



DEPARTMENT OF JUSTICE

“Never Break the Chain”*: Pursuing Antifragility in Antitrust Enforcement

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I. Introduction

Thank you, Professor Spulber, for your introduction and invitation to join you today. I regret that I am not able to join you in person because this is one of the best times of the year to be in the Chicago area.

On my past two trips to Chicago to speak at conferences, I addressed the importance of protecting intellectual property rights and ensuring competition in digital markets¹—both pivotal to the modern innovation economy we inhabit today. I'm pleased to join the Kellogg School, the Northwestern University community, and the U.S. PTO for another opportunity to address the importance of innovation economics.

Protecting innovation by enforcing the competition laws is a centerpiece of the Antitrust Division's work, and I have made it one of my top priorities over the past three years as Assistant Attorney General. The Covid-19 pandemic that we now battle has underscored the importance of our innovation culture: freelance workers, small businesses, and large companies all have had to re-think their business processes from the ground up. No matter their size, businesses have been challenged to find new and innovative ways to operate and deliver goods and services during this pandemic. Indeed, innovations in the field of medical science will be crucial to emerging on the other side of this pandemic.

For our part, during this period, the Antitrust Division has made protecting competition in order to advance innovation in the private sector one of our top priorities. We must ensure that our economy continues to function, that our supply chains remain intact, and that medical science operates at the highest level in working toward treatments and vaccinations for the coronavirus.

* Lyrics from FLEETWOOD MAC, *The Chain*, on RUMOURS (Warner Bros. 1976).

¹ Asst. Att'y Gen. Makan Delrahim, "Don't Stop Believin': Antitrust Enforcement in the Digital Era" (Apr. 19, 2018), <https://www.justice.gov/opa/speech/file/1054766/download>.

To do so, we aim to ensure that antitrust law protects competition without standing as an impediment to rapid innovation.

Like so many others, our attorneys and economists kicked into high gear when the pandemic first struck, recognizing that time is of the essence for companies fighting to protect their businesses, customers, and workers. We announced an expedited process for issuing business review letters to parties seeking the Division's evaluation of whether business conduct could raise antitrust concerns.² Earlier this summer, for example, we quickly reviewed a proposed collaboration among biotechnology companies seeking to exchange information regarding the manufacture of monoclonal antibodies aimed at treating COVID-19.³

Indeed, I believe the current climate—marked by unprecedented struggles for our global community—also presents opportunities for real growth and significant development.

As the scholar Nassim Taleb explains, being subjected to stressors, shocks, and chaos can actually make us better if we are “antifragile.”

To explain the term “antifragile,” which is the title of his book,⁴ Taleb uses an analogy to a package marked fragile—one that, if mishandled would break. He then asks the reader to consider: what is the opposite of a fragile package? It is not, as most would say, merely a robust or resilient package. Those would be simply unharmed by any mishandling. To be truly the *opposite* of fragile, a package, as he describes, would “not just be unbreakable, but would benefit from shocks and a wide array of trauma.”⁵ In this way, he argues: “Antifragility is beyond

² Press Release, “The Justice Department and the Federal Trade Commission Announce Expedited Antitrust Procedure and Guidance for Coronavirus Public Health Efforts” (Mar. 24, 2020), <https://www.justice.gov/opa/pr/justice-department-and-federal-trade-commission-announce-expedited-antitrust-procedure-and>.

³ Press Release, “Department Of Justice Issues Business Review Letter To Monoclonal Antibody Manufacturers To Expedite And Increase The Production Of Covid-19 Mab Treatments (July 23, 2020), <https://www.justice.gov/opa/pr/department-justice-issues-business-review-letter-monoclonal-antibody-manufacturers-expedite>.

⁴ NASSIM TALEB, ANTIFRAGILE: THINGS THAT GAIN FROM DISORDER (2012).

⁵ *Id.* at 31.

resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better.”⁶

The pandemic through which we are now living certainly can be described as a “shock” producing a “wide array of trauma.” While there is tremendous harm, the good news is that, if we rise to the challenge of being antifragile, there is also an opportunity for tremendous growth. Critical innovations and technological developments often result from the kind of extraordinary experimentation the pandemic has made necessary. We have the opportunity to embrace antifragility, to delve into the experimentation and trial and error that drive growth, and to make ourselves better.

