
THE COLUMBIA
SCIENCE & TECHNOLOGY
LAW REVIEW

VOLUME XXIV

STLR.ORG

SPRING 2023

NOTE

REGULATION OF DEFI LENDING: AGENCY
SUPERVISION ON DECENTRALIZATION

Sean Kwon*

The rise of intermediary-less decentralized finance (“DeFi”) lending has led many to wonder how it should be regulated. Although DeFi lending could potentially offer reduced risks of centralization and market frictions, investors in DeFi lending are currently exposed to centralized risks and losses in the volatile market in the absence of regulation. The SEC suggested that the agency might regulate the sector under the federal securities laws. A truly decentralized lending project, however, does not involve any centralized entity that could carry the burden of compliance with the securities laws. This Note shows that many DeFi lending projects are not truly decentralized and are in various stages of decentralization. Unlike P2P lenders and financial intermediaries that bear the costs of compliance, many DeFi developers seek to build automated lending systems and gradually relinquish their control over their creation. However, with the lack of regulation, the investors have no means to tell actors who seek to build secure decentralized systems from those who do not in the early stage of DeFi protocol development. To address the issue, this Note proposes a three-part framework that would oversee the process of decentralization for DeFi lending projects, drawing its structure from the U.S. banking regulation focused on supervision. First, the framework recognizes the value of decentralization in reducing market frictions and risks of centralization. Second, the framework establishes a federal agency that oversees the process of decentralization on the

* J.D. Columbia Law School, Class of 2023. The author thanks Professor Edward F. Greene, Professor Talia Gillis, and Caitlin Kim for thoughtful feedback and comments. The author is also grateful for the excellent support from the editors of *The Columbia Science & Technology Law Review*. The author will be joining Cleary Gottlieb Steen & Hamilton LLP following his graduation.

flexible safety and soundness standard of Glass-Steagall Act. Third, the framework grants enforcement powers to the federal agency to sanction DeFi platforms that do not comply with government regulations.

I.	INTRODUCTION.....	380
II.	OVERVIEW OF LENDING: THE ROLE OF FINANCIAL INTERMEDIARIES AND THE EXISTING REGULATORY FRAMEWORK	388
	<i>A. Brief Overview of the U.S. Banking Regulation.....</i>	389
	<i>B. The Securities Regulation of the New Lenders: P2P Lending.....</i>	390
	<i>C. New Kids on the Block: CeFi and DeFi Lending.....</i>	392
III.	THE SECURITIES REGULATION OF DEFI LENDING PROTOCOLS.....	398
	<i>A. Centralized Risks in DeFi Lending Market.....</i>	400
	<i>B. Regulating Centralized Entities Behind DeFi Lending under the Existing Federal Securities Regulation.....</i>	404
IV.	THE PATH FORWARD: REGULATION OF DEFI LENDING PROTOCOLS FOR DECENTRALIZATION.....	409
	<i>A. Full Decentralization is not an Illusion, but an Achievable Goal</i>	409
	<i>B. Regulating and Maintaining Decentralization in DeFi Lending through Agency Rulemaking, Supervision, and Enforcement</i>	411
V.	CONCLUSION	413

I. INTRODUCTION

The debate over the self-governance of cyberspace is not new, but a recurring debate in different forms. On February 8th, 1996, John Perry Barlow, a founding member of the Electronic Frontier Foundation, penned a “A Declaration of the Independence of Cyberspace” in Davos, Switzerland.

Modeling the Declaration after the language of the Declaration of Independence,¹ Barlow asks the “[g]overnments of the Industrial World” to “leave us alone.”² The cyberspace community today, however, does not celebrate virtual fireworks displays for February 8, nor did it form the United States of Cyberspace free from the control of the federal and state governments.³ While the

¹ *Declaration of Independence: A Transcription*, NATIONAL ARCHIVES, <https://www.archives.gov/founding-docs/declaration-transcript>.

² *Id.*

³ Today, the Internet is subject to government laws and regulations. In the U.S., for example, internet users are bound by the Digital Millennium Copyright Act (DMCA) which implemented “notice-and-takedown system” and other protections for copyright online. *The Digital Millennium Copyright Act*, COPYRIGHT.GOV, <https://www.copyright.gov/dmca/>. There are also various state privacy legislations that bound parties in the cyberspace. See *California Consumer Privacy Act*, STATE OF CALIFORNIA DEPARTMENT OF JUSTICE, OFFICE OF THE ATTORNEY GENERAL,

“[g]overnments of the Industrial World” have already made their way into cyberspace,⁴ the emergence of cryptocurrency and blockchain once again opened a “largely uncharted legal territory,”⁵ reigniting the debate over the governance of cyberspace.

Blockchain is a “database” where “a decentralized network of participating ‘nodes’ that each possess a copy of the database and may (depending upon the consensus mechanism) participate in how the database is updated.”⁶ For Bitcoin, the database at any point exists in a “state” that “consist[s] of the ownership status of all existing bitcoins,” and the update in the database is performed in a “state transition function” that “outputs a new state.”⁷ Blockchains have the liberty to differ in the nature of data they store,⁸ how they update the database,⁹ and how

<https://oag.ca.gov/privacy/ccpa>; see also (740 ILCS 14/) Biometric Information Privacy Act., Illinois General Assembly, <https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3004&ChapterID=57>; see also S.B. 227 Consumer Privacy Act, Utah State Legislature, <https://le.utah.gov/~2022/bills/static/SB0227.html>. For child pornography, federal criminal law that “prohibits the production, distribution, reception, and possession of an image of child pornography . . . almost always applies when the Internet is used to commit a child pornography violation.” *Citizen's Guide To U.S. Federal Law On Child Pornography*, THE UNITED STATES DEPARTMENT OF JUSTICE, <https://www.justice.gov/criminal-ceos/citizens-guide-us-federal-law-child-pornography>.

⁴ *Id.*

⁵ Adam J. Kuegler, *Cryptocurrency and the Sec: How A Piecemeal Approach to Regulating New Technology Selectively Stifles Innovation*, 52 CONN. L. REV. 989, 993 (2020).

⁶ Jamsheed Shorish, *Blockchain State Machine Representation*, SOCARXIV (Jan. 19, 2018), 1, <https://osf.io/preprints/socarxiv/eusxg/>.

⁷ See Vitalik Buterin, *Ethereum Whitepaper*, ETHEREUM.ORG (2014), <https://ethereum.org/en/whitepaper/>.

⁸ For Bitcoin, the database at any “state” consists of unspent transaction outputs (UTXO) defined as coins “that have been minted and not yet spent, with each UTXO having a denomination and an owner.” Buterin, *supra* note 9. Ethereum, in contrast, differs as it is not based on UTXO – each “state” consists of accounts that allow “direct transfers of value and information between accounts.” *Id.* Each account has four fields of information, which are “[t]he nonce, a counter used to make sure each transaction can only be processed once,” “[t]he account’s current ether balance,” “[t]he account’s contract code, if present, [t]he account’s storage.” *Id.*

⁹ The proof-of-work consensus mechanism has an incentive structure for nodes to update the database honestly. See Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, BITCOIN.ORG, 4, <https://bitcoin.org/bitcoin.pdf>. Nakamoto compares the incentives in the proof-of-work mechanism with gold mining—miners (“nodes”) expend resources (“CPU time and electricity” that cost money) to receive compensation (“transaction fees”), “add[ing] gold to circulation” (“distribut[ing] coins into circulation”). *Id.* The incentive structure of bitcoin works when the attackers do not find it more feasible to “assemble more CPU power than all the honest nodes . . . to defraud people by stealing back his payments” than to “us[e] it to generate new coins.” *Id.* So, the value of new coins obtained through defrauding should outweigh the cost of electricity, CPU time, and the undermined “validity of his own wealth” locked in the blockchain. *Id.* For proof-of-stake consensus, the incentive structure replaces the cost of electricity, CPU time of proof-of-work with the collateral. *Proof-of-stake (PoS)*, ETHEREUM.ORG, <https://ethereum.org/en/developers/docs/consensus-mechanisms/pos/>. Here, the nodes that would like to update the database become validators by submitting their crypto assets “as collateral that can be destroyed if the validator behaves dishonestly or lazily.” *Id.* For proof-of-stake mechanism,

often they update the database.¹⁰ With such properties, blockchain is commonly referred to as “a decentralized, distributed public ledger.”¹¹ One of the first uses of blockchain was financial transactions.¹² While computer scientists like Wei Dai and Hal Finney entertained and developed the concepts of decentralized currency in the 1990s and 2000s, economist Milton Friedman predicted the creation of “a reliable e-cash, a method whereby on the Internet you can transfer funds from A to B, without A knowing B, or B knowing A” in 1999.¹³ The first implementation of cryptocurrency came about only in 2009 as “Bitcoin.”¹⁴ Published online by the name “Satoshi Nakamoto,” a 9-page paper describes how one can send “electronic cash” to another without a financial intermediary.¹⁵ Bringing attention to the costs and weaknesses of trust-based systems, the paper introduces “a chain of blocks” as a trustless online payment system.¹⁶ Since then, the market for cryptocurrency blossomed,¹⁷ expanding its reach into the world of financial products traditionally handled by banks.¹⁸

Despite different touted motives behind the creation of cryptocurrencies, cryptocurrencies “have emerged to address market frictions.”¹⁹ As Nakamoto suggested, “an electronic payment system based on cryptographic proof instead of trust” would eliminate the need for financial intermediaries that “increase[]

the disincentives to behave badly are the “cost[s] of controlling significant stake” and in some case consumed “coin age” used to determine who would update the database. Sunny King & Scott Nadal, *PPCoin: Peer-to-peer Cryptocurrency with Proof-of-stake*, (Aug. 19, 2012), <https://decred.org/research/king2012.pdf>.

¹⁰ Bitcoin took 7.02 minutes to confirm transactions (to update the database) on September 29, 2022. *Bitcoin Median Transaction Confirmation Time*, NASDAQ, <https://data.nasdaq.com/data/BCHAIN/ATRCT-bitcoin-median-transaction-confirmation-time>. Ethereum took 12.08 seconds to do the same on September 29, 2022. *Ethereum Average Block Time*, Ycharts, https://ycharts.com/indicators/ethereum_average_block_time.

¹¹ E. Napoletano and John Schmidt, *Decentralized Finance Is Building A New Financial System*, Forbes, <https://www.forbes.com/advisor/investing/defi-decentralized-finance/>.

¹² See Buterin, *supra* note 8.

¹³ National Taxpayers Union, *Milton Friedman Full Interview on Anti-Trust and Tech*, Youtube (Aug. 9, 2012), <https://www.youtube.com/watch?v=mlwxdyLnMXM&t=0s>.

¹⁴ See Vitalik Buterin, *Ethereum Whitepaper*, Ethereum.org (2014), <https://ethereum.org/en/whitepaper/>

¹⁵ See Nakamoto, *supra* note 10.

¹⁶ *Id.* at 1, 7.

¹⁷ As of June 3, 2022, more than 19,000 cryptocurrencies and “dozens of blockchain platforms” exist. Arjun Kharpal, *Crypto firms say thousands of digital currencies will collapse, compare market to early dotcom days*, CNBC (Jun. 3, 2022), <https://www.cnbc.com/2022/06/03/crypto-firms-say-thousands-of-digital-currencies-will-collapse.html>.

¹⁸ To name a few, there are now Bitcoin futures, crypto ETFs, cryptocurrency trusts, and stocks of crypto companies as investment options. *Cryptocurrency Investing*, CHARLES SCHWAB, <https://www.schwab.com/cryptocurrency>.

¹⁹ Hossein Nabilou & André Prüm, *Central Banks and Regulation of Cryptocurrencies*, 39 REV. BANKING & FIN. L. 1003, 1005.

transaction costs.”²⁰ One of the emerging use cases of cryptocurrencies is lending practice, reaching \$10 billion in total loan originations in cryptocurrencies in 2020.²¹ The market for cryptocurrency loans is rising.²² Equally rising are the eyebrows of Washington regulators, most prominently those of the U.S. Securities and Exchange Commission (the “SEC”) chairman Gary Gensler.²³ Amidst flourishing financial start-ups like BlockFi that offer loans, credit cards, and interest-bearing accounts and volatility affecting millions of customer assets in crypto, Gensler wrote to Senator Elizabeth Warren that more regulatory oversight was needed to prevent “regulatory cracks” and “to protect investors in this growing and volatile sector.”²⁴

Although “[c]ryptocurrency regulation is largely uncharted legal territory,”²⁵ there are varying degrees of regulatory oversight currently imposed on actors in the crypto lending market, depending on whether those actors are centralized or decentralized.²⁶ The SEC is starting to bring actors in centralized finance (“CeFi”) under the existing securities regulations.²⁷ The business practice of CeFi actors such as Coinbase or BlockFi is centralized.²⁸ CeFi actors receive cryptocurrencies from customers and lend them out to borrowers with interest, a portion of which they take as their profit and share with customers.²⁹ Here, the practice of crypto lending is *not* decentralized in the form of CeFi actors functioning as a centralized intermediary.³⁰ Rather, what gets lent and borrowed may be decentralized in nature.³¹ Consumers and financial institutions in the CeFi lending practice can trade

²⁰ Nakamoto, *supra* note 10, at 1.

