

CRYPTO-NATIVE CREDIT SCORE: BETWEEN FINANCIAL INCLUSION AND PREDATORY LENDING

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Decentralized credit scoring has surfaced as a new approach in the ever-evolving consumer credit space. While drawing parallels to traditional credit scoring, decentralized credit scoring sets itself apart by evaluating the financial activity and behavior of users within the blockchain ecosystem. Blockchain technology has been fueling this transformation and serving as the backbone for a diverse range of financial products and services collectively known as decentralized finance (DeFi). DeFi lending, in particular, has been thriving in recent years. However, the pseudonymous nature of blockchain, coupled with the inherent volatility of cryptoassets, has resulted in the absence of reliable means of risk assessment for DeFi loan processing. Consequently, a common practice of relying on overcollateralized loans has emerged, limiting access to DeFi loans only to those with substantial collateral.

In the face of this challenge, enterprising DeFi lending protocols sought a transformative solution and introduced crypto-native credit scoring. By tapping into blockchain data, crypto-native credit scoring aims to bridge the gap in risk assessment, rendering DeFi lending more robust and inclusive. While decentralized credit scoring has been touted as safer, more trustworthy, and equitable, we find that it may not be as promising as it has been made out to be.

This Article demonstrates how DeFi loans were heavily promoted to the same disadvantaged populations that have experienced exclusion and bias in the

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traditional finance system and sought out a more equitable alternative. It argues that crypto-native credit models, which currently operate without regulatory oversight and are met with slow regulatory responses, present new fairness, accountability, and transparency harms that have yet to be identified and addressed by legal commentary. These harms include potential predatory practices by DeFi lending protocols requiring borrowers to overcollateralize their loans to build credit history. This Article further underscores the crucial role of the Consumer Financial Protection Bureau in overseeing decentralized credit scores and the involvement of financial influencers. These influencers, which have been operating without much regulatory attention, are increasingly shaping investment choices, particularly among underprivileged and financially excluded populations.

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INTRODUCTION

The evolution of credit scoring has seen a significant shift¹ from relying on personal relationships to forming structured evaluations of financial trustworthiness.² With the introduction of credit scores in the mid-nineteenth century, the lending industry underwent a revolution that made credit scores a pivotal factor in determining eligibility for access to financial products and services.³ Traditional credit scoring models expanded over time from factoring in only the information that has historically been included in credit reports to incorporating data from additional sources, such as information related to individuals' utility payments and rental history.⁴ However, these models still left out a significant portion of individuals who did not fit within their narrow criteria, commonly known as "credit-thins" or "credit invisibles." This untapped market led to the development of alternative credit scoring models by marketplace lenders, who have leveraged big data and machine learning to assess financial trustworthiness more comprehensively.⁵

The rise of tech-powered alternative credit extended to the parallel world of decentralized finance (DeFi), built on the foundation of blockchain technology that emerged in 2008 with the introduction of Bitcoin.⁶ DeFi aimed to replicate traditional financial (TradFi) services in a manner that democratized financial processes and offered equal opportunities for participation.⁷ Within this ecosystem, DeFi lending platforms have assumed a pivotal role by acting as intermediaries through smart contracts that connect lenders and borrowers in an anonymous

¹ See Mikella Hurley & Julius Adebayo, *Credit Scoring in the Era of Big Data*, 18 YALE J.L. & TECH. 148 (2016).

² See generally Nizan Geslevich Packin & Yafit Lev-Aretz, *On Social Credit and the Right to Be Unnetworked*, 2016 COLUM. BUS. L. REV. 339, 351 [hereinafter Packin & Lev-Aretz, *On Social Credit*].

³ See generally Jonathan Weinberg, "Know Everything That Can Be Known About Everybody": *The Birth of the Credit Report*, 63 VILL. L. REV. 431, 441–48 (2018) (providing a detailed history of the introduction of credit scoring and clarifying that there were multiple credit scoring companies—competing with each other and adopting each other's scoring methods—at least as early as 1864); Pamela Foohey & Sara Sternberg Greene, *Credit Scoring Duality*, 85 LAW & CONTEMP. PROBS., no. 3, 2022, at 101.

⁴ See Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 357–60.

⁵ *Id.*

⁶ See generally Yan Chen & Cristiano Bellavitis, *Blockchain Disruption and Decentralized Finance: The Rise of Decentralized Business Models*, 13 J. BUS. VENTURING INSIGHTS e00151 (2020).

⁷ *Id.*

way.⁸ Nevertheless, the lack of traditional intermediaries and borrower pseudonymity brought forth challenges in enforcing defaults and evaluating creditworthiness, which resulted in overcollateralization becoming the norm.⁹ While overcollateralization provides security, it contradicts the inclusive principles of DeFi and has faced criticism for perpetuating inequality and impeding economic growth.¹⁰

In response to these challenges, some DeFi protocols sought to develop uncollateralized lending and introduced financial trustworthiness assessments into the lending process. This effort gave rise to two decentralized credit scoring models: off-chain credit integration and crypto-native credit scores. The former, which we have written about elsewhere,¹¹ involves importing off-chain credit data, while the latter operates solely on chain and uses on-chain activities like loan repayment and trading to assess a borrower's creditworthiness. This Article focuses exclusively on crypto-native credit scoring.

Crypto-native credit scoring creates an on-chain identity by combining the records of various online engagements and wallets of individual users to create a comprehensive profile of each user, encompassing various on-chain activities.¹² The score is updated in real-time to provide a comprehensive and up-to-date credit profile. Despite being conceived as an alternative to the excluding approach of overcollateralization, crypto-native credit scoring has come under scrutiny for potentially perpetuating another form of financial exclusion:

⁸ See, e.g., Sirio Aramonte, Sebastian Doerr, Wenqian Huang & Andreas Schrimpf, *DeFi Lending: Intermediation Without Information?*, 1 (BIS Bull. No. 57, 2022), <https://www.bis.org/publ/bisbull57.pdf> [<https://perma.cc/D47H-5WWL>] (“Lending platforms are a key part of the decentralised finance (DeFi) ecosystem, but their institutional features mostly facilitate speculation in cryptoassets rather than real economy lending. Due to the anonymity of borrowers, overcollateralisation is pervasive in DeFi lending, which generates procyclicality. Reliance on collateral also limits access to credit to borrowers who are already asset-rich, negating financial inclusion benefits.”). For a general overview of peer-to-peer (P2P) lending platforms, see Moran Ofir & Ido Sadeh, *A Revolution in Progress: Regulating P2P Lending Platforms*, 16 N.Y.U. J.L. & BUS. 683 (2020); and Moran Ofir & Ido Tzang, *An Empirical View of Peer-to-Peer (P2P) Lending Platforms*, 19 BERKELEY BUS. L.J. 175 (2022).

⁹ Jonathan Chiu, Emre Ozdenoren, Kathy Yuan & Shengxing Zhang, *On the Inherent Fragility of DeFi Lending* 1–3 (May 2022) (unpublished manuscript), https://www.snb.ch/n/mmr/reference/sem_2022_06_03_chiu/source/sem_2022_06_03_chiu.n.pdf [<https://perma.cc/FPP5-FLMY>].

¹⁰ Jesus Rodriguez, *DeFi Is the Way Forward, but It Needs to Evolve*, YAHOO! COINDESK (Dec. 27, 2022, 9:37 AM), <https://www.yahoo.com/now/defi-way-forward-needs-evolve-143708062.html> [<https://perma.cc/6V5C-4TLA>].

¹¹ See Nizan Geslevich Packin & Yafit Lev-Aretz, *Decentralized Credit Scoring: Black Box 3.0*, AM. BUS. L. J. (forthcoming 2024) [hereinafter Packin & Lev-Aretz, *Black Box 3.0*], https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4375920 (last visited Jan. 22, 2024).

¹² Brandon Vigliarolo, *DeFi Credit Scores: Coming Soon to a Blockchain Near You*, THE REG. (Aug. 25, 2022, 11:44 AM), https://www.theregister.com/2022/08/25/defi_credit_scores_blockchain [<https://perma.cc/6XCS-LMHG>].

borrowers without sufficient on-chain data may face exclusion from the crypto-native credit system, much like individuals with thin credit histories in TradFi.¹³ Moreover, the reliability of crypto-native credit models has been questioned, as borrowers can selectively choose not to link certain wallets, which allows defaulting borrowers to escape accountability by switching wallets and reapplying for credit.¹⁴

In this Article, we shed light on several challenges arising from crypto-native credit scoring. We start by reviewing the fairness challenges, most of which have been identified and discussed by scholars in the context of alternative TradFi credit scoring schemes.¹⁵ These issues stem from the automated nature of the scoring process and include opacity, errors, and algorithmic biases.¹⁶ We then move to spotlight the troubling possibility of advancing predatory lending practices through the introduction of crypto-native credit scoring. Borrowers are incentivized to take on overcollateralized loans using volatile assets, leading to serious net harm and particularly affecting underserved and underprivileged communities. In other words, while crypto-native credit scoring may hold promise for financial inclusion, it may also end up causing financial harm to the very populations it aims to assist. Contextual factors, including the disproportionate representation of minorities and underserved communities in the crypto market, play a significant role in exacerbating these issues.¹⁷

The potential for predatory lending in this context is not isolated. It is part of a pattern and is closely tied to the historical exclusion of vulnerable populations from the mainstream financial system, in which these groups have been targeted with predatory financial products and services.¹⁸ Despite the promising potential of fintech and blockchain

¹³ See generally Chiu, *supra* note 9; Daniel Kuhn, *The Risks and Benefits of On-Chain Credit Protocols*, COINDESK (May 11, 2023, 1:33 PM), <https://www.coindesk.com/layer2/2022/06/23/the-risks-and-benefits-of-on-chain-credit-protocols> [<https://perma.cc/XRK8-KCMD>] (discussing aspects of crypto-native credit protocols and their approaches to setting credit ratings, including the use of on-chain data).

¹⁴ Vigliarolo, *supra* note 12.

¹⁵ See, e.g., Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 401–07. Some of these issues have also been associated with smart contracts. See Packin & Lev-Aretz, *Black Box 3.0*, *supra* note 11.

¹⁶ See *infra* Section I.D.

¹⁷ See, e.g., Shama Hyder, *How Social Media Is Helping Cryptocurrency Flourish: A Case Study with Jonathan Jadali*, FORBES (Nov. 23, 2020, 5:30 PM), <https://www.forbes.com/sites/shamahyder/2020/11/23/how-social-media-is-helping-cryptocurrency-flourish/?sh=76eddb15717d> [<https://perma.cc/J62Z-TCKE>].

¹⁸ See *infra* Part III.

technology to address financial inclusion and democratize finance,¹⁹ the reality remains that minorities and underserved populations continue to experience discrimination and limited access to credit and financial services. This disparity is particularly evident in the context of blockchain-based financial products, where vulnerable communities have been targeted with predatory financial offerings, including crypto investments, often through social media channels.²⁰ Celebrities and influencers have played a significant role in promoting cryptocurrencies, creating a financial fear of missing out (FOMO) within these communities. However, these endorsements have frequently resulted in negative investment outcomes for individuals in these marginalized groups.²¹

This Article makes a twofold contribution, combining descriptive and normative aspects. On the descriptive side, it offers the first legal analysis of crypto-native credit scores, demonstrating how current regulatory frameworks are inadequate in addressing the distinctive features of crypto-native credit scoring models within the DeFi landscape. On the normative front, against the backdrop of long-standing financial exclusion and the targeting of vulnerable populations with exploitative financial products and services, this Article points to various fairness challenges brought about by crypto-native credit scoring and argues that some models follow this familiar predatory pattern. It then suggests potential regulatory remedies to address these issues.

The Article proceeds as follows. Part I delves into the evolution of credit scoring, examining the trajectory from traditional and alternative models in TradFi to decentralized credit scores generally, and crypto-native credit scores in particular. Part II outlines the social and cultural backdrop that has shaped the growth of decentralized credit scoring. This context involves the historical financial neglect endured by vulnerable populations and the deliberate targeting of these marginalized groups with high-risk financial products, particularly in the context of blockchain-based financial services. Part III showcases how design choices within crypto-native credit scoring can inadvertently replicate the

¹⁹ Nizan Geslevich Packin, *Financial Inclusion Gone Wrong: Securities and Cryptoassets Trading for Children*, 74 HASTINGS L.J. 349, 364 n.62 (2023) (“The fintech industry is characterized by the emergence of new technologies that facilitate connectivity and innovative mobile financial transactions of various kinds.”). However, more connectivity does not necessarily mean more equity and equality, as further discussed below. P2P lending platforms, for example, have negative implications for equality and the efficient distribution of wealth. To fully understand these, one has to take a closer look at the identity of the sharing parties, borrowers, and lenders. See Ronit Levine-Schnur & Moran Ofir, *Who Shares the Sharing Economy?*, 32 S. CAL. INTERDISC. L.J. 593, 623 (2023).

²⁰ See *infra* Section II.B.

²¹ See *infra* Section II.B.

same harmful patterns seen in TradFi. These patterns involve the targeting of disadvantaged communities with risky financial products, ultimately leading to predatory lending practices that exploit vulnerable individuals. Part IV shifts the focus to the regulatory landscape. It assesses **the existing regulatory framework's efficacy in providing meaningful** protections against the potential risks posed by crypto-native credit scoring. This analysis delves into whether this framework adequately addresses and how it should tackle the unique challenges presented by crypto-native credit scoring in the digital FOMO era. A conclusion follows.

I. CONSUMER CREDIT EVOLUTION: TRADITIONAL TO DECENTRALIZED

A. *Alternative Credit Off Chain*

In the mid-twentieth century, credit decisions shifted from relying on personal relationships and subjective judgments toward a structured **assessment of an individual's financial trustworthiness**.²² The Fair Isaac Corporation (FICO) devised a model that factored in limited variables to generate a credit score that quantified creditworthiness.²³ As the use of credit scores grew, additional scoring models that incorporated more extensive data and refined scoring algorithms were introduced. Over the following decades, the use of credit scoring became increasingly widespread, with credit scores becoming a crucial determinant of eligibility for various financial products and services. While initially based solely on information from credit reports, traditional credit scoring models now incorporate additional data, such as utility payment history and rental payment data, in an attempt to provide a comprehensive **assessment of individuals' creditworthiness**.²⁴

The factors considered and their respective importance in traditional credit scoring formulas vary, but one factor that consistently **carries significant weight is an individual's credit history**.²⁵ Some individuals, such as young adults, recent immigrants, and people who rely on cash-based transactions, typically lack a record of significant credit activity. Because they have limited or nonexistent credit history, those

²² See generally Packin & Lev-Aretz, *On Social Credit*, *supra* note 2.

²³ *Id.* at 351.

²⁴ *Id.* at 357–60.

²⁵ *What's in My FICO Scores?*, MYFICO, <https://www.myfico.com/credit-education/whats-in-your-credit-score> [<https://perma.cc/DS2K-G9SB>].

“credit-thins” or “credit invisibles” have been struggling to secure credit, and typically end up operating outside the mainstream financial system.²⁶

Recognizing the financial potential in extending consumer credit to those not measured by mainstream tools, market players are devising methods to serve these groups. And so, within the past two decades, marketplace lenders have introduced more and more alternative credit scoring models.²⁷ The availability of vast amounts of data and the development of sophisticated big data algorithms have allowed for further expansion of credit data sources. An individual’s online footprint—including social networking information and browsing history—is now commonly used by marketplace lenders to gauge financial trustworthiness.²⁸ In recent years, lenders have embraced machine learning and artificial intelligence (AI) tools to further improve their credit scoring predictions and identify additional factors that meaningfully correlate with financial risk.²⁹

The rise of tech-powered alternative credit could be attributed to a couple of key factors: (1) the business opportunity in catering to a financially underserved population, and (2) the pursuit of inclusive alternatives to exclusionary practices in the traditional financial system.³⁰ These same motivations have also spurred the development of alternative credit scoring mechanisms within the parallel financial world of DeFi. In 2008, blockchain technology was introduced as the base for Bitcoin, a

²⁶ These individuals are commonly referred to as “unscorable,” or as having a thin credit file, because they do not have enough information in their credit reports to generate a credit score. Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 355.

²⁷ *Id.* at 357–60.

²⁸ *Id.*; see also Janine S. Hiller & Lindsay Sain Jones, *Who’s Keeping Score?: Oversight of Changing Consumer Credit Infrastructure*, 59 AM. BUS. L.J. 61, 76–77 (2022); Nizan Geslevich Packin, *Social Credit: Much More Than Your Traditional Financial Credit Score Data*, FORBES (Dec. 13, 2019, 12:54 PM), <https://www.forbes.com/sites/nizangpackin/2019/12/13/social-credit-much-more-than-your-traditional-financial-credit-score-data/?sh=11b125655a82>

[<https://perma.cc/FP72-R2JE>]; Lital Helman, Pay For (Privacy) Performance: Holding Social Network Executives Accountable for Breaches in Data Privacy Protection, 84 BROOK. L. REV. 523, 534–35 (2019) (explaining how a large amount of data about users is being collected and analyzed, sometimes without users’ full knowledge or understanding).

²⁹ Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 357–60.

³⁰ See EXEC. OFF. OF THE PRESIDENT, BIG DATA: A REPORT ON ALGORITHMIC SYSTEMS, OPPORTUNITY, AND CIVIL RIGHTS 11–12 (2016), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf [<https://perma.cc/B2CC-3TTA>]; Nizan Geslevich Packin, *In Too-Big-to-Fail We Trust: Ethics and Banking in the Era of Covid-19*, 2020 WIS. L. REV. FORWARD 101, 107 (explaining how traditional financial institutions “do not prioritize financial inclusion, which is why commentators, in addition to industry participants, have argued that FinTech could play a great role in increasing access to financial services for underserved, underbanked, and unbanked populations” (footnotes omitted)); Aaron Chou, Note, *What’s in the “Black Box”?* *Balancing Financial Inclusion and Privacy in Digital Consumer Lending*, 69 DUKE L.J. 1183, 1194 (2020).

type of cryptocurrency, which later opened the door for the creation of other cryptocurrencies.³¹ The ideological foundation of blockchain technology rests on several principles, including the ability to distribute power, facilitate collaborative governance, eliminate intermediaries, increase financial inclusion, safeguard privacy, and guarantee transparency.³² As such, the blockchain has represented a promising tool for the creation of an alternative financial system, where power is not concentrated in centralized entities, but rather distributed across a network of participants.³³ This decentralization, presumably, can provide more equal opportunities for participation and democratize decision-making.³⁴

The marriage of the blockchain's decentralization feature and the motivation to establish an alternative financial system have resulted in DeFi—a network of computer programs commonly known as “dApps” or protocols.³⁵ These dApps, which are set up through a series of self-executing smart contracts,³⁶ aim to replicate traditional financial services, including lending, trading, and asset management, using decentralized systems.³⁷ In accordance with the decentralization goal, DeFi protocols typically operate on open-source code, which allows the community of

³¹ Marco Iansiti & Karim R. Lakhani, *The Truth About Blockchain*, HARV. BUS. REV., Jan.–Feb. 2017, at 121, 121; Moran Ofir & Ido Sadeh, *The Rise of FinTech: Promises, Perils, and Challenges*, in LEADING LEGAL DISRUPTION: ARTIFICIAL INTELLIGENCE AND A TOOLKIT FOR LAWYERS AND THE LAW 267 (Giuseppina D’Agostino, Aviv Gaon & Carole Piovesan eds. 2021).

³² See generally KEVIN WERBACH, *THE BLOCKCHAIN AND THE NEW ARCHITECTURE OF TRUST* 28–31 (2018) (showing how a technology resting on foundations of mutual mistrust can become trustworthy).

³³ See Georgios Dimitropoulos, *The Law of Blockchain*, 95 WASH. L. REV. 1117, 1177 (2020) (“It may be said that a ‘societal economy’ of blockchain has replaced traditional political economy. Namely, a non-State based economy has emerged in which certain societal rules replace the rules of a polity.”).

³⁴ Romex K Jha, *Challenges of Effective Decision Making in Decentralized Autonomous Organizations (DAOs)*, WORLD J. RSCH. & REV., July 2023, at 18, 19. The politics of blockchain and the crypto community have been discussed in a series of book-length publications. See DAVID GOLDBERG, *THE POLITICS OF BITCOIN: SOFTWARE AS RIGHT-WING EXTREMISM* (2016); KATHARINA PISTOR, *THE CODE OF CAPITAL: HOW THE LAW CREATES WEALTH AND INEQUALITY* (2019); FINN BRUNTON, *DIGITAL CASH: THE UNKNOWN HISTORY OF THE ANARCHISTS, UTOPIANS, AND TECHNOLOGISTS WHO BUILT CRYPTOCURRENCY* (2019); see also Lital Helman, *Decentralized Patent System*, 20 NEV. L.J. 67, 93 (discussing the characteristics of blockchains and considering their applicability in the context of the patent record).

