contrasting the price effect of wireless regulations in New York and California with differing results achieved through regulation in England).

<sup>161</sup> *Tech Transitions Order*, 29 FCC Rcd 1433, para. 1.

dence collected from actual markets as a core task in any regulatory process. The intent of this recommendation is to emphasize that in a dynamic and fluid industry characterized by constant innovation, the value of abstract theory is especially low relative to information gleaned from specific empirical assessments of agreed-upon performance indicators.<sup>162</sup>

While there are many potential pitfalls for regulators attempting to implement this principle, two are worrisome at this critical juncture of the evolution of the communications industry. First, the Commission has historically and appropriately embraced competition as an important “value” that should guide regulatory policymaking.<sup>163</sup> As shown through generations of economic analysis, competition between providers of goods and services has the potential to do, via the invisible hand, what no central planning or governmental directive can: incentivize firms to offer high quality services at attractive prices while continuing to innovate. In effect, the erstwhile vice of greed is turned, in a competitive setting, into a virtue, propelling a continuous cycle of innovation and gains for consumer welfare.<sup>164</sup> This virtuous cycle inures to the benefit of consumers, relieving regulators from applying their “heavy” (and neither invisible nor costless) hands to promote such salubrious effects. For this reason, the pursuit of competition in the communications industry, all agree, is a worthy public policy goal.<sup>165</sup>

The question, though, is how best to assess and promote competition within the rapidly evolving “global multimedia communications infrastructure” sector.<sup>166</sup> A look at current regulatory practice is not encouraging. By congressional directive, for example, the Commission reviews annually the state of competition in the Commercial Mobile Radio Services sector.<sup>167</sup> In recent years, however, and even as agency staff do a heroic job of collecting relevant, detailed empirical evidence on the fast-changing industry, the Commission has relied heavily in its analysis on abstract models drawn from economic theory; in particular, the Herfindahl-Hirschman Index (HHI) of market concentration.<sup>168</sup>

While such constructs are not without value in economic theory, Principle 3 argues that their predictive value is significantly diluted in industries characterized by rapid innovation. Indeed, while a positive relationship between indus-

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<sup>162</sup> Mayo, *supra* note 15, at 141.

<sup>163</sup> *Tech Transitions Order*, 29 FCC Rcd 1433, para. 58.

<sup>164</sup> ADAM SMITH, *WEALTH OF NATIONS*, (Penguin, Andrew Skinner ed. 1974)

<sup>165</sup> Robert Pitofsky, *Competition Policy In Communications Industries: New Antitrust Approaches*, FTC (Mar. 10, 1997), <http://1.usa.gov/11VQ5Sx>.

<sup>166</sup> *Tech Transitions Order*, 29 FCC Rcd 1433, para. 9.

<sup>167</sup> 47 U.S.C. § 332(c)(1)(C) (1934); *id.* §151.

<sup>168</sup> Richard Bennett, *Looking for Trouble: The FCC's Mobile Competition Report*, INFO. TECH. & INNOVATION FOUND. (June 2, 2010), <http://1.usa.gov/11VQ5Sx>.

try concentration and prices can sometimes be demonstrated in a static and particularly stylized setting of competition, economic theory also recognizes the potential for robust competition in markets with significant industry concentration.<sup>169</sup> The uncoupling of concentration and competition is made all the more pronounced in dynamic industries characterized by constant Big Bang-style disruptions. Market leadership is increasingly short-lived, with new entrants able to deploy low cost, versatile technologies, effectively lowering entry barriers.<sup>170</sup>

Thus, Principle 4 urges the FCC to elevate the role of empirical assessments over abstract economic concepts in the increasingly dynamic markets the agency oversees. Why? As shown dramatically in Figure 4, concerns regarding the price-elevating effects of market concentration by simple application of the theory-based measure of mobile industry concentration by the HHI are flatly contradicted by empirical evidence of actual industry behavior. Between 2002 and 2012, overall industry concentration increased substantially.<sup>171</sup> Yet the FCC's own data shows that during this period, retail prices for mobile services plummeted.<sup>172</sup> Real-world evidence reveals prices correlating *inversely* with industry concentration, utterly defying the HHI-based concerns and underscoring the severe limits of its predictive value in this context.<sup>173</sup>

Of course we do not mean to suggest that this one example should substitute for a voluminous and detailed assessment of competition. Principle 4, however, does indicate that where presented with both high-level theoretical concepts and granular retail data, the Commission should place substantial weight in drawing policy conclusions on the latter, especially in a market in which routine innovation is such a central element of the service.<sup>174</sup>

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<sup>169</sup> Thomas W. Gilligan, *Industrial Concentration*, LIBR. OF ECON. AND LIBERTY, <http://bit.ly/1BNUJNw> (last visited Sep. 16, 2014).

