

REGULATORY FRAGMENTATION: INVESTOR REACTION TO SEC AND CFTC ENFORCEMENT IN CRYPTO MARKETS

YULIYA GUSEVA
IRENA HUTTON

INTRODUCTION	1557
I. INNOVATION AND THE INTERNATIONAL ROLE OF THE COMMISSIONS	1562
<i>A. The Risks and Benefits of Crypto</i>	1563
<i>B. Innovations, Regulatory Fragmentation, and Crypto</i>	1567
<i>C. Inter-Agency Differences</i>	1572
<i>D. Why Is U.S.-Led Enforcement Impactful?</i>	1573
II. THE TWO COMMISSIONS IN CRYPTO	1576
<i>A. The CFTC</i>	1576
<i>B. The SEC</i>	1580
III. EMPIRICAL RESEARCH ON CRYPTOASSET REGULATION	1583
IV. SAMPLE DATA	1587
<i>A. Cryptoasset Classifications</i>	1587
<i>B. Enforcement Data</i>	1589
<i>C. Summary Statistics</i>	1591
V. EMPIRICAL RESULTS	1596
<i>A. Enforcement Action Characteristics and Market Reaction</i>	1596
<i>B. Multivariate Analyses of Market Reaction</i>	1598
<i>C. Enforcement Publicity Measures</i>	1601
<i>D. Types of Respondents/Defendants and Market Reaction</i>	1603
<i>E. Are Bitcoin and Ethereum Special?</i>	1605
<i>F. Penalties and Other Measures</i>	1608
VI. THEORETICAL INTERPRETATIONS	1610
<i>A. Summary of the Results</i>	1610
<i>B. Regulation, Enforcement, and Fragmentation</i>	1610
CONCLUSION	1613

REGULATORY FRAGMENTATION: INVESTOR REACTION TO SEC AND CFTC ENFORCEMENT IN CRYPTO MARKETS

YULIYA GUSEVA*

IRENA HUTTON**

Abstract: In 2022, the White House released a regulatory framework calling for a “whole-of-government” approach to digital asset innovations. Although justified and necessary, this systems-based strategy discounts the reality that U.S. financial regulation is fundamentally fragmented. There are signs of a turf war between the major digital asset regulators, the U.S. Securities and Exchange Commission (SEC) and the U.S. Commodity Futures Trading Commission (CFTC). Both agencies claim jurisdiction over overlapping classes of digital assets, and several congressional bills recently proposed to radically redistribute this jurisdiction.

Policy reforms under the conditions of regulatory fragmentation need empirical data comparing the effect of the regulators’ actions. Empirical literature on digital asset innovations, however, has not paid sufficient attention to the impact of U.S.-specific factors such as regulatory fragmentation. Nor has it explored the importance of U.S. regulators to global digital asset markets. We aim to fill this gap, contribute to the scholarship on financial innovation, and equip policymakers with necessary empirical data.

Note: Because not all platforms support graphs and tables, those appearing in this Article are archived at https://www.bc.edu/content/dam/bc1/schools/law/pdf/law-review-content/BCLR/64-7/Guseva_Hutton_BCLR_64_7.pdf [<https://perma.cc/9QCD-Z44V>].

* Professor of Law, Head of the Blockchain and Fintech Program, Rutgers Law School, yg235@law.rutgers.edu.

** Gene Taylor/Bank of America Professor of Finance and Director of the Gene Taylor/Bank of America Center for Banking and Financial Studies, FSU College of Business, ihutton@business.fsu.edu.

The authors are deeply grateful to Ilya Beylin, Jens C. Dammann, Mira Ganor, Martin Gelter, Carol Goforth, Sean J. Griffith, Howell E. Jackson, Darian M. Ibrahim, David Noll, James Park, and James C. Spindler for their feedback. The authors thank the participants of the European Association of Law and Economics, 2022 Annual Conference; the 2022 Annual Corporate & Securities Litigation Workshop; the NYU Pollack Center for Law and Business Corporate Governance Luncheon Series; the 2022 Harvard Blockchain Conference; and the International Symposium on Law and Economics of Litigation for their comments on the main ideas of this Article. The authors are particularly grateful to SEC Commissioner Hester Peirce for her critiques of the data analysis presented in this project. The authors thank Hang Miao, PhD Student, Rutgers University Department of Economics, who provided invaluable assistance with data collection and coding. The empirical part of this research was generously supported by the University Blockchain Research Initiative, the Ripple Impact Fund, and the Silicon Valley Community Foundation. Riham Alzabey, Allison Berdichevsky, Kale Pasch, and Melissa Perez provided research assistance. All errors are ours.

Our empirical study compares how the SEC and CFTC regulate crypto primarily via enforcement and how the global digital asset market reacts to the agencies. The market distinguishes between the Commissions and reacts particularly negatively to SEC enforcement. Crypto markets, however, should not be assumed to reject formal law or strong enforcement. Digital asset prices exhibit a more positive reaction to U.S.-led antifraud efforts, indicating that investors understand the value of market integrity.

We supply theoretical explanations and underscore that although markets generally view U.S.-led enforcement as costly, some types of regulation may have the potential to improve market quality with positive valuation implications. We hope that our analysis provides new information to scholars and policymakers in evaluating the merits of financial reforms, addressing the current fragmentation in financial regulation, resolving turf wars, and advancing the efforts to promote a whole-of-government approach to digital asset innovation.

INTRODUCTION

In 2022, the White House and the Financial Stability Oversight Council (an assembly of regulators created to identify vulnerabilities in the U.S. financial system) proposed major initiatives designed to trigger a tectonic shift in U.S. regulation of digital assets.¹ The proposals emphasize the need for collaborative and systems-based regulation of technological innovations in finance.

In theory, given the nature of digital asset technology that can be applied across financial markets and industries, adopting “whole-of-government” policies based on collaboration and coordination among regulators appears justified.² The spectacular collapse of FTX, a complex cross-border conglomerate

¹ Ensuring Responsible Development of Digital Assets, Exec. Order No. 14067, 87 Fed. Reg. 14143 (Mar. 9, 2022); *FACT SHEET: White House Releases First-Ever Comprehensive Framework for Responsible Development of Digital Assets*, THE WHITE HOUSE (Sept. 16, 2022) [hereinafter *White House Framework*], <https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/16/fact-sheet-white-house-releases-first-ever-comprehensive-framework-for-responsible-development-of-digital-assets/> [https://perma.cc/NCB9-SZ84]; *FACT SHEET: President Biden to Sign Executive Order on Ensuring Responsible Development of Digital Assets*, THE WHITE HOUSE (Mar. 9, 2022) [hereinafter *White House Order*], <https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/> [https://perma.cc/R96P-29CE]; FIN. STABILITY OVERSIGHT COUNCIL, REPORT ON DIGITAL ASSET FINANCIAL STABILITY RISKS AND REGULATION 1–3 (2022) [hereinafter FSOC 2022], <https://home.treasury.gov/system/files/261/FSOC-Digital-Assets-Report-2022.pdf> [https://perma.cc/VY3V-WWQG]. A digital asset covers a broad category and includes “[a]ny asset that is purely digital, or is a digital representation of a physical asset.” DYLAN YAGA, PETER MELL, NIK ROBY & KAREN SCARFONE, NAT’L INST. OF STANDARDS & TECH., NISTIR 8202, BLOCKCHAIN TECHNOLOGY OVERVIEW 51 (2018), <https://nvlpubs.nist.gov/nistpubs/ir/2018/nist.ir.8202.pdf> [https://perma.cc/BDJ2-AMNU]. Some digital assets are secured through cryptography and reside on distributed ledgers such as blockchains. See *infra* notes 39–60 and accompanying text (discussing relevant technologies).

² See *infra* Part I for a discussion of relevant applications.

toppled by fraud and corporate mismanagement, further underscores this need for a more panoramic approach to cryptoasset markets and their infrastructure.³ Any comprehensive initiatives, however, may (and probably will) collide with the primal fragmentation of U.S. financial law.⁴ This collision may undermine attempts at designing more holistic reforms, which appear achievable in other countries.⁵

The realities of fragmentation are evident in the increasing competition between the major federal regulators claiming jurisdiction over digital asset markets: the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) (i.e., the Commissions). These regulators are the watchdogs of American commodity, derivatives, and securities markets.⁶ In the digital asset space, both agencies claim jurisdiction over the same assets and firms.⁷ Their Chairs diverge on how this market should be regulated and on proposed reforms concerning the Commissions' respective jurisdictions.⁸

Recent testimony by the Chairs of both Commissions before the U.S. Senate highlights this fragmentation. Testifying on the same day, the CFTC Chair stated that "the CFTC's expertise and experience make it the right regu-

³ For an overview of the FTX debacle and preceding events, see generally Candice Choi, *Crypto Crisis: A Timeline of Key Events*, WALL ST. J., <https://www.wsj.com/articles/crypto-crisis-a-timeline-of-key-events-11675519887> [<https://perma.cc/JUC8-HYBE>] (June 6, 2023).

⁴ See *infra* notes 61–83 and accompanying text (discussing the currently fragmented system).

⁵ Various European authorities have rolled out comprehensive reforms and reform proposals targeting many regulatory areas and providing for cooperation among regulators. See, e.g., *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a Digital Finance Strategy for the EU*, at 4–13, COM (2020) 591 final (Sept. 24, 2020); *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Shaping Europe's Digital Future*, at 1–3, COM (2020) 67 final (Feb. 19, 2020); HM Treasury, *Government Sets Out Plan to Make UK a Global Cryptoasset Technology Hub*, GOV.UK (Apr. 4, 2022), <https://www.gov.uk/government/news/government-sets-out-plan-to-make-uk-a-global-cryptoasset-technology-hub> [<https://perma.cc/4JUJ-D4ZJ>]; RON KALIFA, KALIFA REVIEW OF UK FINTECH 4–11 (2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/978396/KalifaReviewofUKFintech01.pdf [<https://perma.cc/5UGH-PZ7S>].

⁶ See discussion *infra* Part II.

⁷ See *infra* notes 61–83 and accompanying text (illustrating this overlap).

⁸ Compare Jesse Hamilton, *CFTC Chief Heaps Praise on Bill That Boosts Agency's Crypto Reach*, COINDESK, <https://www.coindesk.com/policy/2022/06/08/cftc-chief-heaps-praise-on-bill-that-boosts-agencys-crypto-reach/> [<https://perma.cc/ABS8-8KG7>] (May 11, 2023) (noting the CFTC Chief's praise of a proposed bill that would grant the Commission authority over the exchange of major cryptocurrencies, including Bitcoin and Ether), with Nikhilesh De & CoinDesk, *The Crypto Regulation Bill Could 'Undermine' Market Protections, SEC Chief Gary Gensler Says*, FORTUNE (June 14, 2022), <https://fortune.com/crypto/2022/06/14/crypto-regulation-bill-gary-gensler-sec-cftc-lummis-gillibrand/> [<https://perma.cc/WT8W-CJQR>] (highlighting the SEC Chief's fear that the same proposed bill could undermine SEC-established market protections by overclassifying digital assets as commodities, thus subjecting them to CFTC jurisdiction).

lator for the digital asset commodity market,”⁹ while the SEC Chair testified that digital asset stakeholders would benefit from U.S. securities law—the “gold standard that has made our capital markets the most liquid and innovative in the world.”¹⁰ The line between digital commodities (CFTC jurisdiction) and digital asset securities (SEC jurisdiction), however, may be blurred.¹¹

The U.S. Congress has attempted to address these overlapping jurisdictional concerns. The U.S. House of Representatives proposed an omnibus bill on cryptoasset markets in July 2023,¹² and the Senate put forth several major bills in 2022 and 2023.¹³ The bills envision a major overhaul of digital asset regulation with an emphasis on securities, derivatives, and commodity markets.¹⁴ They also seek to assign more responsibility to the CFTC as a key regulator of “digital commodities.”¹⁵

These developments have stirred up policy debates and provoked an uproar from scholars. Some academics suggest that the CFTC has neither the expertise nor the resources to oversee digital asset markets;¹⁶ others challenge the

⁹ *Legislative Hearing to Review S.4760, the Digital Commodities Consumer Protection Act Before the S. Comm. on Agric., Nutrition & Forestry*, 117th Cong. 2 (2022) (statement of Rostin Behnam, Chairman, CFTC), https://www.agriculture.senate.gov/imo/media/doc/Testimony_Behnam_09.15.2022.pdf [<https://perma.cc/U6NJ-5L7R>].

¹⁰ *Oversight of the U.S. Securities and Exchange Commission Before the S. Comm. on Banking, Hous. & Urb. Affs.*, 117th Cong. 6 (2022) (statement of Gary Gensler, Chairman, SEC), <https://www.banking.senate.gov/imo/media/doc/Gensler%20Testimony%209-15-22.pdf> [<https://perma.cc/Q9YU-L2HU>].

¹¹ See discussion *infra* Parts I–II.

¹² See Financial Innovation and Technology for the 21st Century Act, H.R. 4763, 118th Cong. (2023).

¹³ See, e.g., Lummis-Gillibrand Responsible Financial Innovation Act, S. 4356, 117th Cong. (2022); Digital Trading Clarity Act of 2022, S. 5030, 117th Cong. (2022). In July 2023, Senators Lummis and Gillibrand introduced an updated version of the Responsible Financial Innovation Act. See S. 2281, 118th Cong. (2023).

¹⁴ See Daniel Engoren, *U.S. Congressional Leaders Introduce Two Landmark Bills to Create a Digital Assets Regulatory Scheme*, SIDLEY (July 25, 2023), <https://www.sidley.com/en/insights/news-updates/2023/07/us-congressional-leaders-introduce-two-landmark-bills-to-create-a-digital-assets-regulatory-scheme> [<https://perma.cc/J4LP-YDMT>] (providing summaries of both the Financial Innovation and Technology for the 21st Century Act and the Lummis-Gillibrand Responsible Financial Innovation Act).

¹⁵ See, e.g., H.R. 4763 §§ 102(5), 301(a) (defining the term “digital commodity” and excluding it from the definition of “security”). The recent Senate bill uses different terminology and refers to cryptoassets as “digital assets.” S. 4356 § 101. It also grants the CFTC spot market jurisdiction over cryptoassets that are not securities. *Id.* § 403.

¹⁶ See, e.g., Letter from Hilary J. Allen, Prof. & Assoc. Dean for Scholarship, Am. Univ. Wash. Coll. of L., Mark Hays, Senior Pol’y Analyst, Ams. for Fin. Reform & Lee Reiners, Pol’y Dir., Duke Fin. Econ. Ctr., to Debbie Stabenow, Chairwoman, S. Comm. on Agric., Nutrition & Forestry, David Scott, Chair, H. Comm. on Agric., John Boozman, Ranking Member, S. Comm. on Agric., Nutrition & Forestry & Glenn Thompson, Ranking Member, H. Comm. on Agric. (Sept. 12, 2022) (on file with authors), <https://ourfinancialsecurity.org/wp-content/uploads/2022/09/AFR-Letter-Stabenow-Bill.pdf>

appropriateness of the SEC's current strategy and ask for more clarity and reform in crypto.¹⁷ A third line of argument focuses on a joint SEC-CFTC approach and thus belongs to a more holistic view on financial regulation.¹⁸

In this Article, we contribute to the scholarship on digital financial innovation and seek to assist policymakers operating in a fragmented legal regime. From now on, we will use the terms "digital assets," "cryptoassets," and "crypto."¹⁹ Although there are distinctions between cryptoassets and digital assets,²⁰ different agencies seem to use the terms interchangeably.²¹ Overall, there is no uniformity in digital asset taxonomy.²²

To be successful, policy reforms aiming to create a more comprehensive system for financial innovations, such as crypto, need empirical research comparing the actions of relevant regulators. We examine this information to help policymakers form a more systemic perspective on regulatory frameworks.²³

[<https://perma.cc/9CM7-SQHA>] (arguing that the CFTC derivative market differs from the cryptocurrency market and that the CFTC is ill-equipped to look out for retail investors).

¹⁷ See, e.g., E-mail from J.W. Verret, Assoc. Prof., George Mason Univ. Sch. of L., to Vanessa Countryman, Sec'y, SEC (Jan. 22, 2022) (on file with the SEC), <https://www.sec.gov/files/rules/petitions/2022/petn4-782.pdf> [<https://perma.cc/HER6-RHLG>] (requesting the SEC to call for public comments regarding digital asset regulation); see also *infra* note 224 (noting scholarship that calls for reforms in digital asset regulation).

¹⁸ See generally Timothy G. Massad & Howell E. Jackson, *How to Improve Regulation of Crypto Today—Without Congressional Action—and Make the Industry Pay for It* (Hutchins Ctr. on Fiscal & Monetary Pol'y at Brookings, Working Paper No. 79, 2022), <https://www.brookings.edu/wp-content/uploads/2022/10/WP79-Massad-Jackson-updated-2.pdf> [<https://perma.cc/SC8Q-68K9>] (advocating for the creation of a novel self-regulatory organization jointly overseen by the SEC and CFTC).

¹⁹ "Cryptoassets are cryptographically secured digital representations of value that can be transferred, stored or traded electronically. They use some form of distributed ledger technology such as blockchain." *What Cryptoassets Are*, INLAND REVENUE, <https://www.ird.govt.nz/cryptoassets/what-cryptoassets-are> [<https://perma.cc/PU7Y-DTZU>] (July 16, 2021). By "crypto," we mean "cryptoassets" and the infrastructure for their issuance, transfer, trading, and redemption. We provide specific classifications and definitions of cryptoassets *infra* Part IV. We refer to the market for cryptoassets, its ecosystem, infrastructure, and its participants as "crypto market" or "cryptoasset market."

²⁰ See FSOC 2022, *supra* note 1, at 7 (establishing "crypto-assets" as a sub-category of "digital assets").

²¹ See *White House Framework*, *supra* note 1 (appearing to use "crypto-assets" and "digital assets" interchangeably).

²² See discussion *infra* notes 178–193 and accompanying text (highlighting variation in digital asset taxonomy).

²³ We aim to supply policymakers with tools to better regulate a whole system. Essentially, we provide new variables for a "systems analysis," "a methodology developed in the fields of engineering, business information systems, and computer programming specifically to manage complexity." Lynn M. LoPucki, *The Systems Approach to Law*, 82 CORNELL L. REV. 479, 481 (1997).

If the designers regard the systems they design as concrete, rather than as merely conceptual, and operationalize their goals, they make their task more difficult. They must work within the physical limits of the system and make the system work to accomplish an empirically verifiable result. But by doing so, they make the system infinitely more

Empirical analyses provide objective metrics and help alleviate the realpolitik of regulatory fragmentation. Combining regulatory and data analyses enables Congress and the White House to gauge the reaction of the regulated based on global market feedback, rather than through the eyes of competing agencies or industry lobbyists.

We also aim to fill a gap in the literature on digital assets. To date, this scholarship has not paid sufficient attention to the interaction among U.S.-specific factors such as regulatory fragmentation, specific modes of regulation, and the centrality of U.S. agencies in global markets. This omission creates a deep interstice in our understanding of crypto regulation.²⁴

Both Commissions approach digital innovations mainly through enforcement of existing securities, commodities, and derivatives laws.²⁵ To assess this distinct regulatory mode, we examine the market's reaction to 116 enforcement events between April 2017 and November 2021.²⁶ We limit the enforcement actions to the pre-2022 period to avoid the volatility effects of several major antifraud actions and bankruptcies.²⁷

Our cross-sectional analyses and event study indicate that the global crypto market (to a surprising degree) is attuned and susceptible to enforcement actions initiated by the Commissions. In addition, market participants react differently to the SEC compared with the CFTC. Cryptoasset prices react more negatively to SEC actions than to CFTC enforcement. Crypto markets detect differences in enforcement paradigms between the agencies within the balkanized network of U.S. financial regulators. The global crypto market perceives SEC regulation as a particularly negative event. This reality suggests that policymakers should jointly address regulation of securities and commodity mar-

useful. The system can alter behavior and achieve concrete goals rather than merely express ideas.

Id. at 496.

²⁴ See discussion *infra* Part III (expounding shortcomings in crypto scholarship and explaining how this Article helps to fill the void).

²⁵ See Cheryl L. Isaac, Keri E. Riemer, Christine Mikhael & Stephen M. Humenik, *CFTC and SEC Perspectives on Cryptocurrency and Digital Assets—Volume I: A Jurisdictional Overview*, K&L GATES (May 6, 2022), <https://www.klgates.com/CFTC-and-SEC-Perspectives-on-Cryptocurrency-and-Digital-Assets-Volume-I-A-Jurisdictional-Overview-5-6-2022> [<https://perma.cc/X54C-FJ5Q>] (overviewing SEC and CFTC enforcement actions).

²⁶ See discussion *infra* Parts IV–V (outlining our data and laying out our findings).

²⁷ Among the major events that triggered the so-called crypto winter and a crash of cryptoasset prices was the collapse of an algorithmic stablecoin, Terra USD. For a detailed description of Terra, see generally *SEC v. Terraform Labs Pte. Ltd.*, No. 23-CV-1346, 2023 WL 4858299 (S.D.N.Y. July 31, 2023). Several notable bankruptcies followed. For details on the bankruptcy of Celsius, see generally *In re Celsius Network LLC*, 645 B.R. 165 (Bankr. S.D.N.Y. 2022). The next momentous failure was FTX. See, e.g., *CFTC v. Bankman-Fried*, No. 22-CV-10503, 2022 WL 17936617, at *1 (S.D.N.Y. Dec. 23, 2022) (entering a consent judgment against Gary Wang, one of the defendants indicted as a result of the FTX collapse).

kets, and create a more cohesive, less fragmented regulatory regime to improve regulatory efficiency built on the respective strengths of both Commissions.