²¹ Leeor Shimron, *Exploding Past \$10 Billion, Interest Income and Lending Are Bitcoin’s First Killer Apps*, FORBES (May 26, 2020), <https://www.forbes.com/sites/leeorshimron/2020/05/26/exploding-past-10b-interest-income-and-lending-are-bitcoins-first-killer-apps/?sh=53d080d33320>.

²² Harry Robertson, *Crypto lending is booming as investors hunt for yield. It turned this company from niche startup to \$1 billion unicorn in just 4 years.*, BUSINESS INSIDER (Jul. 11, 2021), <https://www.businessinsider.com/crypto-lending-boom-amber-group-bitcoin-stablecoin-investing-2021-7?amp>.

²³ See Eric Lipton & Ephrat Livni, *Crypto’s Rapid Move into Banking Elicits Alarm in Washington*, N.Y. TIMES, Sept. 5, 2021, <https://www.nytimes.com/2021/09/05/us/politics/cryptocurrency-banking-regulation.html>.

²⁴ *Id.*

²⁵ Adam J. Kuegler, *Cryptocurrency and the Sec: How A Piecemeal Approach to Regulating New Technology Selectively Stifles Innovation*, 52 CONN. L. REV. 989, 993 (2020).

²⁶ See Lipton & Livni, *supra* note 24.

²⁷ See *In re BLOCKFI LENDING LLC*, Release No. 11029, 1, 1-14 (Feb. 14, 2022).

²⁸ See Lipton & Livni, *supra* note 24.

²⁹ See *id.*

³⁰ See *id.*

³¹ See William Hinman, Remarks at the Yahoo Finance All Markets Summit: Crypto, U.S. SECURITIES AND EXCHANGE COMMISSION (June 14, 2018).

various cryptocurrencies they loan out, earn, or borrow with fiat currencies, such as the US Dollar, on exchange platforms such as Coinbase.³²

Despite some similarity with the lending practice of a bank, CeFi lending does not offer robust regulatory protections of chartered banks. Banks in the U.S. are closely supervised by the Federal Reserve Board (“Fed”), the Office of the Comptroller of the Currency (“OCC”), and the Federal Deposit Insurance Company (“FDIC”) that are statutorily granted power to approve banking activities, monitor banks, and issue remedies.³³ The agencies exercise their disciplinary authorities “whenever” they determine there are or are about to be “unsafe or unsound practice[s]” in banks they supervise.³⁴ The penalties for such practices can be harsh, as agencies can impose civil and criminal liabilities on banks in addition to controlling how banks invest their assets and distribute bonuses and dividends.³⁵

For example, Coinbase is not a chartered bank in the U.S.³⁶ Hence, it was not subject to the banking regulation when it promised “a safe, secure way to earn interest”³⁷ with Lend, a program for customers to lend their USD Coin (USDC), a type of cryptocurrency, to the company at 4% APY (Annual Percentage Yield) in 2021.³⁸ Its offer of “[h]igher interest without higher risk” also did not come with Federal Deposit Insurance Corporation (“FDIC”) or Securities Investor Protection Corporation (“SIPC”) insurance.³⁹ Although Coinbase offers principal guaranty in case “verified borrowers” default on payment,⁴⁰ the FDIC or SIPC does not protect customers’ assets in Lend in case Coinbase itself fails.⁴¹ In addition to avoiding

³² See Coinbase, Convert cryptocurrency FAQ, COINBASE, <https://help.coinbase.com/en/coinbase/trading-and-funding/cryptocurrency-trading-pairs/convert-cryptocurrency-faq>.

³³ Lev Menand, *Why Supervise Banks? The Foundations of the American Monetary Settlement*, 74 VANDERBILT LAW REVIEW 951, 953-54 (2021).

³⁴ *Id.* at 954 (quoting 12 U. S. C. § 1818(b)).

³⁵ *Id.* at 954 n.6.

³⁶ Coinbase does not hold banking charter but instead holds money transmitter licenses in various states. Coinbase, Licenses & Disclosures, Coinbase, <https://www.coinbase.com/legal/licenses>.

³⁷ Lend, COINBASE (Jan. 22, 2022), <https://www.coinbase.com/lend> [<https://web.archive.org/web/20210909081423/https://www.coinbase.com/lend>].

³⁸ Update as of 5pm ET, Friday, September 17th: we are not launching the USDC APY program announced below, THE COINBASE BLOG, <https://blog.coinbase.com/sign-up-to-earn-4-apy-on-usd-coin-with-coinbase-cdad79e5f5eb>.

³⁹ Update as of 5pm ET, Friday, September 17th: we are not launching the USDC APY program announced below, *supra* note 39. FDIC insures bank deposits up to \$250,000 per depositor, paying the principal balance and accrued interest in an event of bank failure. *Deposit Insurance FAQs*, FDIC (December 8, 2021), <https://www.fdic.gov/resources/deposit-insurance/faq/>. SIPC protects cash and securities of customers at brokerage firms, with the limit of \$500,000 and \$250,000 for cash. *What SIPC Protects*, SIPC, <https://www.sipc.org/for-investors/what-sipc-protects>.

⁴⁰ Lend, *supra* note 38.

⁴¹ See *How is Coinbase insured?*, COINBASE, <https://help.coinbase.com/en/coinbase/other-topics/legal-policies/how-is-coinbase-insured> (last visited Apr. 28, 2023).

financial regulations, Coinbase also claimed that the Lend program was not a security subject to the SEC regulations.⁴² Coinbase thus sought to avoid costly mandatory disclosures under the US securities regulations, which are often critical for investors to make informed decisions.⁴³

Some states sought to bring such lenders under the state securities laws, with New Jersey going as far as sending cease-and-desist letters to BlockFi for selling unregistered securities.⁴⁴ On the federal level, the SEC started to bring strict enforcement actions against CeFi lenders in recent years.⁴⁵ In 2021, the SEC served Coinbase with a Wells Notice—a notification of the agency’s plan to sue Coinbase for securities law violations.⁴⁶ Sixteen days after the SEC’s notice, Coinbase canceled the launch of Lend.⁴⁷ In February 2022, the SEC reached a settlement with another CeFi actor BlockFi, which agreed to cease offering its crypto lending product, pay \$50 million in penalty, and register its future lending products as securities with the SEC.⁴⁸

On the other hand, there are actors in decentralized finance (“DeFi”) that further complicate the landscape for cryptocurrency regulation.⁴⁹ Unlike CeFi actors that function like banks for cryptocurrencies,⁵⁰ DeFi lending platforms seek to enable peer-to-peer exchange of assets without the need for an intermediary.⁵¹ In theory, there are no centralized entities like Coinbase or BlockFi behind DeFi lending.⁵² Once the lending protocol is programmed, the protocol automatically executes the lending process—matching supply with demand.⁵³ The code that runs DeFi is typically open-source and governed by a community of users.⁵⁴

Taking a closer look at DeFi, however, reveals that DeFi projects could be more centralized than its name suggests—revealing the possibility and necessity of

⁴² Paul Grewal, *The SEC has told us it wants to sue us over Lend. We don’t know why.*, The Coinbase Blog (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>.

⁴³ Elisabeth de Fontenay, *Do the Securities Laws Matter? The Rise of the Leveraged Loan Market*, 39 J. CORP. L. 725, 726 (2014).

⁴⁴ See Lipton & Livni, *supra* note 24.

⁴⁵ See *In re BLOCKFI LENDING LLC*, *supra* note 28, at 1–11; see also Grewal, *supra* note 43.

⁴⁶ Grewal, *supra* note 43.

⁴⁷ *Id.*

⁴⁸ *In re BLOCKFI LENDING LLC*, *supra* note 28, at 12–13.

⁴⁹ See Lipton & Livni, *supra* note 24.

⁵⁰ *Id.*

⁵¹ E. Napoletano and John Schmidt, *Decentralized Finance Is Building A New Financial System*, FORBES ADVISOR, <https://www.forbes.com/advisor/investing/defi-decentralized-finance/>.

⁵² Elaine Chan, *Decentralised finance (DeFi): A Game-Changer or Just a Passing Fad?*, 1 J. INT’L. BANKING FIN. L. 39, 39 (2022).

⁵³ *Id.*

⁵⁴ *Id.* Elaine Chan notes that open-source programs can be viewed or verified by anyone, ensuring transparency of the protocol.

regulation.⁵⁵ Currently, most DeFi projects are managed by centralized actors who have “access to a portion of the funds.”⁵⁶ The confusion over DeFi might stem from the fact that DeFi projects can be partially or fully decentralized from their inception.⁵⁷ For example, the team behind DeFi lending protocol Compound Protocol—Compound Labs, Inc.—had once controlled the administrative rights to “pause supply, borrowing, or liquidation in a market” created by the protocol until the founder of the protocol, Robert Leshner, proposed to transfer it to “Community Multi-Sig created by members of the community” in 2021.⁵⁸⁵⁹ Such a proposal created a state of *partial* decentralization for the protocol, since it was still necessary for users to trust the six “signers” who collectively control the administrative rights.⁶⁰ Another leading DeFi protocol, MakerDAO, underwent a similar process of decentralization.⁶¹

Despite the centralized risks of DeFi platforms, transactions on DeFi currently seem to fall through the cracks in securities and banking regulations. Noting that “the regulation is effectively absent” in the DeFi industry, Senator Elizabeth Warren called DeFi “the most dangerous part of the crypto world.”⁶² DeFi lending protocols are not banks but computer codes,⁶³ so they would be free from federal banking supervision.⁶⁴ It is also unclear whether securities agencies could target DeFi protocols using the current framework targeting centralized actors. For both Coinbase and BlockFi, the SEC used Supreme Court cases *Howey* and *Reves* to

⁵⁵ Davis Z Morris, *Lassoing a Stallion: How Gary Gensler Could Approach DeFi Enforcement*, COINDESK (Oct. 22, 2021), <https://www.coindesk.com/policy/2021/10/21/lassoing-a-stallion-how-gensler-could-approach-defi-enforcement>.

⁵⁶ Olga Kharif, *Crypto Exchange Gets Millions After Copy-Paste of a Rival's Code*, BLOOMBERG (Sept. 11, 2020), <https://www.bloomberg.com/news/articles/2020-09-11/-come-to-jesus-moment-for-crypto-finance-apps-rocks-valuations>.

⁵⁷ *Id.*

⁵⁸ Multisignature wallets (“Multi-Sig”) are crypto wallets that could implement approval-by-majority system to manage transactions in decentralized governance. Vincentius Lienardo & Rinaldi Munir, *Blockchain-based Multisignature Wallet System for Decentralized Autonomous Organization*, https://informatika.stei.itb.ac.id/~rinaldi.munir/TA/Makalah_TA_Vincentius.pdf.

⁵⁹ Robert Leshner, *Set Pause Guardian to Community Multi-Sig*, COMPOUND GOVERNANCE (Aug. 28, 2021), <https://compound.finance/governance/proposals/57>.

⁶⁰ At the time of proposal, the six-member committee who could collectively control the administrative rights included @TennisBowling, @arr00, @blck, Compound Labs, Dharma Labs (@0age), and @jared. *Id.*

⁶¹ *The Transfer of MKR Token Control to Governance: The Final Step*, MAKERDAO BLOG (Mar. 25, 2020), <https://blog.makerdao.com/the-transfer-of-mkr-token-control-to-governance-the-final-step>.

⁶² Turner Wright, *‘DeFi is the most dangerous part of the crypto world,’ says Senator Elizabeth Warren*, COINTELEGRAPH (Dec. 14, 2021), <https://cointelegraph.com/news/defi-is-the-most-dangerous-part-of-the-crypto-world-says-senator-elizabeth-warren>.

⁶³ Jeff Benson, *What Is Aave? Inside the DeFi Lending Protocol*, DECRYPT, <https://decrypt.co/resources/what-is-aave-inside-the-defi-lending-protocol>.