<sup>170</sup> Larry Downes, *Managing the Big Bang: The Regulator's Dilemma*, DEMOCRACY J. (2014), <http://bit.ly/1AfC6kA>.

<sup>171</sup> Gerald R. Faulhaber, Robert W. Hahn & Hal J. Singer, *Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports*, SOC. SCI. RES. NETWORK 8 (July 11, 2011), <http://bit.ly/1yWIShR>.

<sup>172</sup> *Id.*

<sup>173</sup> *Id.*

<sup>174</sup> Mayo, *supra* note 15, at 141.

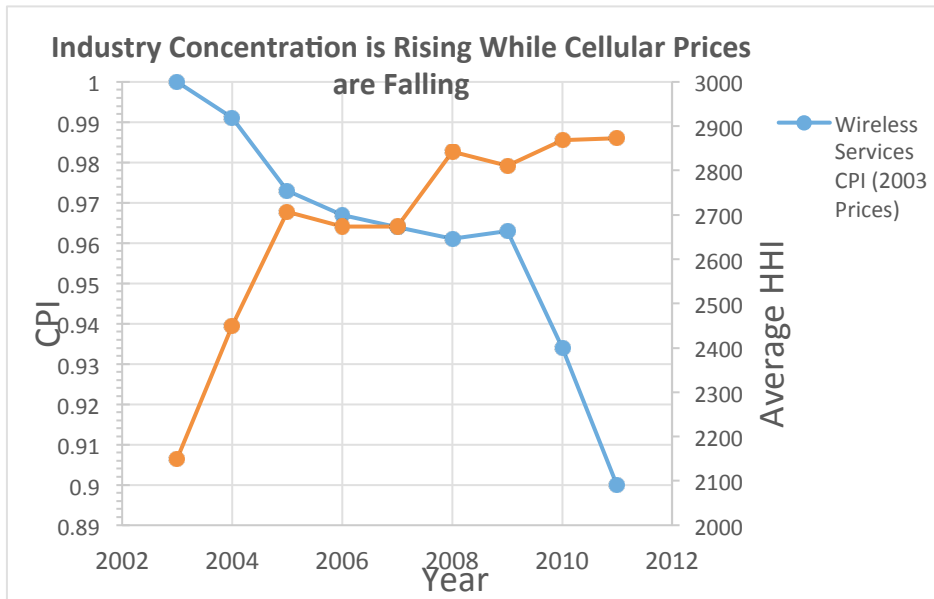


Figure 4

(Source: Faulhaber, Gerald R. and Hahn, Robert W. and Singer, Hal J., “Assessing Competition in U.S. Wireless Markets: Review of the FCC’s Competition Reports (July 11, 2011).” Available at SSRN: <http://ssrn.com/abstract=1880964> or <http://dx.doi.org/10.2139/ssrn.1880964>)

A second prominent fault line that separates the role of high-level theorizing and the use of granular empirical evidence collected from actual markets has recently erupted over spectrum auction design.<sup>175</sup> This time, the theoretical problem concerns the potential harm in the upcoming voluntary incentive auction of bidders gaming their bids based on “foreclosure value.”<sup>176</sup> The theory is that large bidders may spend more for a particular license than the amount they actually value or attribute to that license in order to foreclose smaller ri-

<sup>175</sup> Peter Cramton, *Spectrum Auction Design*, 42 REV. INDUS. ORG. 161, 162 (2013).