³⁵ See generally Chris Brummer, *Disclosure, Dapps and DeFi*, 5 STAN. J. BLOCKCHAIN L. & POL’Y 137, 140–43 (2022) (providing an overview of DeFi and a brief overview of blockchains, protocols, and smart contracts).

³⁶ Lauren Henry Scholz, *Algorithmic Contracts*, 20 STAN. TECH. L. REV. 128, 147 (2017).

³⁷ See *Ethereum-Powered Tools and Services*, ETHEREUM (Sept. 21, 2023), <https://ethereum.org/en/dapps> [<https://perma.cc/WBX5-USK7>].

users to govern and contribute to its development and functionality.³⁸ DeFi governance can be fully centralized, partially centralized, or fully decentralized.³⁹ In fully centralized governance, the operators directly control the executing codes.⁴⁰ Partially centralized governance involves “a board of signers controlling a Multi-sig wallet,” which makes decisions based on token-holder votes.⁴¹ Fully decentralized governance utilizes decentralized autonomous organizations (DAOs),⁴² where participants vote on protocol changes enforced through blockchain transactions and consensus mechanisms.⁴³

The cryptocurrency market experienced a surge in valuations, surpassing three trillion dollars in 2021.⁴⁴ DeFi protocols, together with centralized finance (CeFi)⁴⁵ platforms, have hundreds of millions of users around the globe.⁴⁶ A December 2022 industry research report showed

³⁸ Sean Kwon, Note, *Regulation of Defi Lending: Agency Supervision on Decentralization*, 24 COLUM. SCI. & TECH. L. REV. 379, 385 (2023).

³⁹ *Id.* at 396–97.

⁴⁰ *Id.* at 396.

⁴¹ *Id.*

⁴² Carla L. Reyes, Nizan Geslevich Packin & Benjamin P. Edwards, *Distributed Governance*, 59 WM. & MARY L. REV. ONLINE 1, 4–5 (2017), <https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1003&context=wmlronline> [<https://web.archive.org/web/20221006051111/https://scholarship.law.wm.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1003&context=wmlronline>] (describing DAOs); Carla L. Reyes, *If Rockefeller Were a Coder*, 87 GEO. WASH. L. REV. 373, 414–16 (2019) (explaining how DAOs could organize as business trusts).

⁴³ See Kwon, *supra* note 38, at 396–97.

⁴⁴ Nicole Bobovich, *Analyzing Key Events & Causal Factors Impacting Cryptocurrency Lending Rates 4* (May 2023) (B.S. thesis, University of Pennsylvania); Sophie Kiderlin, *There Are Just Six Bitcoin Billionaires in the World, New Crypto Super-Rich Report Says*, CNBC (Sept. 6, 2023, 1:09 AM), <https://www.cnbc.com/2023/09/06/six-bitcoin-btc-billionaires-in-the-world-new-crypto-super-rich-reportsays.html> [<https://perma.cc/45Y5-E8T9>] (reporting that “425 million people use crypto, according to Henley & Partners’ Crypto Wealth Report”).

⁴⁵ Within the cryptocurrency industry, the term CeFi refers to entities that provide a range of services, operate within the traditional framework, and are subject to regulatory oversight. Typically, these entities comply with know-your-customer (KYC) and anti-money laundering (AML) processes. See, e.g., Roomy Khan, *Crypto Industry Is Going Through Growing Pains—Maturing into a Robust Ecosystem*, FORBES (Dec. 19, 2022, 8:05 AM), <https://www.forbes.com/sites/roomykhan/2022/12/19/crypto-industry-is-going-through-growing-pains--maturing-into-a-robust-ecosystem/?sh=1a96cdda4fb2> [<https://perma.cc/HV7F-RN7B>]. CeFi platforms function like banks for cryptocurrencies, providing a range of services including exchanges, digital currency payments, and lending platforms. See Eric Lipton & Ephrat Livni, *Crypto’s Rapid Move into Banking Elicits Alarm in Washington*, N.Y. TIMES (Nov. 1, 2021), <https://www.nytimes.com/2021/09/05/us/politics/cryptocurrency-banking-regulation.html> [<https://web.archive.org/web/20211102091325/https://www.nytimes.com/2021/09/05/us/politics/cryptocurrency-banking-regulation.html>].

⁴⁶ *Number of Identity-Verified Cryptoasset Users from 2016 to June 2023*, STATISTA (July 2023), <https://www.statista.com/statistics/1202503/global-cryptocurrency-user-base> [<https://perma.cc/YG82-HH8T>].

that, in the first half of 2022, venture capitalists “invested over \$14 billion into 725 crypto [initiatives],” particularly in DeFi protocols.⁴⁷ The report also highlighted a strong growth rate of 44% in DeFi users throughout 2022, reaching a milestone of over five million user wallets in the third quarter.⁴⁸ Institutional involvement has also emerged, with examples including Huntingdon Valley Bank securing loan approval from MakerDAO and J.P. Morgan conducting “a pilot [DeFi] transaction on [the] Aave” lending protocol.⁴⁹ The rapid growth, however, was followed by a period of turmoil and value erosion, which started in mid-2022. This period, known as the “crypto winter,”⁵⁰ witnessed a series of bankruptcies among cryptocurrency businesses.⁵¹ Yet, although crypto fundraising shrank 73% by the end of 2022, funding for DeFi projects rose by 190%, reflecting users’ activity and interest in DeFi projects remaining high.⁵² Similarly, the enthusiasm for digital assets among institutional players has remained strong, with renowned traditional financial firms declaring their initiatives related to digital assets in 2023. These included BlackRock, the largest asset management entity,⁵³ WisdomTree,

47 HENRIQUE CENTIEIRO, JUPITER ZHENG & SCARLETT XIAO, HASHKEY CAPITAL, DEFI ECOSYSTEM LANDSCAPE REPORT 22 (2022), https://capital.hashkey.com/viewerjs-0.5.8/documents/en/capital_insight/HashKey%20Capital%20-%202022%20DeFi%20Ecosystem%20Landscape%20Report.pdf [<https://perma.cc/AU4N-5UKD>].

48 *Id.* at 6, 22.

49 *Id.* at 28; *see also* Bessie Liu, *MakerDAO Opens \$100M DAI Loan to Huntingdon Valley Bank*, BLOCKWORKS (Aug. 23, 2022, 2:28 PM), <https://blockworks.co/news/makerdao-opens-100m-dai-loan-to-huntingdon-valley-bank> [<https://perma.cc/R9D2-SCLA>]; Yueqi Yang, *JPMorgan Executes Its First DeFi Trade Using Public Blockchain*, BLOOMBERG (Nov. 2, 2022, 3:37 PM), <https://www.bloomberg.com/news/articles/2022-11-02/jpmorgan-executes-its-first-defi-trade-using-public-blockchain?leadSource=verify%20wall> [<https://web.archive.org/web/20221102212446/https://www.bloomberg.com/news/articles/2022-11-02/jpmorgan-executes-its-first-defi-trade-using-public-blockchain>].

50 Eric Rosenberg, *Crypto Winter: What It Is, Concerns, FAQs*, INVESTOPEDIA (Aug. 22, 2023), <https://www.investopedia.com/crypto-winter-5496605> [<https://perma.cc/8LQB-U4BA>] (“There are no widely accepted, specific guidelines for how far cryptocurrency prices must fall to be considered a crypto winter. But market leaders and influencers tend to agree publicly when one has begun, as was the case in early 2022.”).

51 CENTIEIRO, ZHENG & XIAO, *supra* note 47, at 3, 15.

52 Lim Yu Qian, *How Much Funding Did Each Crypto Sector Raise Every Year?*, COINGECKO (Mar. 1, 2023), <https://www.coingecko.com/research/publications/crypto-funding-by-sector> [<https://web.archive.org/web/20230306112610/https://www.coingecko.com/research/publications/crypto-funding-by-sector>]; Zach Anderson, *DeFi Funding Skyrockets 190% in 2022*, BLOCKCHAIN NEWS (Mar. 7, 2023, 9:11 AM), <https://blockchain.news/news/defi-funding-skyrockets-190-in-2022> [<https://perma.cc/W6TY-XVAW>].

53 In 2023, BlackRock submitted an application for the registration of a spot bitcoin exchange traded fund (ETF). *See* George Kaloudis, *A Straightforward Explanation for Why Financial Giants Want to Issue a Spot Bitcoin ETF*, COINDESK (June 22, 2023, 1:18 PM), <https://www.coindesk.com/consensus-magazine/2023/06/21/a-straightforward-explanation-for-why-financial-giants-want-to-issue-a-spot-bitcoin-etf> [<https://perma.cc/6Y8R-9T6N>].

Invesco,⁵⁴ Fidelity,⁵⁵ and others. Their initiatives resulted in Bitcoin's summer 2023 value reaching its highest level in over a year, breaking the \$31,000 milestone.⁵⁶

B. *DeFi Lending*

DeFi lending platforms have emerged as a critical component of the DeFi ecosystem, standing alongside decentralized exchanges, asset handling, derivatives, and payment networks.⁵⁷ Decentralized governance is a key aspect of DeFi lending protocols: holders of governance tokens actively participate in the decision-making processes **and hold power to impact protocols' evolution and operation.** But the DeFi lending process demands a deeper technical understanding than CeFi.⁵⁸ DeFi relies on a standalone peer-to-peer flow of funds, which is facilitated through tokenization and smart contracts operating on an Ethereum blockchain.⁵⁹ These automated systems record and execute lending and borrowing transactions.⁶⁰ The loan process requires accurate and up-to-date off-chain data such as confirmation of certain dates or current values of specific cryptoassets. Because smart contracts exist entirely on chain, they receive off-chain information through "oracles"—algorithms that feed relevant off-chain data from predetermined sources into the smart contract.⁶¹

DeFi lending protocols connect anonymous lenders and borrowers using smart contracts that enforce loans in accordance with a

⁵⁴ See *id.* These entities proceeded to file, or refile, applications, with the intent to launch spot bitcoin ETFs.

⁵⁵ Mat Di Salvo, *Fidelity Refiles Bitcoin ETF Application with SEC as BlackRock Renews Hope*, DECRYPT (June 29, 2023), <https://decrypt.co/146432/fidelity-files-bitcoin-etf-application-with-the-sec> [<https://perma.cc/5SUJ-X5QF>].

⁵⁶ See, e.g., MacKenzie Sigalos, Jordan Smith, Talia Kaplan & Kaan Oguz, *Bitcoin Crosses \$31,000, and Galaxy Digital's CIO Shares Crypto Outlook for Q3*, CNBC: CRYPTO WORLD (July 3, 2023, 3:00 PM), <https://www.cnbc.com/video/2023/07/03/bitcoin-31000-galaxy-digital-cio-outlook-q3-crypto-world.html> [<https://perma.cc/8CVP-XPEP>].

⁵⁷ Hendrik Amler et al., *DeFi-ning DeFi: Challenges & Pathway*, 3 CONF. ON BLOCKCHAIN RSCH. & APPLICATIONS FOR INNOVATIVE NETWORKS & SERVS. (BRAINS) 181 (2021).

⁵⁸ Kwon, *supra* note 38, at 394.

⁵⁹ *Id.* at 394–95.

⁶⁰ *Id.*

⁶¹ Oracles connect blockchain networks to smart contracts, passing on information that is necessary for the contracts to be fulfilled. Hugo Benedetti & Sebastián Labbé, *A Closer Look into Decentralized Finance*, in THE EMERALD HANDBOOK ON CRYPTOASSETS: INVESTMENT OPPORTUNITIES AND CHALLENGES (H. Kent Baker, Hugo Benedetti, Ehsan Nikbakht & Sean Stein Smith eds., 2023). For oracles' weaknesses, see Packin & Lev-Aretz, *Black Box 3.0*, *supra* note 11, at 24–26.

predetermined set of rules.⁶² Upon deployment, the lending protocol automatically executes the lending process. Lenders participate by staking their cryptoassets into liquidity pools in return for a deposit rate, while borrowers borrow assets from the lending pool by pledging eligible crypto collateral.⁶³ Borrowers generally pay fees for utilizing the **platform's services. Smart contracts enforce the terms of the loan, such as** its deposit and borrowing rates, and continuously monitor the loan to ensure the value of the collateral remains sufficient to cover the amount borrowed.⁶⁴ DeFi lending displays a range of variations in terms of lender-borrower matching, interest rate calculation, and asset transfer mechanisms through tokenization.⁶⁵

Importantly, assets deposited by users into lending pools in the DeFi ecosystem are not protected by TradFi regulatory frameworks. DeFi lending also currently lacks significant regulation and monitoring.⁶⁶ Because DeFi lending shields borrowers under a veil of pseudonymity, compulsory enforcement of defaults is absent, and defaulters can simply walk away without consequences.⁶⁷ Unlike centralized TradFi systems where borrowers are commonly identified and evaluated for their financial trustworthiness, DeFi borrowers are represented by cryptic hexadecimal addresses that do not guarantee identifiable individuals **behind them. The fact that a wallet's address may be associated with an individual or a protocol fund, or operated by a bot, is a feature and not a bug.** It offers self-sovereign identity,⁶⁸ permissionless interactions,⁶⁹ and

⁶² Jiahua Xu & Nikhil Vadgama, *From Banks to DeFi: The Evolution of the Lending Market*, in ENABLING THE INTERNET OF VALUE: HOW BLOCKCHAIN CONNECTS GLOBAL BUSINESSES 53, 60–62 (Nikhil Vadgama, Jiahua Xu & Paolo Tasca eds., 2022). For potential biases that can be created while connecting anonymous lenders and borrowers, see Shahar Ayal, Daphna Bar-Haim & Moran Ofir, *Behavioral Biases in Peer-to-Peer (P2P) Lending*, in BEHAVIORAL FINANCE: THE COMING OF AGE 367 (Itzhak Venezia ed., 2019).

⁶³ Aramonte, Doerr, Huang & Schrimpf, *supra* note 8. For more on staking, see Nizan Geslevich Packin & Sean Stein Smith, *ESG, Crypto, and What Has the IRS Got to Do with It?*, 6 STAN. J. BLOCKCHAIN L. & POL'Y 1, 37 (2023).

⁶⁴ Aramonte, Doerr, Huang & Schrimpf, *supra* note 8.

⁶⁵ Kwon, *supra* note 38, at 395.

⁶⁶ *Id.* at 398–400.

⁶⁷ Chiu et al., *supra* note 9.

⁶⁸ Self-sovereign identity systems allow users to own and control their digital identities without reliance on centralized authorities. In DeFi, it means users can engage in financial transactions and access services using identities they control, enhancing privacy and user autonomy. See Julieta Cura, *Beyond Passwords: How Self-Sovereign Identity Redefines Online Authentication*, EXTRIMIAN (Dec. 12, 2023, 6:12 PM), <https://extrimian.io/resources/blog/beyond-passwords-how-self-sovereign-identity-redefines-online-authentication> [<https://perma.cc/5JYR-A8RR>].

⁶⁹ DeFi operates on the principle of permissionless open access, where anyone can participate without needing approval from a central authority. This inclusivity and accessibility democratize financial services, allowing wider participation and innovation. See Sam Werner et al., SoK:

composability,⁷⁰ which are central to the DeFi ideology.⁷¹ However, this pseudonymity feature of DeFi lending renders conventional creditworthiness measures infeasible and hinders the creation of reliable risk assessment protocols.⁷² Therefore, DeFi lending predominantly follows a secured lending approach, where protocols heavily depend on collateral that automatically transfers to lenders in the event of default. Each asset used as collateral has a minimum collateral-to-borrow ratio, known as the loan-to-value (LTV) ratio.⁷³ In DeFi lending, the LTV ratio is commonly low—also known as overcollateralization—to ensure that **default is financially unfavorable and to protect lenders' interests.**⁷⁴ Overcollateralization is essential in DeFi lending not only due to the pseudonymity of borrowers, but also because collateral is typically provided in the form of cryptoassets.⁷⁵ Given that the high volatility and opaque nature of cryptoassets amplify risks to lenders, their usage as collateral deviates from the usual collateral standards.⁷⁶ While borrowers have the flexibility to choose acceptable collateral assets, lenders lack control and easy monitoring of the underlying collateral pool, creating an

Decentralized Finance (DeFi) (Sept. 15, 2021) (unpublished manuscript), <https://arxiv.org/pdf/2101.08778.pdf> [<https://perma.cc/A8K4-RUUW>].

⁷⁰ Often likened to “money Legos,” composability in DeFi refers to the ability to seamlessly integrate and build upon existing financial products and services. This leads to rapid innovation and development within the DeFi ecosystem, as new products can be created by combining existing ones in novel ways. *See id.* (manuscript at 1) (describing DeFi “in its ideal form” as “(1) Non-custodial: participants have full control over their funds at any point in time (2) Permissionless: anyone can interact with financial services without being censored or blocked by a third party (3) Openly auditable: anyone can audit the state of the system, e.g., to verify that it is healthy (4) Composable: its financial services can be arbitrarily *composed* such that new financial products and services can be created”).

⁷¹ *See* Julieta Cura, *Why Does the Self-Sovereign Identity Provide a Guarantee of Decentralization for DeFi? Part 1*, EXTRIMIAN (Dec. 12, 2022, 3:44 PM), <https://extrimian.io/resources/blog/why-does-the-self-sovereign-identity-provide-a-guarantee-of-decentralization-for-defi> [<https://perma.cc/VW35-SYZU>] (stating that “DeFi stands on four ideals or principles: non-custodial, permissionless, openly auditable and composable”).

⁷² *See* Lewis Gudgeon, Sam Werner, Daniel Perez & William J. Knottenbelt, *DeFi Protocols for Loanable Funds: Interest Rates, Liquidity and Market Efficiency*, 2 PROC. ACM CONF. ON ADVANCES FIN. TECHS. 92, 93 (2020).

⁷³ Daniel Perez, Sam M. Werner, Jiahua Xu & Benjamin Livshits, *Liquidations: DeFi on a Knife-Edge*, in FINANCIAL CRYPTOGRAPHY AND DATA SECURITY LECTURE NOTES IN COMPUTER SCIENCE 457, 460 (Lecture Notes in Comput. Sci., vol. 12675, Nikita Borisov & Claudia Diaz eds., 2021).

⁷⁴ Lewis Gudgeon, Daniel Perez, Dominik Harz, Benjamin Livshits & Arthur Gervais, *The Decentralized Financial Crisis*, 2020 CRYPTO VALLEY CONF. ON BLOCKCHAIN TECH. 1, 1.

⁷⁵ Abhijay Paliwal, *Analysis Between Different Decentralized Lending and Borrowing Protocols*, 3 J. BUS. ANALYTICS & DATA VISUALIZATION 15, 18 (2022).

⁷⁶ Gudgeon, *supra* note 72, at 93.

information asymmetry.⁷⁷ To mitigate these risks in the DeFi lending ecosystem, overcollateralization has become the standard practice.⁷⁸ If the value of the collateral falls below a certain threshold or default occurs, liquidation procedures are triggered to recover the debt and limit monetary risk by selling off the collateral.

While born out of practical necessity, overcollateralization in DeFi does offer some advantages. Mainly, it allows borrowers to access affordable capital through a transparent process, while granting lenders **improved liquidity and flexibility**. But DeFi's reliance on overcollateralization has faced criticism from both economic and ideological perspectives. Economically, overcollateralization is seen as inefficient as it restricts capital utilization and growth opportunities, particularly when compared to TradFi.⁷⁹ The high collateral requirements often result in underutilized assets, potentially leading to resource wastage. Furthermore, the volatility and price fluctuations inherent in cryptoassets can trigger margin calls and liquidations, resulting in economic losses for both lenders and borrowers.⁸⁰ Additionally, the stringent collateral requirements may discourage qualified and trustworthy borrowers from taking advantage of the benefits offered by DeFi lending and decrease economic activity in the DeFi ecosystem.