⁶⁴ The scope of the banking supervision is limited to various types of banks and bank holding companies. See Menand, *supra* note 34, at 953 n.4.

classify their offerings as a security subject to registration requirements.⁶⁵ In *SEC v. W.J. Howey Co.*, the Supreme Court defined an investment contract as a subset of “security” under the Securities Act as “a contract, transaction or scheme whereby a person [1] invests his money [2] in a common enterprise and [3] is led to expect profits [4] solely from the efforts of the promoter or a third party.”⁶⁶ In *Reves v. Ernst & Young*, the Supreme Court recognized “note” as “security” under the Securities Act using the “family resemblance” test, which presumes a note to be a security until rebutted by “a strong resemblance” to exceptions outlined by the court.⁶⁷ Although SEC Chief Gary Gensler launched an initiative to regulate DeFi loans,⁶⁸ whether the SEC could directly apply such tests to all decentralized protocols is so far an unanswered question. In addition, the heavy burden of security regulation⁶⁹ could disincentivize the process of decentralization for DeFi platforms, as such regulation would leave only the powerful, *centralized* actors in DeFi that could withstand the sunk cost in their investment—as the status of the P2P lending industry demonstrates.⁷⁰

This Note postulates that DeFi lending platforms carry centralized risks that could be regulated under the existing securities regulation. Although the ideals of DeFi founders may lie in the decentralized, transparent, and community-run future without financial intermediaries and their risks, centralized entities play crucial roles in the protocol governance and management at least in the early stage of DeFi development.⁷¹ It is also not uncommon for “a small group of people” to hold “the majority of governance tokens,” which would function similarly to administrative rights over the governance of DeFi lending projects.⁷² Therefore, regulatory agencies should not treat existing DeFi lenders as fully decentralized as they claim. However, this Note recognizes that the costs of mandatory disclosure under the

⁶⁵ Grewal, *supra* note 43; *see also In re BLOCKFI LENDING LLC*, *supra* note 28, at 1–14.

⁶⁶ Sec. Exch. Comm’n v. W.J. Howey Co., 328 U.S. 293, 294 (1946).

⁶⁷ *Reves v. Ernst & Young*, 494 U.S. 56, 67 (1990).

⁶⁸ Robert Schmidt and Benjamin Bain, *New SEC Boss Wants More Crypto Oversight to Protect Investors*, BLOOMBERG (August 3, 2021, 12:01AM) <https://www.bloomberg.com/news/articles/2021-08-03/will-government-regulate-crypto-sec-chair-gary-gensler-on-bitcoin-and-oversight>.

⁶⁹ De Fontenay, *supra* note 44.

⁷⁰ Benjamin Lo, *It Ain’t Broke: The Case For Continued SEC Regulation of P2P Lending*, 6 HARV. BUS. L. REV. 87, 88 (2016).

⁷¹ Aave launched its lending protocol with ICO raising \$16.2 million and took a course to fully decentralize in 2020. *See* William Foxley, *DeFi Lender Aave Rolls Out Governance Token on Path to Decentralization*, COINDESK (Jul. 29, 2020), <https://www.coindesk.com/tech/2020/07/29/defi-lender-aave-rolls-out-governance-token-on-path-to-decentralization/>. While good intentions of the founders of DeFi protocols could help implement a decentralized governance, blockchain community maybe dependent on the promise of the founders for such decentralized governance. If founders of DeFi decide to shut down the platform before decentralizing, the investors could be subject to centralized risk of decision-making.

⁷² Fabian Schär, *Decentralized Finance: On Blockchain- and Smart Contract-Based Financial Markets*, 103 FEDERAL RESERVE BANK OF ST. LOUIS REV. 153, 170 (2021).

existing securities regulation are “substantial, to say nothing of the indirect costs.”⁷³ The cost-bearing aspect of the existing regulation implies the inevitable existence of centralized entities that would cover “at least a few tens of thousands of dollars annually in legal, accounting, and printing costs,”⁷⁴ prohibiting transitions of centralized DeFi projects into fully decentralized ones. Once deployed in a fully decentralized manner, DeFi applications could reduce market frictions such as transaction costs compared with traditional finance.⁷⁵ Based on such findings, this Note will suggest that an alternative regulatory framework is necessary to oversee the process of decentralization for DeFi lending projects. To do so, the new framework should grant effective supervision, monitoring, and enforcement powers to a government agency overseeing the process of decentralization of DeFi lending projects. Part II of this Note will provide an overview of traditional lending by banks and bank supervision in the U.S. It will also introduce P2P lending, CeFi lending, and DeFi lending, which are three new types of lending that emerged with the Internet. Part III will explore centralized risks of DeFi lending and the application of federal securities regulation to DeFi lending protocols, concluding that securities regulation is not an adequate framework to address the problems of DeFi. Part IV will recommend federal agency supervision over DeFi lending to address those risks and to promote decentralization of DeFi lending projects.

II. OVERVIEW OF LENDING: THE ROLE OF FINANCIAL INTERMEDIARIES AND THE EXISTING REGULATORY FRAMEWORK

This Part starts by providing a historical context behind the oldest lending regulation—banking supervision. Then, it will explore the existing regulatory framework over two types of lenders, banks and P2P lending companies, and conclude by introducing the mechanisms of new lending platforms: CeFi and DeFi lending. Commercial banks create money when they extend loans to borrowers.⁷⁶ When a bank makes a loan, it records and thereby creates a deposit in the borrower’s account until the debtor “destroy[s]” the freshly created money in circulation.⁷⁷ As the creators of money besides the Fed that prints paper notes, banks can trigger inflation and deflation by expanding the money supply by lending more and contracting it by lending less.⁷⁸ Such power of banks could be conceptualized “as a special province of the state,” as lending activity of banks could “change[] the value of government-issued money pos[ing] significant risk” and be equated as “the power to govern the motions of economic life.”⁷⁹ Therefore, “most of the legislators

⁷³ De Fontenay, *supra* note 44.

⁷⁴ Tessa E. Shurr, *A False Sense of Security: How Congress and the Sec Are Dropping the Ball on Cryptocurrency*, 125 DICK. L. REV. 253, 282 n.6 (2020).

⁷⁵ See Nakamoto, *supra* note 10, at 1.

⁷⁶ Michael McLeay, *Money creation in the modern economy*, BANK ENG. Q. BULL. (2014 Q1) at 14. See also Menand, *supra* note 34, at 975.

⁷⁷ McLeay, *supra* note 77, at 14.

⁷⁸ See Menand, *supra* note 34, at 976.

⁷⁹ *Id.* at 977–78.

who designed our banking system” understood banks as outsourcers of government’s money supply, granting “the robust scope of supervisory power” over the quasi-public, “premodern independent agencies operated by private actors.”⁸⁰

A. *Brief Overview of the U.S. Banking Regulation*

The structure of the modern U.S. banking regulation emerged after the failure of the system “imported from Britain.”⁸¹ The reason for the failure of the previous system was political—the Bank of the United States (“BUS”) filled with the Federalist Party members as “shareholders and managers” was criticized as aristocratic, and the Democratic-Republicans chartered state banks “to compete with the BUS.”⁸² After the failure, the new system, dubbed the “American Monetary Settlement” (“AMS”) by Professor Lev Menand, appeared in the state level and was codified by Congress in the federal level during the Civil War with OCC issuing charters to and overseeing national banks.⁸³ The federalization of AMS was reinforced after “a half century of monetary breakdowns” in 1913, when Congress created the Fed to oversee state banks, and when Congress “created the FDIC to explicitly backstop bank money for the first time and to subject state banks to federal regulation.”⁸⁴

Currently, the Fed, the OCC, and the FDIC jointly supervise banks to approve banking activities, monitor banks, and issue appropriate remedies.⁸⁵ The Office of Thrift Supervision also supervises 936 additional institutions.⁸⁶ The statutory grant of power is outlined in “various places in Title 12 Banks and Banking of the United States Code (“USC”).”⁸⁷ The OCC is charged with bank chartering and examining banks, which may involve sending examiners to national banks that are mandated to produce reports on their financial condition for the agency.⁸⁸ The Fed, in addition to issuing government notes, supervises “financial holding companies, bank holding companies, state charter banks and foreign bank operations” on the “same safety and soundness” principle.⁸⁹ The FDIC primarily supervises “non-member banks” of the Fed and administers FDIC insurance for bank deposits.⁹⁰ As the federal agencies “have overlapping responsibilities,” “[t]he Federal Financial Institutions Examination Council (“FFIEC”) was set up in 1979 . . . to enhance the

⁸⁰ *Id.* at 978.

⁸¹ *Id.* at 960.

⁸² *Id.* at 983–84.

⁸³ *Id.* at 960.

⁸⁴ *Id.*

⁸⁵ *Id.* at 953–54.

⁸⁶ DALVINDER SINGH, BANKING REGULATION OF UK AND US FINANCIAL MARKETS 33 (2016).

⁸⁷ *Id.* at 33–34.

⁸⁸ *Id.* at 34.

⁸⁹ *Id.* at 34–35.

⁹⁰ *Id.* at 35.

level of uniformity and consistency in their supervisory, examination and enforcement practices.”⁹¹

The agencies’ supervision includes a Uniform Financial Institutions Rating System to evaluate “a bank’s overall condition.”⁹² Banking agencies conduct “a full-scope, on-site safety and soundness examination” and issue a “uniform composite [] rating” called the CAMELS rating.⁹³ The CAMELS stands for “(C) Capital Adequacy; (A) Asset Quality; (M) Management; (E) Earnings; (L) Liquidity; and (S) Sensitivity to Market Risk.”⁹⁴ By providing ratings for each element of examination, 1 being the most positive and 5 being the most negative rating, regulators use CAMELS rating to “provide an assessment of a bank’s overall condition.”⁹⁵ The CAMELS ratings of banks are shielded from the public view, as they “are never made publicly available, even on a lagged basis.”⁹⁶

B. *The Securities Regulation of the New Lenders: P2P Lending*

Direct lending enables people to lend and borrow money “without using a traditional intermediary.”⁹⁷ Direct lending appeared in many forms in history, including informal person-to-person lending between friends and formalized associations that have formed in various cultures like China, Korea, Japan, Mexico, and Nigeria.⁹⁸ Yet, the emergence of the Internet has provided “a huge potential” of financial independence from financial intermediaries in lending.⁹⁹

Online peer-to-peer (“P2P”) lending can be defined as an arrangement over the web between individuals to lend and borrow money from each other.¹⁰⁰ The “[p]ure online P2P lending without a formal intermediary,” for example, could be a simple arrangement between a borrower and a lender on an open website like Craigslist.¹⁰¹ However, the risk of fraud and crime on such “pure” P2P lending is

⁹¹ *Id.*

⁹² Lewis Gaul & Jonathan Jones, *CAMELS Ratings and Their Information Content* 5 (Office of the Comptroller of the Currency, Working paper, 2021)

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.* at 5–6.

⁹⁶ *Id.* at 6.

⁹⁷ R. Charles Inclan, *Private Equity Lending: Leveling Information Asymmetries Without The Need For Regulation*, 20 WAKE FOREST J. BUS. & INTELL. PROP. L. 21, 46.

⁹⁸ Eric C. Chaffee & Geoffrey C. Rapp, *Regulating Online Peer-to-Peer Lending in the Aftermath of Dodd-Frank: In Search of an Evolving Regulatory Regime for an Evolving Industry*, 69 WASH. & LEE L. REV. 485, 496–97 (2012).

⁹⁹ William S. Warren, *The Frontiers of Peer-to-Peer Lending: Thinking About a New Regulatory Approach*, 14 DUKE L. & TECH. REV. 298, 298-299 (2016).

¹⁰⁰ Chaffee & Rapp, *supra* note 99, at 492.

¹⁰¹ *Id.*

extremely high, while lending on closed networks like Facebook offers limited reachability.¹⁰²

What emerged in the 2000s were online P2P lending platforms like Prosper.¹⁰³ The online P2P lending platforms were not the “[p]ure online P2P lending without a formal intermediary” like lending on Craigslist.¹⁰⁴ Instead, the lending platforms have served as the intermediary connecting lenders and borrowers, albeit “without banks interposing their own credit risks and guarantees.”¹⁰⁵ The most dominant and developed form of P2P lending is unsecured consumer loans between strangers provided by brokers like LendingClub and Prosper.¹⁰⁶

The mechanics of P2P lending are as follows. Individual borrowers may request loans up to \$25,000 from lending platforms, which “perform traditional underwriting activities, such as evaluating credit history and ability to repay.”¹⁰⁷ Prosper and LendingClub, for example, require a minimum of 640 and 660 FICO scores for borrowing.¹⁰⁸ Once platforms accept a borrower, they use algorithms based on credit and employment information to classify borrowers and estimate losses in cases of default for each class of borrowers.¹⁰⁹ Lenders then can choose an individual borrower or a bundle of them, most commonly with three-year terms and no penalty for prepayment.¹¹⁰ P2P loans on Prosper and LendingClub have interest rates of 20.6% and 11.4% respectively on average, and the platforms charge borrowers an origination fee and lenders a servicing fee as a portion of principal.¹¹¹

The P2P lending industry had suffered severe risk of default before the SEC stepped in to regulate.¹¹² The SEC ended the regulatory uncertainty in 2008 by sending Prosper Marketplace Inc. (“Prosper”) a cease-and-desist order for selling unregistered securities.¹¹³ For Prosper, the SEC used the Supreme Court precedents, *Howey* and *Reves*, to determine that the notes issued by Prosper were securities under Section 2(a)(1) of the Securities Act.¹¹⁴ The SEC’s order had a profound impact on the operation of P2P lending.¹¹⁵ The burden of registration and

¹⁰² *Id.*

¹⁰³ Lo, *supra* note 71, at 88.