From the start, we would like to address one crucial counterargument. Some commentators suggest that money laundering and crime drive crypto markets and that law is contrary to the community's libertarian ethos.²⁸ But our results indicate that, although investors perceive enforcement as an adverse event, they do not view antifraud actions in a similarly negative light. This indicates that many crypto market participants understand that fraud undermines market integrity. Although crypto investors treat regulation (mainly enforcement of the pre-crypto U.S. securities statutes) as an unfavorable and costly event, the benefits of improved market quality and integrity mitigate these costs. Ultimately, we hope that this study not only contributes to the scholarship on digital innovation but also assists policymakers in designing more efficient reforms based on a more comprehensive view of crypto regulation.

Part I of this Article discusses financial innovation and regulatory fragmentation.²⁹ It also explains the importance of the Commissions and their enforcement in the global world of crypto. Part II summarizes the Commissions' jurisdiction and outlines relevant statements and crypto-related actions.³⁰ Part III discusses our contribution to the financial and economic literature on crypto regulation.³¹ Part IV provides cryptoasset taxonomies and covers our sample data.³² Part V presents our empirical results.³³ Part VI provides theoretical interpretations.³⁴ Finally, the Article concludes that our data supports a comparative reevaluation and reform of the currently fragmented approach to cryptoasset regulation.

I. INNOVATION AND THE INTERNATIONAL ROLE OF THE COMMISSIONS

Section A of this Part explains that crypto presents socioeconomic benefits and simultaneously poses risks that must be carefully addressed.³⁵ Section B discusses digital innovations and the fragmented regulatory system that governs cryptoassets.³⁶ Section C highlights the jurisdiction, policies, and differing

²⁸ For relevant arguments, see Kristin N. Johnson, *Decentralized Finance: Regulating Cryptocurrency Exchanges*, 62 WM. & MARY L. REV. 1911, 1951, 1980 (2021).

²⁹ See *infra* notes 35–104 and accompanying text.

³⁰ See *infra* notes 105–158 and accompanying text.

³¹ See *infra* notes 159–174 and accompanying text.

³² See *infra* notes 175–204 and accompanying text.

³³ See *infra* notes 205–217 and accompanying text.

³⁴ See *infra* notes 218–228 and accompanying text.

³⁵ See *infra* notes 39–60 and accompanying text.

³⁶ See *infra* notes 61–83 and accompanying text.

approaches of the SEC and CFTC.³⁷ Lastly, Part D underscores the global impact of U.S.-led enforcement.³⁸

A. The Risks and Benefits of Crypto

In September 2022, the White House released the first-ever Comprehensive Framework for Responsible Development of Digital Assets.³⁹ In the Framework, the Administration describes the considerable economic potential of digital assets based on distributed ledger technology, such as blockchains and cryptography.⁴⁰ At the same time, the Framework underscores several risks accompanying these innovations, including the risk of fraud, volatility, and systemic risk arising out of a contagion of failures and interconnectedness of financial institutions.⁴¹ Against this risk-reward calculus, the White House urges various U.S. regulators to develop new “whole-of-government” approaches to digital assets, mitigate their risks, and reinforce the “[g]lobal [f]inancial [l]eadership and [c]ompetitiveness” of the United States.⁴²

Cryptoassets are crucial innovations that for years piqued the curiosity of tech enthusiasts, investors, consumers, and financial institutions around the world.⁴³ Data reveal that as many as sixteen percent of American adults have

³⁷ See *infra* notes 84–91 and accompanying text.

³⁸ See *infra* notes 92–104 and accompanying text.

³⁹ See *White House Framework*, *supra* note 1.

⁴⁰ *Id.*

Blockchains are distributed digital ledgers of cryptographically signed transactions that are grouped into blocks. Each block is cryptographically linked to the previous one (making it tamper evident) after validation and undergoing a consensus decision. As new blocks are added, older blocks become more difficult to modify (creating tamper resistance). New blocks are replicated across copies of the ledger within the network, and any conflicts are resolved automatically using established rules.

YAGA ET AL., *supra* note 1, at 1. “Cryptography is the use of coding to secure computer networks, online systems, and digital data. It is a concept whose endgame is to keep vital information that is subject to potential data breaches safe and confidential.” *What Is Cryptography: Definition and Common Cryptography Techniques*, TULANE UNIV., <https://sopa.tulane.edu/blog/what-is-cryptography> [<https://perma.cc/9KSY-GNU3>].

⁴¹ *White House Framework*, *supra* note 1.

⁴² See *id.* (“President Biden’s March 9 Executive Order (EO) on Ensuring Responsible Development of Digital Assets outlined the first whole-of-government approach to addressing the risks and harnessing the potential benefits of digital assets and their underlying technology.”).

⁴³ See, e.g., Tracy Wang, *Goldman Sachs Leading Investor Group to Buy Celsius Assets: Sources*, COINDESK, <https://www.coindesk.com/business/2022/06/24/goldman-sachs-raising-funds-to-buy-celsius-assets-sources/> [<https://perma.cc/N87A-Y5MG>] (May 11, 2023); George Kaloudis, *BlackRock Has Entered the Chat: Why the \$10 Trillion Asset Manager’s Arrival Would Be a Big Deal for Crypto*, COINDESK, <https://www.coindesk.com/markets/2022/02/20/blackrock-has-entered-the-chat/> [<https://perma.cc/V4BG-3PM7>] (May 11, 2023); Ian Allison & CoinDesk, *JPMorgan on Its Crypto Plans: ‘The Overall Goal Is to Bring These Trillions of Dollars of Assets into DeFi,’* FORTUNE (June 12, 2022), <https://fortune.com/2022/06/12/jpmorgan-on-its-crypto-plans-the-overall-goal-is-to-bring->

purchased cryptoassets, and this number remains robust despite a market downturn and a spate of crypto-related enforcement actions.⁴⁴ Not surprisingly, cryptoassets are an omnipresent matter on the agenda of financial market regulators.

Such popularity and regulatory attention stem from the risks and potential economic applications of crypto. To name a few benefits, crypto may provide better security than traditionally centralized financial systems; reduce the need to rely on and expend resources on intermediaries in payments or capital markets; improve transaction speed; and decrease transaction costs.⁴⁵ Crypto also holds promise in the fight for economic justice and equality.

Let us consider a few examples of crypto's potential benefits. Imagine that Alice, a minority entrepreneur, has a solid business project. She would like to expand, but bank officers, who, as research shows, continue to exhibit racial biases,⁴⁶ deny her a loan. She is a developer of a Decentralized Application that could revolutionize and improve tracking carbon offset credits on blockchain. The code underlying her project has been reviewed by independent auditors.⁴⁷ Yet, for the project to take off, she needs extra funds. What if she could receive a loan through peer-to-peer lending platforms that are enabled by technologies like blockchain and crypto?⁴⁸ What if she could raise capital promptly and efficiently

these-trillions-of-dollars-of-assets-into-defi/ [https://perma.cc/D2WV-3YGY]; Andrew Perrin, *16% of Americans Say They Have Ever Invested in, Traded or Used Cryptocurrency*, PEW RSCH. CTR. (Nov. 11, 2021), <https://www.pewresearch.org/fact-tank/2021/11/11/16-of-americans-say-they-have-ever-invested-in-traded-or-used-cryptocurrency/> [https://perma.cc/7VA6-3ZRN].

⁴⁴ *White House Framework*, *supra* note 1; Josh Zumbrun, *Crypto's Quiet Gains: Ownership Climbs Despite Crash in Prices*, WALL ST. J. (June 9, 2023), <https://www.wsj.com/articles/cryptos-quiet-gains-ownership-climbs-despite-crash-in-prices-af76cdd6> [https://perma.cc/WAU9-8DT8].

⁴⁵ See generally CAROL GOFORTH & YULIYA GUSEVA, *REGULATION OF CRYPTOASSETS* 1–5, 11–15 (2d ed. 2022) (discussing the uses of blockchain and cryptoassets); PRIMAVERA DE FILIPPI & AARON WRIGHT, *BLOCKCHAIN AND THE LAW: THE RULE OF CODE* 61–71, 93–104 (2018) (discussing the use of blockchains in payments systems, capital markets, and derivatives markets). Crypto is also connected to financial technology (fintech) that improves efficiencies in finance. See William Magnuson, *Financial Regulation in the Bitcoin Era*, 23 STAN. J.L. BUS. & FIN. 159, 161, 176 (2018).

⁴⁶ See generally Alexander W. Butler, Erik J. Mayer & James P. Weston, *Racial Disparities in the Auto Loan Market*, 36 REV. FIN. STUD. 1 (2023) (explaining that minorities experience lower approval rates and pay higher rates for auto loans); Rachel Atkins, Lisa Cook & Robert Seamans, *Discrimination in Lending? Evidence from the Paycheck Protection Program*, 58 SMALL BUS. ECON. 843 (2022) (arguing “that the historical record and PPP program design choices made it likely that many Black-owned businesses received smaller PPP loans than White-owned businesses”).

⁴⁷ For a discussion of audits, see generally Yuliya Guseva, *When the Means Undermine the End: The Leviathan of Securities Law and Enforcement in Digital-Asset Markets*, 5 STAN. J. BLOCKCHAIN L. & POL’Y 1 (2022).

⁴⁸ Although regulatory challenges remain, technology may improve access to finance. Helen Bollaert, Florencio Lopez-de-Silanes & Armin Schwienbacher, *Fintech and Access to Finance*, 68 J. CORP. FIN. 101941, at *1 (2021).

by selling something that represents the project to market participants who care about the environment and corporate transparency?⁴⁹

Now imagine that the world of conventional finance has not been kind to Bob. He is one of the thirty-one million Americans who do not have proper access to the traditional banking system.⁵⁰ What if Bob could use an app on his phone to safely receive and transfer cryptoassets, allowing him to pay his bills more easily or receive government payments, such as COVID relief funds?⁵¹

Let us also meet John, whose relatives reside in an impoverished country. If he wanted to help his relatives by transferring funds via the conventional bank system, the process would be both expensive and time-consuming.⁵² What if he could transfer funds within seconds with almost no transaction fees by using cryptoassets? Imagine the social and economic possibilities! Proper regulation of crypto could unlock new avenues to improved economic activity and equality.

Crypto and blockchain are also valuable to enforcement agencies. Our Alice, Bob, and John could work as FBI investigators hunting down criminals who transfer funds from one cryptocurrency “wallet” to another across borders.⁵³ They could trace the criminals’ funds back to an original source because

⁴⁹ For an overview of research on these offerings, see Moran Ofir & Ido Sadeh, *ICO vs. IPO: Empirical Findings, Information Asymmetry, and the Appropriate Regulatory Framework*, 53 VAND. J. TRANSNAT’L L. 525, 532–53 (2020).

⁵⁰ See *White House Framework*, *supra* note 1 (explaining that roughly thirty-one million Americans either lack a bank account or rely on expensive nonbank services, like money orders or cash checking).

⁵¹ Bob could transact in stablecoins, i.e., digital assets that purport to maintain stable value and are often pegged to and/or collateralized by fiat currencies. See Alyssa Hertig, *What Is a Stablecoin?*, COINDESK, <https://www.coindesk.com/learn/what-is-a-stablecoin/> [<https://perma.cc/M927-73C6>] (Aug. 8, 2023) (providing an overview of stablecoins).

⁵² See FIN. STABILITY BD., REGULATION, SUPERVISION AND OVERSIGHT OF “GLOBAL STABLECOIN” ARRANGEMENTS 7 (2020) [hereinafter FSB STABLECOIN REPORT], <https://www.fsb.org/wp-content/uploads/P131020-3.pdf> [<https://perma.cc/24BD-FGWY>] (“Some stablecoin projects have the stated ambition to facilitate payments, especially cross-border retail payments, which have remained relatively slow and expensive.”).

⁵³ Crypto wallets are

[T]ool[s] that allow[] users to interact with blockchain networks. They are necessary when sending and receiving Bitcoin and other digital currencies. Crypto wallets can also be used to generate new blockchain addresses. Unlike the traditional wallets we use in our everyday life, cryptocurrency wallets don’t really store your funds. In fact, your coins (or tokens) are simply part of a blockchain system as pieces of data, and the wallets serve as a means to access them.

Dmitri Volhov, *Wallet*, BINANCE ACAD., <https://academy.binance.com/en/glossary/wallet> [<https://perma.cc/LUG6-HLF5>].

transactions on public blockchains are openly accessible and immutable.⁵⁴ The investigators (or any person for that matter) could trace payments by using a search engine called an “explorer”⁵⁵ to find information about transactions and contents (i.e., state) of the public blockchain.

For instance, law enforcement took advantage of the public nature of the Bitcoin blockchain to pinpoint various transactions associated with the ransomware attack that targeted Colonial Pipeline in 2021.⁵⁶ Private data and blockchain analytics firms, such as TRM Labs and Chainalysis, often aid regulators in chasing criminals on blockchains.⁵⁷

Despite offering the aforementioned benefits, crypto technologies are inherently disruptive to existing financial industries and regulation.⁵⁸ They also spawn new risk nodes, including irrational behavior, excessive volatility, systemic risk, investor and consumer protection concerns, and fraud.⁵⁹ As the

⁵⁴ See Shobhit Seth, *Public, Private, Permissioned Blockchains Compared*, <https://www.investopedia.com/news/public-private-permissioned-blockchains-compared/> [<https://perma.cc/C58L-BZF5>] (Aug. 24, 2023) (explaining how blockchains operate).

⁵⁵ See, e.g., BLOCKCHAIN.COM, <https://www.blockchain.com/explorer> [<https://perma.cc/QT87-B4UP>].

⁵⁶ Press Release, U.S. Dep’t of Just., Department of Justice Seizes \$2.3 Million in Cryptocurrency Paid to the Ransomware Extortionists Darkside, <https://www.justice.gov/opa/pr/departments-justice-seizes-23-million-cryptocurrency-paid-ransomware-extortionists-darkside> [<https://perma.cc/HWT2-3XRJ>] (June 8, 2021).

⁵⁷ David Yaffe-Bellany, *The Crypto Detectives Are Cleaning Up*, N.Y. TIMES (Apr. 22, 2023), <https://www.nytimes.com/2023/04/22/business/crypto-blockchain-tracking-chainalysis.html> [<https://perma.cc/4Y3K-2DNE>] (discussing blockchain analytics firms, including TRM and Chainalysis).

⁵⁸ Technologies such as blockchain may disrupt national conventional regulatory approaches. See Georgios Dimitropoulos, *The Law of Blockchain*, 95 WASH. L. REV. 1117, 1119 (2020) (“Blockchain has one feature that makes it even more distinctive than any other disruptive innovation: it is by nature and design a global, transnational technology. It was developed explicitly to circumvent national borders and established institutions.”). Technology may reduce “many of the inefficiencies present in traditional financial markets. By eliminating costly intermediaries and reducing transaction costs, fintech allows financial participants to engage in a greater variety of transactions with fewer delays.” Magnuson, *supra* note 45, at 176. These innovative products may be at odds with the traditional financial system. See generally Dan Awrey, *Bad Money*, 106 CORNELL L. REV. 1 (2020) (analyzing the shift from traditional to modern financial institutions and the corresponding legal issues).

⁵⁹ See FSOC 2022, *supra* note 1, at 4–6 (detailing unique characteristics of crypto technologies and the risks that they may create). The literature has discussed investor protection and new opportunities for crypto-related fraud. See generally Shaanan Cohney, David Hoffman, Jeremy Sklaroff & David Wishnick, *Coin-Operated Capitalism*, 119 COLUM. L. REV. 591 (2019) (noting the shortcomings of smart contracts in initial coin offerings and how those shortcomings can lead to fraud); Dirk A. Zetsche, Ross P. Buckley, Douglas W. Arner & Linus Föhr, *The ICO Gold Rush: It’s a Scam, It’s a Bubble, It’s a Super Challenge for Regulators*, 60 HARV. INT’L L.J. 267 (2019) (explaining that initial coin offerings often escape regulatory scrutiny and do not provide adequate disclosures, raising consumer and investor protection issues). Moreover, innovations may aggravate systemic risk concerns and distort profit-seeking behavior in dangerous ways. See, e.g., Saule T. Omarova, *New Tech v. New Deal: Fintech as a Systemic Phenomenon*, 36 YALE J. ON REGUL. 735, 749 (2019) (“Financial institutions and their clients, searching for higher profits and competitive edge, keep pushing the line toward greater private freedom to transact, to ‘complete’ the perennially ‘incomplete’ markets by creating and

technology continues to evolve at lightning speed, it creates new regulatory challenges and more uncertainty. Policymakers must catch up with the industry while simultaneously promoting socially beneficial innovation through effective regulations and mitigating crypto's risks.⁶⁰

B. Innovations, Regulatory Fragmentation, and Crypto

Theory tells us that properly designed regulations spur innovation, productivity, and growth.⁶¹ Nonetheless, innovations simultaneously challenge existing regulatory paradigms⁶² by forcing public agencies to deal with radical uncertainties given the future's unknown unknowns.⁶³ Innovations also trigger

trading in new financial instruments.”); Magnuson, *supra* note 45, at 178 (“Automation also may reduce allocative efficiency by increasing herd behavior. This may occur in several different ways, but perhaps the simplest involves computer programs sharing certain programming templates.”).

⁶⁰ Many regulators, including U.S. Treasury Secretary Janet Yellen, have expressed these concerns. See, e.g., Fatima Hussein, *Yellen Calls for Crypto Regulation to Reduce Risks, Fraud*, ASSOCIATED PRESS (Apr. 7, 2022), <https://apnews.com/article/cryptocurrency-biden-technology-business-police-260dda0d6423e3f9dee06a2621c8f323> [https://perma.cc/7BZY-MSMA]. Scholarship on the intersection of financial regulation and innovation is voluminous. See generally, e.g., Carol R. Goforth, *Regulation of Crypto: Who Is the Securities and Exchange Commission Protecting?*, 58 AM. BUS. L.J. 643 (2021) [hereinafter Goforth, *Who Is the SEC Protecting?*] (emphasizing the importance of the SEC in the global world of crypto); Chris Brummer & Yesha Yadav, *Fintech and the Innovation Trilemma*, 107 GEO. L.J. 235 (2019) (providing a new theoretical framework for regulating innovative fintech, given that “applying traditional regulatory strategies to new technological ecosystems has proved conceptually difficult”); Alan McQuinn, *Supporting Financial Innovation Through Flexible Regulation*, INFO. TECH. & INNOVATION FOUND. (Nov. 4, 2019), <https://itif.org/publications/2019/11/04/supporting-financial-innovation-through-flexible-regulation> [https://perma.cc/3P69-CQYY] (suggesting that “[m]any fintech firms caught in regulatory tugs of war are unable to launch in the United States due to the uncertainty over whether their products could draw enforcement action from risk-adverse regulators”).

⁶¹ Michael Porter developed one relevant hypothesis in the 1990s, although the evidence on regulation and innovation are mixed. See, e.g., Stefan Ambec, Mark A. Cohen, Stewart Elgie & Paul Lanoie, *The Porter Hypothesis at 20: Can Environmental Regulation Enhance Innovation and Competitiveness?*, 7 REV. ENV'T ECON. & POL'Y 2, 16 (2013) (explaining that regulation may or may not induce innovation—the research is equivocal).

⁶² See generally CRISTIE FORD, INNOVATION AND THE STATE: FINANCE, REGULATION, AND JUSTICE 144 (2017) (“A regulatory regime would be incoherent if it did not rest on some set of general theories and assumptions about its context, object, and purpose. But difficulties arise when, thanks to innovation, the assumptions that undergird a regulatory regime no longer hold true.”). On the disruptive impact of fintech on regulations, see, for example, Saule T. Omarova, *Technology v. Technocracy: Fintech as a Regulatory Challenge*, 6 J. FIN. REGUL. 75, 77 (2020) (“As this article shows, new technologies are dramatically increasing the scale and scope of the financial system—making it move at an unprecedented speed, shifting financial markets’ decisional centre of gravity from humans to algorithms, rendering finance less transparent and more complex, and blurring traditional jurisdictional boundaries.”).

⁶³ See Cristie Ford, *A Regulatory Roadmap for Financial Innovation*, in ROUTLEDGE HANDBOOK OF FINANCIAL TECHNOLOGY AND LAW 62, 64 (Iris H-Y Chiu & Gudula Deipenbrock eds., 2021). On the effect of radical and dynamic uncertainty on financial regulation, see generally Roberta Romano, *Pitfalls of Global Harmonization of Systemic Risk Regulation in a World of Financial Innovation*, in

unavoidable information asymmetries between public agencies and innovative private markets.⁶⁴ Regulators face an uphill battle reacting to nimble private parties and responding to emergent risks. Yet, without an effective and clear regulatory system, growth, productivity, and innovation suffer.

In the United States, this cyclical dilemma is superimposed onto a deeply fragmented network of financial regulators. The U.S. approach to financial regulation spans securities, commodity, derivatives, banking, and money transmitter laws within the demesne of respective federal and state authorities. In fact, the United States has more than a hundred relevant agencies in finance, forcing firms to wade through a morass of legal regimes.⁶⁵

As John C. Coffee and Hillary Sale observed in the wake of the financial crisis of 2008, public opinion reached a point of consensus “that the United States ha[d] a highly fragmented and arguably Balkanized structure of financial regulation, which approach[ed] creating a different regulator for every class of financial institution.”⁶⁶ The number of regulators has not markedly decreased since the crisis.

Regulatory fragmentation may create redundancies and turf wars, particularly when an innovation falls within several regulators’ domains.⁶⁷ This could

SYSTEMIC RISK IN THE FINANCIAL SECTOR: TEN YEARS AFTER THE GREAT CRASH 197 (Douglas W. Arner, Emiliós Avgouleas, Danny Busch & Steven L. Schwarcz eds., 2019).