From an ideological perspective, DeFi's substantial reliance on high collateral requirements contradicts its mission to democratize finance. While criticizing TradFi for exacerbating inequality, DeFi enthusiasts note that individuals with more assets receive superior financial access, leaving the financially marginalized struggling for loans due to asset scarcity. **Despite aiming to be inclusive, DeFi's overcollateralization perpetuates exclusivity, granting capital solely to those with resources, and fostering a "rich get richer" effect.**⁸¹ It is often households and small businesses that need access to capital that lack sufficient collateral to secure loans.⁸²

⁷⁷ Ye Wang, Patrick Zuest, Yaxin Yao, Zhicong Lu & Roger Wattenhofer, *Impact and User Perception of Sandwich Attacks in the DeFi Ecosystem*, 2022 PROC. CHI CONF. ON HUM. FACTORS COMPUTING SYS. 1, 13.

⁷⁸ Sirio Aramonte, Wenqian Huang & Andreas Schrimpf, *DeFi Risks and the Decentralisation Illusion*, BIS Q. REV., Dec. 2021, at 21, 27.

⁷⁹ Rodriguez, *supra* note 10.

⁸⁰ Perez, Werner, Xu & Livshits, *supra* note 73, at 1; Andrey Sergeenkov, *What Does Liquidation Mean and How to Avoid It?*, COINDESK (Sept. 14, 2021, 9:40 AM), <https://www.coindesk.com/markets/2021/08/13/what-does-liquidation-mean-and-how-to-avoid-it> [<https://perma.cc/K7U9-PJXX>].

⁸¹ NIKHIL RAGHUVEERA, ATL. COUNCIL, DESIGNING DECENTRALIZED FINANCE FOR FINANCIAL INCLUSION 5–6 (2021), <https://www.atlanticcouncil.org/wp-content/uploads/2021/10/Designing-decentralized-finance-for-financial-inclusion.pdf> [<https://perma.cc/PCL3-LCSD>].

⁸² Aramonte, Doerr, Huang & Schrimpf, *supra* note 8, at 5.

Investors and advocates within the DeFi community have acknowledged that in order to unlock the true transformative potential of DeFi and ensure widespread accessibility, equal opportunities and financial inclusion must be prioritized.⁸³ This realization has prompted a growing call within the DeFi community to transcend the heavy reliance on collateral and embrace a deliberate vision of financial inclusivity. DeFi, goes the claim, has the power to revolutionize the financial system by providing individuals with accessible means to participate in and benefit from decentralized finance.⁸⁴

C. *Decentralized Credit Scores: Crypto-Native Credit Scores*

The shift away from overcollateralization in the DeFi landscape has prompted many DeFi protocols to develop robust systems for facilitating uncollateralized loans, including through using real-world assets or NFTs⁸⁵ as collateral, and through incorporating financial trustworthiness assessments into the lending process.⁸⁶ Protocols offering consumer credit⁸⁷ currently gauge creditworthiness using one of two models: off-chain credit integration and crypto-native credit scores. Both credit scoring models share a decentralized nature and the objective of assessing creditworthiness. However, the off-chain integration model involves

⁸³ See Clear Chain Capital, *The Current State of Undercollateralized DeFi Lending—2021*, MEDIUM (July 2, 2021), <https://medium.com/coinmonks/the-current-state-of-undercollateralized-defi-lending-2021-1f84e14527b5> [<https://perma.cc/F8EZ-CE5G>]; *Undercollateralized Loans: The Future of DeFi?*, SELFKEY BLOG (Aug. 25, 2020), <https://web.archive.org/web/20230330071946>; Nikhil Raghuvvera, *DeFi's Quest to Reimagine Finance Must Come from a Community-Based Design*, COINTELEGRAPH (Nov. 13, 2021), <https://cointelegraph.com/news/defi-s-quest-to-reimagine-finance-must-come-from-a-community-based-design> [<https://perma.cc/D7T9-2NL5>]; Andy Mukherjee, *The Centuries-Old Financial System Better Than DeFi*, BLOOMBERG (June 20, 2022, 6:30 PM), <https://www.bloomberg.com/opinion/articles/2022-06-20/defi-can-t-hold-a-candle-to-the-centuries-old-trust-based-system-called-hawala#xj4y7vzkg> [<https://perma.cc/RS8B-G2HW>]; Jack McCarthy, *The Quest for On-Chain Credit*, MIRROR: DECENTDAO (Sept. 1, 2022) <https://mirror.xyz/decent-dao.eth/G6mvF4nUznUPmvlFYe0-jsEEerSPJDDMhYYmY7Vq4oM> [<https://perma.cc/3YKA-WCJA>]; Rodriguez *supra* note 10; Aramonte, Doerr, Huang & Schrimpf, *supra* note 8, at 4–5.

⁸⁴ Raghuvvera, *supra* note 83.

⁸⁵ NFTs are digital assets, which can represent real-world objects like certification credentials, art, in-game items, and videos. See Juliet M. Moringiello & Christopher K. Odinet, *The Property Law of Tokens*, 74 FLA. L. REV. 607, 631 (2022).

⁸⁶ There is a third type of uncollateralized loan, called flash loans, which are taken out and paid back within a single transaction without risk of default because both processes are completed simultaneously. See Dabao Wang et al., *Towards A First Step to Understand Flash Loan and Its Applications in DeFi Ecosystem*, 9 PROC. INT'L WORKSHOP ON SEC. BLOCKCHAIN & CLOUD COMPUTING 23 (2021).

⁸⁷ DeFi lending protocols cater to businesses and individuals. This Article focuses on the latter. For institutional borrowers a third model has also been used—that of a third-party risk assessment.

importing off-chain credit data as a data source, either exclusively or in combination with on-chain data, while the crypto-native model operates entirely on chain, utilizing only on-chain data to evaluate creditworthiness. While the integration of off-chain credit data presents its own unique set of challenges, which we discuss at length elsewhere,⁸⁸ this Article primarily focuses on the challenges associated with the crypto-native model.

A crypto-native credit score creates an on-chain identity by harnessing information about a range of existing on-chain activities such as loan repayment, trading, and governance participation. Combining users' wallets creates a pseudonymous identity that encompasses not only financial transactions, but also NFT holdings, gaming transactions, events' participations, salaries, and governance votes.⁸⁹ Like a traditional credit score that is attached to a borrower's identity and can be used across multiple platforms, the crypto-native score is attached to a borrower's wallet. As the wallet partakes in activities on the blockchain, its data is collected, and the credit score is adjusted in real time.

Spectral, a Web3 startup, has created an infrastructure for credit risk evaluation that allows for the generation of a multi-asset credit risk oracle (MACRO) score, an on-chain equivalent to a traditional FICO score.⁹⁰ The score is determined by feeding data from both DeFi- and non-DeFi-related transactions associated with the borrower's wallet into machine learning models.⁹¹ DeFi transaction history, liquidation history, loan safety margin, age- or time-based factors, general wallet history, market conditions, and credit mix are all factored into the MACRO score.⁹² LedgerScore provides independent crypto credit reports to lenders.⁹³ After confirming the borrower's identity, creditworthiness is ascertained by analyzing their cryptocurrency payments, income, and assets.⁹⁴ Centic

⁸⁸ For more on this, see Packin & Lev-Aretz, *Black Box 3.0*, *supra* note 11.

⁸⁹ Vigliarolo, *supra* note 12. Blockchain events' ticketing is like having a virtual wristband accessible via your phone. Minted on a blockchain, such events' tickets represent digital admission passes for events such as festivals, conferences, concerts, or any other community events. NFT tickets are stored in a crypto wallet. *See, e.g.*, Rachel Wolfson, *Ticketing Platforms Use Blockchain to Engage with Customers Post-Pandemic*, COINTELEGRAPH (Apr. 29, 2021), <https://cointelegraph.com/news/ticketing-platforms-use-blockchain-to-engage-with-customers-post-pandemic> [<https://perma.cc/LR79-JL2V>].

⁹⁰ SPECTRAL, <https://www.spectral.finance> [<https://perma.cc/D7EB-NFJZ>].

⁹¹ *Introduction to MACRO Score*, SPECTRAL (Aug. 10, 2022), <https://blog.spectral.finance/introduction-to-macro-score> [<https://perma.cc/Y94D-FVVT>].

⁹² *Id.*

⁹³ LEDGERSCORE, <https://www.ledgerscore.com> [<https://perma.cc/5EzM-3PL5>].

⁹⁴ *How It Works*, LEDGERSCORE, <https://www.ledgerscore.com/how-it-works> [<https://perma.cc/UJ3J-WC8U>].

also offers crypto credit scores based on on-chain activity.⁹⁵ While Centic states that it strategizes to add off-chain data to its credit scoring models mostly from social networks, the platform currently limits its credit sources to on-chain information about the wallet, such as its total assets, transaction history, and trustworthiness of possessing assets.⁹⁶

While Spectral and LedgerScore offer the equivalent of a traditional credit score on chain but do not operate a lending protocol, some lending protocols do both. Prestare is a now-defunct borrowing protocol, which provided an on-chain credit score that is determined by a default risk score and a historical behavioral risk score.⁹⁷ The default risk score is **determined by the characteristics of a user's supplied and borrowed assets** on Prestare, while the historical behavioral risk score is based on the **address's past behavior**.⁹⁸ Similarly, lending platform ArcX⁹⁹ evaluates **creditworthiness based on users' on-chain borrowing activity**.¹⁰⁰ RociFi, an undercollateralized lending protocol, requires its borrowers to mint a nonfungible credit score token as part of their loan application.¹⁰¹ The RociFi model uses machine learning algorithms to analyze credit risk, fraud risk, and reputation risk.¹⁰² **Interestingly, RociFi's model features a "social recourse": if a borrower defaults, their provided information is shared on the protocol's social media and community channels.**¹⁰³ Telefy's protocol also serves as both a scoring mechanism and a lending platform.¹⁰⁴ Its trustless credit score determines the creditworthiness of **users' wallets and assigns loan terms and interest rates that correspond to the calculated score**.¹⁰⁵ Telefy offers limited information on its scoring model, only mentioning that it factors in what is held in the wallet and

⁹⁵ CENTIC, <https://centic.io> [<https://perma.cc/E7Q3-X4FK>].

⁹⁶ Centic, *Centic—Introduction to Our Scoring Model and Methodology*, MEDIUM (Mar. 30, 2023), <https://medium.com/@centicio/centic-introduction-to-our-scoring-model-and-methodology-61f9eed0a1bb> [<https://perma.cc/8DWY-26NW>].

⁹⁷ PRESTARE, <https://prestare.finance> [<https://web.archive.org/web/20230531043751/https://prestare.finance>].

⁹⁸ *Introduction to Prestare Financial*, MIRROR, <https://mirror.xyz/prestare.eth/DKu-DizIsLVaPfirmZf3GoHOjUURJPLxqipLQo1Xq1hQ> [<https://perma.cc/CAN9-U9SL>].

⁹⁹ ARCX, <https://www.arcxanalytics.com> [<https://perma.cc/5GKY-YHJN>].

¹⁰⁰ *DeFi Credit Score*, ARCX, <https://wiki.arcx.money/application/defi-credit-score> [<https://perma.cc/RS9H-TVN9>].

¹⁰¹ ROCIFI, <https://roci.fi> [<https://perma.cc/TV4Y-MXE3>].

¹⁰² RociFi, *RociFi Protocol Litepaper*, MEDIUM (June 7, 2022), <https://blog.roci.fi/roci-fi-protocol-litepaper-12bd2c67e5ed> [<https://perma.cc/7NZ5-MPNG>].

¹⁰³ *Id.*

¹⁰⁴ TELEFY, <https://tefy.finance/#> [<https://perma.cc/3ABE-VL2Y>]. Tele Lend is the lending service, whereas Tele Score is the scoring product.

¹⁰⁵ TELEFY, *WORLDS FIRST CREDIT SCORE ORIENTED MULTI CHAIN DEFI SOLUTION 4* (2022), <https://tefy.finance/assets/Telefy-whitepaper.pdf> [<https://perma.cc/N3LV-S5M2>].

transactions performed by the user.¹⁰⁶ Importantly, Telefy incentivizes users to invest and loan on its platform, as users who hold Tele coins or stake Tele are promised a higher credit score.¹⁰⁷

D. *New Credit Models—Same Old Problems*

Crypto-native credit scores were developed to address the financial exclusion caused by the reliance on overcollateralization in DeFi lending.¹⁰⁸ Notwithstanding these good intentions, however, crypto-native credit scoring has been criticized for creating another type of financial exclusion.¹⁰⁹ By excluding borrowers who lack sufficient on-chain data, crypto-native credit scoring was said to exhibit exclusion similarly to the experiences of those with thin credit in TradFi.¹¹⁰ Additionally, the reliability of crypto-native credit scores has been questioned, especially because of how borrowers can deliberately choose not to link their additional wallets, thereby compartmentalizing their online activities.¹¹¹ Defaulting borrowers can evade repercussions by simply switching wallets and reapplying for credit, a loophole that fails to generate accountability and undermines the integrity of the credit scoring system.¹¹²

Apart from the financial exclusion concern and authentication difficulties, crypto-native credit scores, which heavily depend on complex scoring algorithms, may also present fairness concerns related to opacity, errors, and biases. Automated credit tools, though widely adopted in TradFi, have faced criticism for their potential to generate inaccurate credit reports.¹¹³ These inaccuracies, which could arise from outdated or unrepresentative data and biased or flawed algorithms,¹¹⁴ may similarly materialize in the context of crypto-native credit scoring. TradFi algorithmic credit scoring has also been criticized for perpetuating

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 7.

¹⁰⁸ See discussion *supra* Sections I.B–I.C.

¹⁰⁹ Rony Roy, *Undercollateralized Loans in DeFi—Why the Future of Lending Is Decentralized?*, CRYPTOKNOWMICS (Apr. 16, 2022), <https://www.cryptoknowmics.com/news/undercollateralized-loans-in-defi-why-the-future-of-lending-is-decentralized> [<https://perma.cc/C7SD-A6KZ>].

¹¹⁰ *Id.*

¹¹¹ Vigliarolo, *supra* note 12.

¹¹² Roy, *supra* note 109.

¹¹³ See, e.g., Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 402–03; Asress Adimi Gikay, *The American Way—Until Machine Learning Algorithm Beats the Law?*, 12 CASE W. RSRV. J.L. TECH. & INTERNET 1, 19–21 (2021).

¹¹⁴ Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 403–07.

discriminatory attitudes and reinforcing social biases, leading to unfair results for certain groups.¹¹⁵ Biased algorithmic design, faulty inputs, and biased training data can also be found in crypto-native credit processes. The use of black box machine learning algorithms, which further adds to the challenge of detecting errors and disparate impacts in credit scoring decisions,¹¹⁶ is endemic to crypto-native credit scoring as well.

As we discuss in detail in Part III, crypto-native credit scoring raises the additional concern of instituting predatory lending practices in DeFi. The predatory lending issue is closely linked to the yearslong targeting of vulnerable populations with predatory financial products and services. To grasp the potential for crypto-native credit scoring to enable predatory lending practices, it is essential to consider the historical financial exclusion experienced by underserved communities in TradFi, which has been accompanied by the targeting of these communities with exploitative financial products and services. This broader context sheds light on the implications of using blockchain-based financial systems by underprivileged communities, as discussed in Part II. In addition, it also raises questions about the impact of decentralized credit scoring on vulnerable individuals and communities, previewing our discussion of predatory lending in Part III.

II. UNDERPRIVILEGED COMMUNITIES: TRADFI TO CEFI TO DEFI

The DeFi movement has included the emergence of decentralized credit scoring as part of the effort to decentralize financial services typically offered by the mainstream financial system. The hope has long been that fintech services could increase financial inclusion¹¹⁷ to previously underserved populations,¹¹⁸ including the millions of U.S.

¹¹⁵ See Nicol Turner Lee, Paul Resnick & Genie Barton, *Algorithmic Bias Detection and Mitigation: Best Practices and Policies to Reduce Consumer Harms*, BROOKINGS INST. (May 22, 2019), <https://www.brookings.edu/research/algorithmic-bias-detection-and-mitigation-best-practices-and-policies-to-reduce-consumer-harms> [<https://perma.cc/EMA3-NWVH>]; Rebecca Kelly Slaughter, Janice Kopec & Mohamad Batal, *Algorithms and Economic Justice: A Taxonomy of Harms and a Path Forward for the Federal Trade Commission*, 23 YALE J.L. & TECH. (SPECIAL ISSUE) 1, 7–10 (2021).

¹¹⁶ Slaughter, Kopec & Batal, *supra* note 115, at 10–13.

¹¹⁷ See, e.g., Kristin Johnson, Frank Pasquale & Jennifer Chapman, *Artificial Intelligence, Machine Learning, and Bias in Finance: Toward Responsible Innovation*, 88 FORDHAM L. REV. 499, 500–01 (2019) (describing how some fintech entities “claim that they will integrate historically excluded individuals into credit markets”).

¹¹⁸ See, e.g., EXEC. OFF. OF THE PRESIDENT, *supra* note 30, at 11–12; Ravi Menon, Managing Dir., Monetary Auth. Sing., *Fintech for an Inclusive Society and a Sustainable Planet*, Remarks at the Singapore FinTech Festival 2020 (Dec. 8, 2020), <https://www.bis.org/review/r201210c.pdf> [<https://perma.cc/2P5E-9E7V>].

households that are defined as unbanked,¹¹⁹ among which Black and Hispanic households are overrepresented.¹²⁰ Focusing on new, cutting-edge technologies, commentators, industry participants, and even lawmakers have wondered about, and even expressed hope regarding, fintech's ability to assist in leveling the playing field and become an equalizing, democracy-enhancing, game-changing tool.¹²¹ And while this rhetoric has gained much popularity in general, it has gotten even more attention in connection with distributed ledger technology (DLT) and blockchain-based products and services,¹²² specifically among crypto enthusiasts.¹²³

¹¹⁹ FED. DEPOSIT INS. CORP., 2017 FDIC NATIONAL SURVEY OF UNBANKED AND UNDERBANKED HOUSEHOLDS 1 (2018), <https://www.fdic.gov/householdsurvey/2017/2017report.pdf> [<https://perma.cc/D6RA-9HV8>].

¹²⁰ *Id.* at 2; see also Julia F. Hollreiser, Note, *Closing the Racial Gap in Financial Services: Balancing Algorithmic Opportunity with Legal Limitations*, 105 CORNELL L. REV. 1233, 1235–36 (2020) (explaining that the racial wealth gap has accelerated in recent decades).

¹²¹ Robinhood advertised itself as a fintech company that democratized investing. See, e.g., Jenna Telesca & Geoffrey Rogow, *Warren Buffett Defends Berkshire's Moves over Pandemic Year*, WALL ST. J. (May 1, 2021, 8:35 PM), <https://www.wsj.com/articles/warren-buffett-set-to-discuss-pandemic-markets-at-berkshires-annual-meeting-11619887342> [<https://perma.cc/X94D-ADVC>]. But see Nathaniel Popper & Matt Phillips, *In GameStop Saga, Robinhood Is Cast as the Villain*, N.Y. TIMES (Feb. 18, 2021), <https://www.nytimes.com/2021/02/18/business/gamestop-robinhood-hearing.html> [<https://web.archive.org/web/20230811123459/https://www.nytimes.com/2021/02/18/business/gamestop-robinhood-hearing.html>] (“‘I worry that the real-world impact of Robinhood is the democratization of financial addiction,’ said Representative Ritchie Torres, a Democrat from New York. ‘Addictive trading might be bad for your customers, but it is good for Robinhood.’”). For a more general overview of this aspect, see Moran Ofir & Ido Sadeh, *More of the Same or Real Transformation: Does FinTech Warrant New Regulation?*, 21 HOUS. BUS. & TAX L.J. 101 (2021).

¹²² See, e.g., Samuel N. Weinstein, *Blockchain Neutrality*, 55 GA. L. REV. 499, 591 (2021) (describing a strategy that “offers the best chance for blockchain networks to realize their potential to make financial-services markets more competitive and more democratic”); Mark Fenwick & Erik P.M. Vermeulen, *Technology and Corporate Governance: Blockchain, Crypto, and Artificial Intelligence*, 48 TEX. J. BUS. L., Spring 2019, at 1, 16 (stating that AI and DLT “have the potential to create a genuinely level playing field, transparency and ‘applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third-party interference’”).