During a panel on which I participated last week, the legendary attorney H. Rodgin Cohen noted a perfect example of “antifragility” in action during the pandemic by citing the rise in popularity of mobile banking, a relatively recent innovation that offers significant efficiencies. Absent these extraordinary circumstances, many consumers would have been unlikely to try mobile banking for check deposit services, yet now they are doing so. As a result, businesses are now rethinking what infrastructure and costs are necessary to fuel the modern and future personal banking system.

Our goal at the Antitrust Division is to extend the spirit of innovation beyond our latest efforts to combat the pandemic and protect competition—ultimately, to become antifragile. To do so, I firmly believe we must be forward-looking, both in academic trends and in business trends, as we prepare to confront challenges to competition going into the future. Today I will discuss two areas of innovation economics that are gaining increased attention—behavioral economics and blockchain—and how the Division incorporates those tools into its work.

⁶ *Id.* at 3.

II. The Interplay of Behavioral Economics and Antitrust Law

Early in my tenure as AAG, I noted that one of the most crucial institutional efforts we must undertake is to ensure that we be able to maintain and deploy the latest tools in economic and business thinking.⁷ We have hosted addresses from several Nobel laureates as part of the Jackson-Nash Address series, as well as a number of other private lectures from forward-thinking economists, scholars, and writers such as Franklin Foer, Professor Shoshanna Zubov, and Professor Feng Zhu.

Most recently, we hosted Professor Avishalom Tor, a law professor and economist at Notre Dame Law School who specializes in applying the insights of behavioral economics to the field of antitrust law.⁸

Behavioral economics once was a niche subfield of economics that had few adherents; it often was dismissed as the province of critics of economic orthodoxy, with limited real-world application. Over the past few decades, however, behavioral economics has seen a surge in interest within academic spheres and the business community. Today, at any bookstore, you'll find dozens of "pop economics" books distilling behavioral economics research into real-world observations about individual and collective behavior. Of course, Nobel Prize winner Richard Thaler's book, *Misbehaving*, is required reading in most business circles.⁹

What is behavioral economics?

The field builds on decades of clinical and experimental psychology literature, which tests human decision-making in environments meant to approximate market conditions. All too

⁷ Remarks of Asst. Att'y Gen. Makan Delrahim, Inaugural Jackson-Nash Address 2 (Feb. 26, 2018), <https://www.justice.gov/opa/speech/file/1039136/download>.

⁸ E.g., JUSTIFYING COMPETITION LAW IN THE FACE OF CONSUMERS' BOUNDED RATIONALITY, IN NEW DEVELOPMENTS IN COMPETITION LAW AND ECONOMICS (Klaus Mathias & Avishalom Tor eds., 2019); Avishalom Tor, *Understanding Behavioral Antitrust*, 92 TEX. L. REV. 573 (2014).

⁹ RICHARD H. THALER, *MISBEHAVING: THE MAKING OF BEHAVIORAL ECONOMICS* (2016).

frequently, participants in experiments will make financial decisions that deviate from what models of “rational” human behavior predict. We must take care that the experimental results which inform us are robust and replicable, but those that are can aid our understanding of human behavior.

Based on this research, behavioral economists have questioned or critiqued some of the theoretical assumptions in economics that individuals act to maximize their utility through perfectly “rational” behavior.

For example, modern behavioral economic critiques tend to focus on two types of potential error. The first type is “observational errors,” which relate to how an individual’s choice may change based upon the context in which the choice is presented or “framed.”¹⁰ The second type is sometimes referred to as “willpower errors.” These involve individual choices or actions that seem to go against an individual’s stated preference due to an over- or undervaluation of future costs and benefits.¹¹

The insights of behavioral economics should not be misunderstood, however. Some argue that the results of *clinical* experiments invalidate economic models and insights that are built on “rational actor” premises.¹² That argument ignores that findings in clinical settings are not always robust in the real world. Sometimes the problem is deeper: the clinical results themselves are not always replicable.

¹⁰ See Joshua D. Wright & Judd E. Stone II, *Misbehavioral Economics: The Case Against Behavioral Antitrust*, 33 CARDOZO L. REV. 1517, 1530-31 (2012) (explaining and summarizing observational errors); Avishalom Tor & William J. Rinner, *Behavioral Antitrust: A New Approach to the Rule of Reason After Leegin*, 2011 U. Ill. L. Rev. 805, 829-30, 834-35 (explaining various observational errors).

¹¹ See Wright & Stone, *supra* note 10, at 1531-32 (explaining various types of willpower errors such as hyperbolic discounting and loss aversion).