⁶⁴ See Dan Awrey, *Complexity, Innovation, and the Regulation of Modern Financial Markets*, 2 HARV. BUS. L. REV. 235, 238–39 (2012) (“Complexity and innovation have combined to generate significant asymmetries of information and expertise within financial markets, thereby opening the door to suboptimal contracting and exacerbating already pervasive agency cost problems. At the same time, the pace of innovation has left financial regulators and regulation chronically behind the curve.”). See generally Dan Awrey, *Regulating Financial Innovation: A More Principles-Based Proposal?*, 5 BROOK. J. CORP. FIN. & COM. L. 273 (2011) [hereinafter Awrey, *Regulating Financial Innovation*] (discussing the problem of imbalanced expertise between private actors and public regulators).

⁶⁵ Yesha Yadav, *Looking for the Silver Lining: Regulatory Reform After the “Credit Crunch,”* 15 STAN. J.L. BUS. & FIN. 314, 323–24 (2010).

⁶⁶ John C. Coffee, Jr. & Hillary A. Sale, *Redesigning the SEC: Does the Treasury Have a Better Idea?*, 95 VA. L. REV. 707, 716 (2009).

⁶⁷ See, e.g., RONALD H. FILLER & JERRY W. MARKHAM, REGULATION OF DERIVATIVE FINANCIAL INSTRUMENTS (SWAPS, OPTIONS AND FUTURES) 39 (2014).

From the moment the CBOE was created as an SEC regulated exchange, the stage was set for jurisdictional questions and legal uncertainty. . . . While the final terms of the law creating the CFTC were being hammered out, the turf battles began. Some argued that Congress did not intend for the CFTC to have sole jurisdiction over currencies and derivatives based on government securities. Since that area was dominated by banks, CFTC oversight would undermine the authority of the Office of the Comptroller of the Currency and the Federal Reserve. . . . Another pot began to boil over in the early 1980s when the futures exchanges invented cash settlement and sought to apply this innovation to equities. The SEC’s turf clearly was threatened

prevent public agencies from designing more systemic, whole-of-government policies. To date, crypto innovations in the United States have been regulated through this fragmented legal framework.⁶⁸ Even when crypto and financial technology (fintech) firms attempt to operate outside regulatory perimeters, they fall within the purview of financial regulation at one level or another.⁶⁹

Cryptoassets exemplify this fragmentation, as they may be considered either (1) securities falling within the remit of the SEC; (2) commodities implicating the bailiwick of the CFTC;⁷⁰ or (3) funds and value that substitute for currency or bank services, falling within the remit of bank and money transmitter regulations.⁷¹ For the purposes of this discussion, it is important to em-

Todd E. Petzel, *Derivatives: Market and Regulatory Dynamics*, 21 J. CORP. L. 95, 100–01 (1995). For further illustration of the overlapping domains, see, for example, Letter from Robert A. Schwartz, Deputy Gen. Couns., CFTC, to the Hon. P. Kevin Castel, U.S. D.J., S.D.N.Y. (Feb. 18, 2020) (on file with authors) [hereinafter Letter from Robert A. Schwartz], <https://www.docdroid.net/okmUUBS/cftc-letter-in-telegram-case-pdf> [<https://perma.cc/D42M-HTAN>] (observing that digital assets are commodities, but that “the Commodity Exchange Act [CEA] provides that many securities *are* commodities to which the securities laws apply” (citations omitted)); Christopher L. Culp, *OTC-Cleared Derivatives: Benefits, Costs, and Implications of the “Dodd-Frank Wall Street Reform and Consumer Protection Act,”* 20 J. APPLIED FIN. 1, 5 (2010) (“The 1970s, 80s, and 90s represented a particularly challenging period for derivatives regulation. Those decades were marred by numerous court cases and regulatory disputes over issues related to the enforceability and regulation of various types of derivatives products.”); Alan McQuinn & Daniel Castro, *A Policymaker’s Guide to Blockchain*, INFO. TECH. & INNOVATION FOUND. (Apr. 30, 2019), <https://itif.org/publications/2019/04/30/policymakers-guide-blockchain> [<https://perma.cc/F69U-C96S>] (listing various regulators involved in the oversight of digital assets).

⁶⁸ In this sense, crypto is not a lawless Wild West, contrary to some public statements. *Contra*, e.g., Katanga Johnson, *U.S. SEC Chair Gensler Calls on Congress to Help Rein in Crypto ‘Wild West,’* REUTERS (Aug. 3, 2021), <https://www.reuters.com/technology/us-sec-chair-gensler-calls-congress-help-rein-crypto-wild-west-2021-08-03/> [<https://perma.cc/Q2PP-D4VK>].

⁶⁹ Howell E. Jackson, *The Nature of the Fintech Firm and Its Implications for Financial Regulation*, in FINTECH LAW: THE CASE STUDIES 9, 13 (2020). “[T]he legal system has ways of counteracting innovations that appear egregious.” *Id.* at 15. Overall, the whole financial system is subject to detailed regulation. “Due to the highly regulated nature of the financial sector—especially in the aftermath of the financial crisis—financial services companies have seen their compliance costs steadily rise over the last decade due to enhanced regulatory scrutiny.” McQuinn, *supra* note 60. Feinstein and Werbach observe that “[t]he complex web of legal obligations for securities issuance, broker-dealers, investment companies, exchanges, money transmitters, and other regulated entities must be mapped onto digital assets that operate on fundamentally novel foundations.” Brian D. Feinstein & Kevin Werbach, *The Impact of Cryptocurrency Regulation on Trading Markets*, 7 J. FIN. REGUL. 48, 55 (2021). For further discussion of the application of financial regulation to cryptocurrencies, see generally Benjamin Geva, Seraina Neva Grünwald & Corinne Zellweger-Gutknecht, *The e-Banknote as a ‘Banknote’: A Monetary Law Interpreted*, 41 OXFORD J. LEGAL STUD. 1119 (2021).

⁷⁰ See discussion *infra* Part II.

⁷¹ If cryptoasset arrangements provide services similar to those offered by banks, state bank regulators, the Federal Reserve, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency are possible regulators. See, e.g., STEVEN T. MNUCHIN & CRAIG S. PHILLIPS, U.S. DEP’T OF THE TREASURY, A FINANCIAL SYSTEM THAT CREATES ECONOMIC OPPORTUNITIES: NONBANK FINANCIALS, FINTECH, AND INNOVATION 63–66 (2018), <https://home.treasury.gov/sites/default/files/2018-07/A-Financial-System-that-Creates-Economic-Opportunities---Nonbank-Financi....pdf> [<https://perma.cc/7K8Q-9K8Q>].

phasize that an asset sometimes may be both a commodity and a security,⁷² and sometimes the SEC and CFTC claim jurisdiction over the same assets used for the same purposes.

The complaints that the SEC and CFTC filed against major exchange Binance in March and June 2023, respectively, illustrate this regulatory uncertainty and fragmentation. Both Commissions rely on similar facts and even refer to identical assets. Consider, for example, how the complaints describe Binance USD (BUSD), a stablecoin.⁷³ The SEC classifies BUSD as a security, which “has been offered and sold as an investment contract.”⁷⁴ The CFTC, however, avers that “[BUSD], as well as other virtual currencies as alleged herein, are ‘commodities.’”⁷⁵ The same asset—BUSD—is thus a commodity according to the CFTC and a security according to the SEC.

To summarize, a technology firm may need to comply with the rules of the SEC, the CFTC, and various state and federal bank regulators depending on the regulatory bucket(s) that its activities or assets fall in. Absent reform on crypto and blockchain-enabled markets, the scope of these buckets may be uncertain. This is the classic U.S. approach to financial market regulation.⁷⁶

cc/G7JJ-678W]; GOFORTH & GUSEVA, *supra* note 45, at 68–88, 133–64, 167–94, 640–56; BD. OF GOVERNORS OF THE FED. RESRV. SYS., FED. DEPOSIT INS. CORP. & OFF. OF THE COMPTROLLER OF THE CURRENCY, JOINT STATEMENT ON CRYPTO-ASSET POLICY SPRINT INITIATIVE AND NEXT STEPS 1–2 (2021), <https://www.occ.gov/news-issuances/news-releases/2021/nr-ia-2021-120a.pdf> [<https://perma.cc/SH5P-6NJ3>]. States regulate many crypto businesses as money transmitters and through special purpose charters. *See, e.g., Is Kraken Licensed or Regulated?*, KRAKEN, <https://support.kraken.com/hc/en-us/articles/360031282351-Is-Kraken-licensed-or-regulated> [<https://perma.cc/S9T8-ALY7>]; *Licenses & Disclosures*, COINBASE, <https://www.coinbase.com/legal/licenses> [<https://perma.cc/SWW4-JKBW>]. Many crypto firms must comply with FinCEN’s rules under the Bank Secrecy Act (31 U.S.C. § 310). *See generally* FIN. CRIMES ENFT NETWORK, FIN-2019-G001, APPLICATION OF FINCEN’S REGULATIONS TO CERTAIN BUSINESS MODELS INVOLVING CONVERTIBLE VIRTUAL CURRENCIES (2019), <https://www.fincen.gov/sites/default/files/2019-05/FinCEN%20Guidance%20CVC%20FINAL%20508.pdf> [<https://perma.cc/9CAA-9PYZ>] (explaining the application of the Bank Secrecy Act and money transmission regulation to businesses in the virtual currency space).

⁷² *See, e.g.,* Letter from Robert A. Schwartz, *supra* note 67.

⁷³ Stablecoins are defined *infra* note 78 and accompanying text.

⁷⁴ Complaint at 77, SEC v. Binance Holdings Ltd., No. 23-CV-01599 (D.D.C. June 5, 2023) [hereinafter *Binance SEC Complaint*].

⁷⁵ Complaint at 9, CFTC v. Changpeng Zhao, No. 23-CV-01887 (N.D. Ill. Mar. 27, 2023) [hereinafter *Binance CFTC Complaint*].

⁷⁶ The classic

[A]pproach to financial regulation is based on the regulation of entities. If a firm engages in some core financial function—like banking, insurance, or the securities business—then the firm itself (often along with all affiliated entities) is subject to strict regulation, such as activities restrictions and capital requirements, as well as supervisory oversights, typically reporting, examination, and an enforcement regime.

Jackson, *supra* note 69, at 13; *see* Coffee & Sale, *supra* note 66, at 715–21 (discussing the highly fragmented and inefficient nature of U.S. financial market regulation).

Stablecoins, such as BUSD, exemplify the application of this classic approach to digital assets.⁷⁷ Stablecoin arrangements—i.e., arrangements for issuing, transferring, and redeeming stablecoins, as well as reserve management⁷⁸—may be regulated within the ambit of banking law.⁷⁹ At the same time, as the 2021 Report of the President’s Working Group on Financial Markets observes, the SEC and CFTC may also have jurisdiction over stablecoins.⁸⁰ Similar fragmentation trends are discussed in the 2022 FSOC Report.⁸¹

To sum up, U.S. crypto regulation covers a substantial part of cryptoasset markets and services.⁸² As part of U.S. financial regulation, regulation of crypto is balkanized and exhibits jurisdictional overlaps and uncertainties. We take no normative position on whether this overlapping and fragmented system entails wasteful costs for firms.⁸³ Our argument is different: whole-of-government approaches naturally should be more difficult to implement successfully under conditions of regulatory fragmentation, and market reaction to separate agencies supplies valuable feedback to policymakers working on systemic reform.

In the following Part, we aim to aid holistic initiatives by considering innovations through the lens of several regulatory regimes. We focus on commodities, derivatives, and securities regulations that are the focal point of ongoing legislative efforts. Our analysis (1) measures inter-agency outcomes, and (2) assesses U.S.-led enforcement effects cumulatively.

⁷⁷ For definitions, benefits, and design options for stablecoins, see generally Andreas Kokkinis & Andrea Miglionico, *Open Banking and Libra: A New Frontier of Financial Inclusion for Payment Systems?*, 2020 SING. J. LEGAL STUD. 601 (discussing stablecoins in the context of fostering financial inclusion); Craig Calcaterra, Wulf A. Kaal & Vadhindran Rao, *Stable Cryptocurrencies: First Order Principles*, 3 STAN. J. BLOCKCHAIN L. & POL’Y 62 (2020) (discussing experiments beyond traditional payments and banking and outlining designs of stablecoins).

⁷⁸ A stablecoin arrangement is “[a]n arrangement that combines a range of functions (and the related specific activities) to provide an instrument that purports to be used [as] a means of payment and/or store of value.” FSB STABLECOIN REPORT, *supra* note 52, at 5.

⁷⁹ See PRESIDENT’S WORKING GRP. ON FIN. MKTS., FED. DEPOSIT INS. CORP. & OFF. OF THE COMPTROLLER OF THE CURRENCY, REPORT ON STABLECOINS 16–18 (2021), https://home.treasury.gov/system/files/136/StableCoinReport_Nov1_508.pdf [<https://perma.cc/4R5P-H7TD>].

⁸⁰ *Id.* at 1.

⁸¹ See generally FSOC 2022, *supra* note 1, at 75–111 (discussing the fragmented nature of cryptoasset regulation).

⁸² See *id.*

⁸³ Consolidation and fragmentation have costs and benefits. See, e.g., Zachary D. Clopton, *Redundant Public-Private Enforcement*, 69 VAND. L. REV. 285, 311 (2016) (“[A]lthough redundancy has direct costs and risks over-enforcement, it also can be effective at fighting under-enforcement resulting from errors, resource constraints, information problems, or agency costs, if agents are sufficiently diverse.”); Yadav, *supra* note 65, at 271–272, 325 (discussing the pros and cons of regulatory consolidation, and noting that “the multiplicity of bodies has fostered inter-agency competition, easily translating to turf conflict, with the potential to undermine appropriate disclosure, information sharing, systemic risk assessments, and the development of a holistic understanding of market mechanisms and products”).

C. Inter-Agency Differences

The first dimension of our analysis is to compare and juxtapose the effects of each Commission. Together, the Commissions represent a considerable chunk of the balkanized regulatory regime within the United States. Despite previous calls for merging the agencies,⁸⁴ the SEC and CFTC remain separate, independent regulators of the U.S. securities and derivatives markets.

Although separate, the Commissions pursue similar overarching goals of sound and safe regulation. The SEC's statutory objectives encompass ensuring adequate investor protection, supporting fair and efficient markets, and facilitating capital formation.⁸⁵ The CFTC strives to ensure integrity, stability, and growth across national derivatives markets "through sound regulation."⁸⁶ Both agencies assert their jurisdiction over the cryptoasset market, its infrastructure, and its participants. And both Commissions have explicitly expressed interest in expanding their reach over digital assets, possibly colliding with each other.⁸⁷

⁸⁴ See generally Coffee & Sale, *supra* note 66 (discussing the U.S. Treasury Department's proposal to merge the SEC and CFTC in a bid to streamline financial regulation).

⁸⁵ SEC, AGENCY AND MISSION INFORMATION 4 (2014), <https://www.sec.gov/about/reports/sec-fy2014-agency-mission-information.pdf> [<https://perma.cc/UX3U-ATU2>]. For scholarship examining interconnections between the SEC's general and specific objectives, see generally Brummer & Yadav, *supra* note 60, at 264–82; George S. Georgiev, *The Human Capital Management Movement in U.S. Corporate Law*, 95 TUL. L. REV. 639 (2021).

⁸⁶ *The Commission*, CFTC, <https://www.cftc.gov/About/AboutTheCommission#:~:text=The%20mission%20of%20the%20Commodity,derivatives%20markets%20through%20sound%20regulation> [<https://perma.cc/US2X-UB9X>].

⁸⁷ Statements by the agencies' respective Chairs illustrate this possibility. See, e.g., *Examining Digital Assets: Risks, Regulation, and Innovation Before the S. Comm. on Agric., Nutrition & Forestry*, 117th Cong. 3 (2022) (statement of Rostin Behnam, Chairman, CFTC), https://www.agriculture.senate.gov/imo/media/doc/Testimony_Behnam_020920225.pdf [<https://perma.cc/D6AY-L6PR>] ("As Chairman, I will ensure that the CFTC continues to use our existing enforcement authority to its fullest extent in the digital asset commodity space to protect customers from fraud and manipulation."); Nikhilesh De, *CFTC Should Oversee Crypto Spot Markets, Chief Reiterates Before Congress*, COIN DESK, <https://www.coindesk.com/policy/2022/02/09/cftc-should-oversee-crypto-spot-markets-chief-reiterates-before-congress/> [<https://perma.cc/Y93Z-PJMW>] (May 11, 2023); Bob Pisani, *SEC Chairman Gary Gensler Embarks on Ambitious Regulatory Agenda. What It Means for Investors*, CNBC (Feb. 4, 2022), <https://www.cnbc.com/2022/02/04/sec-chair-gary-gensler-embarks-on-ambitious-regulatory-agenda-what-it-means-for-investors.html> [<https://perma.cc/5LHR-HZCB>] ("[Gensler] noted the SEC will likely claim that certain crypto investments and platforms meet the definition of a security under existing law and will seek to force them to register with the SEC."); Gary Gensler, Chair, SEC, Remarks Before the Aspen Security Forum (Aug. 3, 2021) [hereinafter Gensler, *Aspen*], <https://www.sec.gov/news/speech/gensler-aspen-security-forum-2021-08-03> [<https://perma.cc/T52P-2E9X>] ("I'd like to note we have taken and will continue to take our [regulatory] authorities as far as they go."). An SEC rule proposal released in January 2022 demonstrated this trend by aiming to extend SEC jurisdiction over digital asset trading platforms. Amendments Regarding the Definition of "Exchange" and Alternative Trading Systems (ATSs) That Trade U.S. Treasury and Agency Securities, National Market System (NMS) Stocks, and Other Securities, 87 Fed. Reg. 15496 (proposed Mar. 18, 2022) (to be codified at 17 C.F.R. pts. 232, 240, 242, 249).

Despite the similarities between their foundational objectives, stakeholders have suggested that the CFTC and the SEC are fundamentally different agencies operating under contrasting philosophies. For example, scholars describe the CFTC as more principles-based in its regulation and more open to experimentation than the SEC,⁸⁸ including experimentation with crypto products.⁸⁹ The statutes that the Commissions enforce are also distinct.⁹⁰ As discussed further in this Article, the global crypto market distinguishes between the Commissions: the reaction is more negative with respect to SEC enforcement of federal securities law compared with CFTC enforcement of commodity and derivatives law.⁹¹

D. Why Is U.S.-Led Enforcement Impactful?

The second dimension of this Article involves measuring investors' reactions to U.S.-led enforcement cumulatively. This line of inquiry is particularly important because U.S. regulators occupy a special place in global financial markets. U.S. markets have long served as sizable financial "choke points."⁹² Moreover, about half of the world's largest technology companies are domiciled here.⁹³

The interplay among national regulators, the financial industry, and great national powers ultimately shapes regulatory systems.⁹⁴ Within these systems, the CFTC and SEC represent proxies and agents of a great financial power—

⁸⁸ See, e.g., Jerry W. Markham, *Merging the SEC and CFTC—A Clash of Cultures*, 78 U. CIN. L. REV. 537, 552–53 (2009) (comparing the agencies and the Treasury Department's Blueprint, a proposed regulatory reform that "recognize[d] that . . . a merger [of the SEC and CFTC] will be effective only if the new regulator can operate under a principles-based regulatory system. . . . [that] is employed by the CFTC and is better than the rules-based system of the SEC, which has proved to be a costly failure"); Awrey, *Regulating Financial Innovation*, *supra* note 64, at 311 (observing that the CFTC's approach to market exchange and clearinghouse regulation is based on broad principles, whereas the SEC follows a more rules-based approach).

⁸⁹ For example, Bitcoin futures were self-certified for trading as early as 2017. See Press Release, CFTC, CFTC Statement on Self-Certification of Bitcoin Products by CME, CFE and Cantor Exchange (Dec. 1, 2017), <https://www.cftc.gov/PressRoom/PressReleases/7654-17> [<https://perma.cc/JS7U-GUTX>]. By contrast, the SEC has been consistently rejecting applications to register Bitcoin exchange-traded funds. See GOFORTH & GUSEVA, *supra* note 45, at 580–87.

⁹⁰ See discussion *infra* Part II.

⁹¹ See *infra* Part V.

⁹² See generally Henry Farrell & Abraham L. Newman, *Choke Points*, HARV. BUS. REV., Jan.–Feb. 2020, <https://hbr.org/2020/01/choke-points> [<https://perma.cc/D9CG-YFNF>] (explaining that international economic systems contain "choke points," i.e., points that everything in the system must filter through, and that the U.S. controls one such system).

⁹³ *White House Framework*, *supra* note 1.

⁹⁴ See Pierre-Hugues Verdier, *The Political Economy of International Financial Regulation*, 88 IND. L.J. 1405, 1405–09 (2013).

the United States with its developed financial markets.⁹⁵ Following the acknowledgement by the White House that “U.S. agencies will . . . continue and expand their leadership roles on digital assets work at international organizations and standard-setting bodies,” crypto markets may expect that U.S. regulators will play a crucial, if not pivotal, role.⁹⁶

The Commissions are active players in the United States and beyond. They are participants in the International Organization of Securities Commissions and its Fintech Task Force,⁹⁷ and engage in cross-border enforcement.⁹⁸ Their enforcement divisions, as well as the U.S. Department of Justice with which the Commissions collaborate, have become major international players.⁹⁹ Enforcement naturally bolsters the central role of U.S. regulators in global financial markets. Scholars underscore that U.S. regulatory agencies (particularly the SEC) invest considerable resources in enforcement, which ultimately should cause ripple effects far beyond the United States.¹⁰⁰

In crypto markets, the Commissions have engaged in intensive and often extraterritorial enforcement.¹⁰¹ Actions against major foreign crypto exchange-

⁹⁵ See PIERRE-HUGUES VERDIER, *GLOBAL BANKS ON TRIAL: U.S. PROSECUTIONS AND THE REMAKING OF INTERNATIONAL FINANCE* 3 (2020) (explaining why the United States holds immense control over international finance).