¹²³ See, e.g., Moringiello & Odinet, *supra* note 85, at 655 (describing how “NFTs and cryptocurrencies more broadly are heralded as a way to democratize finance and make markets more accessible and equitable”); CAMPBELL R. HARVEY, ASHWIN RAMACHANDRAN & JOEY SANTORO, *DEFI AND THE FUTURE OF FINANCE* 58–65 (2021); Paul Schrodt, *Cryptocurrency Will Replace National Currencies by 2030, According to This Futurist*, MONEY (Mar. 1, 2018), <http://money.com/the-future-of-cryptocurrency> [<https://perma.cc/7H4T-N24M>]; Kirsten Grind, *Let Me Tell You Some More About Bitcoin—Hello? Hello?*, WALL ST. J. (Jan. 19, 2018), <https://www.wsj.com/articles/mention-bitcoin-one-more-time-and-youre-sleeping-on-the-couch-1516377771> [<https://perma.cc/2XJ6-M5WT>] (quoting Doug Scribner saying that “[Bitcoin is] going to prevent wars, help the unbanked and bring honesty to financial systems”); Stephen Stonberg, *Cryptocurrencies Are Democratizing the Financial World. Here's How*, WORLD ECON. F. (Jan. 22, 2021), <https://www.weforum.org/agenda/2021/01/cryptocurrencies-are-democratising-the-financial-world-heres-how> [<https://perma.cc/YZ7V-WE4T>].

A. *Historic Financial Discrimination*

The discrepancy in wealth and finance among different racial groups in the United States is the result of various factors,¹²⁴ including the historical institution of slavery.¹²⁵ The racial wealth gap has gotten much attention in recent decades, but despite awareness of the problem, a notable gap persists.¹²⁶ Economic inequality, demonstrated by, among other things, Black families possessing a significantly smaller amount of wealth compared to white families, results in greater economic insecurity and limits opportunities for upward mobility.¹²⁷ The American financial regulatory system, which has made specific efforts to address the issue, has yet to provide enough incentives for banks and financial institutions to significantly promote financial inclusion.¹²⁸ In turn, minorities have been alienated, as they have long experienced financial discrimination, been denied access to financial services and credit, and lacked the necessary financial education.

In the 1960s, the Black community voiced its disapproval of economic and financial inequality. The government responded by taking measures to secure equality. In 1964, Congress passed the Civil Rights Act, making race-based discrimination in employment and public places

¹²⁴ Lindsay Sain Jones & Goldburn P. Maynard, Jr., *Unfulfilled Promises of the Fintech Revolution*, 111 CALIF. L. REV. 801, 813–14 (2023) (“There are several factors that are sometimes offered to explain the size of the racial wealth gap, but they only provide partial explanations. These include differences in (1) consumption and savings patterns, (2) income, (3) education, (4) asset holdings, (5) rates of return on assets, (6) access to credit and financial services, (7) the birth lottery and intergenerational transfers, and (8) mass incarceration.” (footnotes omitted)). The research favors structural factors like asset ownership over behavioral factors like family structure and spending patterns. *Id.*

¹²⁵ See, e.g., MEHRSA BARADARAN, *THE COLOR OF MONEY: BLACK BANKS AND THE RACIAL WEALTH GAP* 10–11 (2017); MELVIN L. OLIVER & THOMAS M. SHAPIRO, *BLACK WEALTH/WHITE WEALTH: A NEW PERSPECTIVE ON RACIAL INEQUALITY* 12–13 (10th ed. 2006); Angela Hanks, Danyelle Solomon & Christian E. Weller, *Systematic Inequality: How America’s Structural Racism Helped Create the Black-White Wealth Gap*, CTR. FOR AM. PROGRESS (Feb. 21, 2018), <https://www.americanprogress.org/article/systematic-inequality> [<https://perma.cc/2XYA-8Q8J>] (discussing the racial wealth gap).

¹²⁶ In fact, some argue that it has even accelerated. See BARADARAN, *supra* note 125, at 249.

¹²⁷ See, e.g., ANA PATRICIA MUÑOZ ET AL., *FED. RSRV. BANK OF BOS., THE COLOR OF WEALTH IN BOSTON* (2015), <https://www.bostonfed.org/-/media/Documents/color-of-wealth/color-of-wealth.pdf> [<https://perma.cc/7TUB-SW8F>].

¹²⁸ Nizan Geslevich Packin & Srinivas Nippani, *Ranking Season: Combating Commercial Banks’ Systemic Discrimination of Consumers*, 59 AM. BUS. L.J. 123, 135 (2022) (discussing policies in banking driven by Environmental, Social, and Governance (ESG) and Diversity, Equity, and Inclusion (DEI)).

illegal.¹²⁹ To combat lending and housing discrimination, Congress passed additional laws, including the Fair Housing Act,¹³⁰ the Equal Credit Opportunity Act (ECOA),¹³¹ and the Community Reinvestment Act (CRA).¹³² Nevertheless, discrimination against minorities in the financial industry has been an enduring issue, with minorities often facing impediments in accessing credit and other financial services due to bias and prejudice.¹³³ Businesses owned by minorities have also had difficulty obtaining loans or credit because of discrimination from lenders.¹³⁴

Though the CRA was established with the purpose of stopping redlining¹³⁵—the act of denying loans to people in certain geographic areas¹³⁶—and required banking regulators to inspect the behavior of

¹²⁹ Julia F. Hollreiser, *supra* note 120, at 1241 (recapping financial discrimination in the United States); *see also* Lital Helman, *Innovation Funding & The Valley of Death*, 76 SMU L. REV. 263, 287–88 (2023) (discussing the unequal access to funding by women and minorities in the context of entrepreneurship).

¹³⁰ 42 U.S.C. §§ 3601–3619. *See generally* Charles L. Nier, III & Maureen R. St. Cyr, *A Racial Financial Crisis: Rethinking the Theory of Reverse Redlining to Combat Predatory Lending Under the Fair Housing Act*, 83 TEMP. L. REV. 941, 942 (2011); Jacob S. Rugh & Douglas S. Massey, *Racial Segregation and the American Foreclosure Crisis*, 75 AM. SOCIO. REV. 629, 632 (2010); John P. Reiman, *Foreclosures, Integration, and the Future of the Fair Housing Act*, 41 IND. L. REV. 629, 637 (2008).

¹³¹ 15 U.S.C. § 1691(a)(1).

¹³² For a broad analysis of the CRA, *see* Peter Conti-Brown & Brian D. Feinstein, *Banking on a Curve: How to Restore the Community Reinvestment Act*, 13 HARV. BUS. L. REV. 335 (2023), which contends that the CRA has failed due to supervisory issues and proposes a reform where banks are graded on a curve; Jonathan R. Macey & Geoffrey P. Miller, *The Community Reinvestment Act: An Economic Analysis*, 79 VA. L. REV. 291 (1993), which argues that Congress intended the CRA to prohibit redlining but not racial discrimination; Anthony D. Taibi, *Banking, Finance, and Community Economic Empowerment: Structural Economic Theory, Procedural Civil Rights, and Substantive Racial Justice*, 107 HARV. L. REV. 1463, 1487 (1994), which explains that “[d]espite its weaknesses, the CRA did affect bank behavior”; Peter P. Swire, *The Persistent Problem of Lending Discrimination: A Law and Economics Analysis*, 73 TEX. L. REV. 787 (1995), which explores the desirability of the CRA from an economic perspective; and Kathleen C. Engel & Patricia A. McCoy, *The CRA Implications of Predatory Lending*, 29 FORDHAM URB. L.J. 1571 (2002), which describes the CRA’s impact.

¹³³ *See generally* Keith N. Hylton & Vincent D. Rougeau, *Lending Discrimination: Economic Theory, Econometric Evidence, and the Community Reinvestment Act*, 85 GEO. L.J. 237 (1996).

¹³⁴ *See, e.g.*, Nizan Geslevich Packin, *In Too-Big-to-Fail We Trust: Ethics and Banking in the Era of Covid-19*, 2020 WIS. L. REV. FORWARD 101, 110 (2020) (focusing on PPP loans and stating that “pre-existing financial disparity . . . among other types of racial injustice . . . created more barriers for minority-owners of small businesses to get loans”); Pooja Shethji, Note, *Credit Checks Under Title VII: Learning from the Criminal Background Check Context*, 91 N.Y.U. L. REV. 989, 1000–01 (2016) (“[I]ntentional discrimination may explain some disparities in credit scores.”).

¹³⁵ Steven M. Graves & Christopher L. Peterson, *Predatory Lending and the Military: The Law and Geography of “Payday” Loans in Military Towns*, 66 OHIO ST. L.J. 653, 696 (2005).

¹³⁶ *See, e.g.*, Marion A. Cowell, Jr. & Monty D. Hagler, *The Community Reinvestment Act in the Decade of Bank Consolidation*, 27 WAKE FOREST L. REV. 83 (1992).

depository institutions at intervals, it has proven not to be the anticipated cure-all. The CRA has raised social awareness among bankers,¹³⁷ arguably leading to more branch openings in underserved locations and increased lending to low-income communities,¹³⁸ which in turn has prompted the enactment of other financial laws with a broader fiscal agenda.¹³⁹ However, the CRA has not gone as far as leveling the playing field. In addition, the Consumer Credit Protection Act (CCPA)¹⁴⁰ and the ECOA, which were also specifically designed to address issues of ongoing discrimination, have had significant, yet limited, success in addressing broader economic inequality concerns.¹⁴¹ In response to persisting social inequalities, **and due to public demand and the media's influence**, companies—including financial institutions—have recently started to place more emphasis on corporate social responsibility, Environmental, Social, and Governance (ESG),¹⁴² and Diversity, Equity, and Inclusion (DEI) programs,¹⁴³ taking into account the perspectives of multiple stakeholders.¹⁴⁴ Likewise, institutional investors have begun emphasizing social responsibility, with studies indicating that doing so can provide more than financial justice: this emphasis may also give insight into the

¹³⁷ Yet some have argued that the CRA enforces societal standards on banking institutions and obligates them to serve markets that they consider unprofitable. *See, e.g.*, Macey & Miller, *supra* note 132, at 295.

¹³⁸ Michael S. Barr, *Credit Where It Counts: The Community Reinvestment Act and Its Critics*, 80 N.Y.U. L. REV. 513, 517, 561–66, 623 (2005).

¹³⁹ Housing and Community Development Act of 1977, Pub. L. No. 95-128, § 801, 91 Stat. 1111, 1147 (1977) (codified as amended at 12 U.S.C. §§ 2901–2905); Gramm-Leach-Bliley Act, Pub. L. No. 106-102, 113 Stat. 1338 (1999) (codified as amended in scattered sections of 12 U.S.C. and 15 U.S.C.); Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010) (codified as amended in scattered sections of the U.S. Code).

¹⁴⁰ The CCPA established protections for consumers from financial institutions. For more, see G. Marcus Cole, *Rational Consumer Ignorance: When and Why Consumers Should Agree to Form Contracts Without Even Reading Them*, 11 J.L. ECON. & POL'Y 413, 417 n.8, 462 (2015), which states that the Truth in Lending Act “requires disclosures of basic parameters of any extension of credit by a lender to a consumer.”

¹⁴¹ Packin & Nippani, *supra* note 128, at 132.

¹⁴² Virginia Harper Ho, *Risk-Related Activism: The Business Case for Monitoring Nonfinancial Risk*, 41 J. CORP. L. 647, 650 (2016) (“The term ‘ESG’ is now widely used by institutional investors and investment professionals”); Elizabeth Pollman, *Corporate Social Responsibility, ESG, and Compliance*, in THE CAMBRIDGE HANDBOOK OF COMPLIANCE 662, 666 (Benjamin van Rooij & D. Daniel Sokol eds., 2021); Dana Brakman Reiser & Anne Tucker, *Buyer Beware: Variation and Opacity in ESG and ESG Index Funds*, 41 CARDOZO L. REV. 1921, 1924–25, 1999 (2020).

¹⁴³ *See generally* Stavros Gadinis & Amelia Miazad, *Corporate Law and Social Risk*, 73 VAND. L. REV. 1401 (2020); George S. Georgiev, *The Human Capital Management Movement in U.S. Corporate Law*, 95 TUL. L. REV. 639, 675 (2021).

¹⁴⁴ *See, e.g.*, Paul B. Miller, *Rethinking Corporate Purpose . . . But Not as One Might Expect*, CLS BLUE SKY BLOG (Dec. 23, 2020), <https://clsbluesky.law.columbia.edu/2020/12/23/rethinking-corporate-purpose-but-not-as-one-might-expect> [<https://perma.cc/KJ42-3T5N>].

financial stability and risks of businesses.¹⁴⁵ Yet, without established legal standards, attempts to combat financial discrimination are solely reliant on the private sector's goodwill and commercial objectives.

In connection with the issue of limited access to financial services and credit,¹⁴⁶ commentators have long argued that such access “is a significant step toward individual economic advancement.”¹⁴⁷ Lower-income and minority populations not only encounter limited credit access¹⁴⁸ but also face physical limitations due to a lack of local financial institutions.¹⁴⁹ Having so few banking options in certain areas has made it difficult for people to open bank accounts, acquire loans, and use various financial services that many people can access easily because they reside in places with numerous banking options.

Lastly, lack of financial literacy combined with human bounded rationality may have further contributed to the marginalization of financially disadvantaged populations and minorities.¹⁵⁰ People from disadvantaged backgrounds without access to educational resources may not have the knowledge needed to navigate complex financial systems successfully.¹⁵¹ Lack of knowledge regarding financial matters presents various challenges. For example, errors in credit reports are more frequent than one might think and may lead to credit denials, higher

¹⁴⁵ See, e.g., Robert G. Eccles, Ioannis Ioannou & George Serafeim, *The Impact of Corporate Sustainability on Organizational Processes and Performance*, 60 MGMT. SCI. 2835 (2014) (investigating the effect of sustainability policies on companies).

¹⁴⁶ Many scholars have studied “access to credit.” See, e.g., Anjali Kumar, Mukta Joshi, Loraine Ronchi & Konstantinos Tzioumis, *Measuring Financial Access*, in BUILDING INCLUSIVE FINANCIAL SYSTEMS: A FRAMEWORK FOR FINANCIAL ACCESS 7, 14–30 (Michael S. Barr, Anjali Kumar & Robert E. Litan eds., 2007); Oren Bar-Gill & Elizabeth Warren, *Making Credit Safer*, 157 U. PA. L. REV. 1, 68–69 (2008) (explaining payday loans in low-income areas); Michael Klausner, *Market Failure and Community Investment: A Market-Oriented Alternative to the Community Reinvestment Act*, 143 U. PA. L. REV. 1561, 1571 (1995) (explaining how creditworthy borrowers in low-income areas can be left without access to credit).

¹⁴⁷ Mehrsa Baradaran, *How the Poor Got Cut Out of Banking*, 62 EMORY L.J. 483, 489 (2013).

¹⁴⁸ Regina Austin, *Of Predatory Lending and the Democratization of Credit: Preserving the Social Safety Net of Informality in Small-Loan Transactions*, 53 AM. U. L. REV. 1217, 1256 (2004).

¹⁴⁹ The government can take legal action against banks that refuse to establish branches in minority areas to address the CRA's negative consequences, as they have done before. See Complaint at 5–6, *United States v. Chevy Chase Fed. Sav. Bank*, No. 94-cv-01829 (D.D.C. Aug. 22, 1994).

¹⁵⁰ Susan Block-Lieb & Edward J. Janger, *The Myth of the Rational Borrower: Rationality, Behavioralism, and the Misguided “Reform” of Bankruptcy Law*, 84 TEX. L. REV. 1481, 1529–30 (2006).

¹⁵¹ Private and public sector entities have advocated for financial literacy. See, e.g., Youth Financial Education Act, S. 925, 109th Cong. § 4401(b)(3) (2005); *Improving Financial Literacy in the United States: Hearing Before the S. Comm. on Banking, Hous., and Urb. Affs.*, 109th Cong. (2006) (statement of Ben S. Bernanke, Chairman, Board of Governors of the Federal Reserve System), <https://www.banking.senate.gov/imo/media/doc/bernankel.pdf> [<https://perma.cc/EB44-S5WZ>] (arguing that financial education increases credit standing).

interest rates, or less favorable loan terms.¹⁵² Black borrowers, who may have less financial expertise, could be more vulnerable to errors in their credit reports going unnoticed due to their inability to detect them.¹⁵³ Similarly, disadvantaged populations and minorities also struggle to take advantage of financial opportunities. A 2022 study found that when homes in neighborhoods with a majority Black population are appraised, they are 1.9 times more likely to be appraised at a value lower than the contract price compared to homes in neighborhoods with a majority white population.¹⁵⁴ This in turn causes homes in Black neighborhoods to be valued at approximately 21–23% lower than they would be in non-Black neighborhoods, resulting in a loss of approximately \$162 billion in equity.¹⁵⁵ The decrease in value of homes in majority-Black neighborhoods limits wealth accumulation and wealth inheritance in these neighborhoods.¹⁵⁶ Despite the beneficial potential of financial education programs,¹⁵⁷ they have proven challenging to effectively design.¹⁵⁸

The cryptocurrency space offers another example of the implications of financial illiteracy and bounded rationality on the

¹⁵² See Mikella Hurley & Julius Adebayo, *Credit Scoring in the Era of Big Data*, 18 YALE J.L. & TECH. 148, 155–56 (2017).

¹⁵³ *Id.* at 156; Julia F. Hollreiser, *supra* note 120, at 1249.

¹⁵⁴ Jonathan Rothwell & Andre M. Perry, *How Racial Bias in Appraisals Affects the Devaluation of Homes in Majority-Black Neighborhoods*, BROOKINGS INST. (Dec. 5, 2022), <https://www.brookings.edu/articles/how-racial-bias-in-appraisals-affects-the-devaluation-of-homes-in-majority-black-neighborhoods> [<https://perma.cc/LDX2-F38C>].

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ Some advocate for thoughtful designs for financial education programs. See Al Barbarino, *SEC's Peirce on Crypto Ambitions, GameStop's Lessons*, LAW360 (May 3, 2021, 11:48 AM), <https://www.law360.com/securities/articles/1379758/sec-s-peirce-on-crypto-ambitions-gamestop-s-lessons> [<https://perma.cc/T6QP-5AMJ>]. Others talk about ways to create effective programs. See, e.g., Sergio Alberto Gramitto Ricci & Christina M. Sautter, *Corporate Governance Gaming: The Collective Power of Retail Investors*, 22 NEV. L.J. 51, 63 (2021) (suggesting using gamification); Mike Lee, *How Gamification Could Take Investor Experiences to a New Level*, EY (Apr. 26, 2019), https://www.ey.com/en_us/digital/how-gamification-could-take-investor-experiences-to-a-new-level [<https://perma.cc/9YXG-HJUT>]; James Fallows Tierney, *Investment Games*, 72 DUKE L.J. 353, 406–08 (2022) (discussing a collective action problem in investing in learning and forgoing profit opportunities).

¹⁵⁸ See, e.g., Lisa M. Fairfax, *The Securities Law Implications of Financial Illiteracy*, 104 VA. L. REV. 1065, 1077, 1107–11 (2018); Gregory Elliehausen, E. Christopher Lundquist & Michael E. Staten, *The Impact of Credit Counseling on Subsequent Borrower Behavior*, 41 J. CONSUMER AFFS. 1, 2 (2007) (stating that no important statistical impact of financial education has been shown on credit outcomes); Howell E. Jackson & Stacy A. Anderson, *Can States Tax National Banks to Educate Consumers About Predatory Lending Practices?*, 30 HARV. J.L. & PUB. POL'Y 831, 844 n.51 (2007); Jean Braucher, *An Empirical Study of Debtor Education in Bankruptcy: Impact on Chapter 13 Completion Not Shown*, 9 AM. BANKR. INST. L. REV. 557, 576–77 (2001) (demonstrating how the useful impact of bankruptcy-debtor education disappeared).

financial choices of disadvantaged populations and minorities. The 2022–23 “crypto winter” has had a disproportionate effect on Black Americans due to an alarming education gap. A study conducted in 2022 found that Black investors were less likely to view cryptocurrency as a risky investment (68% compared to 73% of white investors), despite all the negative news about its price volatility, platform hacks, and the lack of government regulation.¹⁵⁹

B. Targeting Vulnerable Populations

Historically, vulnerable communities have been subjected to predatory financial offerings and services.¹⁶⁰ For instance, through aggressive marketing,¹⁶¹ payday lending and similar financial services have been targeted at cash-oriented individuals, providing them with costly fees and credit-based products.¹⁶² With the expansion of consumer credit supply, financial institutions presently market credit to and collect debts from individuals of a lower socioeconomic status.¹⁶³ Such loans,

¹⁵⁹ See *Ariel-Schwab Black Investor Survey*, CHARLES SCHWAB (2022), <https://www.schwabmoneywise.com/tools-resources/ariel-schwab-survey-2022> [<https://perma.cc/JM3E-8VP4>]. Black investors are also more likely to believe that investments in cryptocurrency are safe (33% compared to 18% of white investors) and that they are regulated (30% compared to 14% of white investors). *Id.* This perception is even more prevalent among Black investors under forty. *Id.*

¹⁶⁰ See John P. Relman, *Foreclosures, Integration, and the Future of the Fair Housing Act*, 41 IND. L. REV. 629, 629 (2008) (describing “the legacy of discrimination that has left underserved minority communities particularly vulnerable to the predatory practices of subprime lenders”). For example, data produced under the Home Mortgage Disclosure Act shows that a much higher percentage of high-interest home mortgage loans have been issued to Black and Hispanic borrowers rather than to white borrowers. See Danielle Kie Hart, *Revealing Privilege—Why Bother?*, 42 WASH. U. J.L. & POL’Y 131, 143 (2013) (referencing how women of color were especially subject to this); *Fair Lending Enforcement Program*, U.S. DEP’T OF JUST. (Aug. 6, 2015), <https://www.justice.gov/crt/fair-lending-program-0> [<https://web.archive.org/web/20170129185807/https://www.justice.gov/crt/fair-lending-enforcement-program>].