¹² See, e.g., Dan Ariely, *The End of Rational Economics*, HARV. BUS. REV. (July-Aug. 2009), Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471 (1998); Russell B. Korobkin & Thomas S. Ulen, *Law & Behavioral Science: Removing the Rationality Assumption from Law & Economics*, 88 CAL. L. REV. 1051, 1053 (2000).

If a theory does not hold up to robust evidence, then that theory loses persuasive force, opening the door to new models to emerge. Those new models must stand up to empirical testing themselves. This process is true regardless of whether the criticism of a long-standing model relies on strict rationality assumptions or is “behavioral” in nature.

Put simply, the utility of behavioral economics will be determined by whether it can explain market forces better than existing economic theories.

While I do not think at this point that behavioral economics can “displace” neoclassical economic models, it may one day offer complementary analytical approaches that better predict systematic deviations from rational behavior within a market.

It is still too soon to tell whether that day will come. And rigorous testing would be required before we might unlock the potential of behavioral economics. At that point, behavioral economics could have the potential to increase the “antifragility” of the field of economics.

Professor Tor and other behavioral economists have helped build a body of scholarship applying behavioral insights to the actions of *firms* and their decisions in a competitive marketplace.¹³ Skeptics of behavioral economics may find this to be a far-fetched idea. After all, firms have a greater incentive to act rationally than individuals do.¹⁴ If companies do not behave rationally, then they will be punished in the market: they will lose customers, sacrifice profits, lose shareholder value, and attract a swarm of activist investors ready to change the direction of the business toward more rational and lucrative ends.

As such, actual conduct in the marketplace suggest that companies and their executive leadership and management may not behave rationally at all times.

¹³ See, e.g., Tor & Rinner, *supra* note 10; Tor, *supra* note 8; Christopher R. Leslie, *Can Antitrust Law Incorporate Insights from Behavioral Economics?*, 92 TEX. L. REV. S.A. 53 (2014).

¹⁴ See James C. Cooper & William E. Kovacic, *Behavioral Economics and Its Meaning for Antitrust Agency Decisionmaking*, 8 J.L. ECON. & POL'Y 779, 792 (2012) (summarizing this critique).

In the market for corporate control, activist hedge funds, mutual funds, and private equity investors have reaped enormous gains by turning companies toward rational behavior. More recently, however, many such investors have embraced the insights of cutting-edge behavioral economics research and incorporated them into their financial models.¹⁵

The application of behavioral economics to private firms raises the question of how competition enforcers around the world should grapple with and apply these new insights. Antitrust jurisprudence often asks us to assume that firms will behave rationally, or at least to maximize profits. Some critics contend that antitrust economics relies too heavily on rational actor models, and that seminal precedents relying on these models, such as *Brooke Group* and *Twombly*, may fail to capture harm to competition in the real world.¹⁶

These arguments deserve serious consideration and debate if the field of antitrust law is to prove itself to be “antifragile.” As part of that debate, we should note that certain antitrust doctrines *already* rest at least in part on the premises that companies may not behave rationally.

In particular, two doctrines under Section 7 of the Clayton Act implicitly recognize that companies may engage in mergers and acquisitions that *do not* rest on perfectly rational analyses and justifications.

¹⁵ See Suzanne Wooley, *How To Profit from Behavioral Economics*, BLOOMBERG BUSINESSWEEK (Oct. 27, 2017), <https://www.bloomberg.com/news/articles/2017-10-27/how-to-profit-from-behavioral-economics> (citing examples).

¹⁶ See, e.g., Avshalom Tor, *Illustrating a Behaviorally Informed Approach to Antitrust Law: The Case of Predatory Pricing*, ANTITRUST, Fall 2003, at 52 (developing a behavioral approach to predatory pricing); Chris Guthrie, *Prospect Theory, Risk Preference, and the Law*, 97 NW. U.L. REV. 1115, 1153 (2003) (arguing that “scholars have produced ample evidence demonstrating that predation occurs more commonly than rational choice theory and the courts suggest.”); Christopher R. Leslie, *Behavioral Economics and Antitrust Law: Hindsight Bias*, COMPETITION POL’Y INT’L at 3-5 (Jan. 2019) (discussing hindsight bias in antitrust jurisprudence); Stephen Martin, *Behavioral Economics: Antitrust Implications*, COMPETITION POL’Y INT’L at 6-7 (Jan. 2019) (identifying potentially erroneous assumptions in Supreme Court cases based upon rationality assumptions); see also Max Huffman, *A Look at Behavioral Antitrust from 2018*, COMPETITION POL’Y INT’L at 4-5 (Jan. 2019) (identifying specific applications of behavioral insights to antitrust issues); Max Huffman, *Marrying Neo-Chicago with Behavioral Antitrust*, 78 ANTITRUST L.J. 105, 126-127 (2012) (noting, “Behavioral Antitrust also raises the possibility of enforcement where it has in recent decades not been considered appropriate,” and using *Brooke Group* and *Twombly* as examples).

