



## FROM REGULATION 1.0 TO 2.0

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For over twenty years, I have had one of the best seats in the house to observe the workings of regulation from all angles. I have had the opportunity to organize congressional hearings, draft legislation, serve as a commissioner at a regulatory agency, teach financial regulation, and now sit on the board of an audit regulator. All these experiences have helped shape my belief that regulation is vital to the welfare of our democracy. But this experience also fuels my concern that we need to address new dilemmas raised by changing technologies. The environment in which the regulatory system functions is changing rapidly. As the economy and society change, regulation needs to evolve as well.

I call the direction in which we are heading—whether we like it or not—Regulation 2.0, or the next generation of regulation. The language of “Regulation 2.0” focuses us on the revolution in communications and digital technology. And it contrasts with our regulatory beginnings, which I call Regulation 1.0.

### I. REGULATION 1.0

The U.S. experiment in federal regulation largely began after the Civil War. The formation of modern corporations, coupled with mass production, produced rapid changes in the U.S. economy, with long-lasting effects. This American “industrial revolution” demanded substantial amounts of capital for the building and operation of factories, mines, and railroads. Corporate investment drove rapid economic growth that was largely beneficial.

But there were unintended and unwelcome effects. Building the infrastructure of the nation was not cheap, easy, or fair. Managers flexed the power of the corporation to maximize profits and reduce competition through consolidation. Unrestrained by laws, regulations, or even ethics, managers

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engaged in price fixing, discriminatory pricing, extortion, and rampant worker exploitation.

The great muckraking journalist, Henry Demarest Lloyd, when describing the power of the railroad barons and their companies, summarized the situation this way: “These incidents in railroad history show most of the points where we fail . . . to maintain the equities of ‘government’—and employment—‘of the people, by the people, for the people.’”<sup>1</sup>

As accusations of abuse by railroad customers and suppliers increased, as did violence and social unrest, the state of Illinois attempted to restrict the rates that railroads could charge. But the U.S. Supreme Court ruled that only Congress had the power to regulate shipments between states.

The problem was complex. The corporations propelling the nation’s economy to new heights were also creating social harm and unrest. Congress created a solution to address the risks and threats by crafting its own innovation in 1887: the first federal independent agency, the Interstate Commerce Commission.<sup>2</sup>

The Supreme Court described the advent of administrative agencies as “a response to the felt need.” It was a practical solution to a practical problem.

I refer to this model of commissions, boards, and the like, operating until recently in the world of the tangible, as first-generation regulation, or Regulation 1.0. Reg 1.0 is where we still are.

The U.S. government’s first regulatory intervention into the oversight of big business required expertise for determining railroad rates that were “reasonable and just.”<sup>3</sup> The aim was to manage conflicts of interests and protect the public. And those are still largely the goals today.

Congress would return to this model repeatedly when public-private conflicts occurred in other industries or events demanded reform. Each agency was a response to a defined public-interest problem.

The creation of the Federal Reserve Board in 1913, for example, was a direct reaction to the crash of 1907.<sup>4</sup> The Federal Trade Commission was established in 1914 to deal with increasing concentration in American industry in violation of the antitrust laws.

Fourteen agencies created between 1933 and 1940 were all reactions to the Great Depression. And the more recent additions of the Environmental Protection Agency, the Occupational Safety and Health Administration, and the Consumer Financial Protection Bureau were all in response to their own corresponding policy needs and challenges.

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<sup>1</sup> Henry Demarest Lloyd, *The Story of a Great Monopoly*, THE ATLANTIC (March 1881), <https://www.theatlantic.com/magazine/archive/1881/03/the-story-of-a-great-monopoly/306019/>.

<sup>2</sup> *Interstate Commerce Commission*, FED. REG., <https://www.federalregister.gov/agencies/interstate-commerce-commission> (last visited Dec. 3, 2023).

<sup>3</sup> *The Interstate Commerce Act is Passed*, U.S. SENATE (Feb 4., 1887), [https://www.senate.gov/artandhistory/history/minute/Interstate\\_Commerce\\_Act\\_Is\\_Passed.htm](https://www.senate.gov/artandhistory/history/minute/Interstate_Commerce_Act_Is_Passed.htm).

<sup>4</sup> *Federal Reserve Act*, FED. RSRV., <https://www.federalreserve.gov/aboutthefed/> (last visited Dec. 3, 2023).

The work of all these administrative agencies to date has operated in the universe of the tangible: namely, people and paper. This was true whether the function was granting permissions, considering the bases for policy, or conducting investigations and enforcement.