¹⁰⁴ Chaffee & Rapp, *supra* note 99, at 492.

¹⁰⁵ Andrew Verstein, *The Misregulation of Person-to-Person Lending*, 45 U.C. DAVIS L. REV. 445, 452 (2011).

¹⁰⁶ *Id.* at 451–52.

¹⁰⁷ *Id.* at 452–53.

¹⁰⁸ *Id.* at 453.

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 452–53.

¹¹¹ *Id.* at 454–55.

¹¹² Lo, *supra* note 71, at 88.

¹¹³ *Id.* at 88–89.

¹¹⁴ Prosper Marketplace, Inc., Securities Act Release No. 8984 (Nov. 24, 2008).

¹¹⁵ Lo, *supra* note 71, at 89.

reporting requirements drove smaller companies like Loanio, Virgin Money, and Pertuity out of the market, while Prosper and LendingClub survived.¹¹⁶ In line with the SEC Order, the surviving platforms adjusted their lending process to comply with the SEC regulations.¹¹⁷ Before a lender could invest a deposit, platforms now had to register each loan and record borrower data on SEC's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR).¹¹⁸ Also, the platforms had to increase their roles in lending beyond being a mere intermediary.¹¹⁹ Before the SEC Order, Prosper would match lenders and borrowers and get WebBank, a Utah-based industrial bank, to issue a loan to the borrower.¹²⁰ Prosper would be assigned a note from WebBank, and in turn assign it to a borrower.¹²¹ After the SEC Order, the lending process became more convoluted because the platforms had to avoid making individual lenders becoming registrants of a security.¹²² In the new system, Prosper does not grant lenders any security interest in the loan issued by WebBank. Instead, WebBank issues the loan to the platform, and Prosper "sells a separate debt instrument backed by the original loan to the lenders, who become creditors of the platform rather than the borrower."¹²³

C. New Kids on the Block: CeFi and DeFi Lending

1. CeFi Lending

While the global consumer and P2P lending market has an annual volume of \$85 billion in transactions, crypto lending is expanding, reaching \$10 billion in total loan originations in 2020.¹²⁴ The lending practice of CeFi actors in the crypto lending industry is not so different from traditional banks.¹²⁵ CeFi lenders like Celsius and BlockFi serve as a custodian of customer assets, which are lent out to generate interest.¹²⁶ Like "typical financial services companies," CeFi lenders deploy "in-house risk management procedures to match borrowers and lenders, assess creditworthiness, determine interest rates, and custody the assets."¹²⁷

One of the notable differences between traditional consumer loans and CeFi loans is the yield rate. Compared with the national deposit rate of 0.06% for savings

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ *Id.*

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² *Id.*

¹²³ *Id.*

¹²⁴ Shimron, *supra* note 22.

¹²⁵ See Lipton & Livni, *supra* note 24.

¹²⁶ Shimron, *supra* note 22.

¹²⁷ *Id.*

accounts,¹²⁸ CeFi lenders have offered a very high interest rate for depositors—BlockFi offering 9.25%,¹²⁹ Coinbase 4%¹³⁰ before their shutdown.¹³¹ The pool of crypto assets from depositors seeking high yield rates provides an opportunity for traders and institutions to borrow and make profits—some use cases include avoiding capital gains tax by borrowing instead of selling crypto assets for fiat currencies, taking long or short positions with borrowed funds, and engaging in price arbitrage based on the price difference across crypto exchanges.¹³² Standing between lenders and borrowers of cryptocurrencies, CeFi actors receive commissions from the profit they generate from lending.¹³³ Although cryptocurrencies in CeFi lending may be decentralized—as no central bank or entity mints them¹³⁴—CeFi actors function similar to banks¹³⁵ with centralized management teams.¹³⁶

2. DeFi Lending

DeFi lending projects purport to eliminate intermediaries completely with blockchain technology.¹³⁷ DeFi projects make use of computer protocols—a set of rules in coding¹³⁸—to automate the lending process. Prominent protocols in DeFi

¹²⁸ *National Rates and Rate Caps*, FDIC (Feb. 22, 2022), <https://www.fdic.gov/resources/bankers/national-rates/index.html#footnote> [<https://web.archive.org/web/20220307020244/https://www.fdic.gov/resources/bankers/national-rates/index.html>]

¹²⁹ Ryan Browne, *Peter Thiel-backed crypto start-up BlockFi to pay \$100 million in settlement with SEC, 32 states*, CNBC (Feb. 14, 2022), <https://www.cnbc.com/2022/02/14/crypto-start-up-blockfi-to-pay-100m-in-settlement-with-sec-32-states.html>.

¹³⁰ *Update as of 5pm ET, Friday, September 17th: we are not launching the USDC APY program announced below*, THE COINBASE BLOG (June 29, 2021), <https://blog.coinbase.com/sign-up-to-earn-4-apy-on-usd-coin-with-coinbase-cdad79e5f5eb>.

¹³¹ *See id.*; *see also* BLOCKFI LENDING LLC., Securities Act Release No. 11029, 2022 WL 462445 (Feb. 14, 2022).

¹³² Shimron, *supra* note 22.

¹³³ *Id.*

¹³⁴ *Minting*, COINMARKETCAP, <https://coinmarketcap.com/alexandria/glossary/minting> (last visited Apr. 5, 2023).

¹³⁵ *See* Lipton & Livni, *supra* note 24.

¹³⁶ *See Our Team*, CELSIUS NETWORK, <https://celsius.network/our-team> (last visited Apr. 5, 2023); *see also* *Leadership Team*, BLOCKFI, <https://blockfi.com/team/> (last visited Apr. 5, 2023); *see also* *About Coinbase*, COINBASE, <https://www.coinbase.com/about> (last visited Apr. 5, 2023).

¹³⁷ Shimron, *supra* note 22.

¹³⁸ *What is a protocol?*, COINBASE, <https://www.coinbase.com/learn/crypto-basics/what-is-a-protocol#:~:text=Definition,securely%20exchanged%20on%20the%20internet> (last visited Apr. 5, 2023).

lending include Aave and Compound.¹³⁹ Both Aave¹⁴⁰ and Compound¹⁴¹ are protocols on an Ethereum blockchain. Understanding the DeFi lending process requires more technical information than understanding CeFi, as it does not involve the traditional custody of consumer assets by intermediaries. Instead, peer-to-peer flow of funds that are lent and borrowed is automatically recorded and executed on a blockchain in the form of tokenization¹⁴² and smart contracts.¹⁴³

Ethereum blockchain allows for a program to run on its network called “smart contracts.”¹⁴⁴ Smart contracts are “systems which automatically move digital assets according to arbitrary pre-specified rules.”¹⁴⁵ A simple analogy to smart contracts could be a digital vending machine.¹⁴⁶ Say a vending machine has a logical function, such that money combined with snack selection results in the selected snack being dispensed.¹⁴⁷ On an Ethereum network, a “VendingMachine” smart contract, upon deployment, would automatically dispense a snack if 1ETH (unit of currency) is transferred to the snack owner and if the owner has enough stock of snacks.¹⁴⁸ Just as ordering via a vending machine does not require an intermediary—e.g., a store, a cashier—deploying smart contracts removes the need for intermediaries for executing a contract.¹⁴⁹ Even though Ethereum’s network is maintained by multiple computers,¹⁵⁰ Ethereum could conceptually be understood

¹³⁹ Alex Moskov, *Aave vs. Compound: Which DeFi Lending Platform is Better?*, COIN CENTRAL (June 1, 2021), <https://coincentral.com/aave-vs-compound-defi/>.

¹⁴⁰ See *Aave Protocol Whitepaper V1.0*, GITHUB 1 (Dec. 16, 2020), https://github.com/aave/aave-protocol/blob/master/docs/Aave_Protocol_Whitepaper_v1_0.pdf.

¹⁴¹ Robert Leshner & Geoffrey Hayes, *Compound: The Money Market Protocol*, COMPOUND 2 (Feb. 2019), <https://compound.finance/documents/Compound.Whitepaper.pdf>.

¹⁴² Tokenization is defined as “the process of converting an asset or the ownership rights of an asset to a unique unit called tokens.” Taylor DeJesus, *What Is Tokenization and How Does It Work?*, NASDAQ (Sept. 1, 2022), <https://www.nasdaq.com/articles/what-is-tokenization-and-how-does-it-work#:~:text=Tokenization%20is%20the%20process%20of,ownership%20of%20a%20valuable%20asset.>

¹⁴³ See *Aave Protocol Whitepaper V1.0*, *supra* note 141; see also Leshner & Hayes, *supra* note 142.

¹⁴⁴ *Introduction to Smart Contracts*, ETHEREUM.ORG, <https://ethereum.org/en/developers/docs/smart-contracts/> (last visited Apr. 5, 2023).

¹⁴⁵ Vitalik Buterin, *Ethereum White Paper: A NEXT GENERATION SMART CONTRACT & DECENTRALIZED APPLICATION PLATFORM*, ETHEREUM 1, https://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf.

¹⁴⁶ *Introduction to Smart Contracts*, *supra* note 145.

¹⁴⁷ *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

¹⁵⁰ Ethereum relied on the process called “mining” before its transition into the proof-of-stake algorithm. See *Mining*, ETHHUB, <https://web.archive.org/web/20220917012350/https://docs.ethhub.io/using-ethereum/mining/> (last visited Apr. 5, 2023). See also *Proof-of-Stake*, ETHEREUM.ORG, <https://ethereum.org/en/developers/docs/consensus-mechanisms/pos/> (last visited Apr. 5, 2023).

as a single computer.¹⁵¹ All users access the same data—ledger—and the same computer programs in the form of smart contracts.¹⁵²

Like some other blockchains, the Ethereum blockchain is not maintained by a centralized entity.¹⁵³ DeFi lending protocols are automated programs that facilitate lending among users on an Ethereum blockchain.¹⁵⁴ There are variations in DeFi lending in terms of how lenders and borrowers are matched, how interest rates are calculated, and how assets are transferred via tokenization.¹⁵⁵ But DeFi lending generally takes the form of secured lending, meaning that the collateral of the borrowers will automatically be transferred to the lenders in case of failed repayment.¹⁵⁶

A leading DeFi protocol called the Compound Protocol works in the following manner: An owner of a supported cryptocurrency¹⁵⁷ supplies assets to the “pool” of assets in a market facilitated by the protocol to become a lender.¹⁵⁸ This step requires connecting user’s crypto wallet—which holds the private key to the asset on the blockchain¹⁵⁹—to the Compound Protocol.¹⁶⁰ When users agree to supply their crypto assets to the market, their crypto assets are *tokenized* into cTokens per a predetermined formula.¹⁶¹ Ethereum tokens are user-issued private currency created by smart contracts.¹⁶² Tokens could be used for a special purpose like those used in arcades or public transportation, or they could represent ownership interest in an asset.¹⁶³ Borrowers could tap into the reserves of crypto assets by posting *tokenized* crypto assets as collateral¹⁶⁴ at an interest rate determined by supply and

¹⁵¹ Eric D. Chason, *Smart Contracts and the Limits of Computerized Commerce*, 99 NEB. L. REV. 330, 369 (2020).

¹⁵² *Id.*

¹⁵³ *What is a blockchain?*, COINBASE, <https://www.coinbase.com/learn/crypto-basics/what-is-a-blockchain> (last visited Apr. 6, 2023).

¹⁵⁴ *Decentralized finance (DeFi)*, ETHEREUM, <https://ethereum.org/en/defi/> (last visited Apr. 6, 2023).

¹⁵⁵ See Leshner & Hayes, *supra* note 142; see also *Aave Protocol Whitepaper V1.0*, *supra* note 141. The whitepapers share many of the same elements and core concept of DeFi lending but exhibit differences in tokenization and formulae used.

¹⁵⁶ *Decentralized finance (DeFi)*, *supra* note 155.

¹⁵⁷ See *Market Overview*, COMPOUND, <https://compound.finance/markets> (last visited Apr. 6, 2023). Compound currently supports ETH, DAI, USDC, WBTC, USDT, UNI, BAT, TUSD, COMP, ZRX, WBTC, LINK, MKR, SAI, AAVE, SUSHI, REP, and USDP.

¹⁵⁸ Leshner & Hayes, *supra* note 142, at 2.

¹⁵⁹ *What is a crypto wallet*, COINBASE, <https://www.coinbase.com/learn/crypto-basics/what-is-a-crypto-wallet> (last visited Apr. 6, 2023).

¹⁶⁰ Users carry out the step on <https://app.compound.finance>.

¹⁶¹ Leshner & Hayes, *supra* note 142, at 5. The Formula is: “exchangeRate = (underlyingBalance + totalBorrowBalance_a – reserves_a)/cTokenSupply_a.”

¹⁶² Chason, *supra* note 152, at 364.

¹⁶³ *Id.* at 364–5.