⁹⁶ *White House Framework*, *supra* note 1.

⁹⁷ See INT’L ORG. OF SEC. COMM’NS, IOSCO CRYPTO-ASSET ROADMAP FOR 2022–2023 1, at n.1 (2022), <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD705.pdf> [<https://perma.cc/43R9-LTNR>] (listing members).

⁹⁸ See Verdier, *supra* note 94, at 1419–20.

⁹⁹ See, e.g., VERDIER, *supra* note 95, at 7, 19–20, 36 (describing examples of cooperation).

¹⁰⁰ See, e.g., *id.* at 18, 36, 69–70 (commenting on the extensive enforcement authority of the SEC and CFTC, as well as instances of international enforcement actions); Howell E. Jackson & Mark J. Roe, *Public and Private Enforcement of Securities Laws: Resource-Based Evidence*, 93 J. FIN. ECON. 207 (2009) (finding a correlation between public agencies’ resources and financial outcomes, including market capitalization, volume, and others, and, in particular, emphasizing that U.S. regulators such as the SEC bring more formal enforcement actions); Howell E. Jackson, *Variation in the Intensity of Financial Regulation: Preliminary Evidence and Potential Implications*, 24 YALE J. ON REGUL. 253 (2007) (examining enforcement intensity across countries and reporting on strong securities law enforcement in the United States); John C. Coffee, Jr., *Law and the Market: The Impact of Enforcement*, 156 U. PA. L. REV. 229 (2007) (examining enforcement intensity using various metrics and emphasizing strong SEC enforcement). But see generally Yuliya Guseva, *The SEC and Foreign Private Issuers: A Path to Optimal Public Enforcement*, 59 B.C. L. REV. 2055 (2018) (examining enforcement actions against foreign corporations and concluding that the SEC pursued a relatively low-key enforcement against foreign firms).

¹⁰¹ See generally SIMONA MOLA, CORNERSTONE RSCH., SEC CRYPTOCURRENCY ENFORCEMENT 2 (2022), <https://www.cornerstone.com/wp-content/uploads/2022/01/SEC-Cryptocurrency-Enforcement-2021-Update.pdf> [<https://perma.cc/6RJU-65H5>] (tracking cryptocurrency enforcement since 2013); Douglas S. Eakeley, Yuliya Guseva, Leo Choi & Katarina Gonzalez, *Crypto-Enforcement Around the World*, 94 S. CAL. L. REV. POSTSCRIPT 99, 112 (2021) (observing that “the U.S. agencies imposed substantial fines and brought more cases in court and in-house administrative proceedings” compared to many foreign regulators); Yuliya Guseva, *The SEC, Digital Assets, and Game Theory*, 46 J. CORP. L. 629, 632 (2021) [hereinafter Guseva, *Game Theory*] (observing that “[i]nstead of a formal rule, the

es, developers, and a global stablecoin illustrate this point.¹⁰² For example, in the complaints filed against Binance in March and June 2023, the Commissions provided evidence that Binance management understood the reach of U.S. enforcement and attempted to evade it.¹⁰³ As powerful extraterritorial agencies, the Commissions have yet to lose a case against a crypto firm, either domestic or foreign.¹⁰⁴

As U.S. regulators assert their overlapping jurisdictions in international and often geography-agnostic crypto markets, the need for effective reform becomes even more salient. The international impact of U.S. regulators and the differences between the Commissions further emphasize the importance of

SEC has opted to use a more flexible *modus operandi* of enforcement actions relying on a functional definition of securities such as investment contracts”); James J. Park & Howard H. Park, *Regulation by Selective Enforcement: The SEC and Initial Coin Offerings*, 61 WASH. U. J.L. & POL’Y 99 (2020) (suggesting that SEC enforcement efforts during the wave of initial coin offerings were selective given the agency’s limited resources, but that the actions were decisive and effective in establishing SEC jurisdiction over the new asset class).

¹⁰² See generally *CFTC v. HDR Glob. Trading Ltd.*, No. 20-CV-08132 (S.D.N.Y. Aug. 10, 2021) (granting a permanent injunction against BitMEX); *In re Tether Holdings Ltd.*, CFTC No. 22-04, 2021 WL 8322874 (Oct. 15, 2021) (finding in part that Tether violated the CEA by failing to maintain adequate fiat reserves and making false representations regarding the same); *In re iFinex Inc.*, CFTC No. 22-05, 2021 WL 8322873 (Oct. 15, 2021) (entering a cease-and-desist order based on violations of the CEA); *SEC v. Telegram Grp.*, 448 F. Supp. 3d 352 (S.D.N.Y. 2020) (granting a motion for preliminary injunction concerning a scheme to issue cryptoassets in an unregistered securities offering, in violation of the Securities Act of 1933).

¹⁰³ See *Binance SEC Complaint*, *supra* note 74, at 2–4; *Binance CFTC Complaint*, *supra* note 75, at 3, 35–38.

¹⁰⁴ As this Article was going to print, the only exception to otherwise successful enforcement was *SEC v. Ripple Labs, Inc.*, No. 20 CIV. 10832, 2023 WL 4507900 (S.D.N.Y. July 13, 2023). In an order on motion for summary judgment, Judge Torres of the U.S. District Court for the Southern District of New York granted in part not only the SEC’s motion for summary judgment, but also the defendant’s motion for summary judgment. *Id.* at *17. Note that, as opposed to U.S. agencies, agencies in many other jurisdictions issue light-touch warnings and blacklists in crypto, and engage in at least ostensibly cooperative regulatory programs. As early as 2014, for instance, the U.K. Financial Conduct Authority issued a call for comments from innovators and launched a hub for regulatory cooperation. See FIN. CONDUCT AUTH., PROJECT INNOVATE: CALL FOR INPUT 1–4 (2014), <https://www.fca.org.uk/publication/call-for-input/project-innovate-call-for-input.pdf> [<https://perma.cc/7FVD-PSP3>] (calling for comments from innovators); U.N. SEC’Y-GEN.’S SPECIAL ADVOC. FOR INCLUSIVE FIN. FOR DEV. FINTECH WORKING GRP. & CAMBRIDGE CTR. FOR ALT. FIN., EARLY LESSONS ON REGULATORY INNOVATIONS TO ENABLE INCLUSIVE FINTECH 7–8 (2019), https://www.jbs.cam.ac.uk/file-admin/user_upload/research/centres/alternative-finance/downloads/2019-early-lessons-regulatory-innovations-enable-inclusive-fintech.pdf [<https://perma.cc/2DZS-BUJB>] (reviewing regulatory initiatives and providing regulators with advice when assessing, selecting, and implementing regulatory options). The CFTC and the SEC also have opened cooperative innovation hubs. Press Release, CFTC, CFTC Launches LabCFTC as Major Fintech Initiative (May 17, 2017), <https://www.cftc.gov/PressRoom/PressReleases/7558-17#:~:text=LabCFTC%20is%20the%20agency%27s%20focal,CFTC%27s%20understanding%20of%20new%20technologies> [<https://perma.cc/5NDP-KBRY>]; *Strategic Hub for Innovation and Financial Technology (FinHub)*, SEC, <https://www.sec.gov/finhub> [<https://perma.cc/8G7P-T899>] (Aug. 31, 2023). Yet, the Commissions simultaneously engage in extensive enforcement.

congressional bills and White House initiatives to improve the oversight of global crypto markets.

II. THE TWO COMMISSIONS IN CRYPTO

This Part explains the jurisdiction and actions of the Commissions in crypto and sets the scene for our empirical analysis. Section A discusses the CFTC.¹⁰⁵ Section B focuses on the SEC.¹⁰⁶ This is not a casebook disquisition on the Commissions' general jurisdiction. Readers familiar with the authority of the Commissions and their crypto-related actions may wish to proceed to Part III.

A. The CFTC

The CFTC was one of the first agencies to assert its jurisdiction over cryptoassets and market participants engaged in cryptoasset trading.¹⁰⁷ As early as March 2014, the agency announced that it was considering regulating Bitcoin.¹⁰⁸ And in 2015, in a first-ever enforcement action against a crypto trading platform, the CFTC stated that virtual currencies are commodities.¹⁰⁹

In 2016, the CFTC followed up with a major settlement with Bitfinex, a key foreign "player" in crypto. Bitfinex ran an online platform for trading cryptocurrencies but did not register with the CFTC as a futures commission merchant or designated contract market.¹¹⁰ Once again, the CFTC repeated that

¹⁰⁵ See *infra* notes 107–131 and accompanying text.

¹⁰⁶ See *infra* notes 132–158 and accompanying text.

¹⁰⁷ James Michael Blakemore, *New Things Under the Sun: How the CFTC Is Using Virtual Currencies to Expand Its Jurisdiction*, 73 ARK. L. REV. 205, 209 (2020).

¹⁰⁸ See *id.* (noting that in 2014, the CFTC first declared that virtual currencies fit within the definition of "commodity" per the CEA, thus subject to their jurisdiction).

¹⁰⁹ See *In re Coinflip, Inc.*, CFTC No. 15-29, 2015 WL 5535736, at *2 (Sept. 17, 2015) (explaining, in an action against an unregistered platform for trading bitcoin derivatives, that "[b]itcoin and other virtual currencies are . . . commodities"). The term "commodity" covers agricultural products "and all services, rights, and interests (except motion picture box office receipts . . .) in which contracts for future delivery are presently or in the future dealt in." 7 U.S.C. § 1a(9); see also *id.* § 1a(19)(i) (defining "currency" and "security" as "excluded commodities"); Bd. of Trade of Chi. v. SEC, 677 F.2d 1137, 1142 (7th Cir. 1982) ("This language was also meant to encompass futures markets that were expected to be expanded to cover non-traditional goods and services . . ."), *cert. granted, judgment vacated on other grounds sub nom.* Chi. Bd. Options Exch., Inc. v. Bd. of Trade of Chi., 459 U.S. 1026 (1982), and SEC v. Bd. of Trade of Chi., 459 U.S. 1026 (1982).

¹¹⁰ *In re BFXNA Inc.*, CFTC No. 16-19, 2016 WL 3137612, at *1–3 (June 2, 2016). For reference, "[a] futures commission merchant (FCM) is an entity that solicits or accepts orders to buy or sell futures contracts, options on futures . . . and accepts money or other assets from customers to support such orders." *Futures Commission Merchant (FCM) Registration*, NAT'L FUTURES ASSOC., <https://www.nfa.futures.org/registration-membership/who-has-to-register/fcm.html> [<https://perma.cc/DUQ5-4HK7>]. The term "designated contract market" means "exchanges that may list for trading futures or option contracts based on all types of commodities and that may allow access to their facilities by all types of traders, including retail customers." *Trading Organizations*, CFTC, <https://www.cftc.gov/>

digital assets fall under the definition of commodities per the Commodity Exchange Act (CEA) and relevant regulations.¹¹¹

In addition to these early enforcement actions, the CFTC also released Primers on Virtual Currencies in 2017¹¹² and Digital Assets in 2020,¹¹³ as well as virtual asset guidance in 2020.¹¹⁴ These statements declare that virtual currencies are commodities, a position that appears well-accepted (though not universally embraced)¹¹⁵ in part because several federal courts have supported the CFTC's view.¹¹⁶

Many CFTC cases in our database fall into two categories: (1) impermissible derivatives transactions and violations of registration requirements by derivatives market participants, and (2) market manipulation and fraud. These two categories are explained by the specifics of the CFTC's jurisdiction in spot markets for commodities and in derivatives markets. Derivatives markets, including futures, swaps, and options, are within the regulatory and enforcement authority of the CFTC. Note, however, that the Commission steps in if there is fraud or manipulation in spot markets, including cryptoasset markets, but it does not regulate them directly.¹¹⁷

IndustryOversight/TradingOrganizations/index.htm#:~:text=Designated%20contract%20markets%20(DCMs)%20are,of%20traders%2C%20including%20retail%20customers [https://perma.cc/4H2X-7C8E].

¹¹¹ *In re BFXNA*, 2016 WL 3137612, at *5–6.

¹¹² CFTC, A CFTC PRIMER ON VIRTUAL CURRENCIES (2017), https://www.cftc.gov/sites/default/files/idc/groups/public/documents/file/labcftc_primercurrencies100417.pdf [https://perma.cc/U4NJ-FH5A].

¹¹³ CFTC, DIGITAL ASSETS PRIMER (2020), <https://www.cftc.gov/media/5476/DigitalAssetsPrimer/download> [https://perma.cc/L373-72RK].

¹¹⁴ Retail Commodity Transactions Involving Certain Digital Assets, 85 Fed. Reg. 37734 (June 24, 2020) (to be codified at 17 C.F.R. pt. 1).

¹¹⁵ For relevant arguments, see, for example, GARY E. KALBAUGH, DERIVATIVES LAW AND REGULATION 574–93 (3d ed. 2021).

¹¹⁶ See, e.g., *CFTC v. McDonnell*, 287 F. Supp. 3d 213, 228 (E.D.N.Y. 2018) (“Virtual currencies are ‘goods’ exchanged in a market for a uniform quality and value. They fall well-within the common definition of ‘commodity’ as well as the CEA’s definition of ‘commodities’” (citations omitted)); *CFTC v. My Big Coin Pay, Inc.*, 334 F. Supp. 3d 492, 49699 (D. Mass. 2018) (denying a motion to dismiss upon finding that the CFTC adequately alleged that a virtual currency involved in futures trading was a “commodity” under its jurisdiction); *Ox Labs, Inc. v. Bitpay, Inc.*, No. CV 18-5934 (KSx), 2020 WL 1039012, at *6 (C.D. Cal. Jan. 24, 2020) (“Bitcoin is not merely an ‘idea’ that is entirely divorced from any physical form. Rather, it is dependent on blockchain, a public ledger which records all the transactions. While not directly on point, the Court also finds support from [*CFTC v. McDonnell*]” (dicta), *aff’d*, 848 F. App’x 795 (9th Cir. 2021); *Dekrypt Cap., LLC v. Uphold Ltd.*, No. 82606-9-I, 2022 WL 97233, at *3 (Wash. Ct. App. Jan. 10, 2022) (“Virtual currencies, such as Bitcoin, are commodities in interstate commerce.”).

¹¹⁷ There is a debate on the extent and scope of the jurisdiction of the CFTC. See, e.g., KALBAUGH, *supra* note 115, at 99. Specifics of the debate are outside the scope of this Article. As the Commission has summarized, “the CFTC generally does not oversee ‘spot’ or cash market exchanges and transactions involving virtual currencies that do not utilize margin, leverage, or financing.” CFTC, *supra* note 112, at 11.

A large part of the CFTC's oversight rests on the regulation of intermediaries, such as exchanges. The 2021 settlements with BitMEX and Bitfinex, large international trading platforms that were neither designated nor registered by the CFTC as contract markets, illustrate that a derivatives exchange is within the jurisdiction of the CFTC.¹¹⁸ Failure to register can draw the ire of the CFTC, as the more recent complaint against Binance explains:

Binance has operated and is continuing to operate a trading system or platform in which more than one market participant has the ability to execute or trade swaps with more than one other market participant on the system or platform, including the trading or processing of swap on digital assets that are commodities without being registered as a [designated contract market] or [swap execution facility].¹¹⁹

In cases where a crypto exchange does not provide facilities for derivatives trading and instead facilitates spot market transactions, the CFTC's jurisdiction is limited. In these markets, however, additional protections are provided to retail customers, who are neither eligible contract participants nor eligible commercial entities (which are typically smaller institutions and individuals).¹²⁰ Retail commodity transactions may be risky when smaller traders participate in transactions financed by the offeror or on a leveraged or margined basis.¹²¹ Commodity regulation provides additional protections by treating these transactions as futures, except in cases where "actual delivery" takes place within a limited number of days.¹²² These retail commodity transactions should be executed on regulated exchanges.

In 2021, Bitfinex came under CFTC scrutiny for failing to adequately safeguard U.S. residents trading on their platform and for violating the Commis-

¹¹⁸ *In re iFinex Inc.*, CFTC No. 22-05, 2021 WL 8322873, at *1 (Oct. 15, 2021); CFTC v. HDR Glob. Trading Ltd., No. 20-CV-08132, slip op. at 11–13 (S.D.N.Y. Aug. 10, 2021) (granting a permanent injunction against BitMEX). For example, in relevant parts, the CEA prohibits any person from executing or offering to enter into transactions in connection with commodity futures unless such transactions are conducted on designated contract markets (DCM). 7 U.S.C. § 6(a).

¹¹⁹ Binance CFTC Complaint, *supra* note 75, at 65.

¹²⁰ See 7 U.S.C. § 1a(17)–(18) (defining "eligible commercial entity" and "eligible contract participant").

¹²¹ See *id.* § 2(c)(2)(D) (discussing retail commodity transactions).

¹²² *Id.* § 2(c)(2)(D)(ii)(III)(aa) (excepting from the treatment as "[r]etail commodity transactions" "a contract of sale that results in actual delivery within [twenty-eight] days or such other longer period as the Commission may determine"); see Retail Commodity Transactions Involving Certain Digital Assets, 85 Fed. Reg. 37734, 37734 (June 24, 2020) (to be codified at 17 C.F.R. pt. 1) (informing "the public of the Commission's views when determining whether actual delivery has occurred in the context of retail commodity transactions in certain types of digital assets").

sion's order from 2016.¹²³ The CFTC imposed a fine and requested that Bitfinex both implement procedures protecting U.S. persons and close all margined (or leveraged) positions held by U.S. non-eligible contract participants.¹²⁴

The next market institution under the CFTC's purview are futures commission merchants (FCMs), i.e., firms and individuals that solicit or accept orders for derivatives transactions, including futures and options.¹²⁵ FCMs also must register with the CFTC,¹²⁶ which Bitfinex failed to do despite continuing to execute cryptoasset orders and margining transactions.¹²⁷

Further, recall that the CFTC has broad antifraud and antimanipulation jurisdiction.¹²⁸ The order against Tether Holdings Limited released concurrently with the order against Bitfinex is a case in point. It involved a group of companies affiliated with Bitfinex and operating USDt (Tether), the largest global stablecoin arrangement.¹²⁹ Stablecoins underlying an arrangement—that is, issuance, redemption, transfer, and payment mechanisms—often serve as a medium of exchange or collateral for loans and are traded on various crypto-exchanges. The CFTC considers stablecoins commodities, and Tether's misrepresentations of material facts and omissions brought it within the antifraud and antimanipulation authority of the CFTC.¹³⁰

Tether issued its stablecoin, claiming to have maintained a one hundred percent reserve pegged to the U.S. dollar and representing, among other things, that the stablecoin could always be redeemed. These false and misleading representations led to an enforcement action even though the Tether group did not register any affiliated entities with the CFTC in any capacity.

Our database includes these types of market manipulation and fraud cases together with the aforementioned failures to register. Because the broad extra-territorial jurisdiction of the CFTC allows it to proceed against many foreign

¹²³ See *In re iFinex Inc.*, 2021 WL 8322873, at *2–6 (discussing Bitfinex's failure to adhere to CEA registration rules covering retail transactions). See generally *In re BFXNA Inc.*, CFTC No. 16-19, 2016 WL 3137612 (June 2, 2016) (ordering Bitfinex to cease and desist from violating the CEA).

¹²⁴ *In re iFinex Inc.*, 2021 WL 8322873, at *7–8.

¹²⁵ 7 U.S.C. § 1a(28). The scope of the definition is broad and also includes acting as counterparty in retail commodity transactions on a leveraged or margined basis. *Id.*

¹²⁶ *Id.* § 6d(a)(1). The other categories of market participants within the jurisdiction of the CFTC are commodity trading advisors and commodity pool operators, which are, respectively, persons who for profit or compensation advise others on trading in commodities and derivatives, and persons who are engaged in commodity pools, investment trusts and other similar businesses for trading commodities and derivatives. *Id.* § 1a(11), (12).

¹²⁷ *In re iFinex Inc.*, 2021 WL 8322873, at *1.

¹²⁸ See 7 U.S.C. § 9(1)(3) (prohibiting fraud and manipulation in commodities and derivatives transactions); 17 C.F.R. § 180.1(a) (2023) (prohibiting fraud and manipulation in commodities and derivatives markets).

¹²⁹ *In re Tether Holdings Ltd.*, CFTC No. 22-04, 2021 WL 8322874, at *1–7 (Oct. 15, 2021).

¹³⁰ *Id.* at *8.

parties, cases within our database involve many international and foreign entities in addition to domestic firms.

Note, however, that some cryptoasset derivatives are within the ambit of securities law and SEC jurisdiction, and some assets *simultaneously* represent commodities and securities.¹³¹ As the next Section explains, the SEC's jurisdiction over securities and securities derivatives is broader than the authority of the CFTC in commodity and derivatives markets. It encompasses both regulatory and enforcement authority, including complicated approval processes for securities offerings.