<sup>176</sup> JOHN W. MAYO & DAVID E. M. SAPPINGTON, SPECTRUM AUCTIONS AND ECONOMIC WELFARE: A CAUTIONARY TALE FOR POLICYMAKERS 3 (2014), available at <http://bit.ly/1wbR7Vv>; see also Cramton, *supra* note 175, at 163, 165.



vals who may value the license more but who cannot afford an inflated price.<sup>177</sup> A foreclosure value bid will consequently distort auction results, with potential harm to future competition.<sup>178</sup>

This concern, however, is based entirely on speculation.<sup>179</sup> The empirical evidence is quite to the contrary.<sup>180</sup> The actual data reveal that unfettered auctions conducted since the mid-1990s have been remarkably successful in producing increased output, enhanced consumer value, innovation and falling prices.<sup>181</sup> While a full assessment of this specific issue is beyond the scope of the present article, Principle 4 provides an important guidepost for how regulators might meaningfully sort the various conflicting claims that have circled this issue.

Finally, consider Principle 5, which states that regulators should focus on tangible end-state metrics when fashioning more future-proof regulation. These metrics include a detailed focus on prices, output, investment and innovation.<sup>182</sup> They can be thought of as “retail” metrics – *direct* indicators of the health of the evolving ecosystem. If prices, output, investment and innovation data provide positive indications, then regulatory controls can be confidently removed. This is in direct contrast to an approach which would seek to identify potential, anomalous or speculative consumer harms and then design regulations that may head them off—regulations that are, to use a popular FCC term, “prophylactic” in nature.<sup>183</sup> In rapidly evolving markets, however, *ex ante* regulations based on speculative harms introduce the profound and unnecessary risk of unintentionally constraining innovative behaviors, actually harming

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<sup>177</sup> WILLIAM LEHR & J. ARMAND MUSEY, SUMMIT RIDGE GRP, RIGHT-SIZING SPECTRUM AUCTION LICENSES 28 (2013), available at <http://bit.ly/1xnqhLs>.

<sup>178</sup> *Id.*

<sup>179</sup> For an academic presentation of this concern, see Peter Cramton, Even Kwerel, Gregory Rosston & Andrzej Skrzyzpacz, *Using Spectrum Auctions to Enhance Wireless Competition*, 54 J. L. & ECON. 167 (Feb. 2011); see also *In the Matter of Policies Regarding Mobile Spectrum Holdings*, Ex Parte Submission, WT Docket No. 12-269 (Apr. 11 2013), <http://bit.ly/190lvs6> (echoing the same concerns); see also John W. Mayo & David E. M. Sappington, *Employing Auctions to Allocate Scarce Inputs*, GEO CENTER FOR BUS. & PUB. POL’Y. 1 (Feb. 2014), <http://bit.ly/1zqdHJN> (providing a more vigorous approach to this question).

<sup>180</sup> Mayo & Sappington, *supra* note 176.

<sup>181</sup> *Id.*

<sup>182</sup> Mayo, *supra* note 15, at 141-42.

<sup>183</sup> While prophylactic regulation to demonstrable and non-speculative harms may be warranted regulatory constraints imposed based on speculative concerns creates the substantial risk of harming economic welfare. See, e.g., Larry Downes, *Unscrambling the FCC’s Net Neutrality Order: Preserving the Open Internet, but Which One?*, 20 COMMLAW CONCEPTUS 83, 100 (2011). The phrase “prophylactic” appeared nearly a dozen times in the Open Internet order, an indication that despite 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. *Id.*

both consumer welfare and the ability of the industry to evolve organically.

## V. RBR IN PERSPECTIVE

We have advocated an economic framework for advancing sound policy-making as the industry transitions from a TDM, voice-based, communications platform to an IP voice-data-video communications platform. Our proposal, however, is only one of several possible paths that policymakers may walk in their quest for a 21<sup>st</sup> century approach. Indeed, policy proposals are routinely met with a flood of competing comments and opinions. For example, a recent House of Representatives Committee white paper on industry governance produced no less than 116 comments, totaling 841 pages.<sup>184</sup>

A comprehensive review of the alternative frameworks for policy design in the industry is well beyond the scope of the current article. Nonetheless, some benchmarking is useful. Our review suggests that proposals for a transition path for the communications sector fall into four broad categories: economic, historical/legal, architectural and values-based. We note below each of these alternatives (without intention to offend those omitted) and provide a high-level critique of their advantages and disadvantages.