¹⁶⁴ The collateral factor ranges from 0 to 1, meaning that loans must be overcollateralized.

demand.¹⁶⁵ Since the Protocol does not match an individual borrower to an individual lender, lenders can withdraw their funds at any time by converting cTokens back to their cryptocurrency with an accrued interest, unless all the assets are borrowed.¹⁶⁶ Aave Protocol deploys a similar “pool contract” and tokenization, as borrowers can tap into the pool of funds by posting crypto assets as collateral.¹⁶⁷

What distinguishes DeFi from CeFi and traditional finance is its structure of governance.¹⁶⁸ There are three broad categories of governance for DeFi service.¹⁶⁹ First, the DeFi service could be fully centralized. The operators who created the codes behind the service could directly control the codes that execute the DeFi service.¹⁷⁰ Although smart contracts are immutable once deployed,¹⁷¹ they are “upgradable” by separating the proxy contract from the implementation contract using a “delegate call” function on Ethereum.¹⁷² In the alternative, developers can create a new smart contract with a new address and direct the users to use the new one.¹⁷³ Second, the DeFi service could be partially centralized,¹⁷⁴ such as a board of signers controlling a Multi-sig wallet. In a partially decentralized system, signers can honor the token holders’ vote to control the execution of smart contracts after a popular vote by token holders.¹⁷⁵ The forms and the extent of decentralization would vary, as some developers may retain the veto power through large voting powers or the lack of formal or legal obligations to honor the popular votes.¹⁷⁶ Lastly, fully decentralized governance would make use of decentralized autonomous organizations (“DAOs”), where the participants would democratically vote for changes in the protocol which would be “executed as blockchain

¹⁶⁵ Leshner & Hayes, *supra* note 142, at 3–5.

¹⁶⁶ *Id.* at 3.

¹⁶⁷ See *Aave Protocol Whitepaper V1.0*, *supra* note 141, at 1.

¹⁶⁸ Shimron, *supra* note 22.

¹⁶⁹ Nic Carter et al., *Decentralized Finance (DeFi) Policy-Maker Toolkit White Paper*, WORLD ECONOMIC FORUM (June 2022), 9, https://www3.weforum.org/docs/WEF_DeFi_Policy_Maker_Toolkit_2021.pdf.

¹⁷⁰ *Id.*

¹⁷¹ Mehdi Salehi et al., *Not so immutable: Upgradeability of Smart Contracts on Ethereum*, CORNELL UNIVERSITY ARXIV (June 1, 2022), 2, <https://arxiv.org/pdf/2206.00716.pdf>.

¹⁷² Santiago Palladino, *The State of Smart Contract Upgrades*, OPENZEPLIN (Oct. 6, 2020), <https://blog.openzeppelin.com/the-state-of-smart-contract-upgrades/#delegate-calls>; when the user calls a function in the proxy contract storing the real contract, the proxy forwards it to the real contract. When a developer seeks to “upgrade” the smart contract, they simply change the stored real contract address in the proxy contract to another, and users will now interact with the proxy contract forwarding to the new real contract in the background. See also Mehdi Salehi et al., *Not so immutable: Upgradeability of Smart Contracts on Ethereum*, CORNELL UNIVERSITY ARXIV (June 1, 2022), 2, <https://arxiv.org/pdf/2206.00716.pdf>.

¹⁷³ *Id.*

¹⁷⁴ Nic Carter et al., *supra* note 170 at 9.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

transactions, enforced through the consensus mechanisms of the settlement layer.”¹⁷⁷

DeFi projects are generally initiated by centralized entities.¹⁷⁸ In the absence of financial regulation over the governance of DeFi projects, there are no hard-set rules to stop the centralized founder groups from “benefit[ing] insiders at the expense of users of the protocol.”¹⁷⁹ Indeed, some founder groups have demonstrated that an orderly transfer of their power to the community may be possible.¹⁸⁰ However, DeFi actors have the power to shut down, change, and maintain the protocols by themselves at least in the initial stage of development.¹⁸¹

DeFi actors have an option to transfer their decision powers to the community “once the network hits a critical mass of users.”¹⁸² One way to decentralize is to create a governance community called a DAO.¹⁸³ DAO is a decentralized organization built on blockchains where participants, by holding stakes in DAO through governance tokens,¹⁸⁴ could vote on decisions that are self-enforced through smart contracts.¹⁸⁵ Different DeFi actors issue different governance tokens

¹⁷⁷ *Id.*

¹⁷⁸ See *id.*; see also *What is Aave? (AAVE)*, KRAGEN, <https://www.kraken.com/en-us/learn/what-is-aave-lend> (last visited Apr. 6, 2023); see also Rune Christenson, *MakerDAO Has Come Full Circle*, MAKERDAO BLOG (Jul. 20, 2021), <https://blog.makerdao.com/makerdao-has-come-full-circle/>; see also Rahul Nambiampurath, *What is 88mph?*, <https://thedefiant.io/what-is-88mph> (last visited Apr. 6, 2023).

¹⁷⁹ Francesca Carapella et al., *Decentralized Finance (DeFi): Transformative Potential & Associated Risks*, Finance and Economics Discussion Series 2022-057, WASHINGTON: BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM, 22, <https://www.federalreserve.gov/econres/feds/files/2022057pap.pdf>.

¹⁸⁰ See Cryptopedia Staff, *Compound's Pioneering Community-Led Governance Mechanism*, CRYPTOPEDIA (Jul. 12, 2021), <https://www.gemini.com/cryptopedia/compound-crypto-defi-decentralized-finance#section-compounds-admin-key>. Aave took a course to fully decentralize in 2020. See Foxley, *supra* note 72; for Compound, see Robert Leshner, *Compound Governance is Live*, MEDIUM (Apr. 16, 2020), <https://medium.com/compound-finance/compound-governance-decentralized-b18659f811e0>; for Maker Dao, see Brady Dale, *MakerDAO Foundation Plots Its Own Demise*, COINDESK (Apr. 3, 2020), <https://www.coindesk.com/tech/2020/04/03/makerdao-foundation-plots-its-own-demise/>.

¹⁸¹ *Id.*

¹⁸² Cryptopedia Staff, *Compound's Pioneering Community-Led Governance Mechanism*, CRYPTOPEDIA (Jul. 12, 2021), <https://www.gemini.com/cryptopedia/compound-crypto-defi-decentralized-finance#section-compounds-admin-key>.

¹⁸³ Benedict George, *What Is a Governance Token*, COINDESK (Jan. 12, 2022), <https://www.coindesk.com/learn/what-is-a-governance-token/>.

¹⁸⁴ Governance tokens are cryptocurrencies that serve as voting chips to govern DeFi protocols. See *Governance Token*, COINMARKETCAP, <https://coinmarketcap.com/alexandria/glossary/governance-token> (last visited Apr. 6, 2023).

¹⁸⁵ *Crypto Glossary*, CRYPTOPEDIA, <https://www.gemini.com/cryptopedia/glossary#decentralized-autonomous-organization-dao> (last visited Apr. 6, 2023).

to be used through private sales or initial coin offerings (“ICOs”).¹⁸⁶ Once the power to govern is distributed to the decentralized community that holds the tokens, there would ideally be no centralized decisions like a kill switch, with which an actor can unilaterally shut down the DeFi protocol.¹⁸⁷ Instead, a community of token holders will collectively propose and vote on decisions which would be automatically executed on blockchain by smart contracts.¹⁸⁸ Given the lack of regulatory oversight and industry standards in the decentralization of DeFi platforms, DeFi lending protocols are in various states of decentralization.¹⁸⁹

III. THE SECURITIES REGULATION OF DEFI LENDING PROTOCOLS

DeFi lending platforms are continuing to attract large capital deposits for lending or borrowing.¹⁹⁰ Loan demand hovers around \$20 billion and deposits of Aave, Compound, MakerDAO—the top three DeFi lending platforms—are around \$40 billion as of January 2022.¹⁹¹ Despite the growing volume of lending and subsequent security concerns, none of these DeFi platforms have registered with the SEC.¹⁹² Per the agency, the SEC oversight reaches “a variety of DeFi participants, activities, and assets” because “they involve securities and securities-related conduct.”¹⁹³ As a result, DeFi projects with incentives for promoters and sponsors of lending protocols may fall under the regulatory scope of the SEC.¹⁹⁴

¹⁸⁶ See Leshner, *Compound Governance is Live*, *supra* note 181; see also Foxley, *supra* note 72.

¹⁸⁷ See Robert Leshner, *Set Pause Guardian to Community Multi-Sig*, COMPOUND GOVERNANCE (Aug. 28, 2021), <https://compound.finance/governance/proposals/57>.

¹⁸⁸ For Aave, token holders access <https://governance.aave.com/> where they can propose, vote, and see implementation of the proposal through Aave Improvement Proposals (AIP)—“The framework that formalizes the community intent of improving the Aave Protocol, either in terms of configuration or new functionalities.” See *Aavenomics*, AAVE, <https://docs.aave.com/aavenomics/ecosystem-overview> (last visited April 6th, 2023); see also *Terminology*, AAVE, <https://docs.aave.com/aavenomics/terminology> (last visited April 6, 2023). For Compound, COMP token holders can post a proposal which is then reviewed under the two-day review period and voted for 3 days. If the majority of vote is cast, then the proposal is queued in Timelock for two days before implementation. Users can participate in the process on <https://compound.finance/governance>. See *Governance*, COMPOUND, <https://compound.finance/docs/governance> (last visited April 6, 2023).

¹⁸⁹ See Nic Carter et al., *supra* note 170 at 9; see *Flashpaper*, AAVE, <https://docs.aave.com/aavenomics/flashpaper> (last visited April 6th, 2023); see also Robert Leshner, *Compound Governance*, MEDIUM (Feb. 26, 2020), <https://medium.com/compound-finance/compound-governance-5531f524cf68>; see also Dale, *supra* note 181.

¹⁹⁰ Chris Brookins, *DeFi Lending Platforms Continue To Attract Capital in 2022*, FORBES (Jan. 4, 2022, 4:24pm), <https://www.forbes.com/sites/christopherbrookins/2022/01/04/defi-lending-platforms-continue-to-attract-capital-in-2022/?sh=4ae3e9044e6f>.

¹⁹¹ *Id.*

¹⁹² Caroline A. Crenshaw, *Statement on DeFi Risks, Regulations, and Opportunities*, U.S. SECURITIES AND EXCHANGE COMMISSION (Nov. 9, 2021), https://www.sec.gov/news/statement/crenshaw-defi-20211109#_ftnref12.

¹⁹³ *Id.*

¹⁹⁴ *Id.*

Not surprisingly, the agency has drawn similarities between DeFi lending and P2P lending—the latter of which was brought under the regulation of the SEC.¹⁹⁵

Currently, the SEC seems to have two principal ways to regulate the DeFi lending: (1) regulating DeFi protocols for issuing tokens—unregistered securities—in the manner in the primary market similar P2P lenders like LendingClub¹⁹⁶ and (2) regulating the DeFi protocols under Regulation ATS, defining them as “exchanges.”¹⁹⁷ Each regulation operates under the regulatory scheme established by the Securities Act of 1933¹⁹⁸ and the Exchange Act in 1934.¹⁹⁹ The first measure would require determining whether each DeFi lending involves selling securities,²⁰⁰ treating the DeFi lending market as a primary market for securities. The second measure would require a change in the Exchange Act Rule and considering the DeFi protocols as the secondary market of securities.²⁰¹

However, the difficulty of regulating DeFi protocols under the current regulatory framework is that even when the “lending” itself is defined as a security, it is difficult to know against *whom* to initiate enforcement actions. Consider a fully decentralized DeFi lending protocol which is used to trade or issue unregistered securities: how would the SEC make a decentralized community consisting of millions of people who use the protocol across the globe to “register” each loan before they interact with computer codes that automatically execute the loan? In the absence of a “kill switch” with which a centralized entity could shut down the lending industry,²⁰² a cease-and-desist order would find neither the recipient nor an effective means to shut down the service.

¹⁹⁵ Andrew Asmakov, *'DeFi Will End Poorly' Without Protections: SEC Chair Gary Gensler*, DECRYPT (Oct. 25, 2021), <https://decrypt.co/84332/defi-will-end-poorly-without-protections-sec-chair-gary-gensler>.

¹⁹⁶ *Id.*

¹⁹⁷ *Amendments to Exchange Act Rule 3b-16 Regarding the Definition of “Exchange”;* Regulation ATS for ATSS That Trade U.S. Government Securities, NMS Stocks, and Other Securities; Regulation SCI for ATSS That Trade U.S. Treasury Securities and Agency Securities, SECURITIES AND EXCHANGE COMMISSION (Jan. 26, 2022), <https://www.sec.gov/rules/proposed/2022/34-94062.pdf>.

¹⁹⁸ *Sec. Exch. Comm’n v. W. J. Howey Co.*, 328 U.S. 293, 294 (1946).

¹⁹⁹ 17 CFR § 242.301 (2019).