¹⁶¹ See Pooja Shethji, *Credit Checks Under Title VII: Learning from the Criminal Background Check Context*, 91 N.Y.U. L. REV. 989, 1000–01 (2016) (“Large lenders have drawn ire for targeting and steering Black and Hispanic borrowers toward risky subprime loans Payday lenders, who couple short-term loans with exorbitant interest rates, tend to concentrate their operations in minority neighborhoods as well.”); Austin, *supra* note 148, at 1218–19 (analyzing the high-pressure marketing of subprime loans to vulnerable populations such as minorities); Kathleen C. Engel & Patricia A. McCoy, *Predatory Lending: What Does Wall Street Have to Do with It?*, 15 HOUS. POL’Y DEBATE 715, 715–20 (2004).

¹⁶² See Shethji, *supra* note 161, at 1000–01.

¹⁶³ Baher Azmy, *Squaring the Predatory Lending Circle: A Case for States as Laboratories of Experimentation*, 57 FLA. L. REV. 295, 308–11 (2005) (discussing how most subprime mortgage borrowers do not use their loans to purchase homes but to refinance unsecured debts).

however, often have a high likelihood of never being fully repaid,¹⁶⁴ or **only being repaid by foreclosure on one's home.**¹⁶⁵ This is in part because financial service providers are adopting strategies to include historically excluded minority populations in the financial industry.¹⁶⁶ Even after obtaining a degree of financial stability that would allow them to apply for loans from traditional lenders, some members of ethnic minorities nevertheless use alternative service providers (or shadow banks, or even fintech companies) out of habit.¹⁶⁷ The outcome is a redistribution of money from minorities and the impoverished to their creditors and creditors' investors, which can be seen as cultural exploitation.¹⁶⁸

"Buy now, pay later" (BNPL) services, which have gained much popularity in recent years,¹⁶⁹ offer another example of the targeting of vulnerable populations with risky financial products. BNPL is based on nudging individuals to incur more debt—which Benjamin Franklin has referred to as the number one vice.¹⁷⁰ BNPL is a short-term financing option that mandates having enough money to afford a down payment and requires people to pay for their products or services over time in installments. Regulators have already expressed concerns about this new trend.¹⁷¹ For instance, the British government said in February 2021 that this type of business model would be subject to financial regulation after concluding that there was "a significant risk" of harm to potential

¹⁶⁴ "Buy now, pay later," which is founded on a no-interest, post-purchase monthly installment notion, is a good illustration of this. See, e.g., Packin, *supra* note 19 at 349–50, 385–87 (2023) (discussing how fintech and DeFi companies try to get children to use their services).

¹⁶⁵ See Jean Braucher, *Theories of Overindebtedness: Interaction of Structure and Culture*, 7 THEORETICAL INQUIRIES L. 323, 334–35 (2006) (examining the relationship between the consumer credit structure and culture, focusing on cultural identity and cultural change).

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ Emily Jeffcott, Comment, *The Mortgage Reform and Anti Predatory Act of 2007: Paving A Secure Path for Minorities in the Midst of the Sub Prime Debacle*, 10 SCHOLAR 449, 481 n.174 (2008).

¹⁶⁹ The Journal, *Why "Buy Now, Pay Later" Is Popping Up Everywhere*, WALL ST. J. (Sept. 21, 2021, 4:25 PM), https://www.wsj.com/podcasts/the-journal/why-buy-now-pay-later-is-popping-up-everywhere/baa2dae5-5bde-4f63-99bc-2760e70de1ff?mod=article_inline [<https://perma.cc/C9PD-BNU8>] (describing the increasing number of entities that offer BNPL services).

¹⁷⁰ See 7 BENJAMIN FRANKLIN, THE PAPERS OF BENJAMIN FRANKLIN 342–49 (Leonard W. Labaree ed., 1963).

¹⁷¹ See, e.g., Robin Saks Frankel, *What Is Buy Now, Pay Later?*, FORBES ADVISOR (Apr. 10, 2023, 9:50 AM), <https://www.forbes.com/advisor/credit-cards/buy-now-pay-later> [<https://perma.cc/C9MK-FWTK>]; *Buy Now Pay Later Firms in Saudi Arabia Must Get a Permit: SAMA*, ARAB NEWS (Oct. 5, 2021, 12:51 PM), <https://www.arabnews.com/node/1941831/business-economy> [<https://perma.cc/LU5K-5TVN>].

customers.¹⁷² Similarly, in late 2021, the Consumer Financial Protection Bureau (CFPB) raised concerns about customers and sought details from split-payment providers. Equifax, a U.S. consumer reporting agency, has declared its intention to start recording BNPL plans due to the difficulty of assessing individuals' actual financial capacity and risk when multiple BNPL payments come due.¹⁷³

The targeting of vulnerable populations has not skipped the DLT financial space, including cryptocurrencies, CeFi, and DeFi,¹⁷⁴ which had been thriving up until late 2022, when the “crypto winter” started.¹⁷⁵ A 2022 survey found that Black Americans have invested heavily in the cryptocurrency market. 25% of Black Americans said they owned cryptocurrency and, among Black investors under forty, that number went up to 38%, while only 15% of white investors said they owned cryptocurrency and, among white investors under forty, that number went up to 29%.¹⁷⁶ The same survey also found that “Black investors are more than twice as likely to say cryptocurrency was their first investment (11% of Black investors compared to 4% of white investors).”¹⁷⁷

¹⁷² Rupert Jones, *Consultation Launched on Regulating UK's Buy Now, Pay Later Credit Industry*, THE GUARDIAN (Oct. 21, 2021, 11:45 AM), <https://www.theguardian.com/money/2021/oct/21/consultation-launched-on-regulating-uks-buy-now-pay-later-credit-industry> [<https://perma.cc/4PXE-S6LA>].

¹⁷³ AnnaMaria Andriotis, *Equifax to Add More 'Buy Now, Pay Later' Plans to Credit Reports*, WALL ST. J. (Dec. 19, 2021, 7:00 AM), <https://www.wsj.com/articles/equifax-to-add-more-buy-now-pay-later-plans-to-credit-reports-11639915203?reflink=desktopwebshare> [<https://perma.cc/X4RZ-J6WU>] (stating that such “plans often don’t show up on credit reports, creating a blind spot for lenders that use the information on the reports to gauge an applicant’s ability to repay”).

¹⁷⁴ See, e.g., Carol R. Goforth, *Neither A Borrower Nor A Lender Be Analyzing the SEC's Reaction to Crypto Lending*, 18 U. MASS. L. REV. 2, 8 n.11 (2023) (explaining that “[f]inancial transactions in crypto occurring on centralized platforms are part of the more traditional centralized finance (CeFi) world, while decentralized applications are part of the decentralized (DeFi) ecosystem”); Ephrat Livni & Eric Lipton, *Crypto Banking and Decentralized Finance, Explained*, N.Y. TIMES (Nov. 1, 2021), <https://www.nytimes.com/2021/09/05/us/politics/cryptocurrency-explainer.html> [<https://web.archive.org/web/20240117114859/https://www.nytimes.com/2021/09/05/us/politics/cryptocurrency-explainer.html>].

¹⁷⁵ See, e.g., Michael J. Hsu, *Crypto: “An Immature Industry Based on an Immature Technology,”* 25 FINTECH L. REP., Nov./Dec. 2022, at NL 5 (explaining that the “crypto winter” “exposed severe weaknesses in the risk management practices at a range of crypto firms”); Arjun Kharpal & Ryan Browne, *This ‘Crypto Winter’ Is Unlike Any Downturn in the History of Digital Currencies. Here’s Why*, CNBC (July 14, 2022, 5:01 AM), <https://www.cnbc.com/2022/07/14/why-the-2022-crypto-winter-is-unlike-previous-bear-markets.html> [<https://perma.cc/PHY9-7ZMU>].

¹⁷⁶ Ariel-Schwab *Black Investor Survey*, *supra* note 159.

¹⁷⁷ *Id.*; see also Kelsey Butler, *Young Black Americans Wary of the Stock Market Are Turning to Crypto*, BLOOMBERG (Apr. 5, 2022, 8:00AM), <https://www.bloomberg.com/news/articles/2022-04-05/young-black-americans-wary-of-stock-market-are-turning-to-crypto> [<https://perma.cc/DJ6H-CQKD>].

The surge in popularity owes much to social media, which effectively amplified interest in cryptocurrencies and digital assets by facilitating seamless circulation of digital currency information to a broad audience.¹⁷⁸ Major social media platforms like Twitter, Reddit, Telegram, and even TikTok—which saw a rise in financial-related videos that were nicknamed FinTok¹⁷⁹—have become crucial venues for discussing and analyzing the crypto market, among many other financial offerings, as well as for distributing news and updates about individual projects.¹⁸⁰ Furthermore, social media has facilitated the formation of communities of crypto enthusiasts and investors who share their knowledge and strategies, thereby educating others about the technology and its potential applications. For the most part, regulators have not taken action regarding these interactions of consumers and fintech entities on social media platforms.¹⁸¹ It has become clear that enhanced regulatory oversight by financial authorities could curb predatory practices by institutions operating on these platforms. These predatory practices included the dissemination of deceptive information through targeted “influencer” campaigns aimed at younger consumers, particularly from underprivileged populations.

These social media blasts have contributed not only to a heightened awareness and interest in crypto, but also to financial FOMO.¹⁸² From promotions in TikTok videos to viral posts reaching hundreds of millions of users on Instagram, such as Kim Kardashian’s sponsored-but-undisclosed-as-such cryptocurrency advertisement,¹⁸³ for which she eventually had to settle with the SEC,¹⁸⁴ consumers have been bombarded

¹⁷⁸ See, e.g., Shama Hyder, *How Social Media Is Helping Cryptocurrency Flourish: A Case Study With Jonathan Jadali*, FORBES (Nov. 23, 2020, 5:30 PM), <https://www.forbes.com/sites/shamahyder/2020/11/23/how-social-media-is-helping-cryptocurrency-flourish/?sh=76eddb15717d> [https://perma.cc/6LV5-K7CL].

¹⁷⁹ See generally Nikita Aggarwal, D. Bondy Valdovinos Kaye & Christopher Odinet, *#Fintok and Financial Regulation*, 54 ARIZ. ST. L.J. 1035, 1035–36 (2022); Packin, *supra* note 19, at 383 (describing “the increasing involvement of influencers in the stock market”).

¹⁸⁰ Packin, *supra* note 19, at 383–84.

¹⁸¹ See generally Block-Lieb & Janger, *supra* note 150.

¹⁸² See, e.g., Rashi Maheshwari, *Fear and Greed Index for Crypto*, FORBES (Jan. 12, 2023, 7:43 PM), <https://www.forbes.com/advisor/in/investing/cryptocurrency/fear-and-greed-index-crypto> [https://web.archive.org/web/20230112155912/https://www.forbes.com/advisor/in/investing/cryptocurrency/fear-and-greed-index-crypto] (explaining FOMO and how “social media channels often play a huge role” as they “have a huge influence on crypto markets”).

¹⁸³ See, e.g., David Yaffe-Bellany, *How Influencers Hype Crypto, Without Disclosing Their Financial Ties*, N.Y. TIMES (May 28, 2022), <https://www.nytimes.com/2022/05/27/technology/crypto-influencers.html> [https://perma.cc/G3A9-F7X7].

¹⁸⁴ Michelle Singletary, *Kim Kardashian’s \$1.26 Million SEC Fine Is Pocket Change for the Star*, WASH. POST (Oct. 5, 2022, 7:00 AM), <https://www.washingtonpost.com/business/2022/10/>

with (often hidden) ads. Moreover, consumers have watched the influencers they admire promote crypto investments, products, and services.¹⁸⁵ And, as mentioned, many of those influencers were specifically targeting younger and technology-savvy minorities and underprivileged communities. For instance, while Jay-Z and other celebrities have been heavily promoting cryptocurrency investments,¹⁸⁶ Jay-Z and Twitter cofounder Jack Dorsey also invested \$23.6 million in an endowment they established to support the development of Bitcoin in Africa and India, with the goal of making Bitcoin the “internet’s currency.”¹⁸⁷ And similarly to other predatory financial products and services, marketing efforts for these products and services have focused on financially less sophisticated or excluded populations.¹⁸⁸

Social media influencers have further contributed to the success of predatory schemes, given the role they play in modern consumer finance, and regulators have only recently started to catch up.¹⁸⁹ In June 2023, news broke that FTX, the bankrupt cryptocurrency exchange, had sued former Hillary Clinton aide Michael Kives and his investment firm, K5 Global, alleging that \$700 million in investments were made with

05/sec-kim-kardashian-crypto-settlement [https://perma.cc/856F-XRH3] (“The influencer was charged with failing to disclose that she was paid to promote a crypto offered by EthereumMax. But the penalty will barely sting.”).

¹⁸⁵ See Packin, *supra* note 19, at 363–64, 383–84.

¹⁸⁶ Anthony Conwright, *Inside the Crypto Grift: The Black Capitalism Myth Goes Digital*, THE FORUM (July 6, 2022), <https://forummag.com/2022/07/06/inside-the-crypto-grift> [https://perma.cc/PJT5-BJMP] (describing how crypto “may be the newest chapter in the myth of Black capitalism”).

¹⁸⁷ *Id.*

¹⁸⁸ Leda Alvim & Lulit Tadesse, *Cryptocurrency Attracting Black, Latino Investors and Fans*, ABC NEWS (Feb. 10, 2022, 10:23 AM), <https://abcnews.go.com/Business/cryptocurrency-attracting-black-latino-investors-fans/story?id=82684748> [https://perma.cc/WA9P-4HL3] (explaining that crypto “may be attracting more minority investors who have historically had barriers to traditional financial investment options like the stock market and real estate”).

¹⁸⁹ Being among the first to address this issue, the United Kingdom’s Competition and Markets Authority issued clear guidance for social media influencers and included links for online reviews and endorsements. See Competition & Mkts. Auth., *Hidden Ads: Being Clear with Your Audience*, GOV.UK, <https://www.gov.uk/government/publications/social-media-endorsements-guide-for-influencers/social-media-endorsements-being-transparent-with-your-followers> [https://web.archive.org/web/20230905135732/https://www.gov.uk/government/publications/social-media-endorsements-guide-for-influencers/social-media-endorsements-being-transparent-with-your-followers] (Nov. 3, 2022). Similarly, on May 5, 2023, New York State Attorney General Letitia James released a bill for consideration by the New York State Legislature that would implement comprehensive regulation of digital asset activities in the state. If enacted as currently drafted, the Crypto Regulation, Protection, Transparency, and Oversight Act would amend the New York General Business Law to, inter alia, target conflicts of interest, including in the context of digital asset “influencers.” See Press Release, Letitia James, N.Y. State Att’y Gen., Attorney General James Proposes Nation-Leading Regulations on Cryptocurrency Industry (May 5, 2023), <https://ag.ny.gov/press-release/2023/attorney-general-james-proposes-nation-leading-regulations-cryptocurrency> [https://perma.cc/TB93-254W].

misappropriated FTX funds.¹⁹⁰ In particular, it has been suggested that Sam Bankman-Fried, the founder of FTX, allegedly used its funds to invest in projects that were associated with celebrities and other influential individuals, with the intent of enhancing his own and FTX's social and political influence.¹⁹¹ Bankman-Fried's celebrity endorsement strategy paid off—many stars reportedly promoted various crypto tokens on social media, often without disclosing that their endorsement was compensated.¹⁹² These endorsements, however, were far from benefiting the influencers' followers. A May 2023 study examined the returns associated with approximately 36,000 tweets issued by 180 of the most prominent crypto social media influencers, covering over 1,600 crypto securities over a two-year period ending in December 2022. The study revealed that while advice from “crypto-influencers” on Twitter initially led to positive returns, these gains were eventually outweighed by significant negative returns in the long term, suggesting that celebrity endorsements of cryptoassets may not yield substantial long-term investment value.¹⁹³ Other studies have explored how demographics including ethnicity were factors that played a role in embracing celebrities' endorsements.¹⁹⁴

To tackle issues tied to financial industry influencers, New York State's Attorney General has introduced legislation—the Crypto Regulation, Protection, Transparency, and Oversight (CRPTO) Act—in

¹⁹⁰ Dietrich Knauth, *FTX Sues Ex-Clinton Aide's Investment Firm for \$700 Million*, REUTERS (June 24, 2023, 5:05 PM), <https://www.reuters.com/legal/ftx-sues-ex-clinton-aides-investment-firm-700-million-2023-06-22> [<https://perma.cc/Z3KZ-BVN3>].

¹⁹¹ *Id.* One example is an investment of \$214 million from FTX to buy a minority stake in Kendall Jenner's 818 Tequila brand, although the company's assets were valued at just \$2.94 million according to an SEC filing. This investment was purportedly made through a shell company controlled by Bankman-Fried. Furthermore, Bankman-Fried allegedly found Kives, who has worked as a Hollywood agent for clients such as Arnold Schwarzenegger and Katy Perry, to be “the most connected person [he had] ever met,” given his network of political and celebrity connections, which presumably impressed Bankman-Fried so much that he invested with Kives's firm to access these connections. *Id.*

¹⁹² Max Matza, *Lindsay Lohan and Jake Paul Hit with SEC Charges over Crypto Scheme*, BBC (Mar. 22, 2023), <https://www.bbc.com/news/world-us-canada-65046882> [<https://perma.cc/S8NP-A3GT>].

¹⁹³ Kenneth J. Merkley, Joseph Pacelli, Mark Piorkowski & Brian Williams, *Crypto-Influencers* (May 2023) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4412017 (last visited Jan. 22, 2024).

¹⁹⁴ Shahzeb Hussain, T.C. Melewar, Constantinos-Vasilios Priporas, Pantea Foroudi & Charles Dennis, *Examining the Effects of Celebrity Trust on Advertising Credibility, Brand Credibility and Corporate Credibility*, 109 J. BUS. RSCH. 472, 472 (2020) (describing how “celebrity trust has a positive effect on both advertising credibility and brand credibility, and that these effects are moderated by consumers' ethnicity, with no effects of age or gender”).

mid-2023.¹⁹⁵ Through this legislation, the State aims to prohibit digital asset influencers from participating in promotional activities unless they meet specific requirements, including the disclosure of any ownership interest or compensation related to the promoted digital asset and the filing of a “digital asset influencer statement” with the New York Department of Law.¹⁹⁶ In addition, the Act proposes that the influencer statement would disclose details such as the influencer’s business background, educational background, criminal history, wallet address, social media accounts, and any conflicts of interest arising from or related to any current or past holdings.¹⁹⁷

Alongside social media, “crypto education” has also contributed to the popularity of the crypto industry among minorities. Under the pretense of increasing financial literacy and offering financial education to those who need it the most, crypto education has been especially advanced at minorities and underserved communities. An organization named New Black Wall Street was launched in 2020 to teach financial literacy to Black Americans.¹⁹⁸ Partnering together to launch the Bitcoin Academy at a public housing complex in Brooklyn,¹⁹⁹ Twitter cofounder Jack Dorsey and Jay-Z described their Bitcoin Academy as representing “the future of money.”²⁰⁰ The Academy further stated on its website that “attendees will be given smartphones and MiFi devices” to be able to do what they need for the academy, and that they will offer “a ‘Crypto Kids Camp’ for kids aged 5 to 17.”²⁰¹ These statements and promotions are

¹⁹⁵ See Press Release, Letitia James, *supra* note 189, which would define “promoting” broadly to encompass any communication that, though not purporting to offer a digital asset for sale, encourages investment in such digital asset.