The first doctrine is the “efficiencies defense.” Under the case law, for a court to credit a merger’s efficiencies, they must be both *merger-specific* and *verifiable*. The agencies approach efficiencies claims in the same manner, as we noted in our recently released Vertical Merger Guidelines.¹⁷ This rigorous approach not only serves a useful role in keeping merging parties honest, but it also has behavioral underpinnings.

Specifically, the hopes and expectations of executives that a merger will generate significant efficiencies often fall short and may stem from a “willpower” error called overconfidence bias.¹⁸ Even if merging party executives earnestly *believe* that efficiencies will arise, they still may be wrong or overestimating the actual likelihood that they will materialize.¹⁹

Indeed, empirical research on the impact of mergers on shareholder value bolsters this idea. While target company shareholders benefit by earning a premium for their ownership, the shareholders of acquiring companies find mixed results.²⁰ Moreover, as I noted earlier, we have seen the market discipline company managers who engage in ill-considered acquisition activity.²¹

The second behavioral doctrine is the “failing firm defense,” which permits certain mergers where the parties’ only alternative is bankruptcy. Like the efficiencies defense, the failing firm defense does not merely trust arguments that “only a merger can save the company from failure.”

¹⁷ U.S. DEPARTMENT OF JUSTICE AND FEDERAL TRADE COMMISSION, VERTICAL MERGER GUIDELINES 11 (June 30, 2020), <https://www.justice.gov/atr/page/file/1290686/download>.

¹⁸ *E.g.*, John A. Doukas & Dimitris Petmezas, *Acquisitions, Overconfident Managers and Self-attribution Bias*, 13 EURO. FIN. MGMT. 531 (2007); Ulrike Malmendier & Geoffrey Tate, *Who Makes Acquisitions? CEO Overconfidence and the Market’s Reaction*, 89 J. FIN. ECON. 20 (2008); Richard Roll, *The Hubris Hypothesis of Corporate Takeovers*, 59 J. BUS. 197 (1986); *see also* Dale W. Griffin & Carol A. Varey, *Towards a Consensus on Overconfidence*, 65 ORG. BEHAV. & HUM. DECISION. PROC. 227 (1996); Lee Ross et al., *The “False Consensus Effect”: An Egocentric Bias in Social Perception and Attribution Processes*, 13 J. EXPERIMENTAL SOC. PSYCHOL. 279 (1977).

¹⁹ *See* Amanda P. Reeves & Maurice E. Stucke, *Behavioral Antitrust*, 86 IND. L.J. 1527, 1561-63 (2010).

²⁰ *See id.*; F.M. Scherer, *Some Principles for Post-Chicago Antitrust Analysis*, 52 CASE W. L. REV. 5, 11-18 (2001) (summarizing empirical research findings on the impact of mergers).

²¹ *See, e.g.*, BusinessWire, “Elliott Management Sends Letter to Board of Directors of AT&T” (Sept. 9, 2019), <https://www.businesswire.com/news/home/20190909005482/en/Elliott-Management-Sends-Letter-Board-Directors-ATT> (reprinting letter from Elliott Management to AT&T board of directors criticizing management’s recent acquisition activity).

Even if earnestly believed, such arguments may rest on faulty business judgment stemming from managers' cognitive biases.

Both of these doctrines serve two roles: they are designed to protect consumers from anticompetitive mergers, and they also attempt to ensure that antitrust analysis is not swayed by managers' faulty or irrational business judgment.

III. The Antitrust Division's Cutting-Edge Technologies Initiative: Blockchain, AI, and Machine Learning

I would like to turn now to a new initiative we launched at the Division over the past year. As part of our effort to remain up to speed on the latest economic tools, late last year we launched a novel program to build our expertise by training a handful of our attorneys and economists in cutting edge business applications: specifically, blockchain, machine learning, and artificial intelligence. Understanding the role these technologies play in markets today is increasingly important as their presence and prominence in industries continues to grow.

The foundation of this initiative is academic coursework offered by the MIT Sloan School of Management in blockchain, AI, and machine learning. These courses, like other online learning programs, can provide valuable foundational insights into these technologies, while focusing on practical concerns about how they may apply to new and existing business models. Our goal is for the Division's attorneys and economists to develop a basic but critical understanding of how businesses implement these technologies and what effect they might have on competition.