²⁰⁰ See Blockchain Credit Partners, Release No. 10961, 1-15 (Sec. Exch. Comm’n Aug. 6, 2021).

²⁰¹ See *Amendments to Exchange Act Rule 3b-16 Regarding the Definition of “Exchange”;* Regulation ATS for ATSS That Trade U.S. Government Securities, NMS Stocks, and Other Securities; Regulation SCI for ATSS That Trade U.S. Treasury Securities and Agency Securities, *supra* note 198.

²⁰² See Robert Leshner, *Set Pause Guardian to Community Multi-Sig*, COMPOUND GOVERNANCE (Aug. 28, 2021), <https://compound.finance/governance/proposals/57>; see also *The Transfer of MKR Token Control to Governance: The Final Step*, MAKERDAO BLOG (Mar. 25, 2020), <https://blog.makerdao.com/the-transfer-of-mkr-token-control-to-governance-the-final-step>.

Of course, the question above assumes that DeFi lending projects are decentralized, devoid of any centralized actor who could register the loans. However, many “DeFi” projects are still run by individuals who “aren’t very decentralized at all.”²⁰³ The SEC shut down DeFi Money Market (“DMM”) which offered crypto holders an opportunity to earn interest on their assets in 2021.²⁰⁴ DMM founders issued governance tokens called DMG tokens, allowing users to participate in decentralized governance over some decisions by getting those tokens in an ICO or secondary trading on crypto exchanges.²⁰⁵ The business venture of DeFi Money Market, whose name was chosen “to evoke the idea of a decentralized money market,” ended when the SEC shut down the service with a traditional cease-and-desist order to centralized actors named as Respondents in the order.²⁰⁶

A. Centralized Risks in DeFi Lending Market

The call for regulation in the crypto market did not merely arise from disdain or distrust of new technologies.²⁰⁷ As the SEC Chief Gensler noted, the need for regulation over the crypto market arises from the goal of “protect[ing] investors in this growing and volatile sector.”²⁰⁸ Per Senator Warren, DeFi is “where the scammers and the cheats and the swindlers mix among part-time investors and first-time crypto traders” as “the regulation is effectively absent.”²⁰⁹ Among many risks involved with DeFi lending, rug pulls are infamous schemes associated with the centralized characteristic of DeFi lending.²¹⁰ Rug pulls are exit scams in which a centralized entity creates a protocol, lures crypto owners to deposit their funds to a liquidity pool, and uses backdoors in the smart contract to drain the pool and exit “without a trace.”²¹¹ Even when DeFi developers lack the intention to pull the rug, their abrupt exit from the projects they created²¹² or deceptive promotion and operation of DeFi projects²¹³ could cloud the future of DeFi.

²⁰³ Davis Z Morris, *Lassoing a Stallion: How Gary Gensler Could Approach DeFi Enforcement*, COINDESK (Oct. 22, 2021), <https://www.coindesk.com/policy/2021/10/21/lassoing-a-stallion-how-gensler-could-approach-defi-enforcement/>.

²⁰⁴ Blockchain Credit Partners, *supra* note 201 at 9.

²⁰⁵ *Id.* at 8.

²⁰⁶ *Id.* at 1, 4.

²⁰⁷ See Lipton & Livni, *supra* note 24.

²⁰⁸ *Id.*

²⁰⁹ Wright, *supra* note 63.

²¹⁰ Eli Tan, *DeFi Lending: 3 Major Risks to Know*, COINDESK (Jul 13, 2021), <https://www.coindesk.com/learn/2021/07/13/defi-lending-3-major-risks-to-know/>.

²¹¹ *Id.*

²¹² Sebastian Sinclair, *DeFi Star Developer Andre Cronje Calls It Quits*, BLOCKWORKS (Mar. 7, 2022), <https://blockworks.co/defi-star-developer-andre-cronje-calls-it-quits/>.

²¹³ Blockchain Credit Partners, *supra* note 201 at 1–15.

1. Case Study: DeFi Money Market

The SEC’s cease-and-desist order to the actors behind DMM illustrates the risk of centralization in DeFi projects amid the absence of regulatory oversight. The DeFi protocol in question was a part of a plan by businessmen who served as officers of a private company in Florida.²¹⁴ The entrepreneurs hired programmers to write the smart contracts that offered investors a way to earn passive interest on their crypto assets.²¹⁵ They issued two types of tokens—mTokens and DMG tokens.²¹⁶ When users transfer their crypto assets to DMM’s addresses on Ethereum blockchain, they would be issued mTokens in exchange per smart contract; then, DMM would convert some assets to invest in real-world assets such as car loans and deliver the profit back to the investors who could redeem their mTokens to their crypto assets.²¹⁷ While profit-generating business would be run by the Respondents, DMG token holders would be able to vote on certain non-core business decisions such as changing “digital assets to accept from investors.”²¹⁸ Yet, significant fluctuations in the digital asset value hindered their business plan to generate enough income from real-world asset investment, and the respondents falsely claimed that “DMM assets generated interest” when they were “personally funding payments to redeem[] mToken holders.”²¹⁹

The Respondents’ scheme came to an end when the entrepreneurs behind DMM “ceased offering and selling mTokens by disabling the DMM website and redirecting website visitors to a page where they could redeem outstanding mTokens.”²²⁰ The DMG tokens used for the governance of DMM’s DeFi protocols were not dead but were *functionally dead* as DMM was no longer producing interest using mTokens.²²¹

DMM’s centralized failure is sharply contradicted by its promise of decentralization that sought to “mitigate centralized governance risk” over time.²²² In a 2021 medium post, DMM Foundation introduced DMG governance as the centerpiece of “gradual decentralization” that would “engender broad participation and mitigate centralized governance risk.”²²³ It outlined that DMG Governance

²¹⁴ *Id.* at 4.

²¹⁵ *Id.* at 2.

²¹⁶ *Id.*

²¹⁷ *Id.* at 4–7.

²¹⁸ *Id.* at 10.

²¹⁹ *Id.* at 11.

²²⁰ *Id.* at 9.

²²¹ The tokens live on Ethereum blockchain as they belong to respective owners but would trade at a very low volume given the loss of trust in the project backing those tokens.

²²² DMM Foundation, *DeFi Money Market (DMM): DMG Governance Token*, MEDIUM (Jun. 15, 2020), <https://medium.com/dmm-dao/defi-money-market-dmm-dmg-governance-token-491c9a62c6bf>.

²²³ *Id.*

tokens were to be distributed in the following manner: thirty percent would be sold in public sales; another thirty percent would be “reserved to ecosystem developers, partners, and integrations with other protocols;” lastly, forty percent would be distributed to “DMM Foundation for continued development, support, and other general corporate purposes.”²²⁴

The troubling aspect of DMM’s promise of decentralization is that the same promise can also be made by creators of any DeFi protocol, regardless of their intent or the likelihood of success. In fact, such a promise seems a fairly standard practice. For example, Compound’s Vice President of Engineering notes that developers of the protocol seek to “build[] a platform with the efficiency of a close-knit team, and then remov[]e our authority wherever possible.”²²⁵ Compound Labs, Inc., had controlled the administrative rights to “pause supply, borrowing, or liquidation in a market” created by the Compound protocol until the founder of the protocol, Robert Leshner, proposed to transfer it to the hands of COMP token holders.²²⁶ Maker Foundation also made a similar decision, relinquishing its previously centralized control over their MakerDAO protocol to the decentralized community governance in March 2020.²²⁷ Lastly, the Aave team maintained the control over DeFi protocols as an administrator until they handed the control over the AAVE (governance) token holders in October, 2020.²²⁸

Unfortunately, the absence of regulation means that “part-time investors and first-time crypto traders” would not be able to distinguish good actors from the bad ones.²²⁹ Specifically, there exist centralized points of failure in DeFi projects that are not readily apparent to investors today. It is no surprise, then, that the SEC has suggested²³⁰ mandatory disclosure from DeFi actors for investors to make informed decisions.²³¹

²²⁴ *Id.*

²²⁵ Jared Flatow, *Upgrading Compound Governance*, MEDIUM (Oct. 22, 2019), <https://medium.com/compound-finance/upgrading-compound-governance-c56b55a2996c>

²²⁶ Robert Leshner, *Set Pause Guardian to Community Multi-Sig*, COMPOUND GOVERNANCE (Aug. 28, 2021), <https://compound.finance/governance/proposals/57>.

²²⁷ *The Transfer of MKR Token Control to Governance: The Final Step*, MAKERDAO BLOG (Mar. 25, 2020), <https://blog.makerdao.com/the-transfer-of-mkr-token-control-to-governance-the-final-step/>.

²²⁸ Isa Kivlighan, *Aave Admin Key Handover*, MEDIUM (Oct. 28, 2020), <https://medium.com/aave/aave-admin-key-handover-3e09e603d348> [<https://web.archive.org/web/20201029105100/https://medium.com/aave/aave-admin-key-handover-3e09e603d348>].

²²⁹ Wright, *supra* note 63.

²³⁰ Asmakov, *supra* note 196.

²³¹ De Fontenay, *supra* note 44.

2. The Problem of Centralization in Decentralized Governance

Furthermore, DeFi projects may not be “truly” decentralized even when the founders relinquish some or all of their administrative control over to the community. In the beginning stages of DeFi projects, creators—a team of developers and entrepreneurs that might be incorporated as a legal entity—retain control over the protocols.²³² They determine how protocols could be governed and managed, and they have a “kill switch” to “pause supply, borrowing, or liquidation in a market” like Compound.²³³ When they seek to hand over the control to the community, they design and mint governance tokens to distribute them to the community which would exercise voting rights to collectively determine the future of protocols.²³⁴ However, it is the centralized creator group that decides how to distribute the governance tokens.²³⁵ As founders and creators of protocols mint and distribute governance tokens, they could choose to assign a substantial percentage of tokens to themselves or their affiliates.²³⁶ While governance tokens such as AAVE, COMP, and MKR are tradable on exchanges²³⁷ and such tradability indicates possible dilution of centralized holdings over time, it also could mean a centralized actor could acquire the majority of shares over time. With the absence of regulation over the process on decentralization,²³⁸ decentralization could be defined differently by different actors behind DeFi protocols—which may end up poorly as in the case of DeFi Money Market.²³⁹

²³² See Cryptopedia Staff, *Compound's Pioneering Community-Led Governance Mechanism*, CRYPTOPEDIA (Jul. 12, 2021), <https://www.gemini.com/cryptopedia/compound-crypto-defi-decentralized-finance#section-compounds-admin-key>. Aave took a course to fully decentralize in 2020. See Foxley, *supra* note 72; for Compound, see Leshner, *Compound Governance is Live*, *supra* note 181; for Maker Dao, see Dale, *supra* note 181.

²³³ See Robert Leshner, *Set Pause Guardian to Community Multi-Sig*, COMPOUND GOVERNANCE (Aug. 28, 2021), <https://compound.finance/governance/proposals/57>.

²³⁴ See Leshner, *Compound Governance is Live*, *supra* note 181; see also Foxley, *supra* note 73.

²³⁵ In case of Compound, the founder of the protocol outlined its plan to distribute 2,396,307 COMP to shareholders of Compound Labs, 2,226,037 to founders and team, 372,707 to future team members, 4,229,949 COMP to users of the protocol, and 775,000 COMP for “community to advance governance through other means. Leshner, *Compound Governance is Live*, *supra* note 182. Founders of DMM sought to distribute 40% of DMG (governance token for DMM) to DMM Foundation. DMM Foundation, *DMG Public Token Sale Results & Circulating Supply*, MEDIUM (Jun. 27, 2020), <https://medium.com/dmm-dao/dmg-public-token-sale-results-circulating-supply-127b8bc2d3a8>.

²³⁶ *Id.*

²³⁷ Cryptocurrency Prices, Charts, Daily Trends, Market Cap, and Highlights, COINBASE, <https://www.coinbase.com/price/s/listed?query=dmg>.

²³⁸ Wright, *supra* note 64.

²³⁹ Blockchain Credit Partners, *supra* note 201 at 1–15.

B. Regulating Centralized Entities Behind DeFi Lending under the Existing Federal Securities Regulation

This section will provide a brief overview of the SEC's options to regulate DeFi protocols given the risk of centralization in DeFi protocols. As demonstrated in SEC's letter to DMM's founders,²⁴⁰ the SEC could regulate DeFi protocols for issuing tokens—unregistered securities—in the manner in the primary market similar to P2P lenders like LendingClub.²⁴¹ Also, the SEC has recently proposed an amendment to the Exchange Act Rule 3b-16, raising the possibility of defining DeFi protocols as “exchanges” under the securities regulation.²⁴²

1. Applying Securities Registration on DeFi Actors

If there are centralized actors behind DeFi lending protocols, the SEC could attempt to bring the actors under the traditional securities regulation as it did with the P2P lending industry in 2008. If the SEC were to go after DeFi lending protocols in a similar manner, the SEC would consider whether *Howey* applies to the lending protocols. For Prosper, the SEC used the Supreme Court precedent to determine that the notes issued by Prosper were securities under Section 2(a)(1) of the Securities Act.²⁴³ Here, the obvious difference between the P2P lending platform and DeFi protocols is that the latter involves a computer protocol—a set of rules for data transfer among computers, allowing cryptocurrencies to be exchanged online.²⁴⁴ Reflecting on DMM's case, this Note will draw inferences from the application of *Howey* to Prosper by the SEC to note challenges of applying such precedents on DeFi protocols.