¹⁹⁶ Meghan K. Spillane, Jonathan H. Hecht, John Servidio & Adam Bruce Fovent, *New York CRPTO Bill Would Prohibit Many Digital Asset Activities and Impose Sweeping Market Structure Changes*, GOODWIN (May 16, 2023), <https://www.goodwinlaw.com/en/insights/publications/2023/05/alerts-finance-ftec-new-york-crpto-bill> [<https://perma.cc/SG3G-2M3L>].

¹⁹⁷ *Id.*

¹⁹⁸ Sarah Wynn, *Left Behind by Financial System, Minorities Turn to New Products*, ROLL CALL (Sept. 7, 2021, 3:04 PM), <https://rollcall.com/2021/09/07/left-behind-by-financial-system-minorities-turn-to-new-products> [<https://perma.cc/S9Q2-KPJK>] (quoting a CEO explaining that minorities in crypto have gotten to a place where they “are willing to take a risk on technology and [they’re] taking technology over the actual system”).

¹⁹⁹ Amanda Silberling, *Jay-Z and Jack Dorsey Launched a Bitcoin Academy in a Public Housing Complex*, TECHCRUNCH (June 9, 2022, 7:14 PM), <https://techcrunch.com/2022/06/09/jay-z-jack-dorsey-bitcoin-academy-marcy-public-housing> [<https://perma.cc/4MKK-EHLW>].

²⁰⁰ Jordan Hoffman, *Jay-Z’s Bitcoin Academy Is Far from a Hit*, VANITY FAIR (June 18, 2022), <https://www.vanityfair.com/style/2022/06/jay-z-bitcoin-academy-is-far-from-a-hit> [<https://perma.cc/K6G6-H278>].

²⁰¹ *Id.*

concerning given how unpredictable²⁰² and virtually unregulated²⁰³ the crypto industry has been.

Finally, as described above, because of the decentralized promise of blockchain technology, blockchain-based financial products and services have also been successful with underserved populations who have traditionally suffered from financial inequality.²⁰⁴ Since Bitcoin's inception, proponents have repeatedly promised that the crypto industry "will revolutionize money, or payments, or finance—or all of the above."²⁰⁵ Underprivileged populations put religious-like faith in these assurances, with the thought that crypto would give them a chance to make fresh wealth and even out the historically imbalanced playing field.²⁰⁶ The often made claim that "crypto had the potential to close a pernicious, generations-old racial wealth gap for Black and Latino would-be investors" is premised on the belief that cryptocurrencies were primed to "democratize finance."²⁰⁷ Decentralization features mean de facto that cryptocurrency is not under the control and regulation of mainstream financial institutions. Underprivileged and minority groups have therefore seen DeFi as representing the promise of an alternative financial

²⁰² Lin Lin & Dominika Nestarcova, *Venture Capital in the Rise of Crypto Economy: Problems and Prospects*, 16 BERKELEY BUS. L.J. 533, 563–64 (2019) ("The value of crypto-assets is uncertain given the volatile nature of the crypto market. Furthermore, the accounting profession does not agree as to how such assets should be valued.").

²⁰³ See Gary Gensler, Chair, U.S. Sec. & Exch. Comm'n, Remarks Before the Aspen Security Forum (Aug. 3, 2021), <https://www.sec.gov/news/public-statement/gensler-aspen-security-forum-2021-08-03> [<https://perma.cc/RC9G-AW9K>]; Asress Adimi Gikay, *Regulating Decentralized Cryptocurrencies Under Payment Services Law: Lessons from European Union Law*, 9 CASE W. RESRV. J.L. TECH. & INTERNET 1, 2 (2018) ("The only constant is the fast evolution of cryptocurrencies and businesses centred on them and the lack of robust legal framework regulating them in many areas."); Sarah Jane Hughes & Stephen T. Middlebrook, *Advancing a Framework for Regulating Cryptocurrency Payments Intermediaries*, 32 YALE J. ON REGUL. 495, 495 (2015) ("[T]he operation of wallets and exchanges requires a new commercial law.").

²⁰⁴ Alvim & Tadesse, *supra* note 188 (quoting Cleve Mesidor, leader of advocacy group National Policy Network of Women of Color in Blockchain explaining that Black "communities have been locked out of the financial system" and that "decentralization is an opportunity for us to not have any barriers to entry and also participate and be producers as well").

²⁰⁵ Hilary J. Allen, *The Superficial Allure of Crypto*, FIN. & DEV., Sept. 2022, at 27, 27, <https://www.imf.org/-/media/Files/Publications/Fandd/Article/2022/September/Allen.ashx> [<https://web.archive.org/web/20221205013816/https://www.imf.org/-/media/Files/Publications/Fandd/Article/2022/September/Allen.ashx>].

²⁰⁶ Tonantzin Carmona, Opinion, *Crypto Was Billed as a Vehicle to Wealth. For Many Black Investors, It's Been Anything But*, CNN (Dec. 24, 2022, 9:49 AM), <https://www.cnn.com/2022/12/23/opinions/crypto-black-investors-carmona/index.html> [<https://perma.cc/7CYR-839D>] (explaining that "venture capital firms, celebrities and even some elected officials were hailing cryptocurrency as the future of personal finance").

²⁰⁷ *Id.*

ecosystem²⁰⁸—one that could grant them financial independence from the TradFi institutions that historically have not served them well.²⁰⁹

Here, however, comes a twist. Despite the promise of DeFi, there are two significant barriers to its widespread adoption by ordinary consumers. First, participating in DeFi applications generally requires a higher level of technical skill and understanding compared to TradFi products.²¹⁰ Second, DeFi transactions come with a higher degree of risk and complexity, as there is usually no intermediary or central authority to resolve disputes or provide insurance.²¹¹ As a result, many consumers ended up relying on CeFi-type intermediaries, which were prominent on social and mainstream media,²¹² such as FTX, Celsius, and others. But CeFi platforms turned out to be everything but decentralized.²¹³ The crypto market emerged as a response to the 2008 financial crisis, which is reflected in its fundamental principle of promoting true individual ownership and self-sovereignty.²¹⁴ The market's core tenets revolve around individuals having full control over their wallets and the ability to

²⁰⁸ Tressie McMillan Cottom, Opinion, *The Strange Allure of the Blockchain*, N.Y. TIMES (Jan. 24, 2022), <https://nyti.ms/32w2kJu> [<https://perma.cc/ZJ82-Q2EZ>].

²⁰⁹ Wynn, *supra* note 198 (arguing that DeFi has “no intermediaries such as banks involved in transactions and no credit checks” and that “[a]dvocates of DeFi say it will benefit . . . people left behind by the financial system, while others decry the risks”); see also MARK KUTZBACH, ALICIA LORO, JEFFREY WEINSTEIN & KARYEN CHU, FED. DEPOSIT INS. CORP., 2019 FDIC SURVEY: HOW AMERICA BANKS: HOUSEHOLD USE OF BANKING AND FINANCIAL SERVICES 2 (2020), <https://www.fdic.gov/analysis/household-survey/2019execsum.pdf> [<https://perma.cc/B9PZ-KM9Z>] (noting that the unbanked rate among Black households is significantly higher than that of white households and that lack of trust in banks was the second-most cited reason).

²¹⁰ Steve Kaaru, *BIS: DeFi Could Shape the Future of Finance, But It's Too Complex*, COINGEEK (Jan. 27, 2023), <https://coingeek.com/bis-defi-could-shape-the-future-of-finance-but-its-too-complex> [<https://perma.cc/YM7R-6PHL>] (“[DeFi] harnesses innovative technology and could shape the future of finance. However, it’s too technologically and economically complex, and a deep understanding of DeFi is still lacking in the market, a new paper by the Bank for International Settlements (BIS) says.”).

²¹¹ For more on this concept, see Kevin Werbach, *Trust, But Verify: Why Blockchain Needs the Law*, 33 BERKELEY TECH. L.J. 487, 491 (2018). See also Joel Khalili, *Investing in DeFi is Seriously Risky, But Maybe It Doesn't Have to Be*, TECHRADAR (Jan. 31, 2021), <https://www.techradar.com/news/investing-in-defi-is-seriously-risky-but-maybe-it-doesnt-have-to-be> [<https://perma.cc/AT8L-FLYJ>] (explaining that DeFi retail investors are more exposed to “[h]igh transaction fees, market volatility and security incidents linked [to] vulnerabilities in smart contracts”).

²¹² See, e.g., Sara Morrison, *Last Year's Super Bowl Ads Aged Like Milk*, VOX (Feb. 9, 2023, 8:00 AM), <https://www.vox.com/recode/2023/2/9/23591622/super-bowl-commercials-lvii-crypto-ads> [<https://perma.cc/GM64-YG6Y>].

²¹³ Shingo Lavine & Adam Lavine, *The End of the “Centralization Era” in Crypto*, COINDESK (Nov. 16, 2022), <https://www.coindesk.com/layer2/2022/11/16/the-end-of-the-centralization-era-in-crypto> [<https://perma.cc/873G-KPMQ>].

²¹⁴ David Z. Morris, *Satoshi Wept: How Crypto Replayed the 2008 Financial Crisis*, COINDESK (May 11, 2023, 1:02 PM), <https://www.coindesk.com/layer2/2022/07/12/satoshi-wept-how-crypto-replayed-the-2008-financial-crisis> [<https://perma.cc/M7GN-TUV8>] (“It only took 13 years for crypto to recreate the same kind of financial crisis it was designed to prevent.”).

engage in peer-to-peer crypto transactions without relying on intermediaries.²¹⁵ Initially, centralized crypto exchanges or “crypto banks” offered a convenient avenue for investing and trading crypto, attracting consumers with their user-friendly interfaces and celebrity endorsements. However, what many consumers have come to realize, often through unfortunate experiences, was that the intermediary services provided by these centralized entities had nothing to do with individual ownership and self-sovereignty.²¹⁶ The term CeFi has traditionally referred to financial services and products offered by centralized entities like exchanges, banks, and other lending institutions that act as intermediaries between borrowers and lenders. These institutions are centralized, meaning that they are controlled by one entity or a small group of entities.²¹⁷ These entities typically hold and control the assets of their users, and users should go through know-your-customer (KYC) and anti-money laundering (AML) compliance processes.²¹⁸ Examples of CeFi entities that have operated or are still operating in the crypto industry include cryptocurrency exchanges like Binance, Coinbase, Kraken, and (the now bankrupt) FTX, which enabled consumers to buy, sell, and trade cryptocurrencies and related products.²¹⁹ Centralized lending platforms include entities like Nexo, and the now-bankrupt BlockFi, Celsius, and Voyager, which allowed users to borrow or lend cryptocurrencies.²²⁰

The 2022–23 crypto winter, and the bankruptcy filings of major CeFi entities, such as FTX,²²¹ Celsius,²²² Voyager,²²³ and BlockFi,²²⁴ further proved that CeFi entities are very much centralized. CeFi lacked emphasis

²¹⁵ BANK FOR INT’L SETTLEMENTS, THE CRYPTO ECOSYSTEM: KEY ELEMENTS AND RISKS, REPORT SUBMITTED TO THE G20 FINANCE MINISTERS AND CENTRAL BANK GOVERNORS 2 (2023), <https://www.bis.org/publ/othp72.pdf> [<https://perma.cc/D9PJ-DZ8K>] (describing how “crypto operates under the banner of decentralisation”).

²¹⁶ See *infra* notes 221–24.

²¹⁷ See, e.g., Khan, *supra* note 46.

²¹⁸ See generally Shlomit Wagman, *Cryptocurrencies and National Security: The Case of Money Laundering and Terrorism Financing*, 14 HARV. NAT’L SEC. J. 87, 94–95 (2022) (reviewing AML and counter-financing of terrorism frameworks and their application to cryptocurrencies).

²¹⁹ Khan, *supra* note 46.

²²⁰ See, e.g., Goforth *supra* note 174, at 72 n.320; *id.* at 8 (analyzing CeFi “platforms that offered to pay their customers interest on cryptoassets deposited with them”).

²²¹ Nizan Geslevich Packin, *FTX Is on Fire, but Where Is Its “Break the Glass” Plan?*, FORBES (Nov. 17, 2022, 1:26 AM), <https://www.forbes.com/sites/nizangpackin/2022/11/17/ftx-is-on-fire-but-where-is-its-break-the-glass-plan/?sh=518457645ad8> [<https://perma.cc/FV79-86E9>].

²²² Tom Wilson & Dietrich Knauth, *Crypto’s String of Bankruptcies*, REUTERS (Jan. 20, 2023, 12:27 PM), <https://www.reuters.com/business/finance/cryptos-string-bankruptcies-2023-01-20> [<https://perma.cc/WU8K-ESXD>].

²²³ *Id.*

²²⁴ *Id.*

on consumer protection, leading to significant failures that impacted millions of consumers and billions of dollars in assets. Users had to painfully learn that they have no property interest in their coins and as such are considered unsecured creditors during bankruptcy.²²⁵ Additionally, since these CeFi entities were not part of a regulated financial framework, users who transacted through them did not have access to the safeguards that traditional financial institutions offer, which guarantee that consumers will not suffer losses of their investments should their providers fail.²²⁶ Importantly, the devastating effects of the collapse of major CeFi entities have been acutely felt in communities of color, which have seen a disproportionately large percentage of crypto investors.²²⁷

This Part has shown that the exclusion of marginalized communities from the traditional financial system has made them more likely to be drawn to DeFi products and services. These communities were specifically targeted with the idea of DeFi as an equalizing force in finance and an alternative to the traditional financial sector. Despite the ideological appeal of DeFi, many opted for CeFi because DeFi requires a high level of technical expertise and because users did not trust a fully decentralized financial system. CeFi, on the other hand, was seen as a decentralized system with safeguards, a risk-free version of DeFi. The recent failure of major CeFi providers has revealed that neither the perceived decentralization nor the believed protection was real. Building on the contextual and cultural background provided in this Part, the following Part sheds light on an additional distinctive harm that crypto-native credit scores may result in, and how they resemble predatory lending practices.

²²⁵ See, e.g., Steven Zeitchik, *Bad News for Thousands of Crypto Investors: They Don't Own Their Accounts*, WASH. POST (Jan. 5, 2023, 6:51 PM), <https://www.washingtonpost.com/technology/2023/01/05/celsius-crypto-bankruptcy-ruling> [https://perma.cc/ZR77-CTS2] (reporting a bankruptcy court finding that a cryptocurrency exchange's customers had no property interest in deposited assets, but rather that the assets belonged to the exchange). See generally Adam J. Levitin, *Not Your Keys, Not Your Coins: Unpriced Credit Risk in Cryptocurrency*, 101 TEX. L. REV. 877 (2023).

²²⁶ Namely, users did not have access to the Securities Investor Protection Corporation and Federal Deposit Insurance Corporation protections. Nizan Geslevich Packin, *Bankruptcy and Crypto*, FORBES (July 15, 2022, 8:44 PM), <https://www.forbes.com/sites/nizangpackin/2022/07/15/bankruptcy-and-crypto/?sh=5b95e9327df5> [https://perma.cc/SHG9-D32G].

²²⁷ Carmona, *supra* note 206; see also Conwright, *supra* note 186 (“[T]he ‘crypto crash’ might be especially dangerous for those Black Americans who rushed to crypto as a passport to long-term economic inclusion Of all crypto backers now suffering the aftereffects of the crash, Black Americans are least able to afford the projected loss of 66 percent of their income or wealth.”).

III. CRYPTO-NATIVE CREDIT SCORES FOR UNDERSERVED POPULATIONS AND MINORITIES—NEW AGE PREDATORY LENDING

Decentralized credit scoring models were set to solve the problems discussed above by tapping into blockchain's untapped financial data. These models vary in approach but generally involve tracking wallet activities to generate credit scores. Engaging in on-chain borrowing can help users establish credit history and become eligible for undercollateralized loans. Most undercollateralized credit protocols therefore highly recommend that their users borrow on chain. In some cases, borrowers are incentivized to take out loans using the same protocol because successful repayment of the loan will increase their score significantly in that protocol's scoring system. But until borrowers build a credit history, they are ineligible for undercollateralized loans and must rely on overcollateralized loans to generate credit history. In other words, decentralized credit scoring indirectly compels individuals to extensively engage in overcollateralized borrowing as a prerequisite to credit.

Predatory lending practices refer to “a catalogue of onerous lending practices, which are often targeted at vulnerable populations and result in devastating personal losses, including bankruptcy, poverty, and foreclosure.”²²⁸ Examples of practices with abusive terms or implications include loans causing severe harm, involving fraud or deception, lacking transparency, or requiring a waiver of legal rights.²²⁹ Decentralized credit scoring seems to fit the bill, holding potential for serious net harm to borrowers by incentivizing them to undertake unaffordable overcollateralized loans, forcing them to acquire more volatile assets. This harm disproportionately affects marginalized communities.

This last part is important. Predatory lending has long been described in the context of the cultural choices of, and financial alternatives available to, less sophisticated and smaller-scale loan borrowers, which typically include minorities and underprivileged populations.²³⁰ Therefore, legal behavioral analysis has been used as a tool

²²⁸ Kathleen C. Engel & Patricia A. McCoy, *A Tale of Three Markets: The Law and Economics of Predatory Lending*, 80 TEX. L. REV. 1255, 1260 (2002). For more on predatory lending, see generally ELIZABETH WARREN & AMELIA WARREN TYAGI, *THE TWO-INCOME TRAP: WHY MIDDLE-CLASS MOTHERS AND FATHERS ARE GOING BROKE* (2003).

²²⁹ Engel & McCoy, *supra* note 228, at 1260.

²³⁰ See, e.g., Austin, *supra* note 148 (examining predatory lending in the context of the cultural choices of and financial alternatives available to small-loan borrowers); Patricia A. McCoy, *A Behavioral Analysis of Predatory Lending*, 38 AKRON L. REV. 725, 734 (2005) (“[S]ubprime quotes by different lenders are almost never posted side-by-side and when they are, the quotes do not permit meaningful comparison.”).

to explore the inconsistencies between the written law and how these laws are actually implemented.²³¹ This kind of analysis involves a deep dive into a group's culture, practices, preferences, and perceptions.²³² It is especially beneficial for investigating predatory lending, since while some types of unique lending models, such as subprime lending, can be readily identified and quantified, predatory lending is context dependent and often hard to precisely identify accurately.²³³ For instance, while subprime loan products can be suitable in some contexts, their transformation into predatory instruments in other situations can occur due to factors such as inadequate disclosure, imbalanced bargaining power, or fraudulent misrepresentation.²³⁴

Regulating predatory practices is challenging as seemingly secure loan products for a specific group can be exploited by predatory lenders when offered to unqualified borrowers. Moreover, when community-based entities target vulnerable borrowers unlikely to report suspicious activity to authorities, loan sale abuses can often go unnoticed by regulators. Attempting to address these issues, scholars have tried to characterize or define predatory lending and have proposed substantial legal rules or standards for its regulation.²³⁵ Certain studies highlight the racial implications of predatory lending, while others investigate disclosure laws, counseling, or education as potential remedies.²³⁶ A handful of experts have deliberated on policies that might generate acceptable alternatives to predatory loans, while others have examined state-specific issues, and some have studied context-specific predatory

²³¹ See Austin, *supra* note 148, at 1220.

²³² Nicole Lutes Fuentes, Comment, *Defrauding the American Dream: Predatory Lending in Latino Communities and Reform of California's Lending Law*, 97 CALIF. L. REV. 1279, 1302 (2009).

²³³ See Janis Bowdler, *Jeopardizing Hispanic Homeownership: Predatory Practices in the Homebuying Market* 9 (Nat'l Council of La Raza, Issue Brief No. 15, 2005), <https://www.policyarchive.org/download/20251> [<https://perma.cc/VS84-PT4F>].

²³⁴ Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., *The Subprime Mortgage Market*, Speech at the Federal Reserve Bank of Chicago's 43rd Annual Conference on Bank Structure and Competition (May 17, 2007), <https://www.federalreserve.gov/newsevents/speech/bernanke20070517a.htm> [<https://perma.cc/U2ZH-S2GC>] (“[S]pecific lending practices that may be viewed as inappropriate in some circumstances are appropriate in others . . .”).

²³⁵ See, e.g., Celeste M. Hammond, *Predatory Lending—A Legal Definition and Update*, 34 REAL EST. L.J. 176 (2005) (summarizing predatory practices, law, and proposed reforms); Patricia E. Obara, *Predatory Lending*, 118 BANKING L.J. 541, 542 (2001) (advocating “common sense” regulation because costs of predatory lending laws are passed on to consumers); Dee Pridgen, *Predatory Lending: The Hidden Scourge of the Housing Boom*, WYO. LAW., Oct. 2005, at 18, 21 (summarizing predatory practices and calling for stronger legislation).