This provides a key opportunity for our enforcers to engage deeply with the practical realities of how these technologies are being used today—and how they may be used in the future. In an ever-evolving world, we must keep pace in order to be effective and “antifragile” enforcers.

I would like to dive into some examples of why this effort is so important, particularly as it relates to blockchain. This Spring I enrolled, alongside other members of the Division's staff

and Front Office, in the MIT Sloan School course in blockchain technology. After completing that course, we recognized the transformational effect that blockchain solutions may have on technology, businesses, and society in general over the coming years.

Blockchain is a “general purpose technology” whose applications have the potential to transform the entire economy. We have seen the wide-ranging impact of other general purpose technologies such as railroads, electricity, telecommunications, and information technologies like the Internet. Each of these played a starring role in the evolution of our society; each spurred incredible innovations that fundamentally altered our ways of life.

Importantly, these general purpose technologies carried the promise of toppling existing monopoly structures, as well as the prospect of new monopolists emerging and seeking to entrench themselves. Blockchain today holds a similar promise—with the added potential to maintain more decentralized marketplaces. Its success, though, is not yet guaranteed. I expect the Division will play a critical role in ensuring market conditions are conducive to unleashing blockchain’s revolutionary potential.

Blockchain, at its core, is a distributed (or “shared”) ledger method of recording information and transactions. It allows applications to be built atop a network that is fueled by the participation of distributed devices (or nodes) instead of a centralized data warehouse or the cloud. Transactions are recorded by appending blocks of information, building from the first—or the genesis—block to the most recent, hence the name “blockchain.”

As the CEO of New Mine, Ibrahim Alkurd, eloquently explains, blockchain is “a ledger of transactions that is distributed to computers all over the world. The ledger automatically updates with every transaction and can be viewed by anyone at any time. Essentially, the entirety of the

network reaches a consensus on each of the transactions, thereby preventing false transactions from being added to the ledger.”²²

This innovation could have profound implications for many industries and issues the Division analyzes, from financial services and credit monitoring to healthcare and health insurance. Likewise, verification over the blockchain also could impact the markets for intellectual property rights, such as by helping to manage IP rights in digital goods like streaming music or eBooks, or, as a company called IPwe aims to achieve, by building a single global database of patent ownership that can facilitate IP transactions.²³

Importantly, blockchain solutions provide a means for dramatically decreasing networking costs, which relate to the value created for users when more users join a network. In traditional networking solutions, the company that owns the network infrastructure can raise the cost of doing business on the network as the network becomes larger and more ubiquitous. The potential of blockchain is the ability to operate a marketplace or network without a centralized intermediary. Again, the ability to lower networking costs has important implications for markets the Division regularly considers in the context of conduct or merger investigations.

Whether and how well a given blockchain solution achieves networking cost reductions ultimately may determine the potential magnitude of change in an industry. Thus, it is of utmost importance that we prevent competitive abuses in markets where blockchain may offer consumers and businesses lower cost or higher value options.

²² Ibrahim Alkurd, *What is the Blockchain and Why Does it Matter?*, FORBES (May 18, 2020), <https://www.forbes.com/sites/theyec/2020/05/18/what-is-the-blockchain-and-why-does-it-matter/#177dfe3848a1>. Successful blockchain solutions provide an ability to decrease costs in two pillars of the modern information economy: verification and networking. Verification relates to the ability to confirm various information and attributes, such as ownership of a digital asset. Often, a trusted intermediary is required to complete the confirmation process: think of a bank confirming you have sufficient funds to complete an online purchase. Blockchain solutions aim to offer the means of verification without relying on a centralized intermediary.

²³ IPwe, “About Us,” <https://aboutipwe.com/about-us/>.