### A. The Economic Approach

Section IV detailed RBR, an economic framework for policy design. The distinguishing characteristic of the RBR approach is that it is grounded in pragmatic economic principles and economic lessons learned (often the hard way) from the practice of regulation over the past fifty years. Our approach is, however, neither new nor alone.<sup>185</sup> Indeed, as described elsewhere, the RBR approach is substantively related to seminal work of Alfred Kahn, Paul Joskow, Robert Hahn, Cass Sunstein and Stephen Breyer.<sup>186</sup>

At a policy level, both Democratic and Republican presidents, from Jimmy Carter through Barack Obama, have embraced the application of RBR principles.<sup>187</sup> For example, to accelerate the perceived need to evolve the regulatory process, President Obama in 2011 issued an Executive Order requiring executive agencies to:

- (1) propose or adopt a regulation only upon a reasoned determination that its benefits

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<sup>184</sup> HOUSE OF REPRESENTATIVES ENERGY & COMMERCE COMMITTEE, MODERNIZING THE COMMUNICATIONS ACT WHITE PAPER (Jan. 8, 2014); see #CommActUpdate, ENERGY & COMMERCE COMMITTEE, <http://1.usa.gov/1Y7jAm>.

<sup>185</sup> Mayo, *supra* note 15, at 154.

<sup>186</sup> *Id.*

<sup>187</sup> *Id.* at 155.

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.<sup>188</sup>

## B. Historical/Legal

A second approach toward regulatory evolution is largely rooted in a historical and legal context that recognizes the pressures exerted on the regulatory system by the routinization of disruptive innovation in the industry and attempts to adapt existing legal frameworks in the interest of preserving historic policy goals.<sup>189</sup> It likewise argues that rapid technological change has made existing regulatory structures “anachronistic.”<sup>190</sup> Yet, this approach seeks at its heart to maintain the historical continuity of legacy regulation by extending its reach to IP-based services.<sup>191</sup>

The historical/legal argument begins with a nuanced re-reading of Section 230(b) of the Communications Act, added in 1996, which describes the policy of the United States “to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation.”<sup>192</sup>

The historical/legal argument is that Section 230(b) should not be read as a deregulatory mandate, as its *prima facie* reading would suggest, but rather in a way that would legally permit the FCC to impose regulation on the Internet.<sup>193</sup> Arguing that the FCC has legal authority elsewhere in the statute to engage in regulation of Internet services, the legal/historical approach then urges the FCC to exercise that authority as an adaptation of old policy to new technology: “[i]f the Internet is consuming legacy communications and media industries, then Internet policy is the new telecommunications policy. The central provisions of the Communications Act must morph to apply to Internet-based sys-

<sup>188</sup> Exec. Order No. 13563, 76 Fed. Reg. 3821 (2011).

<sup>189</sup> Werbach, *supra* note 85, at 205.

<sup>190</sup> *Id.* at 206.

<sup>191</sup> Kevin D. Werbach, *Off the Hook*, 95 CORNELL L. REV. 535, 543-544 (2010).

<sup>192</sup> Telecommunications Act of 1996, 47 U.S.C. § 230(b)(2) (2012).

<sup>193</sup> Werbach, *supra* note 191, at 566 (arguing that the intent of Section 230 is “to limit, rather than expand, FCC regulatory authority” this approach ultimately finds refuge for the rationale to regulate the Internet in Section 251 and 256 of the Communications Act).

tems.”<sup>194</sup>

Thus, at its core, the historical/legal rationale for extending regulation to the Internet is: (a) there is legal authority to do so; and (b) this emerging technological platform for communications creates services today that are unregulated under the existing regulatory structure; so (c) traditional regulatory tools must be extended to cover these services that have heretofore not been subject to FCC regulation.<sup>195</sup>

There is much to be said for developing a governance structure that is mindful of the historical evolution of the industry and which offers a sound legal framework. To do so, however, without adhering to RBR principles, creates a profound risk that the transplanted regulations will harm rather than promote economic welfare. For instance, where the historical/legal approach argues in favor of morphing the regulatory structure applied to legacy communications networks onto IP-based services by extending Title II regulation to information services, the RBR principles caution against any reflexive regulatory extension. In particular, application of RBR Principle 1 requires that policymakers consider carefully whether regulation of post-PSTN IP-based services will in practice extend benefits to consumers that exceed the costs associated with that regulation. And in light of the rapid evolution of innovation in this sector, Principle 2 dictates that policymakers reconsider the very design of the governance structure to promote economic welfare.<sup>196</sup> It cautions, therefore, against reflexively extending regulation designed in one era onto services in a new era, with new market dynamics and a new legal environment. Principles 3-5 urge policymakers, in similar fashion, to engage in detailed empirical and counterfactual analysis, steps all seemingly omitted from the historical/legal approach to governance of the communications sector. Thus, the RBR approach imposes significant discipline on the historical/legal approach. Whether that discipline ultimately complements or contradicts the implications of the historical/legal approach to governance, the industry requires a full application of the RBR principles to the governance issues at hand.