B. The SEC

The SEC joined the crypto-related enforcement fracas only in mid-2017. The Commission released a Report of Investigation concerning the DAO (DAO Report), a crypto-based decentralized autonomous organization originating in Germany. The DAO's purpose was to seek capital contributions for further investment in revenue-generating projects.¹³² The DAO Report described the application of securities law to "virtual organizations or capital raising entities that use distributed ledger or blockchain technology to facilitate capital raising and/or investment and the related offer and sale of securities."¹³³ As a threshold matter, using smart contracts (i.e., computerized protocols to execute transactions) and relying on code does not shield actors from federal securities law.¹³⁴

The jurisdiction of the SEC extends only over securities, securities markets, and their participants. Thus, it was important to bring cryptoassets within the definition of securities. The DAO achieved this result by applying the decades-old, four-prong *Howey* investment contract test¹³⁵ to the digital assets and transactions at issue. The DAO Report concluded that the DAO offered and sold investment contracts (i.e., securities). The SEC has consistently applied the *Howey* test to cryptoassets ever since. To clarify its application to crypto, the SEC issued the 2019 *Framework for "Investment Contract" Analysis of Digital Assets*.¹³⁶

¹³¹ See, e.g., Letter from Robert A. Schwartz, *supra* note 67.

¹³² DAO Report, Exchange Act Release No. 81,207, 117 SEC Docket 745, at *1–2 (July 25, 2017).

¹³³ *Id.* at *2.

¹³⁴ *Id.*

¹³⁵ SEC v. W.J. Howey Co., 328 U.S. 293, 298–99 (1946) (defining an "investment contract" as "a contract, transaction, or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party").

¹³⁶ SEC, FRAMEWORK FOR "INVESTMENT CONTRACT" ANALYSIS OF DIGITAL ASSETS (2019) [hereinafter THE FRAMEWORK], <https://www.sec.gov/files/dlt-framework.pdf> [<https://perma.cc/36LG-WVN7>].

Several court decisions against foreign firms have supported the SEC's position. In the first decision, *SEC v. Telegram Group*, the U.S. District Court for the Southern District of New York concluded that the issuer's series of transactions and undertakings satisfied the *Howey* test and were thus investment contracts.¹³⁷ Consequently, the court granted the SEC's motion for a preliminary injunction, and Telegram, a foreign company, had to return investor contributions to both domestic and foreign parties.

In the second decision, *SEC v. Kik Interactive Inc.*, the Southern District of New York also applied the *Howey* test and granted the SEC's motion for summary judgment against Kik, a Canadian company.¹³⁸ This case concerned an issuance of tokens (a form of cryptoassets) almost simultaneously with a sale of investment agreements. Under those circumstances, according to the court, *Howey* served as both "a clearly expressed test for determining what constitutes an investment contract" and "an objective test that provides the flexibility necessary for the assessment of a wide range of investment vehicles."¹³⁹ The court found that Kik engaged in an unregistered securities offering.

Howey, however, is not the only test that the SEC applies to cryptoassets, even though it has served as a reliable framework.¹⁴⁰ In February 2022, in an enforcement action against BlockFi, a company offering crypto-based lending products, the SEC examined the cryptoassets at issue using the *Reves* test.¹⁴¹ Under the *Reves* test, debt instruments, namely notes, are presumed to be securities, unless they fall under a list of financial instruments deemed not securities or they bear a "family resemblance" to those excluded categories.¹⁴² Although the SEC ultimately issued a cease-and-desist order based on a settlement agreement, it reasoned that BlockFi's crypto program was an unregistered security under both the *Reves* and *Howey* tests.¹⁴³

¹³⁷ 448 F. Supp. 3d 352, 367-68 (S.D.N.Y. 2020).

¹³⁸ 492 F. Supp. 3d 169, 177-78, 183-84 (S.D.N.Y. 2020).

¹³⁹ *Id.* at 183.

¹⁴⁰ For a discussion of *Howey*'s broad and functional approach, see generally Howell E. Jackson, *Regulation in a Multisector Financial Services Industry: An Exploratory Essay*, 77 WASH. U. L.Q. 319 (1999).

¹⁴¹ BlockFi Lending LLC, Securities Act Release No. 11,029, Investment Company Act Release No. 34,503, 2022 WL 462445, at *1-2 (Feb. 14, 2022); see *Reves v. Ernst & Young*, 494 U.S. 56, 64-67 (1990) (establishing the *Reves* test for determining whether a "note" is a security subject to SEC jurisdiction).

¹⁴² The "family resemblance" test involves a four-pronged approach, including motivations of reasonable sellers and buyers, a distribution plan leading to common trading for purposes of speculation or investment, reasonable expectations of investors, and the presence of alternative regulatory regimes. *Reves*, 494 U.S. at 66-67.

¹⁴³ *BlockFi Lending LLC*, 2022 WL 462445, at *1.

Once an issuer is determined to be offering and selling securities, securities law imposes a variety of registration and reporting obligations.¹⁴⁴ In addition to these primary markets for securities, SEC jurisdiction also covers secondary market trading and exchanges,¹⁴⁵ as well as various market participants, including investment companies.¹⁴⁶ Several enforcement actions in our database involve unregistered crypto exchanges, broker-dealers, or investment companies and implicate the Securities Exchange Act,¹⁴⁷ the Investment Company Act,¹⁴⁸ and the Investment Advisers Act.¹⁴⁹

For example, the SEC concluded that, in addition to selling unregistered securities (a threshold matter determined by applying the *Howey* and/or *Reves* tests), BlockFi violated the Investment Company Act.¹⁵⁰ That Act makes it unlawful for an investment company to “offer for sale, sell, or deliver after sale . . . any security or any interest in a security” or “engage in any business in interstate commerce,”¹⁵¹ unless the company is registered as an investment company or, among other things, excluded from the definition of an investment company.¹⁵² Because BlockFi was offering and selling unregistered securities and was neither registered nor excluded from the definition of investment company, it violated the Securities Act¹⁵³ and the Investment Company Act.¹⁵⁴

¹⁴⁴ For a discussion of the current registration requirements and exemptions, see generally Guseva, *supra* note 47.

¹⁴⁵ The term “exchange” is defined as

any organization, association, or group of persons, whether incorporated or unincorporated, which constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by a stock exchange as that term is generally understood, and includes the market place and the market facilities maintained by such exchange.

15 U.S.C. § 78c(a)(1).

¹⁴⁶ An investment company is any issuer that is engaged “or proposes to engage primarily, in the business of investing, reinvesting, or trading securities” or:

is engaged or proposes to engage in the business of investing, reinvesting, owning, holding, or trading, in securities, and owns or proposes to acquire investment securities having a value exceeding 40[%] of the value of such issuer’s total assets (exclusive of Government securities and cash items) on an unconsolidated basis.

Id. § 80a-3(a)(1)(A), (C).

¹⁴⁷ *Id.* § 78a–rr.

¹⁴⁸ *Id.* § 80a-1 to -64.

¹⁴⁹ *Id.* § 80b-1 to -21.

¹⁵⁰ BlockFi Lending LLC, Securities Act Release No. 11,029, Investment Company Act Release No. 34,503, 2022 WL 462445, at *8–9 (Feb. 14, 2022).

¹⁵¹ 15 U.S.C. § 80a-7(a)(1), (4).

¹⁵² *BlockFi Lending LLC*, 2022 WL 462445, at *8–9.

¹⁵³ Specifically, the SEC found that BlockFi violated §§ 5 and 17 of the Securities Act. *Id.* at *8; 15 U.S.C. § 77e, 77q.

Finally, SEC enforcement actions have made it clear that crypto-exchanges must register with the SEC or seek an exemption, including as an alternative trading system (ATS) under the Securities Exchange Act.¹⁵⁵ One of the first pronouncements to this effect was made in the DAO Report, which reiterated that rules “provide[] a functional test to assess whether a trading system meets the definition of exchange.”¹⁵⁶ Our database includes several events involving exchanges.

By way of example, in one of the first orders against a crypto exchange, the SEC described how unregistered crypto exchange Poloniex used an order book and trading protocol to facilitate order execution.¹⁵⁷ In its 2023 complaints, the SEC continued to focus on crypto-firms’ failures to register as securities exchanges, but it also targeted their failures to register as broker-dealers or clearing agencies.¹⁵⁸ (Because we limit our sample to pre-crash markets, we exclude these complaints.)

The progression of enforcement actions is unmistakable: First, by interpreting decades-old case law through enforcement actions and staff statements, the SEC firmly expressed its view that many cryptoassets are securities. In doing so, it informed cryptoasset issuers around the globe that they must comply with the registration and reporting requirements of securities law. Second, using enforcement and statements, the SEC has signaled that crypto market participants, including exchanges, broker-dealers, investment companies, and others, must register with the SEC.

III. EMPIRICAL RESEARCH ON CRYPTOASSET REGULATION

In our study of how crypto markets react to commodity, derivatives, and securities law enforcement, we contribute to economic and financial literature on crypto in the following way. We have identified several studies examining how cryptoasset markets react to the news of regulation or anticipated regulation. All of them compared reactions to news and regulations in several jurisdictions. By contrast, we examine the effect of U.S.-led *enforcement* because there are no new U.S. regulations (instead, the Commissions heavily rely on enforcement) and because the Commissions’ actions carry major international ramifications.

¹⁵⁴ *BlockFi Lending LLC*, 2022 WL 462445, at *8–9.

¹⁵⁵ See 15 U.S.C. §§ 78c(a)(1), 78e; 17 C.F.R. §§ 240.3b–16(a), 240.3a1–1(a)(2) (2023).

¹⁵⁶ DAO Report, *supra* note 132, at *16.

¹⁵⁷ Poloniex, LLC, Exchange Act Release No. 92,607, 2021 WL 3501307, at *1–2 (Aug. 9, 2021).

¹⁵⁸ See Binance SEC Complaint, *supra* note 74, at 123–24, 133 (alleging that Binance was “required to but did not register as an exchange, broker-dealer, or clearing agency,” and that it engaged in fraud); Complaint at 80, SEC v. Coinbase, Inc., No. 23-CV-04738 (S.D.N.Y. June 6, 2023) (similar, excluding allegations of fraud).

In addition, we focus on cryptoassets that fall within the jurisdiction of the Commissions as securities, commodities, or both.¹⁵⁹ These regulatory classifications encircle various types of tokens and coins¹⁶⁰ and help us examine the effect of U.S.-specific regulatory fragmentation in finance.

In our analysis, we focus on global market prices. Relatedly, Feinstein and Werbach studied cross-border trading volumes following regulatory events, including, among others, securities law announcements, anti-money-laundering (AML) regulation, newly developed licensing for crypto activities and firms, and antifraud enforcement.¹⁶¹ In contrast to Feinstein and Werbach, we do not survey volume-related information. Instead, we examine price reaction and focus on the impact of enforcement by major U.S. regulators (the SEC and CFTC). Nor do we cover AML and new forms of licensing. For one, there is no new crypto-specific licensing by the Commissions. Moreover, AML regulation is undergoing international harmonization with standard-setters, like the Financial Action Task Force,¹⁶² providing guidelines on crypto.¹⁶³ Consequently, it is more important to zero in on commodity law and securities law, given

¹⁵⁹ In this sense, our analysis differs from the literature that examines cryptoassets with characteristics of different financial assets, like shares of stock, currencies, etc. *See, e.g.,* Elise Alfieri, Radu Burlacu & Geoffroy Enjolras, *On the Nature and Financial Performance of Bitcoin*, 20 J. RISK FIN. 114, 114–15 (2019) (showing that Bitcoin may be examined like stock); Saifedean Ammous, *Can Cryptocurrencies Fulfil the Functions of Money?*, 70 Q. REV. ECON. & FIN. 38, 38–39 (2018) (evaluating crypto in terms of money's three primary roles, including a tool for value, exchange, and accounting unit); Dirk G. Baur, KiHoon Hong & Adrian D. Lee, *Virtual Currencies: Media of Exchange or Speculative Asset?* 29 (Swift Inst., Working Paper No. 2014-007, 2016), http://www.swiftinstitute.org/wp-content/uploads/2016/06/Bitcoin-Baur-et-al_-2016-SWIFT-FINAL.pdf [<https://perma.cc/6DSP-Q2GX>] (concluding, after analyzing whether Bitcoin should be considered currency or an asset, that Bitcoins are unlike either and are primarily held for purposes of investment rather than transactional use); David Yermack, *Is Bitcoin a Real Currency? An Economic Appraisal*, in HANDBOOK OF DIGITAL CURRENCY 31, 32–33 (David Lee Kuo Chuen ed., 2015) (questioning if Bitcoin may function as a currency).

¹⁶⁰ *See infra* Part IV.

¹⁶¹ *See generally* Feinstein & Werbach, *supra* note 69 (examining how cryptocurrency regulation influences trading markets). Feinstein and Werbach observe that regulatory events do not impact trading volume in several major jurisdictions and globally, but may “at least hint at the possibility that regulations negatively affect global cryptocurrency prices.” *Id.* at 82, 85.

¹⁶² *See* Chris Brummer, *How International Financial Law Works (and How It Doesn't)*, 99 GEO. L.J. 257, 295–97 (2011) (discussing the origins and role of the Financial Action Task Force).

¹⁶³ *See, e.g.,* FIN. ACTION TASK FORCE, SECOND 12-MONTH REVIEW OF THE REVISED FATF STANDARDS ON VIRTUAL ASSETS AND VIRTUAL ASSET SERVICE PROVIDERS (2021), <https://www.fatf-gafi.org/content/dam/fatf-gafi/guidance/Second-12-Month-Review-Revised-FATF-Standards-Virtual-Assets-VASPS.pdf.coredownload.pdf> [<https://perma.cc/PS78-4MHU>]; FIN. ACTION TASK FORCE, UPDATED GUIDANCE FOR A RISK-BASED APPROACH TO VIRTUAL ASSETS AND VIRTUAL ASSET SERVICE PROVIDERS (2021), <https://www.fatf-gafi.org/content/dam/fatf-gafi/guidance/Updated-Guidance-VA-VASP.pdf.coredownload.inline.pdf> [<https://perma.cc/7VJM-7LWR>]; FIN. ACTION TASK FORCE, GUIDANCE FOR A RISK-BASED APPROACH TO VIRTUAL CURRENCIES (2015), <https://www.fatf-gafi.org/content/dam/fatf-gafi/guidance/Guidance-RBA-Virtual-Currencies.pdf.coredownload.pdf> [<https://perma.cc/6HGU-JCS2>].

that the merits and specifics of their applications to crypto are still debated in the literature and in Congress.

Some of our findings support prior research demonstrating a negative market price reaction to the news of regulation, particularly securities law.¹⁶⁴ Scholars Chokor and Alfieri, for example, examined cryptoassets using the methodology applicable to stock markets and measured the cryptoasset market's reaction to regulatory news in various countries.¹⁶⁵ Using event studies, they estimated abnormal returns of thirty top cryptocurrencies between 2015 and 2019 in relation to sixty-three regulatory news events from jurisdictions including the European Union, the United States, and others.¹⁶⁶ The authors found that the market reaction to regulatory news is negative and statistically significant, with a stronger negative reaction associated with securities law announcements.¹⁶⁷

Koenraadt and Leung also determined that the overall market reaction to regulatory news events is negative, particularly if the announcements are related to securities regulation.¹⁶⁸ These findings comport with a study by Shanaev and coauthors that found regulation of exchanges and issuances impacts cryptoasset prices.¹⁶⁹ Similarly, Auer and Claessens, using an event study approach focusing on major cryptocurrencies, such as Bitcoin, XRP, and Ether, found that news signaling a possibility of applying securities law to cryptoasset markets is associated with a strong adverse market reaction.¹⁷⁰

Our study contributes to this prior work by showing a negative market reaction to enforcement actions as a distinct regulatory method different from regulation via rulemaking. Global crypto markets appear to distinguish between the SEC and CFTC, with the reaction to SEC enforcement being more negative.

¹⁶⁴ See, e.g., Jeroen Koenraadt & Edith Leung, *Investor Reactions to Crypto Token Regulation*, 2022 EUR. ACCT. REV. 1, 3 (noting that the overall market tends to react negatively to news signaling increased regulation); Ahmad Chokor & Elise Alfieri, *Long and Short-Term Impacts of Regulation in the Cryptocurrency Market*, 81 Q. REV. ECON. & FIN. 157, 157 (2020) ("The results suggest that events that increase the probability of regulation adoption are associated with negative abnormal returns for the cryptocurrencies concerned."); Raphael Auer & Stijn Claessens, *Regulating Cryptocurrencies: Assessing Market Reactions*, 2018 BIS Q. REV. 51, 52 (highlighting the adverse effect that news about regulatory actions has on cryptocurrency valuations).

¹⁶⁵ Chokor & Alfieri, *supra* note 164, at 162–66.

¹⁶⁶ *Id.* at 166–72.

¹⁶⁷ *Id.* at 170–72.

¹⁶⁸ See Koenraadt & Leung, *supra* note 164, at 24–25.

¹⁶⁹ Savva Shanaev, Satish Sharma, Binam Ghimire & Arina Shuraeva, *Taming the Blockchain Beast? Regulatory Implications for the Cryptocurrency Market*, 51 RSCH. INT'L BUS. & FIN. 1, 9–10 (2020).

¹⁷⁰ Auer & Claessens, *supra* note 164, at 51–53, 59–62; see also Raphael Auer & Stijn Claessens, *Cryptocurrency Market Reactions to Regulatory News 1* (Globalization Inst., Working Paper No. 381, 2020) [hereinafter Auer & Claessens, *Regulatory News*], <https://www.dallasfed.org/~media/documents/institute/wpapers/2020/0381.pdf> [<https://perma.cc/C2GV-56JR>] (finding, based on an event study approach, that the crypto market generally reacts negatively to regulatory news).

These results also support scholarship arguing that the Commissions are fundamentally different entities with distinct regulatory philosophies.¹⁷¹ The distinct price reactions also highlight the sensitivity of global crypto markets to U.S. enforcement and call for more research on the respective approaches of the SEC and the CFTC.

We also contribute to literature on the quality and liquidity of cryptoassets. For instance, Chokor and Alfieri's cross-sectional analysis demonstrates that cumulative market-adjusted returns are less negative for less liquid cryptocurrencies and cryptoassets with greater information asymmetry.¹⁷² This suggests that markets view possible regulation of those cryptoassets more favorably. Our results contribute to Chokor and Alfieri's conclusions. We find that more liquid assets tend to have a more negative reaction to the announcement of enforcement events. We also indicate, however, that risky and volatile assets are more negatively affected by such announcements.

Interestingly, Koenraadt and Leung's cross-sectional analysis indicates that utility tokens (i.e., a separate asset class distinct from what is commonly referred to as "cryptocurrencies")¹⁷³ with more disclosures experience a less negative reaction to regulatory news.¹⁷⁴ As opposed to Koenraadt and Leung, we do not distinguish between cryptoassets, such as tokens and coins, and consider all assets targeted by the Commissions.

Our results, however, are broadly consistent with both Chokor and Alfieri's and Koenraadt and Leung's conclusions. That is, events signaling increased regulation—here, enforcement actions—have a negative effect on cryptoasset valuations. We further confirm these conclusions by examining the price reaction of Bitcoin and Ethereum, i.e., the two assets that are decentralized commodities according to the CFTC. Importantly, we show that even though cryp-

¹⁷¹ On the differences between the Commissions' philosophies, see generally Markham, *supra* note 88, at 591–96; JERRY W. MARKHAM, THE HISTORY OF COMMODITY FUTURES TRADING AND ITS REGULATION 99–100 (1986); Heath P. Tarbert, *Rules for Principles and Principles for Rules: Tools for Crafting Sound Financial Regulation*, 10 HARV. BUS. L. REV. 1 (2020).

¹⁷² Chokor & Alfieri, *supra* note 164, at 168–69, 172.

¹⁷³ For classifications and definitions, see *infra* Part IV.

¹⁷⁴ Koenraadt & Leung, *supra* note 164, at 25. Koenraadt and Leung examine market reaction to fifteen news events in countries with significant token activity in terms of market capitalization. *Id.* Their findings may indicate that investors in utility tokens expect that good-quality and transparent token issuers are better prepared to handle upcoming regulatory challenges. Other research confirms that crypto projects with better (mostly voluntary) disclosures, corporate governance mechanisms, and crypto-expert vetting have been more successful at raising capital. See, e.g., Thomas Bourveau, Emmanuel T. De George, Atif Ellahie & Daniele Macciocchi, *The Role of Disclosure and Information Intermediaries in an Unregulated Capital Market: Evidence from Initial Coin Offerings*, 60 J. ACCT. RSCH. 129, 130–34 (2021). Projects that have better founders, transparency, and liquidity also tend to have more operational success. See Sabrina T. Howell, Marina Niessner & David Yermack, *Initial Coin Offerings: Financing Growth with Cryptocurrency Token Sales*, 33 REV. FIN. STUD. 3925, 3964 (2020).

to investors perceive regulation via enforcement as a costly activity, this negative effect is offset by a more positive reaction to enforcement actions against fraudulent parties, i.e., actions that contribute to better market quality and integrity. The following Parts discuss our analysis in detail.

IV. SAMPLE DATA

This Part presents our data. Section A explains the cryptoasset classifications we used in our analysis.¹⁷⁵ Section B introduces the data on enforcement that we further examine in Part V.¹⁷⁶ Section C provides summary statistics.¹⁷⁷

A. Cryptoasset Classifications

The word “cryptoasset” may refer to cryptocurrencies, virtual currencies, coins, tokens, stablecoins, and non-fungible tokens, among others.¹⁷⁸ From a technological standpoint, coins may be called “native tokens,” which indicates that they are intrinsic to their underlying blockchain.¹⁷⁹ Tokens built on existing blockchains are considered non-native.¹⁸⁰ The White House’s Framework and the SEC cumulatively refer to these assets as “digital assets,” “issued and transferred using distributed ledger or blockchain technology, including, but not limited to, so-called ‘virtual currencies,’ ‘coins,’ and ‘tokens.’”¹⁸¹ In this Article, we mainly use the term “cryptoasset.”