At the core of these inquiries lies a central question for antitrust enforcers: whether this new way of organizing interactions can prevent or limit the concentration of market power. Many have argued that blockchain solutions might do just that.²⁴

The dream for blockchain developers is that it will enable all the benefits of network effects, while minimizing or eliminating the market power that usually comes with those benefits. There is still a long way to go, however. For instance, developers still face critical questions of how to build into such a network's base architecture proper incentives to maintain, improve, and update that network. Blockchain solutions face a potential tragedy of the commons concern. The benefit of blockchain is that it may be able to eliminate, or shift the role of, intermediaries. The drawback in the system is that individual participants might lack the proper incentives to invest in creating the network in the first instance or in maintaining it over time.²⁵

It is not a given that society ultimately will realize the full potential of these solutions, or that the dream of blockchain technology toppling hubs of market power will come to fruition. Dedication to achieving this new world is vital—both from blockchain experts and from those who can support these competitive efforts, like the Antitrust Division. Our goal at the Division is to

²⁴ George Gilder, a leading economist, investor, and thinker, argues that blockchain technology carries the inherent potential to topple and supplant dominant businesses and platforms premised on data aggregation. He contends that this concentrated vision of the world is “unlikely to survive the root-and-branch revolution of distributed peer-to-peer technology”—a blockchain-based system he names the “cryptocosm.” GEORGE GILDER, *LIFE AFTER GOOGLE* 48 (2018).

²⁵ Another critical issue is scaling. Today, cryptocurrencies built on blockchain technology like Bitcoin and Ethereum are popular, but are they truly scalable for widespread use? Their distributed ledgers require some amount of time to confirm transactions—which may be only a few seconds but could be up to several minutes. Bitcoin's average time to confirm a transaction in July of this year, for instance, was nearly 10 minutes. Jennifer Rudden, *Average Bitcoin Transaction Confirmation Time 2017-2020*, STATISTA (Aug. 5, 2020), <https://www.statista.com/statistics/793539/bitcoin-transaction-confirmation-time/>. This is despite its relative limited use as a medium of exchange today. Were it to become more ubiquitous, the added traffic would slow confirmation times even further. Brilliant minds are continuing to investigate practical and effective solutions to these kinds of issues, so that we might one day unlock the full range of value blockchain offers. See, e.g., Peter Chawaga, *How the Lightning Network Will Grow Following Bitcoin's Third Halving*, BITCOIN MAGAZINE (May 21, 2020), <https://bitcoinmagazine.com/articles/how-the-lightning-network-will-grow-following-bitcoins-third-halving> (describing Lightning Network, which batches transactions much faster and cheaper, to increase the scalability of blockchain).

inquire how disruptive innovators might be deploying these technologies and how incumbents might try to stop or co-opt them.

There is also, most certainly, potential for abuse. Incumbents could use blockchains anticompetitively to exclude competition. For example, consider seafood harvesters that establish a permissioned blockchain to track food through the supply chain and assure quality and sourcing. If multiple competing harvesters conditioned access to that permissioned blockchain on agreeing to certain prices or output, competition and consumers would suffer tremendous harm.

Indeed, many astute observers of blockchain technology have raised questions about its implications for collusive activity. Blockchain solutions might, for instance, facilitate sharing of competitively sensitive information. As Dr. Thibault Schrepel has observed, by virtue of its distributed ledger, the blockchain “turns private information into genuinely public information.”²⁶ It may be difficult (or impossible) to identify which actors are sharing what information because the blockchain is based on pseudonyms and largely anonymous transactions. This combination of factors could embolden competitors to share more competitively sensitive information through the blockchain than they would otherwise. Moreover, blockchain’s smart contract capabilities could facilitate the design and implementation of anticompetitive agreements.

It should be clear by now that even though blockchain technology offers tremendous potential value, there is potential for misuse of well-crafted blockchain solutions.

Therefore, it is vital for antitrust enforcers to understand how the emerging technology works, how it can impact competition, and what existing companies may be doing to implement it. We cannot fall behind and learn, only too late, that entrenched monopolists have taken

²⁶ Thibault Schrepel, *Collusion by Blockchain and Smart Contracts*, 33 HARV. J.L. & TECH. 117, 132 (2019).

anticompetitive actions to eliminate the threat from blockchain technology to their business models. That would harm competition and thus consumers.

To this end, the Antitrust Division's new training initiative will play an important role in improving our enforcement efforts. Our attorneys and economists need to continue to study, or at a minimum be aware of, the impact of technological development, including developments in machine learning and AI, on business activity and competition. We aim to be well-equipped for the next transaction or course of conduct where understanding what actually motivates business decisions could prove pivotal.

IV. Conclusion

To conclude, I would like to return again to the concept of "antifragility." In our business and personal lives, each of us has suffered some setback, failure, or tragedy, and it is no cliché to say that how we respond ultimately will define us. For our part at the Division, as we carry out our mission and face new challenges every day during this pandemic, our goal is to become stronger. The ultimate beneficiaries will be American consumers, businesses, innovators, and workers—for many years to come.

Thank you again for the opportunity to join you today.