Standing alone, the historical/legal approach to the future of regulation is at best a two-legged stool. In particular, it fails in several respects to weigh costs and benefits, both for applying existing regulatory structures to new problems and to the relative value of alternative governance structures.<sup>197</sup> Professor

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<sup>194</sup> *Id.* at 571-72; see Werbach, *supra* note 85, at 229 (observing that “unless the FCC intends to go out of business, it must take action.”). We eschew a detailed rebuttal to this seeming proffer of a “self-preservation principle,” simply noting that it finds no support among RBR principles.

<sup>195</sup> See Werbach, *supra* note 191, at 537-38.

<sup>196</sup> Mayo, *supra* note 124.

<sup>197</sup> See Douglas A. Galbi, *Transforming the Structure of Network Interconnection and Transport*, 8 COMMLAW CONSPECTUS 203 (2000).

Werbach, for example, describes the many consumer benefits thought to be served by a command-and-control approach to voice interconnection, concluding that these values transcend the transition to all-IP networks that merge voice with other forms of communication and content.<sup>198</sup> Therefore, he concludes that the FCC should continue its traditional role in mandating interconnection, using the existing statutory foundation of Sections 251 and 252 of the Communications Act and related regulations.<sup>199</sup> Indeed, he proposes extending the interconnection mandates for voice traffic to all IP traffic, including video and data traffic that were never subject to such rules.<sup>200</sup>

These recommendations, however, fail to weigh the benefits of traditional interconnection against the cost to competition and innovation, either in the legacy PSTN market or in emerging IP markets.<sup>201</sup> Nor are these recommendations based upon any empirical evidence that the benefits even exist, or their scale. Moreover, there is no consideration of the competing costs or benefits of an alternative governance structure, namely, to let the market continue to police interconnection for IP traffic as it has done for decades in the form of peering and transit agreements, over 99% of which are so straightforward, according to the OECD, that the parties do not even bother to reduce them to writing.<sup>202</sup>

Against this self-evidently efficient form of market-based governance, Werbach offers the anecdotal case of Verizon's tactical response to the destruction of its PSTN network on Fire Island in the wake of Hurricane Sandy.<sup>203</sup> Unable to expedite or justify the expense of rebuilding an obsolete analog network, Verizon initially offered its customers a mobile alternative, a service known as VoiceLink.<sup>204</sup> As Werbach and others point out, however, VoiceLink is in many respects inferior to traditional PSTN, unable to support many analog devices such as older fax machines.<sup>205</sup> Given that inferiority, Werbach questions whether IP services are in fact clearly better than traditional PSTN, and whether routinized innovation, consequently, serves as an effective market regulator over Title II.<sup>206</sup>

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<sup>198</sup> Werbach, *supra* note 85, at 245.

<sup>199</sup> *Id.* at 247.

<sup>200</sup> *See id.* at 224.

<sup>201</sup> *See Internet Traffic Exchange: Market Developments and Policy Changes*, ORG FOR ECON. CO-OPERATION & DEV. COMMITTEE FOR INFO. COMPUTER & COMM. POL'Y 11 (2013), <http://bit.ly/1xnqVso>.

<sup>202</sup> *Id.*; *see Internet Interconnections: Proposals for New Interconnection Model Comes Up Short*, INTERNET SOC'Y, <http://bit.ly/1BRC6ex> (last visited May 21, 2014).

<sup>203</sup> Werbach, *supra* note 85, at 216-17.

<sup>204</sup> *See* Tom Maguire, *Setting the Record Straight on Fire Island and Voice Link*, VERIZON POL'Y. BLOG, <http://vz.to/1zqeA4S> (last visited Oct. 4, 2014).

<sup>205</sup> Werbach, *supra* note 85, at 216.