Under *SEC v. W. J. Howey Co.*, involving an investment contract, the Supreme Court defined an investment contract as a subset of “security” under the Securities Act as “a contract, transaction or scheme whereby a person [1] invests his money [2] in a common enterprise and [3] is led to expect profits [4] solely from the efforts of the promoter or a third party.”²⁴⁵ Section 5 of the Securities Act requires that an offer or sale of a security to be registered with the SEC.²⁴⁶ The key difference between the P2P lending and DeFi lending is that the latter does not involve a debt instrument issued by banks. As explained in Part II of this Note, the P2P lending before the SEC crackdown had a bank assign a note to the P2P lending platform,

²⁴⁰ *Id.*

²⁴¹ Asmakov, *supra* note 196.

²⁴² *Amendments to Exchange Act Rule 3b-16 Regarding the Definition of “Exchange”;* *Regulation ATS for ATSs That Trade U.S. Government Securities, NMS Stocks, and Other Securities; Regulation SCI for ATSs That Trade U.S. Treasury Securities and Agency Securities*, *supra* note 198.

²⁴³ In the Matter of Prosper Marketplace, Inc., Respondent., Release No. 8984 (Nov. 24, 2008)

²⁴⁴ *What is a protocol?*, *supra* note 139.

²⁴⁵ 328 U.S. 293, 294, (1946).

²⁴⁶ In the Matter of Prosper Marketplace, Inc., *supra* note 244.

which would assign it to a borrower.²⁴⁷ DeFi lending involves smart contracts and tokenization that facilitate a peer-to-peer flow of funds recorded on blockchain rather than chartered banks.²⁴⁸ The SEC’s cease-and-desist order against DMM hints at a possible way to define a “security” in DeFi lending. In the Order, the SEC described how DMM provided a smart contract that converted user deposits of digital assets to interest-bearing mTokens.²⁴⁹ Although mTokens were not used as a debt instrument or a common currency for lending, the SEC defined mTokens as a security sold to people who deposited their crypto assets to smart contracts created by DMM.²⁵⁰ The tokenization is a common mechanism used in DeFi lending to facilitate peer-to-peer flow of funds, when users deposit their crypto assets on their smart contracts.²⁵¹ Also, the SEC noted that governance tokens—a tradable cryptocurrency giving voting rights to holders—could as well be a security under the Howey test in its order against DMM.²⁵²

First, it is possible that there is investment of money when a crypto lender on a DeFi protocol transfers digital assets to a smart contract that executes interest-bearing lending contracts. In the cease-and-desist order on DMM, the SEC noted that the interest-bearing tokens (“mTokens”) minted for user deposit of USDC were “investment of money in the form of digital assets.”²⁵³ This means that the SEC views tokens issued for user deposits of crypto assets could be taken as investment of money under the Securities Act. The SEC could also view the issuance of governance tokens as a security. Giving voting rights to users of a DeFi lending protocol does “not preclude the token from being a security.”²⁵⁴ The SEC claimed that governance tokens could be securities considering “the economic realities underlying a transaction.”²⁵⁵ The governance tokens are not mined like other cryptocurrencies.²⁵⁶ Instead, founders distribute them, and they can be traded for profits.²⁵⁷ Thus, regardless of the disclaimer that the governance token is not a

²⁴⁷ Lo, *supra* note 71, at 89.

²⁴⁸ See *Aave Protocol Whitepaper V1.0*, *supra* note 141; see also Leshner & Hayes, *supra* note 142.

²⁴⁹ Blockchain Credit Partners, *supra* note 201 at 4–5.

²⁵⁰ *Id.* at 10.

²⁵¹ Aave and Compound smart contracts issue tokens—cTokens and aTokens—that generate interest according to platform-specific formulae when users deposit their funds on their smart contracts. See Leshner & Hayes, *supra* note 143, at 5; see also *Aave Protocol Whitepaper V1.0*, *supra* note 141, at 6.

²⁵² Blockchain Credit Partners, *supra* note 201 at 10.

²⁵³ *Id.* at 11.

²⁵⁴ *Id.* at 10.

²⁵⁵ *Id.* (quoting Forman, 421 U.S. at 849).

²⁵⁶ Paul Baker, What Are Governance Tokens and Do They Threaten the Whole Concept of Blockchain?, BAIRESDEV BLOG, <https://www.bairesdev.com/blog/governance-tokens-they-threaten-blockchain/>.

²⁵⁷ *Id.*

security or investment of money, the SEC could determine that a governance token is an investment of money should it bear interest.²⁵⁸

It is also possible that the second prong of *Howey*, “common enterprise” requirement, is met for DeFi protocols. Here, all courts have ruled that horizontal commonality meets the requirement.²⁵⁹ Horizontal commonality “exists when a pool of investors is created whose fortunes are tied to the overall success of the venture.”²⁶⁰ The SEC has not published its detailed legal analysis of “common enterprise” when it sent a cease-and-desist order to DMM.²⁶¹ However, if a protocol collects the crypto deposits in a pool,²⁶² rather than directly match a single lender to a single borrower, the SEC may recognize a horizontal commonality with “a pool of investors is created whose fortunes are tied to the overall success of the venture.”²⁶³

Third, the primary use case of DeFi lending today could meet the expectation of profits element in the *Howey* test. DeFi lending is often touted as a way to generate passive income.²⁶⁴ The last element of the *Howey* test is that the investor’s expectation of profit is based solely on the efforts of others. Here, it could be argued that investors—benefiting from the democratic governance that grants voting rights to change how protocols work—do have an active role in expectation of profits. If investors in a protocol do not make enough profit, they would be able to technically propose an amendment to the protocol and start making profit. However, if the SEC finds that there is a relatively small group of programmers and contributors who wield influence behind the code-writing and protocol change process, they could identify the “others” on whom the investors rely for profit.

²⁵⁸ Blockchain Credit Partners, *supra* note 201 at 10.

²⁵⁹ Chaffee & Rapp, *supra* note 99, at 512.

²⁶⁰ *Id.*

²⁶¹ Blockchain Credit Partners, *supra* note 201 at 9.

²⁶² Compound’s whitepaper notes that “Compound is a protocol on the Ethereum blockchain that establishes money markets, which are pools of assets with algorithmically derived interest rates, based on the supply and demand for the asset;” Aave also makes a similar point, noting “The birth of the Aave Protocol marks Aave’s shift from a decentralized P2P lending strategy (direct loan relationship)” in the whitepaper. See *Aave Protocol Whitepaper V1.0*, AAVE 1 (2020), https://github.com/aave/aave-protocol/blob/master/docs/Aave_Protocol_Whitepaper_v1_0.pdf; see also Robert Leshner & Geoffrey Hayes, *Compound: The Money Market Protocol*, Compound 2 (2019), <https://compound.finance/documents/Compound.Whitepaper.pdf>.

²⁶³ Chaffee & Rapp, *supra* note 99, at 512.

²⁶⁴ Numerous online outlets that introduce DeFi lending have introduced DeFi lending as a way to earn passive income by deposit. See Marsha Prusso, All the Ways to Generate Passive Income With DeFi, *The Defiant* (May 3, 2021), <https://thedefiant.io/all-the-ways-to-generate-passive-income-with-defi/>; see also Andrey Sergeenkov, Top 6 Crypto Passive Income Generators for 2022, *CoinDesk* (Jan. 7, 2022), <https://www.coindesk.com/learn/top-6-crypto-passive-income-generators-for-2021/>.

2. Regulation in the Secondary Market: Regulation ATS

Another way to bring DeFi lending “so far completely unregulated in the U.S.”²⁶⁵ under control is to regulate it under Exchange Act Rule 3b-16 that governs alternative trading systems (“ATs”).²⁶⁶ The SEC hinted at its path in regulating DeFi protocols by proposing an amendment to Exchange Act Rule 3b-16 on January 26, 2022.²⁶⁷ This would require DeFi lending projects to be governed under the registration requirements of being an ATS—with the application of broker-dealer laws and regulations rather than exchange laws and regulations as exempted under Section 5 of the Securities and Exchange Act of 1934.²⁶⁸

Regulation ATS asks a broker-dealer to register with the SEC by filing a Form ATS, which “give[s] general notice of its operations as required under the law.” For compliance, a broker-dealer is responsible for “fees, consumer protection, examination, and books and records.”²⁶⁹ Under 17 CFR § 242.301 (b)(5)(ii)(C), the broker-dealer is responsible to “[m]ake and keep records” about subscribers and report the information on Form ATS-R.²⁷⁰ The costs of compliance “are typically cost prohibitive for startups.”²⁷¹

3. Applying Securities Regulation to DeFi Protocols: Limited Use Cases

The Howey analysis above may, on its face, bring hope to regulators who seek to bring law and order to a growing industry fraught with investor risks. The amendment to Exchange Act Rule 3b-16 also provides additional ammunition to the SEC to bring actors behind DeFi protocols under control.²⁷² However, such measures would only be applicable in limited cases where DeFi protocols are

²⁶⁵ Dave Michaels & Paul Kiernan, *Crypto’s ‘DeFi’ Projects Aren’t Immune to Regulation, SEC’s Gensler Says*, THE WALL STREET JOURNAL (Aug. 19, 2021), <https://www.wsj.com/articles/cryptos-defi-projects-arent-immune-to-regulation-secs-gensler-says-11629365401>

²⁶⁶ Britt Whitesell Biles et al., *SEC Proposes to Redefine “Exchange” - New Definition Could Subject Blockchain Crypto Platforms to SEC Regulation*, JDSUPRA (Mar. 11, 2022), <https://www.jdsupra.com/legalnews/sec-proposes-to-redefine-exchange-new-3664621/>.

²⁶⁷ *Amendments to Exchange Act Rule 3b-16 Regarding the Definition of “Exchange”; Regulation ATS for ATs That Trade U.S. Government Securities, NMS Stocks, and Other Securities; Regulation SCI for ATs That Trade U.S. Treasury Securities and Agency Securities*, *supra* note 198.

²⁶⁸ Wulf A. Kaal & Samuel Evans, *Blockchain-Based Securities Offerings*, 20 U.C. Davis Bus. L.J. 89, 94 (2019).

²⁶⁹ *Id.*

²⁷⁰ 17 C.F.R. § 242.301 (2019).

²⁷¹ Kaal & Evans, *supra* note 269, at 94.

²⁷² Biles et al., *supra* note 267.

essentially centralized and where lenders and borrowers depend on centralized entities for transactions.²⁷³

As opposed to P2P lenders that continue to provide processes of approval and screening,²⁷⁴ developers of the protocols may seek to “build[] a platform with the efficiency of a close-knit team, and then remov[e] our authority wherever possible.”²⁷⁵ The SEC’s enforcement actions, on the other hand, hold centralized entities responsible for the securities they sell—imposing “at least a few tens of thousands of dollars annually in legal, accounting, and printing costs” on centralized entities.²⁷⁶ The problem of imposing stiff costs on DeFi developers lies in the prohibitive costs of compliance: there would be no incentive to develop DeFi protocols only to spend “tens of thousands of dollars” for compliance²⁷⁷ and decentralize the governance of the protocols. With the prohibitive costs of compliance under either Regulation ATS and Securities Act,²⁷⁸ many, if not all, DeFi actors may simply choose to shut down the service at an early stage of development.²⁷⁹ While the risks of centralization are present in DeFi,²⁸⁰ the SEC’s uniform application of securities regulation to DeFi developers would likely bring an end to the innovative technology for lending that could potentially reduce market frictions.²⁸¹ Also, the SEC actions would have a narrow timeframe to have any enforcement effects on DeFi lending operations. If DeFi lending project founders have already relinquished their options to kill the project—as in Compound’s case, to have an administrative right to “pause supply, borrowing, or liquidation in a market”²⁸²—it would be an impractical ex post measure to send a cease-and-desist

²⁷³ The SEC noted that there was “common enterprise” because lenders and borrowers depended upon a centralized entity, Prosper, for transaction, and that “[a]ll lenders would be negatively affected if Prosper were unable to operate the platform.” Also, the SEC found that lenders had to depend on the efforts of others—Prosper—for investment return. *In the Matter of Prosper Marketplace, Inc., Respondent.*, Release No. 8984 (Nov. 24, 2008), 4. For DMM, the SEC found the centralized entities who issued governance tokens which might have been issued for the purpose of decentralization. Blockchain Credit Partners, *supra* note 201 at 4–5. The SEC has not discussed applicability of Howey and Reves once DeFi protocol is fully decentralized.