Let us look at the specific terminology that may apply to different classes of cryptoassets. The first term is “cryptocurrency.” The CFTC defines cryptocurrency (also “digital currency” or “virtual currency”) “as a digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value, but does not have legal tender status in any jurisdiction.”¹⁸² Put another way, a cryptocurrency performs all or some of the three functions of *money* without being associated with a particular state.¹⁸³ These

¹⁷⁵ See *infra* notes 178–192 and accompanying text.

¹⁷⁶ See *infra* notes 193–199 and accompanying text.

¹⁷⁷ See *infra* notes 200–204 and accompanying text.

¹⁷⁸ See *Crypto Assets and Cryptocurrency*, NEW BRUNSWICK FIN. & CONSUMER SERVS. COMM’N, <https://fcnb.ca/en/investing/high-risk-investments/crypto-assets-and-cryptocurrency> [<https://perma.cc/6P98-ZWUV>].

¹⁷⁹ See Yuliya Guseva, *A Conceptual Framework for Digital-Asset Securities: Tokens and Coins as Debt and Equity*, 80 MD. L. REV. 166, 175–76 (2020) (reviewing native and non-native tokens).

¹⁸⁰ See *id.*; CFTC, *supra* note 113, at 9 (“Digital token refers to a digital asset that requires another blockchain network to operate and may serve a variety of functions beyond virtual currency, e.g., utility tokens.”).

¹⁸¹ THE FRAMEWORK, *supra* note 136, at 12 n.2.

¹⁸² *In re Coinflip, Inc.*, CFTC No. 15-29, 2015 WL 5535736, at *1 n.2 (Sept. 17, 2015).

¹⁸³ Economists have questioned these functions of crypto. See, e.g., Yermack, *supra* note 159, at 32–33 (arguing that Bitcoin more closely resembles a speculative investment rather than a currency).

virtual currencies are often called coins or native tokens. Bitcoin is a good example of a cryptocurrency.

The next term, digital tokens, represents a broader category. The U.K. Financial Conduct Authority, for instance, sets forth the following classifications: e-money tokens; security or investment tokens; and unregulated tokens such as utility tokens.¹⁸⁴ The European Union proposed a similar taxonomy and added to these three categories “asset-referenced tokens.”¹⁸⁵ E-money and asset-referenced tokens are essentially stablecoins whose value is tied to commodities and/or currencies, which can be either digital or non-digital assets.¹⁸⁶ Finally, utility tokens are, generally, “a type of crypto-asset which is intended to provide digital access to a good or service, available on [distributed ledger technology], and is only accepted by the issuer of that token.”¹⁸⁷ To summarize, “tokens” can be a multifaceted term, which explains why regulations may prefer broader terms such as “digital asset” or “cryptoasset.”

Our database covers enforcement actions instigated by the CFTC and SEC against a variety of parties engaged in issuing, offering, rating, redeeming, and trading most of these diverse assets. Following previous research suggesting that some cryptoassets’ intrinsic characteristics do not affect investor reactions,¹⁸⁸ we include all types of cryptoassets in our enforcement database.¹⁸⁹ Moreover, the SEC and CFTC do not distinguish between subclasses of cryptoassets, and we follow the same approach.¹⁹⁰

The cryptocurrency price data was extracted from CoinGecko, one of the largest crypto price data aggregators.¹⁹¹ From forty-five days before the announcement of an enforcement action until five days before the announcement

¹⁸⁴ FIN. CONDUCT AUTH., GUIDANCE ON CRYPTOASSETS 14 (2019), <https://www.fca.org.uk/publication/policy/ps19-22.pdf> [<https://perma.cc/AD9L-XV9F>].

¹⁸⁵ See *Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-Assets, and Amending Directive (EU) 2019/1937*, at 10, COM (2020) 593 final (Sept. 24, 2020).

¹⁸⁶ See *id.* at 34 (first defining asset-referenced tokens as “a type of crypto-asset that purports to maintain a stable value by referring to the value of several fiat currencies that are legal tender, one or several commodities or one or several crypto-assets, or a combination of such assets”; and then defining e-money tokens as “a type of crypto-asset the main purpose of which is to be used as a means of exchange and that purports to maintain a stable value by referring to the value of a fiat currency that is legal tender”).

¹⁸⁷ *Id.*

¹⁸⁸ See Chokor & Alfieri, *supra* note 164, at 172 (“The fact that a crypto is private or a token does not affect the investor reactions to regulatory events.”).

¹⁸⁹ We exclude major stablecoins from our cryptoasset data but not from our enforcement database. The main stablecoins, such as USDC and Tether, have generally maintained their pegs over the years and may be less sensitive to enforcement shocks. At the same time, enforcement actions against stablecoins, particularly antifraud actions, may have broader implications for the crypto market.

¹⁹⁰ See *supra* Part II (detailing the SEC and CFTC’s positions on cryptoassets).

¹⁹¹ COINGECKO, <https://www.coingecko.com> [<https://perma.cc/H8VH-4ZYX>].

(-45,-5),¹⁹² we extracted daily prices, volume, and market capitalization of 2,397 liquid cryptoassets with a minimum market capitalization of one million dollars at the end of the period. We used this data to compute the following: abnormal returns around the announcement dates of the enforcement actions; “normal” or pre-announcement returns unaffected by the enforcement action; and volatility of pre-announcement returns as a measure of risk.

B. Enforcement Data

Our sample of enforcement data consists of all actions initiated by the SEC and CFTC between April 1, 2017, and November 1, 2021.¹⁹³ Although the SEC’s DAO Report¹⁹⁴ is widely regarded as the first clear policy statement on digital-asset securities, one crypto-related securities fraud case and one crypto-related trading suspension predated the Report.

We identify relevant cases by reviewing the Crypto Assets and Cyber Enforcement Actions database on the SEC’s website¹⁹⁵ and the CFTC cases reported on its website.¹⁹⁶ We also manually search for cases on Bloomberg Law, Westlaw, and LexisNexis.¹⁹⁷ Additionally, we examine the Commissions’ enforcement releases and annual reports. We manually trace each case to dockets on Bloomberg Law, Westlaw, and LexisNexis.

Further, we collect information on the key enforcement action characteristics after reviewing all complaints, orders, settlement releases, and final decisions. Specifically, we collect information about the statutory provisions involved, settlements, penalties, and disgorgement. Furthermore, we identify the defendant and respondent type by assigning them into the following categories:

- “Initial Coin Offering (ICO) Issuer.” This term, for our purposes, includes security token offerings and other types of cryptoasset offerings.

¹⁹² The length of the pre-announcement period is informed by the event-study literature in finance. The pre-event period should be long enough to capture “normal” pre-event behavior of the asset without being affected by other material events.

¹⁹³ The sample does not include the 2016 action that the CFTC brought against Bitfinex. Only the 2021 order against Bitfinex is included. Starting our analysis in 2017 enables us to compare the two Commissions side by side. Before 2017, it was unclear whether the SEC would consider cryptoassets securities.

¹⁹⁴ See generally DAO Report, *supra* note 132.

¹⁹⁵ *Cyber Assets and Cyber Enforcement Actions*, SEC, <https://www.sec.gov/spotlight/cyber-security-enforcement-actions> [<https://perma.cc/3FCL-RAFA>].

¹⁹⁶ *Enforcement Actions*, CFTC, <https://www.cftc.gov/LawRegulation/EnforcementActions/index.htm> [<https://perma.cc/7RQ9-XKWJ>].

¹⁹⁷ The comprehensive list of search keywords includes: ICO, Initial Coin Offering, Blockchain, Bitcoin, Crypto, Cryptocurrency, SAFT, Agreement for Future Tokens, Smart Contract, STO, Security Token, Token, Digital Asset, Exchange Offering, Coin, Token Offering, and Virtual Currency.

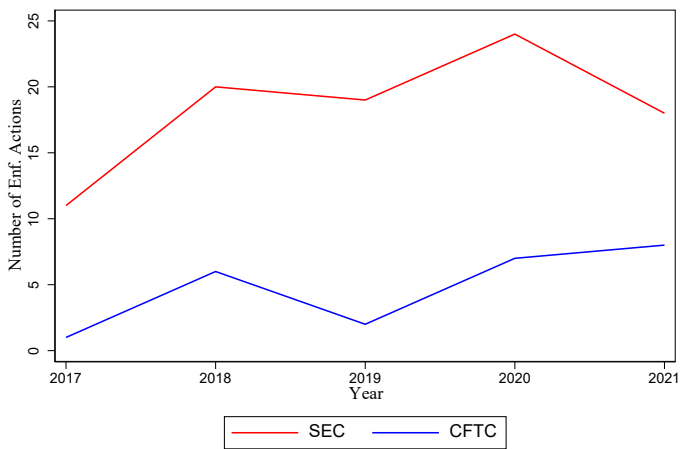
- “Exchange.” Crypto-exchanges are online trading platforms listing tokens and coins for trading. Crypto-exchanges may also provide placement and vetting services, similar to those of investment banks, for projects seeking listing. Consequently, they may serve as gatekeepers enabling not only listing and trading but also offerings. Crypto-exchanges may be centralized or decentralized.¹⁹⁸ In the United States, many crypto-exchanges are registered as money transmitters with the states, and several are ATS registered with the SEC.¹⁹⁹
- “Rating agency.” Rating agencies in crypto are mainly unregistered platforms and firms providing opinions on the quality and ratings of cryptoassets and/or exchanges.
- “Broker-dealer.” The term as used in this Article includes not only security broker-dealers, but also FCMs in commodity and derivatives markets. We also include in this category enforcement actions concerning investment advisers and commodity trading advisers.
- “Investment fund.” In this article, this term covers investment companies, other funds, and various pooled investment vehicles such as commodity pools often used in the crypto space.
- “Other.” This includes attorneys and promoters, including famous actors.

The final sample contains 116 enforcement actions, including twenty-seven CFTC actions and eighty-nine SEC actions. Figure 1 demonstrates the temporal distribution of enforcement actions and shows a marked increase in enforcement activity by both agencies. The SEC actions increased from five in 2017 to twenty-four in 2020 and slightly declined after that. The CFTC actions increased from one in 2017 to eight in 2021.

¹⁹⁸ See Johnson, *supra* note 28, at 1920 (flagging the “potential for centralized trading infrastructure to morph into decentralized infrastructure”).

¹⁹⁹ See Guseva, *supra* note 47, at 54 n.295.

Figure 1. Enforcement Actions by Year



C. Summary Statistics

In Table 1, we provide summary statistics for the variables used in our analyses. In Panel A, we report abnormal returns around the announcement of enforcement actions (i.e., event dates). We employ a standard event-study methodology to construct abnormal returns on date $t=0$ (event date) and cumulative abnormal returns over event windows: $(-1,0)$, $(0,1)$, $(-1,1)$, and $(-3,3)$.²⁰⁰ This approach is similar to that used by Joos and Leung,²⁰¹ Chokor and Alfieri,²⁰² and Koenraadt and Leung.²⁰³ Incorporating additional pre- and post-event days into event windows allows us to account for early information leakage, slow incorporation of information into asset prices, and also correct for potential small errors in identification of the announcement date. Moreover, a wider event window $(-3,3)$ allows us to determine the speed of information incorporation into returns.

We define enforcement action announcement by the date of the following actions taken by the SEC or CFTC: (1) filing a complaint in federal district court; (2) announcing an administrative enforcement action (i.e., issuing an order instituting SEC cease-and-desist proceedings or instituting proceedings

²⁰⁰ For example, $(-1,0)$ means from one day before the announcement of an enforcement event to the enforcement event, etc.

²⁰¹ See generally Philip P.M. Joos & Edith Leung, *Investor Perceptions of Potential IFRS Adoption in the United States*, 88 ACCT. REV. 577 (2013).

²⁰² See generally Chokor & Alfieri, *supra* note 164.

²⁰³ See generally Koenraadt & Leung, *supra* note 164.

pursuant to the Commodity Exchange Act, often accompanied by a settlement); or (3) publishing a trading suspension. In two cases involving exchanges (Coinbase and Uniswap), we use information about pending investigations or potential enforcement actions that was either leaked by the target (namely, Coinbase in a post)²⁰⁴ or revealed through media sources.

We compute abnormal returns by subtracting the expected (i.e., normal) return from the event day raw return. Further, we calculate cumulative abnormal returns (CARs) by adding up abnormal returns over the event window. The equation below illustrates the CAR methodology:

$$CAR = \sum_{t \in T} \left(R_t - \bar{R}_T \right) = \sum_{t \in T} \left(R_t - \frac{1}{\#(T)} \sum_{t' \in T} R_{t'} \right)$$

where t denotes the number of days in the event window affected by the enforcement action; T contains the days in the pre-event window; R_t is the return at t ; and $\bar{R}_T$ is the sample mean of pre-event to approximate the expected return. We define expected return by the average daily return during the pre-event window (-45,-5). The length of the window is short enough to minimize overlap with other enforcement actions. The event window ends five days before the event to ensure that pre-event information leakage does not affect the expected return.

The summary statistics for the pre-event and event cumulative abnormal returns are provided in Panel A of Table 1. We report returns over multiple event windows (0), (-1,0), (0,1), (-1,1), and (-3,3). We also compute average daily return during the pre-event period (-45,-5). The sample of announcement date abnormal returns contains 82,444 observations, with multiple observations (i.e., market reaction to different enforcement events) for the same asset. Therefore, the observations in our sample are not independent, and the returns are correlated in the cross-section at the asset and event time level. Because the assumption of independence necessary for traditional statistical tests is violated, the resulting analysis of abnormal performance would yield upward biased t-statistics. This would lead us to overstate abnormal performance around enforcement actions. To correct for this, we cluster standard errors on those two dimensions. This reduces the degrees of freedom to the size of the smallest cluster (number of enforcement actions) and generates conservative t-statistics. The t-statistic is used to determine the presence of abnormal performance (i.e., whether the event day abnormal return is statistically different from zero). In empirical corporate finance, t-statistics exceeding 1.64, which corresponds to

²⁰⁴ Paul Grewal, *The SEC Has Told Us It Wants to Sue Us Over Lend. We Don't Know Why.*, COINBASE (Sept. 7, 2021), <https://blog.coinbase.com/the-sec-has-told-us-it-wants-to-sue-us-over-lend-we-have-no-idea-why-a3a1b6507009> [<https://perma.cc/9BXS-CLBR>].

ten percent statistical significance, are considered evidence of abnormal performance. The statistical significance of the test captures the likelihood of obtaining a given result by chance. Higher t-statistics and lower levels of statistical significance provide stronger statistical evidence of abnormal performance. In addition to statistical significance, we also pay attention to the economic significance or magnitude and sign of the effect.

The global crypto market reacts negatively to announcements of U.S. regulators' enforcement actions regardless of the event window over which returns are measured. This result is consistent with related studies that find that the market generally perceives crypto regulation as a negative event. It is interesting, however, that *enforcement* actions of regulators in one market can so significantly move global cryptoasset values. This observation supports the theoretical arguments on the important international role of the SEC and CFTC, which we examined in Part I of this Article.

At the announcement date $t=0$, the one-day abnormal return ($AR(0)$) is economically small (-0.004) and statistically insignificant (t-statistic=-0.880). But for the two-day window that includes day $t=-1$, we observe some information leakage. $CAR(-1,0)$ is -0.016 and significant at five percent with a t-statistic of -2.260. The three-day $CAR(-1,1)$ is marginally smaller at -0.015 with a t-statistic of -1.870, suggesting that the effect of the enforcement action attenuates shortly after the announcement. The extended seven-day $CAR(-3,3)$ of -0.014 is statistically insignificant with a t-statistic of -1.130. Thus, the effect is concentrated on days $(-1,0)$, has limited pre-event leakage, and is not long-lived.

In Panel B, we provide summary statistics of cryptoasset characteristics. As a measure of size, we use median daily market capitalization of each individual cryptoasset during the pre-announcement period $(-45,-5)$. We use medians rather than means because means are sensitive to high volatility of cryptoasset values. The average value is \$855.156 million, and the median is significantly smaller at \$10.990 million. This variance is indicative of considerable size variation in the cryptoasset space, where well-established large assets like Bitcoin or Ethereum coexist with thousands of small assets.

Similar to market capitalization, our measure of volume is the median daily value of the pre-event volume. The average of these median values is \$96.967 million assets a day, whereas the median is only \$448 thousand. This spread in the distribution of size and volume persists despite the exclusion of assets with less than one million dollars in market capitalization at the end of the pre-event period $(t=-5)$. Finally, the average total buy-and-hold return during the pre-event period is large and positive at 0.195. This value is affected by some well-performing assets; the median asset earns a small negative return of -0.011. The average and median volatility of pre-event daily returns is 0.097 and 0.082, respectively.

In Panel C, we report several characteristics of enforcement actions, which are likely to affect the market upon announcement. As already described in Figure 1, the majority of enforcement actions are initiated by the SEC (76.8%) with the rest coming from the CFTC. Roughly half of the enforcement actions (55.4%) involve some form of fraud. We define fraud actions as those dealing with fraudulent and manipulative behavior. In our sample, this includes violations of §§ 9 and 10(b) of the Securities Exchange Act and Rule 10b-5; § 17 of the Securities Act; §§ 6(c), 4c, 4o, and 4b of the Commodity Exchange Act and Regulation 180.1; and § 206 of the Investment Advisers Act. Further, 70.6% of actions are registration violations, which in our sample implicate § 5 of the Securities Act; §§ 5 and 15 of the Securities Exchange Act; § 7 of the Investment Company Act; and §§ 4(a)&(b), 4c(b), 4d, 4m, and 5h of the Commodity Exchange Act. Some actions involve both fraud and registration violations.

Most enforcement actions are focused on four large homogeneous groups of respondents or defendants: (1) ICO issuers; (2) brokers; (3) exchanges; and (4) funds, which account for 92.5% of the sample. The remainder is spread across attorneys, promoters, rating agencies, and crypto-related firms (i.e., firms whose business models include blockchain-related products and/or cryptoassets). The actions against ICO issuers dominate the sample at 49.3%, brokers follow at 16.1%, exchanges make up 11.6%, and funds compose 10.2%. The average action has 2.809 respondents in administrative actions (or defendants in district court cases). The median is 2.000. The financial penalties consisting of fines, settlements, disgorgement awards, and pre-judgement interest average \$42.131 million, with a median of \$543 thousand. A small percent of actions (4.1%) result in trading suspensions—mostly crypto-related firms.

In some of our robustness analyses, we evaluate the effect of action visibility on the magnitude of the market reaction. We search for respondents' and defendants' names on X (formerly known as and hereinafter called Twitter) over days (-1,1) and find that 74.3% of all actions have some form of coverage. Finally, in some cases, an agency may initiate separate actions against several respondents. This heightened regulatory activity is likely to attract more attention. In 13.1% of enforcement actions, there are other simultaneously initiated actions.

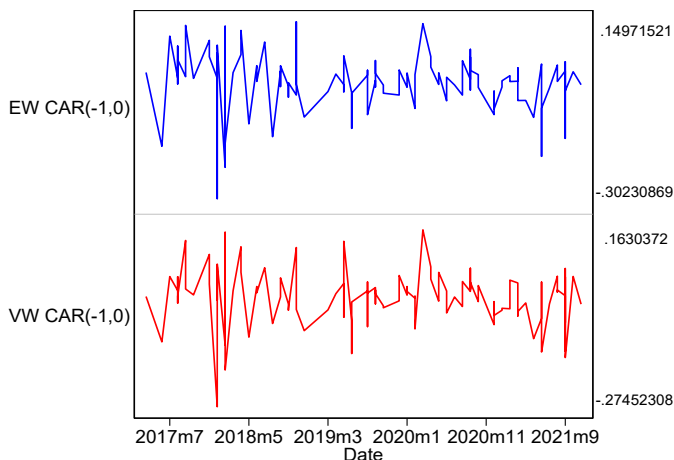
Table 1. Summary Statistics

This table reports summary statistics for variables used in the regression analyses. Panel A reports abnormal returns around enforcement action announcement dates. Panel B and Panel C report characteristics of cryptoassets and enforcement actions, respectively. In Panel A, (unreported) standard errors in means tests are based on standard errors clustered at cryptoasset and event level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Filing and Decision Date Cumulative Abnormal Returns									
	Obs.	Mean	t-stat.	St.Dev	P25	P50	P75	Min.	Max.
AR(0)	82,444	-0.004	-0.880	0.100	-0.049	-0.005	0.034	-0.561	0.908
CAR(-1,0)	82,444	-0.016**	-2.260	0.132	-0.082	-0.014	0.042	-0.934	1.000
CAR(0,1)	82,444	-0.003	-0.430	0.126	-0.066	-0.006	0.052	-1.123	1.065
CAR(-1,1)	82,444	-0.015*	-1.870	0.147	-0.097	-0.015	0.057	-0.460	0.609
CAR(-3,3)	82,273	-0.014	-1.130	0.255	-0.143	-0.010	0.108	-1.744	2.344
Ave. Daily Ret.(-45,-5)	82,444	0.006***	5.770	0.017	-0.005	0.003	0.013	-0.183	0.149
Panel B. Pre-Filing Cryptoasset Characteristics									
	Obs.	Mean	St.Dev	P25	P50	P75	Min.	Max.	
Market.Cap.(Mil)	82,444	855.156	17456.115	3.454	10.990	50.508	1.000	1173412.875	
Volume (Mil)	82,444	96.976	1427.971	0.060	0.448	3.231	-0.118	102524.750	
Total Ret.(-45,-5)	82,444	0.195	0.839	-0.291	-0.011	0.388	-0.997	6.383	
Volatility	82,444	0.097	0.059	0.057	0.082	0.120	0.001	0.574	
Panel C. Enforcement Action Characteristics									
	Obs.	Mean	St.Dev	P25	P50	P75	Min.	Max.	
SEC	82,444	0.768	0.422	1.000	1.000	1.000	0.000	1.000	
CFTC	82,444	0.232	0.422	0.000	0.000	0.000	0.000	1.000	
Fraud	82,444	0.554	0.497	0.000	1.000	1.000	0.000	1.000	
Registration	82,444	0.706	0.456	0.000	1.000	1.000	0.000	1.000	
Broker	82,444	0.161	0.368	0.000	0.000	0.000	0.000	1.000	
ICO Issuer	82,444	0.493	0.500	0.000	0.000	1.000	0.000	1.000	
Exchange	82,444	0.116	0.321	0.000	0.000	0.000	0.000	1.000	
Fund	82,444	0.102	0.303	0.000	0.000	0.000	0.000	1.000	
Other	82,444	0.075	0.263	0.000	0.000	0.000	0.000	1.000	
Number of Defendants	78,989	2.809	2.261	1.000	2.000	3.000	1.000	12.000	
Trading Suspension	78,502	0.041	0.198	0.000	0.000	0.000	0.000	1.000	
Total Penalties	57,426	42.131	165.672	0.010	0.543	9.474	0.000	1242.500	
Twitter	82,444	0.743	0.437	0.000	1.000	1.000	0.000	1.000	
Multiple Actions	82,444	0.131	0.337	0.000	0.000	0.000	0.000	1.000	

The main focus of our empirical analyses is to examine the global crypto market reaction to the announcement of enforcement actions by the U.S. regulators. In Figure 2, we consider the average equal-weighted and value-weighted CAR(0,-1) for all 116 actions aggregated to monthly level. Value-weighted returns are weighted by the market value of cryptoassets at $t=-5$, which marks the end of the pre-event window. Rapid growth in the cryptoasset markets combined with the SEC’s shift toward registration violations could have changed the direction and magnitude of market reaction to the enforcement actions during the sample period. Nevertheless, we observe no directional change in either equal- or value-weighted returns. There is also no discernible size effect. Value-weighted returns, which are dominated by the returns of the two largest cryptoassets (Bitcoin and Ethereum), behave in a way similar to equal-weighted returns. The only noticeable trend over our sample period is the attenuation of volatility in announcement returns. This suggests that the nature and the outcomes of enforcement actions may have become either more predictable or less impactful.