The U.S. Securities and Exchange Commission (SEC) illustrates the model. It was created in 1934 as part of the second of two laws designed to respond to the market problems that led up to the stock market crash in 1929. The new laws said that companies offering securities for sale to the public must tell the truth about their business operations, the securities they sell, and the risks involved in investing in those securities.<sup>5</sup> And any intermediaries who sell and trade securities—that is, brokers, dealers, and exchanges—must also treat investors fairly and honestly.

To ensure that companies and intermediaries are operating in the markets fairly and honestly, the SEC, like other administrative agencies, can deploy certain tools in carrying out the responsibilities bestowed by Congress to establish and then enforce binding rules and standards.

These rules must be ones for which compliance is amenable to inspection and is enforceable. Inspect-ability and enforceability are constraints that require the rules to be targeted largely to paper or people—or both.

For example, a prospectus written on paper must be filed with the SEC and provided to investors about the offering and sale of securities. Companies need to provide written “continuing disclosures,” such as annual reports and other documents, that can be used by investors for current information to be used for investment decisions after the initial offering. Securities transactions must be confirmed by written forms of confirmation. Securities prices must be transparent and are aggregated onto a consolidated tape, which was once known as the ticket tape.

Similarly, the SEC identifies and prohibits certain types of conduct by people who are operating in the markets. The Commission has disciplinary powers over regulated entities and persons associated with the regulated entities.

With its focus on paper and people, the SEC is an example of Regulation 1.0. I think it is one of the best examples over time of an independent administrative agency that tailors its rules to balance the interest of the public and the groups it regulates, in an ecosystem that reflects what documents say and what people do.

The question confronting the SEC today—as with all other regulatory agencies—is whether, or perhaps how, Regulation 1.0 can continue. As the economy moves away from direct human actors and a paper-based environment into a new reality created by the digital revolution, in which data moves at the speed of light, in what direction should regulation head?

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<sup>5</sup> See *the Role of the SEC*, U.S. SEC. & EXCH. COMM’N, <https://www.investor.gov/introduction-investing/investing-basics/role-sec> (last visited Dec. 3, 2023) (“The main purpose of these laws can be reduced to two common-sense notions: Companies offering securities for sale to the public must tell the truth about their business, the securities they are selling, and the risks in investing in those securities.”).

## II. REGULATION 2.0

The digital revolution and the innovations it has brought us in terms of speed, storage, and capacity—the very same technical innovations that put powerful computing in your pocket—have forever changed our economy. And it will require shifting regulation beyond a focus just on paper and people. Most economic payments are now made computer to computer. Data are in. Paperwork is out. Paper has been disintermediated. Paper has disappeared. This is true with how people conduct almost all financial transactions. You use your phone to pay for groceries. You Venmo money to a friend. I recently traveled to Singapore to attend a meeting on global audit quality, and I never used cash or had to change money.

People also have been disintermediated. I can perform economic transactions without ever interacting with another human being. I can purchase stock on a variety of apps and never interact with a human being.

Algorithms push certain products towards me based on my past viewing or spending patterns. Although a human data scientist might have designed the original algorithm, no human is interacting with me in deciding what is pushed to my screen. In effect, interactions between humans are almost nonexistent.

All this disrupts a regulatory paradigm that concentrates on people and paper. It makes it quite challenging when thinking about regulatory incentives and disincentives or so-called carrots and sticks. How does a regulatory system provide incentives and disincentives? How does it gather facts without being able to examine human conduct and a paper trail? How does it pivot to a different way of operating?

And these questions are only more acute in today's era of artificial intelligence (AI). Interest in AI exploded late in November 2022 with the release of OpenAI's text-writing tool, ChatGPT. The technology underlying ChatGPT has also been incorporated into Microsoft's Bing chatbot. And Alphabet Inc.'s Google has released its own AI contender, Bard.

Alan Turing, the British mathematician who devised the method for breaking the central "Enigma Code" used by Germany in WWII, is often thought to be the father of digital computers and of AI.<sup>6</sup> Turing once said that "what we want is a machine that can learn from experience," and he noted that the "possibility of letting the machine alter its own instructions provides the mechanism for this."<sup>7</sup>

In 1950, Turing devised a practical test for determining true AI.<sup>8</sup> A human and a computer would respond to questions posed by a questioner. If the questioner could not distinguish the computer from the human, the computer would be considered an intelligent, thinking entity: artificially intelligent.

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<sup>6</sup> See B.J. Copeland, *Alan Turing*, BRITANNICA (Nov. 1, 2023), <https://www.britannica.com/biography/Alan-Turing>.

<sup>7</sup> *Id.*

<sup>8</sup> See Graham Oppy & David Dowe, *The Turing Test*, STANFORD ENCYCLOPEDIA OF PHIL. (Oct. 4, 2021), <https://plato.stanford.edu/entries/turing-test>.

It may be that no machine or program has thus far fully passed the Turing Test. But it sure seems like we are close.