<sup>206</sup> *Id.* at 257 ("The Communications Act does not direct the FCC to ensure that telecommunications service levels never decline; it merely requires a showing that a significant

But VoiceLink is not, in fact, an IP-based service at all.<sup>207</sup> It is a non-Internet service that operates on older cellular technology.<sup>208</sup> It is inferior to PSTN, in other words, but has nothing to do with the IP transition.<sup>209</sup> So the prime example offered for the historical approach to governing IP-based services is not, in fact, a relevant example.<sup>210</sup> This lack of empirical accuracy highlights the limits more broadly of this approach, which would substitute the attractive rhetoric of maintaining the FCC's historical though undefined duty to protect the "public interest"<sup>211</sup> for a more analytical rigor approach. While the former provides continuity, the latter is essential for making policy decisions with the potential to accelerate technological innovation and significantly improve the economic lives of consumers.<sup>212</sup>

### C. Architectural

Another "framework" proposed for the post-PSTN communications world is architectural in nature. In a recent paper, Taylor and Auriemma offer "a new model of the broadband ecosystem," which they call the "lattice structural model."<sup>213</sup> Their paper argues that the lattice structural model offers policy-makers "a coherent theoretical framework within which to decide what action (or forbearance) is appropriate under what conditions."<sup>214</sup> The model, however, is simply descriptive, offering a visual depiction of the multidimensional relationships that exist between the various elements of the broadband ecosystem.<sup>215</sup> As a preliminary step toward operationalizing this model, the paper examines "capital expenditure and various monetary indicators as a proxy for market power."<sup>216</sup> Examining one plane of the broadband ecosystem, the visualization purports to show "the superior market power of Verizon compared to

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change of this sort, on balance, serves the public interest.").

<sup>207</sup> VoiceLink is a kludge implemented using a "common wireless technology," that is, CDMA. It is not an IP-based service. *See* Maguire, *supra* note 204 (explaining that VoiceLink is a kludge implemented using a "common wireless technology," that is, CDMA. It is not an IP-based service).

<sup>208</sup> *See id.* (explaining that VoiceLink is a kludge implemented using a "common wireless technology," that is, CDMA. It is not an IP-based service).

<sup>209</sup> Werbach, *supra* note 85, at 216; *see* Maguire, *supra* note 204 (explaining that VoiceLink is a kludge implemented using a "common wireless technology," that is, CDMA. It is not an IP-based service).

<sup>210</sup> *See* Werbach, *supra* note 85, at 216-17.

<sup>211</sup> *See id.* at 257.

<sup>212</sup> *See id.* at 207.

<sup>213</sup> RICHARD D. TAYLOR & JOSHUA AURIEMMA, COMPETITION VERSUS REGULATION IN THE POST-SUNSET PSTN 3 (2013).

<sup>214</sup> *Id.*

<sup>215</sup> *Id.* at 20-21.

<sup>216</sup> *Id.* at 24.

Apple on the Network Operations plane.”<sup>217</sup>

Our suggested RBR framework, like that of Taylor and Auriemma, is intended to provide a model for assessing the relative merits of alternative regulatory governance structures. It is unclear, however, precisely how the visualization of the related “planes” of the broadband ecosystem offers more than a description of various competing elements.<sup>218</sup> Indeed, where the model is pushed to offer insights that might, from an economic perspective, guide policymaking, it simply draws “market power” conclusions from the relative magnitudes of firms’ capital expenditures.<sup>219</sup> Expenditures are, however, logically unrelated to market power as defined by economists.<sup>220</sup> While subsequent development of the Taylor-Auriemma approach may create a more coherent platform for policymakers, it has not yet done so.<sup>221</sup>

#### D. Values-Based

A final platform for guiding policymaking in the communications sector is rooted in the enunciation of technology-independent consumer-oriented “values” to which the FCC should anchor its policymaking.<sup>222</sup> A prominent description of the relevant values is offered by Public Knowledge, and include: (1) service to all Americans; (2) competition and interconnection; (3) consumer protection; (4) network reliability, and (5) public safety.<sup>223</sup>

These values are said to derive from the successes of regulatory policies that were adopted as mainstays of 20th century regulation.<sup>224</sup> In that respect, the “values” share a similarity with RBR principles, which also derive from an examination of economically successful historic governance structures. But the changing nature of disruptive technological innovation, discussed in Section II above, question the absolute value of prior regulatory mechanisms that operated in less dynamic environments.

Simply put, 20<sup>th</sup> century values, even those that worked, may have little rel-

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<sup>217</sup> *Id.* at 29.