Figure 2. Announcement Returns by Year



V. EMPIRICAL RESULTS

Section A of this Part measures distinct enforcement actions and their market reaction.²⁰⁵ Section B provides multivariate analyses of market reaction.²⁰⁶ Section C examines the effect of action visibility on the reaction to enforcement announcements. Section D studies the effect of the respondent/defendant type on the announcement reaction. Section E explores whether Bitcoin and Ethereum are statistically special in the context of enforcement.²⁰⁷ Finally, Section F zeroes in on the effect of disclosed or anticipated penalties on market reaction to enforcement actions.²⁰⁸

A. Enforcement Action Characteristics and Market Reaction

The summary statistics demonstrate that SEC and CFTC enforcement actions have a negative valuation effect for both the median and mean cryptoassets. In this Section, we explore the cross-sectional determinants of the reaction to enforcement actions by focusing on the characteristics of both the enforcement actions and cryptoassets themselves. We begin by looking at the average market reaction for different types of enforcement actions. Specific-

²⁰⁵ See *infra* notes 209–212 and accompanying text.

²⁰⁶ See *infra* notes 213–214 and accompanying text.

²⁰⁷ See *infra* note 215 and accompanying text.

²⁰⁸ See *infra* notes 216–217 and accompanying text.

ly, we focus on the agency initiating the action and whether the violation constitutes fraud.²⁰⁹ These results are reported in Table 2.

Table 2. Market Reaction to Enforcement Action by Action Type

This table presents average abnormal returns by enforcement type. Abnormal returns are returns adjusted by average daily return over days (-45,-5) relative to the filing date. The first two columns report actions initiated by the SEC and CFTC. The third and fourth columns report actions involving fraud and non-fraud. The t-statistics are computed using standard errors corrected for clustering of observations by cryptoasset and event and are reported in parentheses below the estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	SEC	t-stat	CFTC	t-stat	Fraud	t-stat	Non-fraud	t-stat
AR(0)	-0.008	-1.310	0.007	1.050	0.004	1.080	-0.015*	1.670
CAR(-1,0)	-0.018**	-2.060	-0.010	-0.960	-0.006	-0.610	-0.029***	-2.870
CAR(0,1)	-0.008	1.000	0.012	0.900	0.007	0.930	-0.014	-1.420
CAR(-1,1)	-0.018*	-1.970	-0.005	-0.310	-0.003	-0.320	-0.029**	-2.570
CAR(-3,3)	-0.015	-1.10	-0.010	-0.036	-0.005	-0.320	-0.025	-1.310

These comparisons show that the market reacts negatively to SEC actions regardless of the event window. Event windows (-1,0) and (-1,1) have the largest statistically significant returns, measuring -0.018 in both cases with respective t-statistics of -2.060 and -1.970. In contrast, the market reaction to CFTC actions is small and either positive or negative; none of the returns are statistically different from zero. Further, in all cases, the SEC actions have more negative returns than the CFTC actions, which is consistent with the investors’ negative view of application of securities law to crypto.

Finally, we compare fraud actions to other violations. Although the market generally views regulation as costly and reacts negatively, some types of regulation may have the potential to improve market quality with positive valuation implications.²¹⁰ We find that abnormal returns associated with fraud cases are positive for AR(0) and CAR(0,1), and are negative for the other three event windows. None of the fraud returns are statistically significant and distinguishable from zero. The non-fraud cases are markedly different with large negative returns, which are statistically significant for AR(0), CAR(-1,0), and

²⁰⁹ Examining fraud as a separate category is important in light of several studies that suggest that cryptoasset offerings (particularly early ICOs) were riddled with misrepresentations and fraud. See generally Zetzsche et al., *supra* note 59, at 278–79, 287–89 (discussing how ICOs raise a number of issues, including information asymmetry, capital misallocation, shaky legal protections, and systemic risk); Cohnsey et al., *supra* note 59, at 591 (stating “that many ICOs failed even to promise that they would protect investors against insider self-dealing”).

²¹⁰ For a theoretical discussion, see *infra* Section VI.A.

CAR(-1,1). CAR(-1,0) and CAR(-1,1) are also economically large at -0.029. This suggests that although investors treat regulation (namely, enforcement of pre-crypto statutes) as an unfavorable and costly event for the crypto market, the benefits of improved market quality and integrity offset the cost of regulation in some cases.

To assess how cryptoasset and enforcement action characteristics affect the market reaction to enforcement actions, we estimate an Ordinary Least Squares (OLS) regression model on a dataset consisting of filing returns for 82,444 cryptoasset-enforcement action pairs. In the interest of brevity, we focus on AR(0), CAR(-1,0), and CAR(0,1). This regression models abnormal return as a function of several predictor (i.e., control) variables, such as the type of action and crypto characteristics that have been shown to explain the cross-section of returns. Our cryptoasset controls include pre-event market capitalization, volume, buy-and-hold return, and volatility. In this dataset, the observations are correlated by the cryptoasset and event levels. This cross-sectional correlation violates the independence assumption of the test statistics and may overestimate the significance of market reaction in our analyses at the cryptoasset level.²¹¹ Therefore, we cluster the standard errors at the event- and cryptoasset-level by implementing the estimator proposed by Sergio Correia.²¹²

B. Multivariate Analyses of Market Reaction

In Table 3, we show the effect of the enforcement action type on returns over days AR(0), CAR(-1,0), and CAR(0,1). For each return, we estimate three models that control for cryptoasset characteristics and enforcement action characteristics. In terms of enforcement characteristics, we focus on SEC actions (not CFTC actions) and fraud or registration violations. We estimate the effect of one action characteristic at a time to determine its independent effect. In two of three models, SEC actions have a more negative statistically significant effect than CFTC actions. The SEC action return is 0.017% more negative than the return associated with CFTC actions (t-statistic is 1.9) in the AR(0) model. In the CAR(0,1) model, this effect is more economically meaningful at -0.024 with a t-statistic of -1.67.

²¹¹ See Stephen J. Brown & Jerold B. Warner, *Measuring Security Price Performance*, 8 J. FIN. ECON. 205, 232–33 (1980) (noting the impact of the independence assumption on data analysis).

²¹² See generally Sergio Correia, A Feasible Estimator for Linear Models with Multi-Way Fixed Effects (Mar. 2016) (unpublished manuscript) (on file with Duke University), <http://scorreia.com/research/hdfe.pdf> [<https://perma.cc/CK67-FTNE>] (proposing “a feasible and computationally efficient estimator of linear models with multiple levels of fixed effects”).

Enforcement actions focused on fraud mitigate the negative reaction to enforcement actions, which is consistent with the view that regulation may improve disclosure and market quality. The strongest difference in returns between fraud and non-fraud cases is observed for $AR(0)$, where the coefficient estimate and t-statistic are 0.018 and 1.93, respectively. The coefficient estimates of fraud in the other two regressions are also positive and economically large (0.022 and 0.020, respectively), but the t-statistics of 1.63 and 1.55 fall slightly short of meeting traditional levels of statistical significance.

Further, registration violations also have a strong market reaction in two out of three regressions. In our data, we include in the category Registration: failures to (1) register securities under § 5 of the Securities Act (in actions mainly initiated against issuers of cryptoassets); (2) register as a DCM, swap execution facility, commodity pool operator, or FCM under the Commodity Exchange Act; and (3) register as a securities exchange or securities broker-dealer under the Securities Exchange Act or an investment adviser under the Investment Advisers Act.²¹³ The objective of this category is to distinguish these violations from antifraud cases. We further separate out these market participants and measure the reaction to enforcement actions against each of these categories in a different model.²¹⁴

For combined registration violations (i.e., violations of multiple types), the coefficients are negative, large and significant at a one percent level in $AR(0)$ and $CAR(-1,0)$ regressions measuring -0.022 and -0.029, respectively. Registration violations likely proxy for the SEC enforcement actions. These results also highlight the stronger differential effect of enforcement characteristics observed on day $t=0$ in $AR(0)$; this effect is then diluted by the information coming out on days $t=-1$ and $t=1$. It is reasonable that $t=-1$ information is incomplete or inaccurate, and day $t=1$ return is affected by the new information unrelated to the enforcement action.

Lastly, cryptoasset characteristics have an effect in the individual cryptoasset's response to the enforcement action's announcement. We include a measure of pre-announcement market capitalization, daily trading volume, buy-and-hold return over pre-event window, and standard deviation of daily returns. Surprisingly, asset size has little effect on the market reaction to enforcements. $\text{Log}(\text{Market Capitalization})$ coefficients remain small and positive in eight of nine regressions, and none of the coefficients are statistically significant or approach conventional levels of statistical significance. The coefficients in log transformed models of coefficients may be interpreted as a 1%

²¹³ For the respective statutory frameworks and description of these categories, see *supra* Part II and Part IV.

²¹⁴ See discussion *infra* Section V.D.

change in market capitalization associated with a coefficient 1% change in announcement reaction.

We also find that more liquid assets tend to have a more negative reaction to the announcement, meaning that in all nine regressions the coefficients are negative, ranging from -0.001 to -0.002, and significant at least at five percent or better. Similarly, assets with the largest pre-filing returns lose more value around the announcement. In AR(0) regressions, the coefficient is around -0.011 to -0.013, and in two-day regressions, they are approximately double those values (i.e., absolute values). In eight of nine regressions, the coefficients are statistically significant. Finally, risky and volatile assets are more negatively affected by the announcements. Similar to returns, the magnitude of volatility coefficients in AR(0) regressions is approximately -0.115 to -0.117. This effect roughly doubles in two-day return regressions. In all cases, the effect is significant at a one percent level. To summarize, after controlling for the agency initiating the action or type of enforcement, investors view more liquid, better performing, and riskier cryptoassets as more vulnerable to enforcement.

Table 3. The Effect of Crypto and Enforcement Action
Characteristics on Market Reaction

This table presents OLS regression estimates of the relation between abnormal filing returns around the enforcement action filing date and enforcement action and cryptoasset characteristics. Abnormal returns are returns adjusted by average daily return over days (-45,-5) relative to the filing date. SEC is a binary variable equal to 1 if the action is initiated by the SEC and 0 if the action is initiated by the CFTC. Fraud is a binary variable equal to 1 if the violation constitutes fraud and 0 otherwise. Registration is a binary variable equal to 1 if the action is targeting a registration violation and 0 otherwise. Twitter is a binary variable equal to 1 if the action is covered on Twitter and 0 otherwise. Multiple Actions is a binary variable equal to 1 if other crypto actions were filed the same day and 0 otherwise. Log Market Capitalization (Volume) is the natural log of median daily cryptoasset’s market capitalization (trading volume) during pre-filing period (-45,-5). Pre-filing return is cryptoasset return over pre-filing period (-45,-5). Volatility is standard deviation of daily cryptoasset returns over pre-filing period (-45,-5). The t-statistics are computed using standard errors corrected for clustering of observations by cryptoasset and event and are reported in parentheses below the estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	AR(0)			CAR(-1,0)			CAR(0,1)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SEC	-0.017*			-0.014			-0.024*		
	(-1.90)			(-1.13)			(-1.67)		
Fraud		0.018*			0.022			0.020	
		(1.93)			(1.63)			(1.55)	
Registration			-0.022***			-0.029**			-0.014
			(-3.00)			(-2.43)			(-1.13)
Log Mkt.Cap	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.001	0.000
	(0.09)	(0.38)	(0.18)	(0.00)	(0.22)	(-0.06)	(0.13)	(0.36)	(0.19)
Log Volume	-0.001**	-0.001**	-0.001**	-0.002**	-0.002***	-0.002**	-0.001**	-0.002**	-0.001**
	(-2.15)	(-2.34)	(-2.18)	(-2.42)	(-2.74)	(-2.45)	(-2.02)	(-2.12)	(-1.96)
Pre-filing Ret.	-0.013*	-0.011	-0.013*	-0.031**	-0.029**	-0.031**	-0.028***	-0.026***	-0.027***
	(-1.74)	(-1.51)	(-1.71)	(-2.35)	(-2.21)	(-2.45)	(-2.95)	(-2.72)	(-2.83)
Volatility	-0.117***	-0.117***	-0.115***	-0.260***	-0.262***	-0.259***	-0.219***	-0.217***	-0.213***
	(-2.82)	(-2.79)	(-2.83)	(-3.33)	(-3.39)	(-3.42)	(-3.82)	(-3.73)	(-3.70)
Obs.	82444	82444	82444	82444	82444	82444	82444	82444	82444
R2	0.016	0.019	0.021	0.037	0.041	0.045	0.034	0.034	0.031

C. Enforcement Publicity Measures

So far, our analyses indicate that global markets view U.S. enforcement of crypto regulations as an unfavorable, albeit short-lived, event. Further, global markets react most negatively to SEC actions that have no substantive effect on market quality—that is, non-fraud actions. In the next table, we examine the effect of action visibility on the reaction to enforcement announcements. The strength and speed with which asset values incorporate value-relevant content depends on the information available to investors. Because the crypto-investor base is not only global but also heavily retail-oriented, it is unclear how a lack of media coverage affects returns.

We conduct time-constrained searches of Twitter, a social media platform that retail investors use for financial information sharing, over days (-1,1) using the names of respondents/defendants. We used this information to construct a binary variable for Twitter coverage. Additionally, in some cases, multiple enforcement actions (which may be launched by the same agency against several entities) are initiated simultaneously. These actions may be more noticeable and perceived as a stronger signal of an agency’s enforcement intent.

In Table 4, we estimate six models—two for each of the three return types—using a specification similar to that in Table 3. For each return, we es-

timate one model that combines SEC and Fraud variables. The second model adds publicity variables Twitter and Multiple Actions. Finally, all models have cryptoasset level controls for pre-event size, volume, return, and volatility. Similar to previous results, AR(0) models show the strongest difference in returns between SEC and CFTC cases, and fraud and non-fraud actions. Both binary variables have statistically significant coefficients. In Model 2, day $t=0$ abnormal return is -0.015 implies a more negative for the SEC actions ($t\text{-stat.}=-1.96$) and 0.016 less negative for actions disciplining fraud ($t\text{-stat.}=1.75$). These coefficients maintain their signs in all other models and are either statistically significant or close to significance.

Interestingly, neither measure of publicity is either strongly or convincingly related to announcement returns. For example, Twitter is positive in two out of three regressions but is not significant in any of them. Multiple Actions is negative in two models and has a negative coefficient of -0.024 with a t -statistic of -1.82 in CAR(0,1) model, suggesting that the news of more rigorous enforcement negatively affects crypto prices over event days (0,1). Overall, our baseline results are not sensitive to proxies of publicity or our initial result of the negative SEC effect. Similarly, the non-fraud actions' effect is consistent with the prior result.

Table 4. The Effect of Enforcement Action Visibility on Market Reaction

This table presents OLS regression estimates of the relation between abnormal filing returns around the enforcement action filing date and enforcement action and cryptoasset characteristics. Abnormal returns are returns adjusted by average daily return over days (-45,-5) relative to the filing date. SEC is a binary variable equal to 1 if the action is initiated by the SEC and 0 if the action is initiated by the CFTC. Fraud is a binary variable equal to 1 if the violation constitutes fraud and 0 otherwise. Twitter is a binary variable equal to 1 if the action is covered on Twitter and 0 otherwise. Multiple Actions is a binary variable equal to 1 if other crypto actions were filed the same day and 0 otherwise. Log Market Capitalization (Volume) is the natural log of median daily cryptoasset's market capitalization (trading volume) during pre-filing period (-45,-5). Pre-filing return is cryptoasset return over pre-filing period (-45,-5). Volatility is standard deviation of daily cryptoasset returns over pre-filing period (-45,-5). The t -statistics are computed using standard errors corrected for clustering of observations by cryptoasset and event, and are reported in parentheses below the estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	AR(0)		CAR(-1,0)		CAR(0,1)	
	(1)	(2)	(3)	(4)	(5)	(6)
SEC	-0.014*	-0.015*	-0.010	-0.005	-0.020	-0.028*
	(-1.69)	(-1.96)	(-0.85)	(-0.45)	(-1.46)	(-1.83)
Fraud	0.016*	0.016*	0.020	0.021	0.016	0.017
	(1.75)	(1.75)	(1.48)	(1.45)	(1.34)	(1.54)
Twitter		-0.003		0.004		0.016
		(-0.38)		(0.28)		(1.34)
Multiple Actions		-0.006		0.015		-0.024*
		(-0.66)		(1.02)		(-1.82)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	82444	82444	82444	82444	82444	82444
R2	0.022	0.022	0.042	0.044	0.038	0.041

D. Types of Respondents/Defendants and Market Reaction

We have observed a significant amount of variation in the types of respondents/defendants targeted by enforcement actions. The focus on a certain type of respondent or defendant may have implications for further regulatory activity. In Table 5, we study the effect of the respondent/defendant type on the announcement reaction. Similar to previous regressions, we use a specification with enforcement action characteristics (the respondent/defendant type) and cryptoasset controls. In all models, the errors are clustered at cryptoasset and date levels. We estimate these models for the entire sample (Models 1–3) and a subsample of SEC actions (Models 4–6).

Our key independent variables are dummy variables that capture the respondent/defendant type: Broker, ICO Issuer, Exchange, and Fund. Their coefficients will be estimated relative to the remaining category, Other, that consists of multiple poorly represented parties. In many cases, these parties (promoters, attorneys, rating agencies, and crypto-related firms) are unlikely to have significant value implications for the cryptoasset market. Of these four categories, funds have the least negative reaction relative to the Other category. The coefficients alternate between positive and negative, and are never statistically significant.

The most significant effects are observed for brokers and exchanges, which have a broad and critical impact on the trading of cryptoassets. The co-

efficients are significant in multiple regressions in the overall sample and in the SEC subsample. The magnitude of the coefficients ranges from -0.023 to -0.066. For the brokers, the result is much stronger in the SEC subsample. The ICO issuers fall in the middle of the range with two statistically significant coefficients. For most variables, the coefficients are more negative in the SEC action subsample. In summary, we find that the enforcement actions that have the potential for the most profound and costly effect on the largest number of crypto market participants receive the most negative market reaction.