²⁷⁴ Verstein, *supra* note 106, at 453.

²⁷⁵ Jared Flatow, *Upgrading Compound Governance*, Medium (Oct. 22, 2019), <https://medium.com/compound-finance/upgrading-compound-governance-c56b55a2996c>.

²⁷⁶ Shurr, *supra* note 75, at 282 n.6.

²⁷⁷ *Id.*

²⁷⁸ See Kaal & Evans, *supra* note 269, at 94; see also Shurr, *supra* note 75, at 282 n.6.

²⁷⁹ This assumes that the actors are still retaining centralized control over the DeFi projects which was the case for Compound and MakerDAO.

²⁸⁰ See Eli Tan, *DeFi Lending: 3 Major Risks to Know*, Coindesk (Jul 13, 2021, 10:30 AM), <https://www.coindesk.com/learn/2021/07/13/defi-lending-3-major-risks-to-know/>.

²⁸¹ Hossein Nabilou & André Prüm, *Central Banks and Regulation of Cryptocurrencies*, 39 REV. BANKING & FIN. L. 1003, 1005.

²⁸² Robert Leshner, *Set Pause Guardian to Community Multi-Sig, Compound Governance, Compound* (Aug. 28, 2021), <https://compound.finance/governance/proposals/57>.

order to the centralized entity that designed but maintains no control over the maintenance of DeFi protocols.

IV. THE PATH FORWARD: REGULATION OF DeFi LENDING PROTOCOLS FOR DECENTRALIZATION

In light of the previous findings, this Note proposes that an alternative regulatory framework is necessary to regulate DeFi lending projects. The alternative framework, however, does not preclude drawing wisdom from banking supervision and securities regulation that have addressed centuries of failures and risks in the financial market. The alternative framework consists of three parts. First, the new framework recognizes the value of decentralization in facilitating a trustless flow of money in society and reducing market frictions. Second, it statutorily grants the power of monitoring and supervision to a new agency to oversee DeFi governance structure and act on “unsafe and unsound” DeFi protocol actions. Third, the framework uses an effective, market-based enforcement mechanism to promote an orderly introduction and maintenance of decentralization.

A. Full Decentralization is not an Illusion, but an Achievable Goal

Some have suggested that “full decentralisation in DeFi is illusory.” The argument notes that centralization is a solution to the “contract incompleteness” where “enterprises are unable to devise contracts that cover all possible eventualities” per Ronald Coase.²⁸³ And as an analogy, DeFi faces the same problem of “‘algorithm incompleteness,’ whereby it is impossible to write code spelling out what actions to take in all contingencies.”²⁸⁴ Hence, the argument relies on a premise that centralization is “inevitable” given such an “incompleteness” problem.²⁸⁵

It is not unimaginable to accept the theory of algorithm incompleteness—should smart contracts encompass every possible scenario that could ever arise, they would never see the light of deployment as developers would spend the rest of their lives drafting new codes. However, algorithm incompleteness does not warrant a conclusion that full decentralization is illusory. In fact, Coase does not suggest that centralization is inevitable in any condition in his paper. Instead, he explains that a firm comes into existence in a specialized exchange economy²⁸⁶

²⁸³ Sirio Aramonte et al., *DeFi Risks and the Decentralisation Illusion*, BIS QUARTERLY REVIEW, 28.

²⁸⁴ *Id.*

²⁸⁵ *Id.* at 21, 27.

²⁸⁶ Coase does not define the term in his paper, but he considers “economic specialisation” and “exchange transactions” in the market economy as the background of the economic problem he is trying to solve, which is “to discover why a firm emerges at all” when those two activities are present. R. H. Coase, *The Nature of the Firm*, 4 *Economica* 16, 386, 388–9 (1937).

because “certain marketing costs are saved.”²⁸⁷ Coase first posits that if individuals each make contracts with one another using a price mechanism²⁸⁸ rather than a firm, there is a cost for each individual to “discover[] what the relevant prices are.”²⁸⁹ Also, there are “[t]he costs of negotiating and concluding a separate contract for each exchange transaction.”²⁹⁰ And in cases where it is more desirable to make long-term contracts than short-term ones, saving the costs of making many short-term contracts and being risk-averse, Coase states that “[a] firm is likely therefore to emerge in those cases.”²⁹¹ Yet, he does not go as far as to claim that centralization is a necessary outcome of those costs involved in contract-making, as the argument against decentralization implies.

Furthermore, we should not hastily conclude that the failures of some DeFi platforms in recent years serve as evidence that full decentralization is an illusion; instead, those failures should be understood in the context of the absence of timely regulatory intervention and supervision. Indeed, market panic and runs are not a unique feature of the DeFi space. Markets fail, and regulators act. The Federal Reserve Act passed in 1913 as a response to the Panic of 1907,²⁹² and Glass-Steagall Act passed “to deal with bank mismanagement.”²⁹³ If DeFi actors fail to achieve full decentralization in the absence of government intervention, the government may have an incentive to regulate them to achieve decentralization.

Indeed, one appeal of decentralization today is eliminating financial intermediaries and risks associated with trusting them—and we have a novel technology that could, in theory, enable trustless transactions. To regulate DeFi lending, we must recognize the value of decentralization in reducing market frictions, risks of centralization, and transaction costs. Yet, the trustless system still suffers from some issues “resembl[ing] those in traditional finance,”²⁹⁴ and technology alone cannot prevent market runs, panics, and frauds without regulation. The correct approach to DeFi lending would be to understand DeFi lending as a novel way to extend credits in society and to relate the ills of DeFi lending today to the absence of government regulation and supervision.

²⁸⁷ *Id.* at 392.

²⁸⁸ Price mechanism is defined as “a system of price determination and allocation of goods by free market forces.” Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/price%20mechanism> (last visited Apr. 28, 2023).

²⁸⁹ Coase, *supra* note 288, 289.

²⁹⁰ *Id.* at 390–391.

²⁹¹ *Id.* at 391–392.

²⁹² Menand, *supra* note 34, at 1001.

²⁹³ Singh, *supra* note 87, at 70.

²⁹⁴ Aramonte et al., *supra* note 284, at 33.

B. Regulating and Maintaining Decentralization in DeFi Lending through Agency Rulemaking, Supervision, and Enforcement

Some argue that “banking regulation and supervision” could serve as a “precept” in its regulation because “challenges in DeFi resemble those in traditional finance.”²⁹⁵ Yet, banking regulation and DeFi lending regulation have two fundamentally different objectives: the former is supervision of the quasi-public, “premodern independent agencies operated by private actors,”²⁹⁶ while the latter is supervision over private actors in the economy facilitating intermediary-less lending. Then, the extraordinary and intrusive power of banking regulation may seem unwarranted in the context of DeFi lending.

However, selective modeling of the bank regulation and supervision powers could equip the federal government with the power to regulate the elusive industry of DeFi—purporting to do away with the concept of intermediary—in the most effective manner. One way is for DeFi regulators to mandate the founders of new DeFi lending projects to register with the agency which would promulgate rules on the decentralization process. For example, the agency could promulgate rules on the issuance and proportion of governance tokens that founders could claim, mechanisms to update smart contracts to comply with government regulations, and the period of time for full decentralization to be achieved. The agency would be able to impose rules on existing DeFi lending projects and steer them in the direction of full decentralization, as most DeFi projects are currently managed by centralized actors.²⁹⁷ For instance, if the founder and affiliates hold governance tokens that are above the amount the rule permits, they could be forced to sell the governance tokens they currently own.

Also, the agency could supervise the DeFi lending projects with Glass-Steagall Act’s standard of safety and soundness, with rating and report systems on the safety and soundness of DeFi lending protocols. The incredible discretion of regulators in interpreting the standard of safety and soundness in Glass-Steagall Act of 1933, as Congress purposely left it in ambiguity “to evolve with the changing expectations,”²⁹⁸ would allow DeFi regulators to flexibly supervise the codes behind the lending and governance structure to be written, amended, and maintained over time. The regulators could consider factors such as the degree of centralization of the project, vulnerabilities of the codes in audits, feasibility of plans for decentralization, and actual implementation of the promised changes over time in rating the projects, like the CAMELS ratings.

²⁹⁵ *Id.*

²⁹⁶ Menand, *supra* note 34, at 978.

²⁹⁷ Olga Kharif, *Crypto Exchange Gets Millions After Copy-Paste of a Rival’s Code*, Bloomberg (Sept. 11, 2020, 2:48 PM), <https://www.bloomberg.com/news/articles/2020-09-11/come-to-jesus-moment-for-crypto-finance-apps-rocks-valuations>.

²⁹⁸ *Id.*

It may be argued that CAMELS-like ratings are incompatible with DeFi regulation as they “are provided to the institution's board of directors and management for their confidential use,” implying centralization and secrecy from the public.²⁹⁹ The ratings, however, would find uses in fully centralized, partially decentralized, and fully decentralized DeFi lending platforms. As explained in Part II, operators who created the DeFi service could directly control the codes executing the DeFi service in fully centralized DeFi service.³⁰⁰ As regulators extend their supervisory scope to the fully centralized DeFi service in its inception, they would be able to guide the operators of the service to devise a feasible and secure decentralization plan and supervise their plan over time with the rating system. For partially decentralized DeFi platforms with boards of signers controlling Multisig wallets,³⁰¹ regulators could place each board in charge of working with the regulators who would assign ratings to the project, similar to the manner in which they supervise banks. In addition to the signers, regulators could also supervise those who retain veto power through large voting powers or the lack of formal or legal obligations to honor the popular votes.³⁰² For the fully decentralized platforms, where the participants would democratically vote for changes in the protocol which would be “executed as blockchain transactions, enforced through the consensus mechanisms of the settlement layer,”³⁰³ regulators could continue to supervise players who make significant contributions to the project and consider making the ratings public: investors, borrowers, and lenders of DeFi platforms would be able to make better informed decisions with public information on the degree of centralization and security of the project.

Lastly, the federal agency could obtain enforcement power over DeFi lending platforms in two ways. First, the federal agency could pursue enforcement actions against actors who engage in insider trading or deceptive marketing. In at least the centralized and partially decentralized state of DeFi lending, regulators would be able to pursue enforcement actions to ban certain individuals from DeFi industry and cease and desist their operation in the manner similar to ones issued by bank regulators.³⁰⁴ Second, the agency could bring decentralized platforms under

²⁹⁹ Fed. Deposit Ins. Corp. and Bd. of Governors of the Fed. Reserve Sys., *Request for Information on Application of the Uniform Financial Institutions Rating System*, Federal Register (Oct. 31, 2019), 84 Fed. Reg. 211 <https://www.federalregister.gov/documents/2019/10/31/2019-23739/request-for-information-on-application-of-the-uniform-financial-institutions-rating-system>.

³⁰⁰ Nic Carter et al., *supra* note 170 at 9.

³⁰¹ *Id.*

³⁰² *Id.*

³⁰³ *Id.*

³⁰⁴ The OCC could pursue a broad range of enforcement actions such as “requir[ing] the bank to achieve its minimum capital requirement,” “requir[ing] a bank or IAP to cease and desist from unsafe or unsound practice or violation,” and “prohibiting an IAP from any participation, in any manner, in the conduct of the affairs of any insured depository institution.” *Enforcement Action Types*, THE OFFICE OF THE COMPTROLLER OF THE CURRENCY, <https://www.occ.treas.gov/topics/laws-and-regulations/enforcement-actions/enforcement-action-types/index-enforcement-action-types.html>.

compliance with the power to suspend trading of governance tokens of non-complying DeFi protocols on exchange platforms. Although there may not be centralized actors in a sufficiently decentralized DeFi lending protocol governance, the agency's threat of delisting the governance tokens would have a significant impact on how the community collectively votes and executes changes requested by the agency. As such a drastic measure could wipe out the value of tokens that individual investors are holding for trading, it may be used sparingly and as an enforcement mechanism for token holders to vote for amendments to comply with the government regulation.

V. CONCLUSION

DeFi introduces decentralized governance to the lending market traditionally run by financial intermediaries under federal regulations. While investors in DeFi are currently exposed to risks of fraud and market volatility, such risks do not warrant a conclusion that full decentralization is an illusion or an unmanageable risk itself. They also do not warrant uniform application of federal securities laws over DeFi projects. The cost of securities regulations would prohibit the development of DeFi that could potentially eliminate market frictions and risks of centralization in the future. Instead, this Note proposes a new regulatory framework that has three components: (1) recognizing the value of decentralization in lending, (2) creating a federal agency that supervises the process of decentralization, and (3) granting powers to the agency to enforce any policy through sanctions, including suspension of trading of governance tokens on exchange platforms. Although the framework is a novel approach to DeFi lending regulation, it draws its structure partially from the banking system that currently oversees lending by banks in the U.S. With a new regulatory framework, DeFi actors would be incentivized to fully decentralize and maintain stability of their lending platforms, regardless of their degree of decentralization.