²³⁶ *Women in the Subprime Market*, CONSUMERS UNION SWRO, Oct. 2002, at 1–4, <https://web.archive.org/web/20111101034343/http://www.consumersunion.org/pdf/women-sub.pdf> (identifying weaknesses in Texas consumer protections that leave women, minorities, and elders vulnerable to predatory mortgage lending practices).

tactics, which have highlighted common patterns in predatory lending.²³⁷ For instance, Professor Regina Austin conducted research on predatory lending within low-income, urban African American communities.²³⁸ **She found that these communities' preference for informal finance and credit transactions made them more susceptible to exploitation and overreach by lenders.**²³⁹

In the case of decentralized credit scoring, motivated by DeFi's promise of a parallel financial system, crypto's potential to bridge wealth disparities, as well as the blockchain's capacity to establish alternative credit scoring procedures and lending mechanisms, caused minorities and underprivileged populations to find themselves incrementally investing in highly volatile digital assets.²⁴⁰ Initially, these investments were carried out to ensure eligibility for overcollateralized loans and, subsequently, to generate ample on-chain activity for crypto-native credit scores. However, these continuous investments in volatile assets turned out to be unfavorable for many, especially when evaluated through the perspective of legal behavioral analysis. It has been observed that minorities and underprivileged populations were disproportionately represented among these crypto investors.²⁴¹ And many of the popular entities they dealt with, mainly the CeFi ones, were fraudulent, employed deceptive practices, demonstrated a lack of transparency, and made consumers waive certain legal rights without realizing it.²⁴² They did so **while profiting from these populations' desperate need to find an alternative to the existing financial system, their desire to catch up financially, and financial or technological illiteracy.**²⁴³ Indeed, context matters.

Lastly, research has indicated that the benefits of lending have predominantly favored white men, providing them with opportunities

²³⁷ See Drew DeSilver & Kristen Bialik, *Blacks and Hispanics Face Extra Challenges in Getting Home Loans*, PEW RSCH. CTR. (Jan. 10, 2017), <https://www.pewresearch.org/short-reads/2017/01/10/blacks-and-hispanics-face-extra-challenges-in-getting-home-loans> [https://perma.cc/Y9LA-4CT5].

²³⁸ See Austin, *supra* note 148.

²³⁹ *Id.*

²⁴⁰ See *supra* Section II.B.

²⁴¹ See *supra* Section II.B.

²⁴² See, e.g., Levitin, *supra* note 225, at 887–88 (highlighting the importance of holding and securing one's own private keys, including passwords to cryptocurrency wallets). Many users found out during bankruptcy proceedings that they had de facto given up their legal rights. *Id.* at 902–03.

²⁴³ See *supra* Section II.B.

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for homeownership and advanced education.²⁴⁴ When credit opportunities were extended to minorities, however, “predatory lending practices, subprime loans, and structural inequality twisted credit into a false promise that, instead of opening up access to homes and education, drowned people in mountains of debt they were unable to repay.”²⁴⁵ History seems to be repeating itself as decentralized credit scoring, which targets and has a disproportionate influence on minorities and underserved communities, offers the promise of financial inclusion and access to credit. But to take advantage of this promise, vulnerable individuals have been motivated to commit to taking on overcollateralized loans in an immensely volatile market, which continues being unpredictable, risky, and less regulated. Hence, the “credit is used in an attempt to close . . . [a wealth] gap, but ultimately only widens the [wealth] gap,”²⁴⁶ as has been the case before with other predatory credit and lending models.

IV. THE REGULATORY MAZE OF CRYPTO-NATIVE CREDIT SCORES

The previous Parts outlined challenges associated with crypto-native credit scores, including error, discrimination, and perpetuation of social injustices, as well as novel concerns involving lending model design choices that may lead to predatory lending practices.

In this Part, we examine the existing regulatory framework governing lending and credit reporting and assess whether existing safeguards effectively extend to decentralized credit scoring. We then consider the regulatory overlap around DeFi, which leads to an accountability paradox, where authority is seemingly shared, yet no one agency or regulator bears the weight. This Part concludes with an overview of practical regulatory challenges in the DeFi space.

²⁴⁴ Tonya L. Brito, Kathryn A. Sabbeth, Jessica K. Steinberg & Lauren Sudeall, *Racial Capitalism in the Civil Courts*, 122 COLUM. L. REV. 1243, 1279 (2022); see also Creola Johnson, *The Magic of Group Identity: How Predatory Lenders Use Minorities to Target Communities of Color*, 17 GEO. J. ON POVERTY L. & POL’Y 165, 187 (2010) (“[P]ayday-lending stores [are] concentrated in minority neighborhoods and more heavily concentrated in lower-income African American communities . . .” (footnote omitted)); Robin A. Prager, *Determinants of the Locations of Payday Lenders, Pawnshops and Check-Cashing Outlets* 21 (Bd. of Governors of the Fed. Rsrv. Sys., Fin. & Econ. Discussion Series No. 2009-33, 2009), <https://www.federalreserve.gov/pubs/feds/2009/200933/200933pap.pdf> [<https://perma.cc/8ZMU-U4U4>].

²⁴⁵ Brito, *supra* note 244.

²⁴⁶ Chrystin Ondersma, *A Human Rights Approach to Consumer Credit*, 90 TUL. L. REV. 373, 380 (2015).

A. *Regulatory Landscape*

Regulation of predatory lending in the United States includes federal regulation and state regulation, as well as soft regulation in the form of best practices, industry guidelines, and awareness campaigns. Regulation of credit reporting has focused on ensuring fairness by increasing transparency, improving accuracy, addressing discriminatory practices, **and guaranteeing a secure process that would also protect consumers' privacy.**²⁴⁷ Therefore, as this Section shows, existing laws do offer regulatory protection that is relevant to decentralized credit scoring, but their applicability to crypto-native credit scoring is somewhat uncertain. To assess the pertinence and adequacy of the current regulatory framework for decentralized credit scoring, we examine the Truth in Lending Act (TILA), the Fair Credit Reporting Act (FCRA), the ECOA, and the Gramm-Leach-Bliley Act (GLBA). These regulations are applicable to a range of business entities, presumably including those operating in the crypto space.²⁴⁸

1. TILA

TILA requires lenders to disclose the terms and costs of borrowing in a standardized manner.²⁴⁹ This allows consumers to make informed decisions and avoid hidden fees. In accordance with the Dodd-Frank Act, the enforcement of TILA falls under the jurisdiction of the CFPB.²⁵⁰ As a result, “[o]ne of the CFPB’s first actions was to amend TILA’s Regulation Z, originally requiring disclosures by credit card companies, in order to

²⁴⁷ This is particularly relevant as, unlike in other countries, the United States does not have a comprehensive federal data privacy law. See Ari Ezra Waldman, *Privacy, Practice, and Performance*, 110 CALIF. L. REV. 1221 (2022) (discussing the current legal status of privacy).

²⁴⁸ FIN. CRIMES ENF’T NETWORK, DEP’T OF TREAS., APPLICATION OF FINCEN’S REGULATIONS TO PERSONS ADMINISTERING, EXCHANGING, OR USING VIRTUAL CURRENCIES 1 (2013), <https://www.fincen.gov/sites/default/files/guidance/FIN-2013-G001.pdf> [<https://perma.cc/3LHJ-7H3N>]. This was confirmed in a more recent update from FinCEN in 2019. FIN. CRIMES ENF’T NETWORK, DEP’T OF TREAS., APPLICATION OF FINCEN’S REGULATIONS TO CERTAIN BUSINESS MODELS INVOLVING CONVERTIBLE VIRTUAL CURRENCIES 1 (2019) <https://www.fincen.gov/sites/default/files/2019-05/FinCEN%20Guidance%20CVC%20FINAL%20508.pdf> [<https://perma.cc/B6NL-BCJU>] (covering money transmission, AML, KYC, record and information keeping, etc.).

²⁴⁹ Truth in Lending Act, 15 U.S.C. §§ 1601–1667f.

²⁵⁰ CONSUMER FIN. PROT. BUREAU, TRUTH IN LENDING ACT 3 (2015), https://files.consumerfinance.gov/f/201503_cfpb_truth-in-lending-act.pdf [<https://perma.cc/G9TA-NJ57>].

comply with the new rules set out in the CARD Act,²⁵¹ the stated purpose of which was to “establish fair and transparent practices related to the extension of credit.”²⁵²

A “creditor” under TILA is a “person,” who is in turn defined as “a natural person or an organization.”²⁵³ While an organization is defined expansively as “a corporation, government or governmental subdivision or agency, trust, estate, partnership, cooperative, or association,” DeFi protocols are not clearly covered by this definition.²⁵⁴ A “consumer” under TILA is defined as “a natural person,” which does not clearly extend to wallets.²⁵⁵

2. FCRA

The FCRA was enacted by Congress in 1970 to address issues of abuse and unfair practices in the collection of consumer information.²⁵⁶ It imposes obligations on consumer reporting agencies (CRAs) to provide consumers with access to their credit reports,²⁵⁷ ensure the accuracy of consumer reports,²⁵⁸ and implement procedures for correcting inaccuracies.²⁵⁹ The FCRA aims to enhance transparency and accuracy in credit scoring while balancing the disclosure of nonpublic consumer information with the protection of privacy rights.²⁶⁰ It restricts the use of “consumer reports” for specific permissible purposes, such as consumer

²⁵¹ Allison J. Zimmon, *Rx for Costly Credit: Deferred Interest Medical Credit Cards Do More Harm Than Good*, 35 B.C. J.L. & SOC. JUST. 319, 336 (2015).

²⁵² Credit Card Accountability Responsibility and Disclosure Act of 2009 (CARD Act), Pub. L. No. 111-24, 123 Stat. 1734 (codified as amended in scattered sections of 15 U.S.C).

²⁵³ 15 U.S.C. § 1602(d)–(e), (g) (defining a “creditor” as “a person who both (1) regularly extends, whether in connection with loans, sales of property or services, or otherwise, consumer credit which is payable by agreement in more than four installments or for which the payment of a finance charge is or may be required, and (2) is the person to whom the debt arising from the consumer credit transaction is initially payable on the face of the evidence of indebtedness or, if there is no such evidence of indebtedness, by agreement”).

²⁵⁴ *Id.* § 1602(d).

²⁵⁵ *Id.* § 1602(i).

²⁵⁶ Hiller & Jones, *supra* note 28, at 77–78.

²⁵⁷ Pursuant to section 612 of the FCRA, credit reporting agencies (CRAs) must provide consumers with a copy of their credit report upon request at least once in any twelve-month period. 15 U.S.C. § 1681j(a)(1)(A).

²⁵⁸ *Id.* § 1681e(b).

²⁵⁹ Under section 611 of the FCRA, consumers have the right to request that CRAs conduct a “reasonable reinvestigation” of any information they contest, free of charge. *Id.* § 1681i(a)(1)(A).

²⁶⁰ Allison Piper Geber, Comment, *Secret Surveillance Scores: Pay No Attention to What’s Behind the Curtain*, 41 N. ILL. U. L. REV. 203, 212 (2020).

credit transactions.²⁶¹ CRAs are required to implement reasonable procedures to prevent unlawful access to consumer reports.²⁶² Additionally, the FCRA, with guidance from the CFPB, requires lenders to provide borrowers with relevant information about why they were given adverse or materially worse credit determinations.²⁶³

The FCRA regulates CRAs and the information they provide, as “furnishers.”²⁶⁴ The term “consumer reporting agency” is defined under the FCRA as any “person” who,

for monetary fees, dues, or on a *cooperative nonprofit basis*, regularly engages . . . in the practice of assembling or evaluating consumer credit information or other information on consumers for the purpose of furnishing consumer reports to third parties, and [who] uses any means or facility of interstate commerce for the purpose of preparing or furnishing consumer reports.²⁶⁵

The term “consumer report” is defined as the “communication of any information by a consumer reporting agency bearing on a consumer’s credit worthiness, credit standing, credit capacity, character, general reputation, personal characteristics, or mode of living” that is used or collected in order to make decisions about credit.²⁶⁶

Decentralized protocols and entities that utilize on-chain information to generate credit scores fall under the FCRA’s definition of “a person,” which is broadly defined as any “entity.”²⁶⁷ However, the term “consumer” is defined as “an individual,”²⁶⁸ which brings up a question as to whether scoring wallets that score other wallets count as providing credit to individuals. While DeFi protocols generating scores solely for internal use may not qualify as CRAs, DeFi-based scoring products that engage in the practice of “assembling or evaluating consumer credit information . . . for the purpose of furnishing consumer reports” (often in the form of NFTs) to third parties are likely considered CRAs.²⁶⁹ Both DeFi protocols and DeFi scoring services generate consumer credit reports, assessing factors like creditworthiness, credit capacity, reputation, and character.

²⁶¹ 15 U.S.C. § 1681b(a); *Trans Union LLC. v. Fed. Trade Comm’n*, 295 F.3d 42, 49 (D.C. Cir. 2002); *Cole v. U.S. Capital, Inc.*, 389 F.3d 719, 725 (7th Cir. 2004).

²⁶² 15 U.S.C. § 1681e(a).

²⁶³ Chou, *supra* note 30, at 1208.

²⁶⁴ 15 U.S.C. §§ 1681e, 1681s-2.

²⁶⁵ *Id.* § 1681a(f).

²⁶⁶ *Id.* § 1681a(d)(1).

²⁶⁷ *Id.* § 1681a(b).

²⁶⁸ *Id.* § 1681a(c).

²⁶⁹ *Id.* § 1681a(f).

3. ECOA

Congress passed the ECOA in 1974 to guarantee that all creditworthy customers of all sexes and marital statuses had equal access to credit²⁷⁰ and, in 1976, expanded it to prohibit other types of discrimination.²⁷¹ The ECOA permits creditors to collect information concerning specific, potentially discriminatory characteristics, but prohibits them from using that information when making credit-related decisions.²⁷² The ECOA is implemented by Regulation B, which applies the nondiscriminatory standards outlined in the ECOA to anyone who regularly makes credit decisions in the ordinary course of business,²⁷³ and covers creditor activities before, during, and after the extension of credit.²⁷⁴ Should a credit scoring system not meet the criteria of being “empirically derived[and] demonstrably and statistically sound,” as outlined in Regulation B, it will be deemed a “[j]udgmental” evaluation system.²⁷⁵

The ECOA defines the term “creditor” as “any person who regularly extends, renews, or continues credit; any person who regularly arranges for the extension, renewal, or continuation of credit; or any assignee of an original creditor who participates in the decision to extend, renew, or **continue credit.**”²⁷⁶ Decentralized credit scoring may be covered under this definition as it includes a lending protocol that determines eligibility for undercollateralized loans and can be viewed as an assignee of the original creditor.²⁷⁷ **However, the creditor definition refers to a “person,” which the ECOA defines as “a natural person, a corporation, government or governmental subdivision or agency, trust, estate, partnership, cooperative, or association.”**²⁷⁸ It is unclear whether DeFi protocols that exist in a decentralized manner completely on chain would be covered under this definition.

Assuming that decentralized credit scoring protocols fit under the definitional scope of ECOA, they could be accused of discriminatory

²⁷⁰ *Id.* § 1691; *see also* Geber, *supra* note 260, at 213.

²⁷¹ Hiller & Jones, *supra* note 28, at 80.

²⁷² Packin & Lev-Aretz, *On Social Credit*, *supra* note 2, at 353–54.

²⁷³ 12 C.F.R. § 202.1 (2023).

²⁷⁴ *Id.* § 1002.4(a).

²⁷⁵ *Id.* § 202.2(p), (t).

²⁷⁶ 15 U.S.C. § 1691a(e).

²⁷⁷ *See supra* Section I.C.

²⁷⁸ 15 U.S.C. § 1691a(f).

underwriting due to their novel and opaque processes.²⁷⁹ Businesses could collect data from various sources, organize and format it, feed it to an oracle which is de facto the business's algorithm, and get an algorithmically generated credit score.²⁸⁰ However, the process may react differently to certain types of data, such as race, which could lead to discriminatory outcomes and trigger an ECOA violation.²⁸¹

4. GLBA

The GLBA requires financial institutions to inform customers of their information-sharing practices and take measures to protect sensitive data. The provisions of the GLBA limit when a “financial institution” may disclose a consumer’s “nonpublic personal information” to nonaffiliated third parties.²⁸² The law covers various financial institutions, including those not traditionally categorized as such but significantly engaged in financial activities as defined in section 4(k) of the Bank Holding Company Act.²⁸³ Traditionally, the GLBA applied to banks, mortgage companies, insurance companies, investment firms, and similar institutions. However, other entities could also fall under its purview.²⁸⁴ For example, in 2022, the U.S. Department of Treasury Office of Foreign Assets Control (OFAC) sanctioned Tornado Cash, a DeFi protocol operating on the Ethereum blockchain, governed by a decentralized autonomous organization.²⁸⁵ This designation by OFAC

²⁷⁹ See generally Anthony J. Casey & Anthony Niblett, *Self-Driving Laws*, 66 U. TORONTO L.J. 429, 431 (2016) (“Innovations in big data and artificial intelligence will make it increasingly easy to predict outcomes.”).

²⁸⁰ See Christopher K. Odinet, *Consumer Bitcredit and Fintech Lending*, 69 ALA. L. REV. 781, 822 (2018).

²⁸¹ *Id.* at 820–22.

²⁸² 16 C.F.R. §§ 313.3(k)(1), (n)(1), 313.10(a)(1) (2023).

²⁸³ See Peter Swire, *The Portability and Other Required Transfers Impact Assessment (PORT-IA): Assessing Competition, Privacy, Cybersecurity, and Other Considerations*, 6 GEO. L. TECH. REV. 57, 114 n.191 (2022).

²⁸⁴ See *id.* (explaining that the GLBA defines financial institution as “any institution the business of which is engaging in financial activities as described in section 4(k) of the Bank Holding Company Act of 1956” and that “[a]n institution that is significantly engaged in financial activities is a financial institution” (quoting 16 C.F.R. § 313.3(k)(1))); FINANCIAL PRIVACY LAW GUIDE ¶ 1017 (2023) (“The term ‘financial institution’ as defined in the privacy rules is based upon Section 505(3) of the Gramm-Leach-Bliley Act. Both the statute and the privacy rules provide that a financial institution is any institution the business of which is engaging in activities that are financial in nature, or incidental to such financial activities, as described in Section 4(k) of the Bank Holding Company Act of 1956.”).

²⁸⁵ Press Release, U.S. Dep’t of Treasury, U.S. Treasury Sanctions Notorious Virtual Currency Mixer Tornado Cash (Aug. 8, 2022), <https://home.treasury.gov/news/press-releases/jy0916> [<https://perma.cc/BT7Z-TB8J>].

indicates that the GLBA may apply to platforms, regardless of whether they are regulated institutions or administered by a centralized authority.²⁸⁶

The GLBA defines “financial activities” in accordance with the Bank Holding Company Act and regulations set by the Federal Reserve Board.²⁸⁷ These activities include, among others: (1) “[l]ending, exchanging, transferring, investing for others, or safeguarding money or securities,” covering services provided by lenders, check cashers, wire transfer services, and money order sellers; (2) “[p]roviding financial, investment, or economic advisory services,” encompassing services provided by credit counselors, financial planners, tax preparers, accountants, and investment advisors; and (3) brokering and servicing loans.²⁸⁸

The GLBA was established to safeguard consumers’ financial information and regulate the financial services industry. It does not directly address the use of digital technology like smart contracts. However, certain aspects of the Act, such as data security provisions, may have relevance to the development and usage of financial protocols and smart contracts.²⁸⁹

B. *Regulatory Overlap: Interagency Perspectives*

The dominant regulatory agencies in the TradFi credit space have also migrated to offering consumer protection in the context of cryptocurrencies. Many crypto products and services are viewed as some type of investment vehicles, which is why the Commodity Futures Trading Commission (CFTC) and the Securities and Exchange

²⁸⁶ ALEXANDER C. DRYLEWSKI ET AL., SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP, *THE DISTRIBUTED LEDGER: BLOCKCHAIN, DIGITAL ASSETS AND SMART CONTRACTS* (2022), <https://www.skadden.com/-/media/files/publications/2022/08/the-distributed-ledger/the-distributed-ledger-august-2022.pdf> [<https://perma.cc/5SG2-924X>].