Machine-learning algorithms today have resulted in a variety of innovations: facial recognition and other visual authentication tools; Amazon's Alexa and its tailoring of recommendations; widgets that provide the weather forecast on your mobile phone; robo-advisers; and even vaccine research. Through neural networks, self-improving algorithms, feedback-loops, and a few bells and whistles, the combination of complex algorithms and computer processing now appears intelligent in a human-like manner.

These AI technologies are and will have lasting impacts on both business and regulation. Could AI lead to untraceable market manipulation? To untraceable ways to launder money? To unheard of ways of accomplishing theft or fraud? No one yet knows. And we are just beginning to think of ways to create standards that can defend against such acts.

So, what could Regulation 2.0 look like?

Currently, most regulatory agencies have a narrow charge and a discrete number of tools to provide the public with benefits without creating any unintended effects. Agencies are also playing catch-up on the technological trends occurring in the private sector.

Innovations like ChatGPT, though, raise both opportunities and challenges.

For administrative agencies, the use of AI technology will likely bring new responsibilities. Thierry Breton, the European Union Commissioner for the Internal Market, has said that the upcoming EU Artificial Intelligence Act would include provisions targeted at generative AI systems, such as ChatGPT and Bard.<sup>9</sup> Breton has explained that "AI solutions can offer great opportunities for businesses and citizens but can also pose risks. This is why we need a solid regulatory framework to ensure trustworthy AI based on high-quality data."<sup>10</sup> Agencies in Europe will be responsible for developing and carrying out that new regulatory framework.

Agencies will also confront the challenge of deepfakes. Algorithms may make it impossible to know what is real and what is not. As author Kirk Borne has observed, "AI has become so powerful, and so pervasive, that it's increasingly difficult to tell what's real or not, and what's good or bad."<sup>11</sup> He has added that this technology is being adopted faster than it can be regulated.

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<sup>9</sup> See Foo Yun Chee & Supantha Mukherjee, *Exclusive: ChatGPT in Spotlight as EU's Breton Bats for Tougher AI Rules*, REUTERS (Feb. 3, 2023, 04:23 PM EST), <https://www.reuters.com/technology/eus-breton-warns-chatgpt-risks-ai-rules-see-tackle-concerns-2023-02-03/>.

<sup>10</sup> *Id.*

<sup>11</sup> David Smith, *Experts Call for Safeguards to Promote Best Use of AI*, SAS (Feb 8, 2023), [https://www.sas.com/en\\_gb/news/press-releases/2023/february/experts-call-for-safeguards-to-promote-best-use-of-ai.html](https://www.sas.com/en_gb/news/press-releases/2023/february/experts-call-for-safeguards-to-promote-best-use-of-ai.html).

Earlier this year, the nonprofit Future of Life Institute published a letter entitled “Pause Giant AI Experiments: An Open Letter.”<sup>12</sup> It was signed by Elon Musk, Yoshua Bengio, Steve Wozniak, and other tech luminaries, and it argued for a six-month time-out so that basic safety rules can be created for the design of advanced AI. The authors of the letter stated that “these protocols should ensure that systems adhering to them are safe beyond a doubt.”<sup>13</sup>

Whatever one makes of this open letter, or of what new protocols should say, a fundamental question must be confronted: How can regulatory agencies be more agile and nimble to deal with the opportunities and challenges created by digital innovations?

One way might be to make direct use of some of the same digital technologies that are advancing in the private sector.

In 1946, the Administrative Procedure Act (APA) demanded public participation in an administrative agency’s process of making rules.<sup>14</sup> The APA requires public notice of a proposed rulemaking. Agencies must provide interested persons with a meaningful opportunity to comment on any proposed rule through the submission of written “data, views, or arguments.”

And yet, there is a widespread perception that in practice only sophisticated stakeholders, such as regulated entities, industry groups, law firms, and professional associations have the knowledge, time, and attention to contribute to the notice-and-comment process. The most important questions for agencies are: Who are we not hearing from? Who is not at the table?

In 2006, a feature article in *Wired* magazine described a trend in the way businesses were using the internet to collaborate on solving problems.<sup>15</sup> Companies were posting problems on a website to elicit the help of “solvers”—that is, hobbyists and other members of the public. The article explained that “it’s not outsourcing; it’s crowdsourcing.”<sup>16</sup>

Perhaps much the same ought to apply to administrative rulemaking. AI can radically improve the engagement process, in effect helping to crowdsource public involvement in the rulemaking process. For example, bots could target stakeholders and members of the public, explaining to them the problem underlying the proposed rule and what the potential regulatory solution would do. The same digital tools could provide easy ways for the public to submit comments too. And as long as agencies have the requisite quality and quantity of data, they could use AI as a valuable tool in evaluating the efficacy of their existing rules—both qualitatively and quantitatively.