<sup>218</sup> *See id.* at 21.

<sup>219</sup> *Id.* at 3, 24, 29.

<sup>220</sup> *See* Richard A. Posner & William M. Landes, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 939 (1980) (discussing “market power” as “the ability to set price above marginal cost”).

<sup>221</sup> Taylor, *supra* note 213, at 29; Jeffrey Eisenach & Gus Hurwitz, *Call for Participation: Regulating the Evolving Broadband Ecosystem*, AEI (Jun. 10, 2014), <http://bit.ly/1vU7v7U> (noting that as of now the FCC is still pursuing concrete opinions on how to manage the growing broadband ecosystem).

<sup>222</sup> Zachary Katz, *Policymaking in a Time of Technology Transitions*, FCC (Feb. 22, 2013), <http://fcc.us/1svdY95>; Eisenach & Hurwitz, *supra* note 221.

<sup>223</sup> Griffin & Feld, *supra* note 108.

<sup>224</sup> Tom Wheeler, *Adapting Regulatory Frameworks to 21st Century Networks and Markets*, FCC BLOG (Jan. 9, 2014), <http://fcc.us/19qrcQn>.

evance for 21<sup>st</sup> century markets. In any case, that these values arguably guided sound regulatory decision-making does not, *ipso facto*, lead to the conclusion that they remain lodestones for the FCC.<sup>225</sup> The RBR principles, on the other hand, are fluid enough to support regulatory design that can evolve to accommodate and enable rapidly-changing technological innovations.<sup>226</sup> In this regard, one concern about the values-based approach is that 20<sup>th</sup> century successes may be inappropriately “cut and pasted” into a 21<sup>st</sup> century environment, with the values themselves lost in translation. For example, as noted above, the maturation of the Department of Justice Antitrust Division and the Federal Trade Commission would seem to dictate a rethinking –rather than a simple extrapolation – of FCC governance of consumer protection and competition values.<sup>227</sup>

The values-based approach also confuses technological change with a change in consumer values. In some cases, valuable features of legacy technology may be more a historical accident and, even if not offered on the newer platforms, does not support a conclusion that routinized innovation will not provide more efficient and effective discipline for the market than rules that ossify values discovered only in their absence.<sup>228</sup>

For example, those who urge a slower implementation of the regulatory relief needed to complete the IP transition point out that IP voice services, including cable-based VoIP and over-the-top Internet VoIP, do not generally operate with independent power sources outside of battery backups at the user’s site.<sup>229</sup> In many cases during failure of the power system during natural disasters, they argue, customers of the old PSTN system could still place phone calls.<sup>230</sup> That “value” must, therefore, be translated into enforceable rules for future technologies or used as a brake to slow the transition from old to new.<sup>231</sup>

But is backup power aside from batteries a core “value” and, if so, one that is relevant to the IP transition? For one thing, most consumers no longer have handsets and can operate on the PSTN network’s independent power source, having traded that “value” for the benefit of cordless handsets, answering machines, and other features that required use of the home power connection at all times.<sup>232</sup>

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<sup>225</sup> Katz, *supra* note 222.

<sup>226</sup> Mayo, *supra* note 124, at 23-24.

<sup>227</sup> FTC Staff, *Broadband Connectivity Competition Policy*, FTC 1 (2007), <http://bit.ly/1wD3Xe0>.

<sup>228</sup> Taylor, *supra* note 213, at 10.

<sup>229</sup> Mustafa Haque, *VoIP: Regulating the Future*, 6 WASH. U. GLOBAL STUD. L. REV. 159, 161 (2007).

<sup>230</sup> *The Difference Between VoIP and PSTN Systems*, WEBOPEDIA (May 9, 2008), <http://bit.ly/1yWM4Kl>.

<sup>231</sup> Downes, *supra* note 126.