²⁸⁷ Heidi Mandanis Schooner, *The Role of Rival Litigation in Wilmarth’s New Glass-Steagall*, 93 U. COLO. L. REV. 961, 969 (2022) (“Under GLBA, financial holding companies . . . may engage in any activity that is ‘financial in nature or incidental to such financial activity; or is complementary to a financial activity and does not pose a substantial risk to the safety or soundness of depository institutions or the financial system generally.’ GLBA lists various activities as financial in nature, including insurance and securities underwriting.” (footnotes omitted) (quoting 12 U.S.C. § 1843(k)(1))).

²⁸⁸ See 12 U.S.C. § 1843(k)(4)(A)–(C).

²⁸⁹ Dacia Green, *Big Brother Is Listening to You: Digital Eavesdropping in the Advertising Industry*, 16 DUKE L. & TECH. REV. 352, 376 (2018) (describing “the Gramm[–]Leach–Bliley Act, which protect[s] consumers’ financial information,” and describing how it, along with a few other statutes, reflects “Congress’s effort to respond to privacy concerns in individual sectors of the economy, especially in the now-digital world”).

Commission (SEC) are interested in them. Consumer protection in this context has also been tasked to the Federal Trade Commission (FTC) and the CFPB.

According to the SEC, its jurisdiction extends to a range of DeFi participants, activities, and assets due to DeFi participants' involvement with securities and securities-related conduct.²⁹⁰ The SEC regulates DeFi lending protocols either due to the issuance of tokens that are considered unregistered securities or by classifying the protocols as "exchanges" under Regulation ATS.²⁹¹

The CFPB has a broad mandate to exercise oversight over those "offering or providing a consumer financial product or service."²⁹² In November 2021, the former head of the CFPB, Rohit Chopra, stated that "the CFPB is actively monitoring and preparing for broader consumer adoption of cryptocurrencies," referencing the possibility of using stablecoins for "consumer deposits, stored value instruments, retail and other consumer payments mechanisms, and in consumer credit arrangements."²⁹³ In early 2022, the CFPB announced that it will safeguard crypto consumers "against errors, theft, or fraud."²⁹⁴ Shortly after, the CFPB also declared its intention to use its existing authority to supervise "nonbanks" whose activities may present risks to consumers, in an attempt to monitor those that are rapidly expanding or are in markets that are not currently under the bureau's supervision.²⁹⁵

The FTC, which is tasked with punishing fraud and unfair or deceptive practices, has also used its authority to protect crypto-trading consumers. In August 2022, the agency investigated the operators of the

²⁹⁰ Caroline A. Crenshaw, Comm'r, U.S. Sec. & Exch. Comm'n, Statement on DeFi Risks, Regulations, and Opportunities (Nov. 9, 2021), <https://www.sec.gov/news/statement/crenshaw-defi-20211109> [<https://perma.cc/TPK2-3UAH>] (arguing that regulations and laws do not clearly address how to handle DeFi transactions).

²⁹¹ Kwon, *supra* note 38, at 399.

²⁹² 12 U.S.C. § 5481(6)(A).

²⁹³ Press Release, Consumer Fin. Prot. Bureau, Statement of CFPB Director Chopra on Stablecoin Report (Nov. 1, 2021), <https://www.consumerfinance.gov/about-us/newsroom/statement-cfpb-director-chopra-stablecoin-report> [<https://perma.cc/W4B8-4AW8>]. Likewise, in the March 2022 Presidential Executive Order on digital assets, the CFPB was specifically named as part of an interagency group responsible for creating a regulatory framework for digital assets. The order included the Bureau's existing mandate in this issue, and its role was referenced twelve times. Exec. Order No. 14067, 87 Fed. Reg. 14143 (Mar. 9, 2022).

²⁹⁴ Press Release, Consumer Fin. Prot. Bureau, CFPB Director Chopra Statement on President Biden's Digital Assets Executive Order (Mar. 9, 2022), <https://www.consumerfinance.gov/about-us/newsroom/cfpb-director-rohit-chopra-statement-on-president-bidens-digital-assets-executive-order> [<https://perma.cc/54ZG-YH4E>].

²⁹⁵ Press Release, Consumer Fin. Prot. Bureau, CFPB Invokes Dormant Authority to Examine Nonbank Companies Posing Risks to Consumers (Apr. 25, 2022), <https://www.consumerfinance.gov/about-us/newsroom/cfpb-invokes-dormant-authority-to-examine-nonbank-companies-posing-risks-to-consumers> [<https://perma.cc/JP2C-434B>].

BitMart cryptocurrency exchange following a security breach in December 2021.²⁹⁶ The BitMart case is the first known investigation by the FTC into the crypto markets, despite the agency having issued guidance and research relevant to the space.²⁹⁷ A 2019 bill titled the Digital Taxonomy Act would have required the FTC to develop a plan “to prevent unfair or deceptive acts or practices in transactions relating to digital tokens.”²⁹⁸

While regulatory agencies have made efforts to establish regulations and provide consumer guidance on cryptocurrencies,²⁹⁹ they have not specifically addressed or acknowledged the emergence of decentralized credit scoring. This could be attributed to the relative novelty of decentralized credit scoring or to uncertainty regarding whether decentralized credit providers fall within the purview of traditional credit regulations and under the authority of these agencies. For example, the SEC attempted to address the lack of a middleman in DeFi lending protocols by expanding the definition of “exchange.”³⁰⁰ But the definition of “person” does not include the possibility of a computer program acting

²⁹⁶ *In re* Civ. Investigative Demand to Bachi.tech Corp., No. 222-3050, 2022 WL 3500455 (F.T.C. Aug. 9, 2022).

²⁹⁷ Leah Nylen, *FTC Probes BitMart Exchange Breach, Marking Agency’s First Crypto Case*, BLOOMBERG (Aug. 10, 2022, 4:28 PM), <https://www.bloomberg.com/news/articles/2022-08-10/ftc-probes-bitmart-exchange-breach-marking-first-crypto-case> [<https://perma.cc/D6FC-5WEW>]. Some of the Agency’s publications include: Cristina Miranda, *Worried about Crypto Exchange Losses? Don’t Pay Money for “Help” Recovering Money*, FED. TRADE COMM’N (Nov. 16, 2022), <https://consumer.ftc.gov/consumer-alerts/2022/11/worried-about-crypto-exchange-losses-dont-pay-money-help-recovering-money> [<https://perma.cc/AP5P-43LW>]; and Cristina Miranda, *Spotting Cryptocurrency Investment Scams*, FED. TRADE COMM’N (May 17, 2021), <https://consumer.ftc.gov/consumer-alerts/2021/05/spotting-cryptocurrency-investment-scams> [<https://perma.cc/4UDM-ZYW7>].

²⁹⁸ Digital Taxonomy Act § 2, H.R. 2154, 116th Cong. (2019). This bill has been introduced in the House but, as of December 2023, has not seen any further developments.

²⁹⁹ See, e.g., Clarity for Payment Stablecoins Act of 2023, H.R. 4766, 118th Cong. (2023) (offered by the House Financial Services Committee Chairman Patrick McHenry); Keep Your Coins Act of 2023, H.R. 4841, 118th Cong. (2023) (offered by Representative Warren Davidson); Press Release, House Fin. Servs. Comm., House Financial Services Committee Reports Digital Asset, ESG Legislation to Full House for Consideration (July 27, 2023), <https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=408944> [<https://perma.cc/X364-E5DX>].

³⁰⁰ See Amendments Regarding the Definition of “Exchange” and Alternative Trading Systems (ATSs) That Trade U.S. Treasury and Agency Securities, National Market System (NMS) Stocks, and Other Securities, 87 Fed. Reg. 15496 (proposed Mar. 18, 2022) (to be codified at 17 C.F.R. pts. 232, 240, 242, and 249).

as a person,³⁰¹ thus precluding it from being a potential issuer through which the trading of securities takes place.³⁰²

C. *Practical Challenges to Regulating DeFi Protocols*

Regulating the intricate features and operational mechanisms of the technologies that constitute DeFi, including smart contracts, dApps, DLT, AI, and machine learning, presents significant challenges. The race between technology and regulation is as prevalent in DeFi as in any other industry. DeFi technologies advance rapidly, posing challenges for regulators to stay in sync. The dynamic nature of DeFi means that regulations often lag behind, as emerging technologies and practices outpace the development and implementation of regulatory frameworks. In addition to its rapid technological advancement, the decentralized nature of DeFi challenges traditional enforcement approaches. Because decision-making and control are distributed among various participants, regulators struggle to identify responsible parties or entities for enforcement and oversight.³⁰³

The global and borderless nature of DeFi platforms presents an additional challenge for regulators. DeFi enables participation from users worldwide, which results in jurisdictional issues and does not allow uniform enforcement across different regions. Because DeFi platforms are comprised of code and smart contracts running on a distributed network, it is also hard to identify the appropriate jurisdiction and regulatory framework to apply.³⁰⁴

Another regulatory challenge is tied to the interconnectivity of DeFi systems. DeFi ecosystems often consist of interconnected protocols and platforms that are difficult to isolate if regulation of individual components is required. Changes or vulnerabilities in one system can

³⁰¹ Securities Act of 1933, ch. 38, 48 Stat. 74, § 2 (codified as amended at 15 U.S.C. § 77b(a)(2)).

³⁰² The recognition of computer programs as legal persons is not just limited to securities laws, and for very valid reasons. For instance, the Restatement (Third) of Agency specifically includes a comment to the section defining “agents” explaining that “a computer program is not capable of acting as a principal or an agent as defined by the common law. At present, computer programs are instrumentalities of the persons who use them.” RESTATEMENT (THIRD) OF AGENCY § 1.04 cmt. e (AM. L. INST. 2006).

³⁰³ Kwon, *supra* note 38, at 399. This does not include “many ‘DeFi’ projects [that] are still run by individuals who ‘aren’t very decentralized at all.’” *Id.* at 400 (quoting Davis Z. Morris, Opinion, *Lassoing a Stallion: How Gary Gensler Could Approach DeFi Enforcement*, COINDESK (May 11, 2023, 5:44 AM), <https://www.coindesk.com/policy/2021/10/21/lassoing-a-stallion-how-gensler-could-approach-defi-enforcement> [<https://perma.cc/JCA3-XKSX>]).

³⁰⁴ Hanna Meakin, Peter McBurney & Albert Weatherill, *Decoding DeFi Regulation: Challenges and Opportunities*, 3 INT’L J. BLOCKCHAIN L. 19, 23 (2022).

have cascading effects throughout the network, further complicating regulatory efforts. This interconnectedness is also tied to issues of opacity, especially with the integration of AI and machine learning in DeFi. Beyond the specialized knowledge and understanding required to regulate these platforms,³⁰⁵ their black box nature makes it hard to scrutinize decision-making processes from a regulatory perspective.

These practical challenges have led regulators to enforcement actions for which there was no clear regulation on point. Critics have consequently argued that legal rules were applied in an unexpected manner, which could be seen as regulation by enforcement,³⁰⁶ rather than the preferred regulatory approach. For example, it has been acknowledged that although protocols may appear decentralized, the individuals responsible for creating, owning, or running them may be subject to legal liability.³⁰⁷ Similarly, it has been observed that even though DAOs are decentralized, the (voting) members of the community are still exposed to potential legal liability.³⁰⁸

³⁰⁵ *Id.* at 24.

³⁰⁶ See, e.g., Yuliya Guseva, *The SEC, Digital Assets, and Game Theory*, 46 J. CORP. L. 629 (2021) (discussing regulation by enforcement in connection with the SEC); see also Chris Brummer, Yesha Yadav & David Zaring, *Regulation by Enforcement*, S. CAL. L. REV. (forthcoming) (manuscript at 1–2), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4405036 (last visited Jan. 25, 2024) (“[R]egulation by enforcement[]” prompted fierce critiques from commentators and the marketplace, often from the standpoint of fairness—and based on an implicit assumption that such regulatory conduct might be illegal, or at the very least, politically motivated.”).

³⁰⁷ In 2022, a group of traders brought a class action against Uniswap, a cryptocurrency exchange based on a decentralized network protocol, in which they also named developers and venture capital backers of the exchange. The class action alleged that since the protocol allowed users to freely list and also trade tokens, its creators should be responsible for “rampant fraud on the exchange,” and it must be registered as a broker-dealer with FINRA. Complaint at 1, *Risley v. Universal Navigation Inc.*, No. 22-cv-2780 (S.D.N.Y. Apr. 4, 2022); see also Samuel Haig, *Uniswap Faces Class Action Lawsuit From Trader Who Lost Money On Altcoins*, YAHOO: THE DEFIANT (Apr. 15, 2022), <https://www.yahoo.com/video/uniswap-faces-class-action-lawsuit-125256995.html> [<https://perma.cc/7XLU-8HMY>] (noting that among those sued were unusual parties—the protocol’s founder and investors—who were accused of “abetting Uniswap’s ‘failure to register as an exchange’” (quoting Complaint, *supra*, at 3)).

³⁰⁸ See *CFTC v. Ooki DAO*, No. 22-cv-05416, 2023 WL 5321527, at *1 (N.D. Cal. June 8, 2023). In this regulation-by-enforcement case, the CFTC argued that natural persons and legal entities are potentially liable for all of a DAO’s violations of the Commodity Exchange Act’s (CEA) CFTC regulations if they participate in the DAO’s governance by voting with its governance tokens. The CFTC stated that DAOs are equivalent to unincorporated associations, and thus persons voting using the DAO’s governance tokens are members of such an association. Based on state law principles, this implies that they are potentially personally, jointly, and severally liable for up to all of the debts of the DAO. Similarly, these persons are potentially personally both jointly and severally liable for all of the DAO’s violations of the CEA and CFTC. Among those criticizing this CFTC decision was Commissioner Summer K. Mersinger, who issued a forceful dissent. See Alison Frankel, *Novel Action Against Ooki Crypto Collective Draws Rebuke from Commodities Trading*

In sum, while traditional credit scoring activities are governed by a regulatory framework that prioritizes transparency, accuracy, integrity, antidiscrimination measures, and the protection of privacy and security, crypto-native credit scores require optimization toward these same objectives, but to an even greater extent. However, the current regulatory framework fails to address the unique nature of decentralized credit scoring, leaving a gap in oversight.

D. *The CFPB's Role in DeFi and Finfluencers Oversight*

As evident from the above discussion, the regulation of decentralized credit scores, especially in the context of crypto-native credit scoring, faces several current deficiencies. Regulators are struggling to catch up with the recent emergence of these innovative credit products. The adaptability of statutory definitions to crypto-native credit scores remains uncertain. The overlapping regulatory authority over DeFi creates an accountability paradox, dispersing authority without a singular entity assuming full responsibility. And there are practical challenges associated with regulating the intricate technological landscape of DeFi. We argue that the answer to most of these concerns lies within CFPB authority.

Title X of the Dodd-Frank Act established the CFPB to ensure consumer protection in the financial sector.³⁰⁹ The CFPB has the authority to prescribe rules defining and prohibiting unfair, deceptive, or abusive acts or practices.³¹⁰ The scope of this authority encompasses “covered persons,” which Dodd-Frank broadly defines as “any person that engages in offering or providing a consumer financial product or service.”³¹¹ The term “person” is also defined expansively as “an individual, partnership, company, corporation, association (incorporated or unincorporated), trust, estate, cooperative organization, or other entity.”³¹² As DeFi lending protocols qualify both as persons under this definition—either as a cooperative organization or other entity—and as covered persons—because they offer a financial product or service—they

Commissioner, REUTERS (Sept. 23, 2022, 4:49 PM), <https://www.reuters.com/legal/government/novel-action-against-ooki-crypto-collective-draws-rebuke-commodities-trading-2022-09-23> [<https://perma.cc/HP2U-BH5D>].

³⁰⁹ Hiller & Jones, *supra* note 28, at 81.

³¹⁰ *Id.*; *Seila L. LLC v. Consumer Fin. Prot. Bureau*, 140 S. Ct. 2183, 2239 (2020) (Kagan, J., concurring in part) (“Congress, to be sure, gave the CFPB new authority over ‘unfair, deceptive, or abusive act[s] or practice[s]’ in transactions involving a ‘consumer financial product or service.’” (alterations in original) (quoting 12 U.S.C. §§ 5517(a)(1), 5536(a)(1))).

³¹¹ 12 U.S.C. § 5481(6)(A).

³¹² *Id.* § 5481(19).

fall within the CFPB's jurisdiction. Errors, algorithmic biases, and predatory lending practices align with the very types of unfair or abusive actions that Dodd-Frank aimed to safeguard against by empowering the CFPB with rulemaking authority. Equipped with both authority and financial expertise, the CFPB stands well-positioned to regulate decentralized credit scores.

Beyond addressing fairness harms in decentralized credit scoring, **we contend that the CFPB's role should extend to overseeing financial influencers, often referred to as "finfluencers."**³¹³ Finfluencers have emerged as powerful voices shaping consumer financial choices, bolstering sales, and exerting substantial sway over financial decision-making, particularly among vulnerable populations.³¹⁴ Recognizing the persuasive power of influencers over consumers' behavior, the FTC has conducted investigations, brought cases against influencers under section 5 of the FTC Act, and published guidelines on the topic.³¹⁵ **Analogous concerns in the financial context have led to New York's proposed CRPTO Act, which emphasizes the need for digital asset promoters to register and openly disclose any compensation and ownership stakes tied to their endorsements.**³¹⁶

Against the backdrop of figures like Kim Kardashian and Floyd Mayweather, who are entangled in legal disputes over allegations of misleading financial endorsements, the CRPTO Act's provisions prove relevant yet insufficient. Much like the FTC's measures with influencers, the CFPB should exercise its authority to curb unfair, deceptive, or abusive practices by regulating the finfluencers' market. Financial promotions are no longer confined to financial experts; the digital era has democratized this space, necessitating a heightened, tailored oversight. Inspired by the CRPTO Act, a nationwide approach should mandate that finfluencers submit detailed disclosures to regulators before engaging in any financial promotion. These disclosures should encompass ownership interest, compensation, potential conflicts of interest, wallet addresses, and even educational and criminal backgrounds. Regular updates on these disclosures would sustain ongoing transparency. Proceeds reaped by noncompliant finfluencers from such promotions should be redirected to a protective fund to compensate aggrieved consumers.

³¹³ *Rise of the Finfluencers, The Pros and Cons of Social Media Powered Literacy*, NBCUNIVERSAL ADVERT. & P'SHIP 1 (Mar. 2023), <https://together.nbcuni.com/wp-content/uploads/sites/3/2023/03/Rise-of-the-Finfluencer-.pdf> [<https://perma.cc/GR3P-XR85>].

³¹⁴ *Id.*

³¹⁵ *FTC's Endorsement Guides: What People Are Asking*, FED. TRADE COMM'N, <https://www.ftc.gov/business-guidance/resources/ftcs-endorsement-guides-what-people-are-asking> [<https://perma.cc/DJ4A-ZWXR>] (June 2023).

³¹⁶ *See supra* note 189.

Implementing these measures would not only safeguard consumers' interests, but also preserve the credibility of the digital financial ecosystem, ensuring it remains an arena of genuine opportunity rather than a minefield of misinformation.

CONCLUSION

In the ever-evolving landscape of DeFi, where the promise of blockchain technology lies in democratizing financial processes, DeFi lending has played a significant role. DeFi lending protocols, however, have encountered operational and ideological obstacles, arising from the absence of traditional intermediaries and the veil of borrower pseudonymity, which ultimately gave rise to the prevalent practice of overcollateralization. Attempts to tackle these challenges through the introduction of crypto-native credit scoring have been met with skepticism, as it raises concerns about potential financial exclusion and the reliability of the credit-gauging process.

Throughout this Article, we have underscored the fairness challenges that arise in the context of crypto-native credit scoring, encompassing issues such as built-in opacity, errors, and algorithmic biases. Moreover, our examination has shed light on the disconcerting prospect of predatory lending in connection with crypto-native credit scoring—a prospect that gains context when viewed in light of the historical patterns of financial exclusion and the subsequent targeting of vulnerable communities with exploitative financial offerings. As we show in our review of the regulatory landscape, statutory protections in TradFi credit reporting do not naturally extend to DeFi lending generally and crypto-native credit scoring, in particular.

We argue that the CFPB holds the potential to address these issues and use its authority to regulate unfair, deceptive, or abusive practices in the financial sector. We further advocate for the CFPB to exercise its authority to oversee influencers to ensure transparency and accountability in the financial choices they promote. The proposed **CRPTO Act's provisions indicate the regulatory direction. By implementing protective measures, such as comprehensive disclosure requirements and the redirection of noncompliant influencers' proceeds to a compensation fund, consumer interests can be safeguarded, and the digital financial ecosystem's credibility can be maintained.**