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<sup>12</sup> *Pause Giant AI Experiments: An Open Letter*, FUTURE OF LIFE INST. (Mar. 22, 2023), <https://futureoflife.org/open-letter/pause-giant-ai-experiments/>.

<sup>13</sup> Deepa Seetharaman, *Elon Musk, Other AI Experts Call for Pause in Technology’s Development*, WALL ST. J. (Mar. 29, 2023, 15:03 ET), <https://www.wsj.com/articles/elon-musk-other-ai-bigwigs-call-for-pause-in-technologys-development-56327f>.

<sup>14</sup> 5 U.S.C. §§ 551-559.

<sup>15</sup> Jeff Howe, *The Rise of Crowdsourcing*, WIRED (June 1, 2006, 12:00 PM), <https://www.wired.com/2006/06/crowds>.

<sup>16</sup> *Id.*

AI could help with enforcement too. Last December, the SEC announced fraud charges for a multi-year, multi-million-dollar front-running scheme.<sup>17</sup> The SEC staff had analyzed trading using the consolidated audit trail database to uncover the allegedly fraudulent trading and to identify how an employee profited by repeatedly front-running large trades by his employer.

In a similar way, machine-learning algorithms could be used to analyze millions of records for patterns that may be indicative of misconduct. They could analyze trading patterns to assist with insider trading investigations. Machine-learning algorithms could also be used to triage complaints and tips.

The debate over the rules of the road will continue for years to come, as all of us become users of generative AI. Although regulatory agencies will not be able to afford or maintain the quality of technology of some of the most sophisticated market participants, algorithmic tools still have the potential to be great equalizers, even if government expertise and resources are constrained.

### III. SHIFTING THE REGULATORY PARADIGM

Regulators around the world also are being challenged by questions about whether traditional legal concepts can apply to artificial intelligence (AI). What laws should apply? Who should enforce them? Who should be liable for what a self-teaching AI bot does? Solving these questions can remake administrative law, criminal law, and tort law. They show the perplexing and exciting challenges that young lawyers will confront throughout their careers.

I began this lecture by discussing the first administrative agency: the Interstate Commerce Commission (ICC). The ICC was born in a period of rapid technological advancement and innovation. More recent technology made the ICC obsolete, and it was abolished by Congress in 1995.

In the 1950s, the political scientist Marver Bernstein compared “the rhythm of regulation” to the human life cycle, with phases of “gestation, youth, maturity, and old age.”<sup>18</sup> Today, this life cycle is moving at a much more rapid pace than ever before. Administrative agencies need to respond to today’s innovations and advancements, including to the ways that technology affects agencies’ own ability to operate effectively.

The law school experience today is also dramatically different than it was years before. Students today have cell phones and tablets that allow them to avoid carrying legal casebooks around as I had to do.

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<sup>17</sup> Press Release, Sec. & Exch. Comm’n, SEC Charges Financial Services Professional and Associate in \$47 Million Front-Running Scheme (Dec. 14, 2022), <https://www.sec.gov/news/press-release/2022-228>.

<sup>18</sup> *Regulation*, BRITANNICA, <https://www.britannica.com/explore/savingearth/regulation> (last visited Dec. 3, 2023).

In the same way, administrative agencies must come to terms with and understand the new world in which they operate. Not doing so would be the equivalent of failing to understand how the railroad was reshaping society 150 years ago.

The advent of digital technologies and the algorithms that power them will challenge the focus, tools, and techniques of administrative agencies. AI will raise a host of novel questions. Can an algorithm be completely transparent? How can regulation be effective without accountable people or paper? Are there any tools that agencies can reasonably obtain to deal with the new world?

We know that algorithms can be secretive. They can malfunction. They seldom declare their intent. And they can, as some like to say, “hallucinate”—or lie.

How do these characteristics inform public officials’ decisions about the right regulatory approach? In its impact, the AI era is bringing on a new “railroad revolution” multiplied many times over. How do regulators gain the understanding of technology necessary to craft regulation for 2023 and beyond?

Our regulatory paradigm is not ready for ChatGPT—or of the algorithms behind its actions—but these algorithms will revolutionize our agencies and how we regulate.

This is a particularly fascinating and exciting time to be studying and thinking about our regulatory paradigm in the United States. We have been down similar roads before. But there are new challenges that lie ahead.

Soon it will be the turn of the next generation of lawyers. It will not be long before those who are in law school today will be in positions of leadership and policymaking authority. And every single one of you attending or reading this lecture will be part of the upcoming revolution in regulation—whether you are affiliated with an administrative agency, a technology firm, an innovator, or as an attorney at a law firm.

What is your approach? Where do you draw the lines? It is you who will create Regulation 2.0.