Table 5. The Effect of Respondent/Defendant Type on Market Reaction to Enforcement Actions

This table presents OLS regression estimates of the relation between abnormal filing returns around the enforcement action filing date and the types of respondents/defendants targeted by the enforcement action. The first three models are estimated using the full sample; the last three columns are estimated using only SEC actions. Abnormal returns are returns adjusted by average daily return over days (-45,-5) relative to the filing date. Broker (ICO Issuer/Exchange/Fund) is a binary variable equal to 1 if the respondent or defendant is a broker (ICO issuer/exchange/fund) and 0 otherwise. Controls include Log Market Capitalization, Volume, Pre-filing Return, and Volatility. Log Market Capitalization (Volume) is the natural log of median daily cryptoasset’s market capitalization (trading volume) during pre-filing period (-45,-5). Pre-filing Return is cryptoasset return over pre-filing period (-45,-5). Volatility is standard deviation of daily cryptoasset returns over pre-filing period (-45,-5). The t-statistics are computed using standard errors corrected for clustering of observations by cryptoasset and event and are reported in parentheses below the estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	All Actions			SEC Actions		
	AR(0)	CAR(-1.0)	CAR(0.1)	AR(0)	CAR(-1.0)	CAR(0.1)
	(1)	(2)	(3)	(4)	(5)	(6)
Broker	-0.023*	-0.031*	-0.020	-0.053***	-0.055**	-0.060**
	(-1.70)	(-1.79)	(-0.97)	(-2.72)	(-2.24)	(-2.18)
ICO Issuer	-0.020***	-0.025	-0.008	-0.023***	-0.030	-0.008
	(-2.67)	(-1.38)	(-0.63)	(-2.89)	(-1.57)	(-0.59)
Exchange	-0.045*	-0.050**	-0.039	-0.058	-0.066*	-0.050
	(-1.85)	(-2.01)	(-1.47)	(-1.55)	(-1.91)	(-1.28)
Fund	0.001	-0.004	0.024	-0.015	-0.020	0.011
	(0.10)	(-0.24)	(0.95)	(-1.46)	(-0.84)	(0.43)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	82444	82444	82444	63281	63281	63281
R2	0.027	0.048	0.043	0.041	0.046	0.054

E. Are Bitcoin and Ethereum Special?

The cryptoasset market is dominated by the two largest assets—Bitcoin and Ethereum. For better perspective, the distribution of the entire cryptoasset market capitalization is highly skewed. For example, at the end of our sample period, Bitcoin and Ethereum account for 57.68% of the entire market share; top fifty coins account for 90.10%; and top 130 coins account for 95.08%. These two coins also differ from the rest of the cryptoasset market in terms of their classification as commodities and not securities. As discussed in Part II, several district courts, as well as the CFTC itself, have held that Bitcoin is a commodity. The CFTC has long stated that Ether is a commodity; as this Article was going to print, a federal district court referred to Ether as a commodity in an August 2023 order.²¹⁵

In Table 6, we examine how these two largest cryptoassets respond to enforcement news. We repeat several of our prior analyses, gauging the market reactions of these two cryptoassets over a sample of 116 enforcement actions.

²¹⁵ See *Bitcoin, Ethereum Are Commodities, Says CFTC Chair Rostin Behnam*, CNBC (May 16, 2022), <https://www.cnbc.com/video/2022/05/16/bitcoin-ethereum-are-commodities-says-cftc-chair-rostin-behnam.html?&qsearchterm=cryptocurrency> [<https://perma.cc/NEZ5-JD4U>]; *Risley v. Universal Navigation Inc.*, No. 22 Civ. 2780, 2023 WL 5609200, at *14 (S.D.N.Y. Aug. 29, 2023) (referring to Ether and Bitcoin as commodities).

Overall, the statistical significance is much weaker, but the economic significance is similar to our prior results.

In Panel A, we replicate Table 2 for the sample of Bitcoin and Ethereum. Regardless of the type of enforcement, the abnormal returns are not consistently negative and never statistically significant. In Panel B, we replicate Table 3 and find evidence of statistically significant and negative SEC and registration effects in the AR(0) regression. The SEC and registration coefficients are negative in two other groups of regressions. The coefficient estimate on fraud is positive but not significant.

This weak effect is not surprising. As these two cryptocurrencies are well-established, decentralized, and global, investors may be viewing U.S. enforcement risk to Bitcoin and Ethereum as low. Finally, in Panel C, we replicate Table 5. Interestingly, Bitcoin and Ethereum also react negatively to enforcement actions targeting exchanges and, to a much lesser extent, brokers. The coefficient estimate on the Exchange dummy is significant in all regressions and ranges from -0.047 to as large as -0.062.

Table 6. Bitcoin and Ethereum Market Reaction to Enforcement Actions

This table presents summary statistics and OLS regressions of the abnormal filing returns for Bitcoin and Ethereum. In Panel A, we provide summary statistics for abnormal returns grouped by types of enforcement action. In Panels B and C, we report OLS regressions of enforcement action announcement returns. Abnormal returns are returns adjusted by average daily return over days (-45,-5). SEC is a binary variable equal to 1 if the action is initiated by the SEC and 0 if the action is initiated by the CFTC. Fraud is a binary variable equal to 1 if the violation constitutes fraud and 0 otherwise. Registration is a binary variable equal to 1 if the action is targeting a registration violation and 0 otherwise. Broker (ICO Issuer/Exchange/Fund) is a binary variable equal to 1 if the respondent or defendant is a broker (ICO issuer/exchange/fund) and 0 otherwise. Log Market Capitalization (Volume) is the natural log of median daily cryptoasset's market capitalization (trading volume) during pre-filing period (-45,-5). Pre-filing return is cryptoasset return over pre-filing period (-45,-5). Volatility is standard deviation of daily cryptoasset returns over pre-filing period (-45,-5). The t-statistics are computed using standard errors corrected for clustering of observations by event date and are reported in parentheses below the estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Filing Date Cumulative Abnormal Returns by Action Type for Bitcoin and Ethereum								
	SEC	t-stat	CFTC	t-stat	Fraud	t-stat	Non-fraud	t-stat
AR(0)	0.001	0.310	0.004	0.800	0.004	0.890	0.001	0.160
CAR(-1,0)	-0.000	-0.060	-0.004	-0.520	-0.001	-0.140	-0.003	-0.390
CAR(0,1)	0.004	0.620	0.008	1.100	0.006	1.020	0.004	0.610
CAR(-1,1)	0.002	0.250	-0.000	-0.050	0.002	0.180	0.000	0.040
CAR(-3,3)	-0.001	-0.050	-0.004	-0.300	-0.002	-0.140	-0.002	-0.180

Panel B. Determinants of Filing Returns for Bitcoin and Ethereum								
	AR(0)			CAR(-1,0)			CAR(0,1)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SEC	-0.017*			-0.002			-0.019	
	(-1.72)			(-0.16)			(-1.37)	
Fraud		0.006			0.004			0.008
		(0.73)			(0.28)			(0.65)
Registration			-0.015*			-0.017		-0.006
			(-1.77)			(-1.27)		(-0.46)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	232	232	232	232	232	232	232	232
R2	0.036	0.019	0.034	0.059	0.059	0.045	0.038	0.029

Panel C. The Effect of Respondent/Defendant Type on Market Reaction to the Filing.						
	All Actions			SEC Actions		
	AR(0)	CAR(-1,0)	CAR(0,1)	AR(0)	CAR(-1,0)	CAR(0,1)
	(1)	(2)	(3)	(4)	(5)	(6)
Broker	-0.012	-0.029	-0.022	-0.019	-0.038**	-0.028
	(-0.89)	(-1.56)	(-1.21)	(-1.35)	(-2.04)	(-1.42)
ICO Issuer	-0.014	-0.023	-0.013	-0.014	-0.022	-0.014
	(-1.36)	(-1.15)	(-0.89)	(-1.36)	(-1.09)	(-0.86)
Exchange	-0.047**	-0.061***	-0.050**	-0.047*	-0.062**	-0.054**
	(-2.09)	(-2.62)	(-2.23)	(-1.90)	(-2.40)	(-2.13)
Fund	0.006	-0.004	0.019	0.005	-0.005	0.019
	(0.58)	(-0.20)	(0.80)	(0.43)	(-0.20)	(0.77)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232	232	232	208	208	208
R2	0.070	0.098	0.080	0.078	0.101	0.086

F. Penalties and Other Measures

Our last analysis zeroes in on the effect of disclosed or anticipated penalties on market reaction to enforcement actions. If the penalties are viewed as a potential regulatory cost that can affect other crypto market participants, it is interesting to examine which components of penalties are affecting valuation of the crypto market.

In Table 7, we model the announcement reaction as a function of multiple penalties and cryptoasset characteristics as control variables. Our dependent variable continues to be the three types of announcement returns because, in most actions, announcement and completion dates coincide.²¹⁶ In untabulated analyses, we used completion date returns, which produced qualitatively similar results. The penalties consist of both financial and nonfinancial penalties, and this part of our analysis includes the number of respondents/defendants, the binary indicators for officers charged, injunction or cease-and-desist orders, injunctions, court cases, and a disgorgement dummy. We also include a natural log of total financial penalties. We use a binary variable for disgorgement because it usually signals an end of a project, and a continuous variable is effectively a measure of project size, which is already captured by market capitalization.

The effects of penalties are noisy across different return models and we do not observe any statistically significant coefficients. In contrast, several unreported firm control variables continue to be significant predictors of returns. But taken together, these findings do not paint a coherent picture of the penalties capitalized into the values of cryptoassets.

It is possible that the market reacts to initial news of an enforcement action, which in itself is a clear signal of a more expansive regulatory approach. The SEC and CFTC have an almost unbroken (excluding one case as of this writing)²¹⁷ track record of success in crypto-related enforcement, which strongly suggests, *inter alia*, that once a case is initiated, some penalties are forthcoming. By contrast, specifics of ultimate penalties differ depending on cooperation of the accused, the facts of a case, and other factors. This makes penalties initially less certain and quantifiable.

²¹⁶ This typically happens when the SEC or CFTC releases an order instituting proceedings, making findings, imposing sanctions, and often simultaneously settling the matter.

²¹⁷ SEC v. Ripple Labs, Inc., No. 20 Civ. 10832, 2023 WL 4507900 (S.D.N.Y. July 13, 2023). The SEC is seeking permission to appeal. *See, e.g.*, Chris Dolmetsch, *SEC Moves to Appeal Ripple Ruling That XRP Isn't a Security (1)*, BLOOMBERG L. (Aug. 18, 2023), https://www.bloomberglaw.com/bloomberglawnews/securities-law/XBA0P31C000000?bna_news_filter=securities-law#jcite [<https://perma.cc/8TB5-NVZM>].

Table 7. Market Reaction to Penalties

This table presents OLS regression estimates of the relation between abnormal filing returns around the enforcement action completion date and imposed penalties. Abnormal returns are returns adjusted by average daily return over days (-45,-5) relative to the decision date. Number of Resp./Def. is the number of defendants or respondents listed in the filing. Officers Charged is a binary variable equal to 1 if the officers/directors are charged and 0 otherwise. Court is a binary variable equal to 1 if the action is litigated and 0 if it is administrative. Cease-and-Desist/Injunction is a binary variable equal to 1 if there is a cease-and-desist or injunction order and 0 otherwise. Disgorgement is a binary variable equal to 1 if disgorgement of funds is ordered and 0 otherwise. Log (Fine, Settlement) is the natural log of Fine or Settlement. Controls include Log Market Capitalization, Volume, Pre-filing Return and Volatility. Log Market Capitalization (Volume) is the natural log of median daily cryptoasset’s market capitalization (trading volume) during pre-filing period (-45,-5). Pre-filing Return is cryptoasset return over pre-filing period (-45,-5). Volatility is standard deviation of daily cryptoasset returns over pre-decision period (-45,-5). The t-statistics are computed using standard errors corrected for clustering of observations by cryptoasset and event and are reported in parentheses below the estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	AR(0) (1)	CAR(-1,0) (2)	CAR(0,1) (3)
Num.Resp./Def.	-0.000 (-0.14)	0.002 (0.47)	-0.001 (-0.21)
Officers Charged	0.003 (0.30)	0.014 (0.78)	0.013 (0.72)
Court	0.008 (0.67)	-0.026 (-1.47)	0.001 (0.08)
Cease-and-Desist/ Injunction	0.014 (0.76)	0.013 (0.48)	0.008 (0.32)
Disgorgement	-0.002 (-0.18)	-0.008 (-0.47)	-0.010 (-0.73)
Log Penalty	-0.003 (-1.23)	0.003 (0.75)	-0.000 (-0.03)
Controls	Yes	Yes	Yes
Observations	49129	49129	49129
R2	0.024	0.048	0.049

VI. THEORETICAL INTERPRETATIONS

Section A of this Part summarizes the empirical results provided in Part V. Section B discusses the need for regulation of crypto markets and examines our results in the context of U.S. regulatory fragmentation.²¹⁸

A. Summary of the Results

To summarize our results, global crypto markets are sensitive to U.S.-led enforcement efforts and regulatory fragmentation. The price reaction is particularly negative with respect to several categories of actors, such as issuers and developers of cryptoassets, and especially brokers and crypto exchanges. The markets react differently to *who* enforces U.S. law: the SEC (in securities law enforcement actions) or the CFTC (in commodity and derivatives law enforcement). SEC actions appear to trigger a more negative market reaction than CFTC enforcement actions. These effects, however, are somewhat weaker for Bitcoin and Ether, which have traditionally been viewed as well-established, decentralized, and global cryptocurrencies. Courts and the CFTC typically classify both currencies as commodities, which may render them less sensitive to U.S.-based enforcement risks.

In addition, although crypto-investors view enforcement as a costly activity for the markets, the more positive reaction to antifraud actions, which improve market integrity, offsets this negative effect. The results also depend on the quality characteristics of the assets. Market reaction depends on the differences among highly heterogeneous cryptoasset classes. For instance, markets perceive more liquid, better-performing, and risky cryptoassets as more vulnerable to U.S. enforcement after controlling for the agency initiating enforcement actions. These observations confirm that regulation and enforcement may improve market quality. In Section B of this Part, we consider several possible explanations for this finding.

B. Regulation, Enforcement, and Fragmentation

Our results lend support to the theories about the crucial role U.S. regulators play in global financial markets.²¹⁹ It is evident that U.S. commodity and securities regulators have crypto markets on their radar. But why has this triggered an overall negative reaction?

²¹⁸ See *infra* notes 219–228 and accompanying text.

²¹⁹ See *supra* Part I.

One germane line of scholarship warns that regulation may stifle economic growth and innovation.²²⁰ Not all regulation, however, is counterproductive. Properly designed rules may improve market integrity; correct market failure; foster future innovation;²²¹ protect consumers and investors; and reduce transaction costs, information asymmetry, and agency costs.²²² Instead of rejecting regulation and enforcement, our results should be interpreted as a signal from crypto markets that some regulatory efforts exhibit, metaphorically speaking, a low “goodness of fit.”²²³ A need for updated law and regulation may explain our results.

Similarly, scholarship underscoring that pre-crypto securities statutes are not an ideal framework for crypto innovations may explain the relevant differences in price reaction to the SEC versus the CFTC. That literature spans the whole cryptoasset ecosystem: from better definitions of cryptoassets as securities to the outdated rules on primary markets (i.e., distribution of tokens and coins by issuers to investors and consumers) to the need for better secondary market and infrastructure regulation.²²⁴

²²⁰ On the uneasy relationship between regulation and innovation, see generally, e.g., Cary Coglianese & Christopher Carrigan, *The Jobs and Regulation Debate*, in DOES REGULATION KILL JOBS? 1, 2–10 (Cary Coglianese, Adam M. Finkel & Christopher Carrigan eds., 2013) (examining the political and economic implications of employment and regulation); Cary Coglianese, *The Limits of Performance-Based Regulation*, 50 U. MICH. J.L. REFORM 525, 541–46 (2017) (discussing performance and means standards and innovation); Jay P. Kesan & Rajiv C. Shah, *Shaping Code*, 18 HARV. J.L. & TECH. 319 (2005) (examining the impact of various regulatory approaches, including standards, prohibitions, product liability, and others, on code); Yafit Lev-Aretz & Katherine J. Strandburg, *Regulation and Innovation: Approaching Market Failure from Both Sides*, 38 YALE J. ON REGUL. BULL. 1, 17–21 (2020) (examining regulation and innovation in light of demand and intellectual property doctrine, as well as relevant mechanisms of stifling innovation).

²²¹ See *supra* note 61 and accompanying text.

²²² See, e.g., Feinstein & Werbach, *supra* note 69, at 61–62 (considering the perspective that well-designed regulation can promote the adoption of and participation in cryptocurrency trading); Bruce G. Carruthers & Naomi R. Lamoreaux, *Regulatory Races: The Effects of Jurisdictional Competition on Regulatory Standards*, 54 J. ECON. LITERATURE 52, 87–90 (2016) (noting that regulatory regimes may benefit businesses by solving information or agent issues); Mike Orcutt, *New Money-Laundering Rules Change Everything for Cryptocurrency Exchanges*, MIT TECH. REV. (Aug. 15, 2019), <https://www.technologyreview.com/2019/08/15/102778/new-money-laundering-rules-change-everything-for-cryptocurrency-exchanges/> [<https://perma.cc/3GLW-6GRC>] (noting that new regulations would deter money launderers and blacklist others suspected of terrorist activity or subject to financial sanctions).

²²³ In the same vein, prior research demonstrates that regulatory proposals tailored specifically to crypto are associated with positive returns. Auer & Claessens, *Regulatory News*, *supra* note 170, at 1–2.

²²⁴ The literature on these subjects is considerable. See generally Goforth, *Who Is the SEC Protecting?*, *supra* note 60 (examining the regulatory framework, suggesting that the SEC applies its regulatory authority too broadly, and emphasizing the costs of this approach); Carol R. Goforth, *Cinderella’s Slipper: A Better Approach to Regulating Cryptoassets as Securities*, 17 HASTINGS BUS. L.J. 271 (2021) (proposing a reform of securities law and also discussing commodity regulation); Guseva, *Game Theory*, *supra* note 101 (examining the efficacy of SEC crypto-enforcement efforts); Johnson, *supra* note 28 (examining crypto-exchanges); Carol R. Goforth, *Using Cybersecurity Failures to Cri-*

If substantive securities laws were indeed more outdated, rigid,²²⁵ or unsuitable for crypto than commodity and derivatives regulation, then SEC enforcement naturally would be associated with a higher risk and more negative market reaction. The intensity of SEC enforcement would only exacerbate these trends—indeed, the SEC launches more enforcement actions and imposes larger penalties than the CFTC or its foreign counterparts.²²⁶

It also does not seem likely that the SEC, which is larger than the CFTC, has been more skillfully addressing information asymmetry or a possible crypto bubble than the CFTC.²²⁷ If that were the case, the effect of SEC enforcement would be stronger and more persistent than a few days around the event date.

It would be wrong to assert that the SEC was less effective in regulating crypto than the CFTC. In fact, the SEC has been successfully overseeing the largest capital market in the world for almost a century.²²⁸ It is possible, however, that digital asset markets challenge the agency in novel ways as investors

tique the SEC's Approach to Crypto Regulation, 65 S.D. L. REV. 433, 434 (2020) (arguing “that the federal securities laws should be amended with rules specifically addressing the new class of cryptoassets in order to better address the actual problems posed by this technology”); Lewis Rinaudo Cohen, *Ain't Misbehavin': An Examination of Broadway Tickets and Blockchain Tokens*, 65 WAYNE L. REV. 81 (2019) (pointing out that an investment scheme that may be a security is not the same as its object that is not a security); Carol Goforth, *Securities Treatment of Tokenized Offerings Under U.S. Law*, 46 PEPP. L. REV. 405 (2019) (calling for reforming the current approach to crypto and the application of the investment contract test); Jonathan Rohr & Aaron Wright, *Blockchain-Based Token Sales, Initial Coin Offerings, and the Democratization of Public Capital Markets*, 70 HASTINGS L.J. 463 (2019) (calling for regulatory certainty, and proposing reforms and safe harbors); Shlomit Azgad-Tromer, *Crypto Securities: On the Risks of Investments in Blockchain-Based Assets and the Dilemmas of Securities Regulation*, 68 AM. U. L. REV. 69 (2018) (calling for balancing the costs of securities law and structural assessments of cryptoassets); Kevin Werbach, *Trust, but Verify: Why the Blockchain Needs the Law*, 33 BERKELEY TECH. L.J. 487, 519 (2018) (agreeing with the need for regulation but suggesting that not all token offerings are securities); Eric C. Chaffee, *Securities Regulation in Virtual Space*, 74 WASH. & LEE L. REV. 1387 (2017) (examining statutory language and suggesting that context may require different interpretations and approaches in crypto). *But see generally*, e.g., Marco Dell'Erba, *From Inactivity to Full Enforcement: The Implementation of the “Do No Harm” Approach in Initial Coin Offerings*, 26 MICH. TECH. L. REV. 175 (2020) (arguing that SEC enforcement in the arena of ICOs furthers investor protection and preservation of capital formation and that a lack of enforcement would likely increase investor uncertainty); Usha R. Rodrigues, *Embrace the SEC*, 61 WASH. U. J.L. & POL'Y 133 (2020) (arguing that “government regulation is a feature, not a bug for ICOs”).

²²⁵ Recall that securities law is more rules-based compared with regulation of commodity derivatives. *See supra* Part I. Innovators may prefer the more flexible *principles-based* policies pursued by the CFTC to rules-based securities regulation.

²²⁶ Eakeley et al., *supra* note 101, at 99–100.

²²⁷ It has been argued, however, that the SEC stemmed the tide of unregulated, unregistered ICOs. *See, e.g.*, Dell'Erba, *supra* note 224, at 226–27 (concluding that SEC enforcement helped foster a more stable crypto environment); Daniel Roberts, *SEC Quietly Widens Its Crackdown on Token Sales*, DECRYPT (Oct. 10, 2018), <https://decrypt.co/3622/sec-tightens-the-noose-on-ico-funded-startups> [<https://perma.cc/FTG2-A78F>].

²²⁸ *Our Goals*, SEC, <https://www.sec.gov/our-goals> [<https://perma.cc/497B-PQQJ>] (Apr. 6, 2023).

react negatively to securities law enforcement. In crypto markets where asset classifications overlap, reconsidering and redesigning regulatory fragmentation could address possible inefficiencies of securities law and yield benefits from the *joint* efficiency of the Commissions.

CONCLUSION

We hope that our analysis will contribute to the scholarship on financial regulation and provide new information to Congress, the Commissions, and other stakeholders. We also hope it helps in evaluating the merits of financial reforms addressing fragmentation in U.S. financial regulation, resolving turf wars, and advancing efficient reforms. Due to the economic potential of blockchains and other relevant technologies, regulation of crypto will remain one of the important topics on the agenda of policymakers, the SEC, and the CFTC. Our empirical evidence supports the call for a comparative reassessment and reform of the currently fragmented regulation of cryptoassets. The central role of U.S. regulators in the global world of finance makes this need for reform more pressing.