<sup>232</sup> *How to Keep Your Home Phone Working in a Power Outage*, SIMPLE LIFE AND HOME



To the extent consumers are still relying on the power backup, it is perverse to allow that “value” to serve as the regulatory tail wagging the technology dog. One might better ask why the power grid is so much more likely to fail than the PSTN network during natural disasters, or even during more mundane weather incidents. Perhaps it is because the continued regulation of the power grid under a strict federal-state public utility model has failed to incentivize power generators and distributors from investing in the kind of basic innovation (or even basic maintenance) that would keep these essential services in more robust condition.<sup>233</sup> The problem, in other words, is not with the technology of IP voice services but the weaknesses of the regulated power grid. If emergency access is a core value, we should use it as a basis for ensuring consumers continue to have not only dial-tone but also light, heat, and other essential services during emergencies.<sup>234</sup>

Which is not to say, as we have noted repeatedly, that there is no role for the FCC and other regulators in the all-IP world. Some network values, notably emergency services and other public safety uses of the network, may well warrant continued, even permanent, intervention, oversight, and direction from regulators to assure critical uses of the network are not left purely to market forces.<sup>235</sup> Indeed, one positive side-effect of the “experimental” approach inherent in the RBR framework and which has been adopted by the FCC for the IP transition is that it will generate real data, and not ungrounded speculation, on what features—and values—consumers truly treasure, especially when they are asked to weigh one generation of technologies against another in possible trade-offs.<sup>236</sup>

The focus of the value-based approach is on “what must be done” by regulators, to generate “commensurate benefits” from the evolving IP-based communications networks as they did from the traditional phone system. While the focus on core policy goals and associated values is laudable, the RBR Framework provides a number of disciplinary filters to assure that these benefits are best met with the appropriate balance of regulatory and market controls. Thus, the “values” approach and RBR may be best seen as complementary, rather than competitive, frameworks for communications governance in the 21<sup>st</sup> century.

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(Jul. 9, 2013), <http://bit.ly/1yUjvs5>.

<sup>233</sup> David Malkin & Paul A. Centolella, *Results Based Regulation: A Modern Approach to Modernize the Grid*, GE DIGITAL ENERGY 3, available at <http://bit.ly/1yUjvs5> (last visited Oct. 4, 2014).

<sup>234</sup> *Emergency Planning: First Responders*, FCC, <http://bit.ly/1sverrO> (last visited Sept. 14, 2014).

<sup>235</sup> *Technology Transitions and Public Safety*, FCC, <http://bit.ly/1sverrO> (last visited Sept. 14, 2014).

<sup>236</sup> Julie Veach, *Protecting Consumers in the Transition from Copper Networks*, FCC (May 7, 2014), <http://fcc.us/1oWjnIs>.

## VI. CONCLUSION

The Communications Act of 1934 was enacted “to make available, so far as possible, to all people of the United States a rapid, efficient, nationwide and world-wide wire and radio communications service with adequate facilities at reasonable charges.”<sup>237</sup> Judged by the sparse dissemination of expensive voice services then,<sup>238</sup> and the essentially ubiquitous nature of voice, video and data services today,<sup>239</sup> the Communications Act has been wildly successful. Much of this change has occurred only in recent years with the on-going convergence of all communications platforms to IP-based technologies which, by all accounts, sets the stage for an amazing set of “next generation” communications services that promise to substantially improve the economic lives and welfare of Americans.<sup>240</sup>

We have documented the evolution of this profound innovation, with a special eye on how this progress, in turn, necessitates a corresponding evolution of regulatory governance for the associated industries.<sup>241</sup> We draw upon and develop the implications of this double evolution for a Results-Based Regulation framework. We do so not to provide regulatory prescriptions but rather to offer a set of economically-rooted principles, which we urge all stakeholders to embrace at this critical moment of inflection.

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<sup>237</sup> Federal Communications Act of 1934, 47 U.S.C. § 151 (2012).

<sup>238</sup> See e.g., *Milestones in AT&T Network History*, AT&T, <http://soc.att.com/1vU9bOA> (last visited Oct. 24, 2014) (stating that AT&T’s transcontinental telephone line opened in 1915 but cost \$20.70 for the first three minutes and had very low usage).

<sup>239</sup> *GSA: 116 Mobile Operators Have Commercially Launched HD Voice Services*, FIERCEWIRELESSEUROPE (Sept. 24, 2014), <http://bit.ly/1uReq2d>.

<sup>240</sup> *Convergence and Next Generation Networks*, OECD 5, <http://bit.ly/1vU9ucf> (last accessed Sept. 15, 2014).

<sup>241</sup> Tom Wheeler, *The IP Transition: Starting Now*, FCC (Nov. 19, 2013), <http://fcc.us/1oK7uWM> (quoting FCC Commissioner Rosenworcel).