April 3, 2025

Commissioner Hester M. Peirce
Crypto Task Force
U.S. Securities and Exchange Commission
100 F St., NE,
Washington, DC 20549

Re: A Legal Basis for Interpreting the Definition of an Exchange to Exclude a Decentralized Exchange Operating an Automated Market Maker

Dear Commissioner Peirce,

On February 21, 2025, you requested "input from anyone in the public with an interest in [crypto] … that will make [crypto clarity] richer." Among the 48 listed questions soliciting answers from the public, one of the most important related to trading:

> Should the Commission create a new entity registration status with tailored registration requirements for any platform that trades crypto assets that are securities? Should the Commission use or adapt the existing requirements for national securities exchange registration or the alternative trading system exemption from such registration, and if so, how?

In addition to addressing the facts and circumstances in which a digital asset may be sold pursuant to an investment contract, the Securities and Exchange Commission (SEC) should issue guidance interpreting the definition of an "exchange" in the Securities Exchange Act of 1934 ("Exchange Act") to exclude decentralized exchanges ("DEXs") operating an automated market maker ("AMM"). This is because peer-to-peer transaction protocols do not resemble traditional stock exchanges that the Exchange Act was intended to cover. Rather, the SEC should request Congress to amend the Exchange Act if the agency seeks to regulate DEXs.

The purpose of this letter is to provide a legal basis as to why a DEX operating an AMM does not constitute an "exchange" under the Exchange Act, as well as why the registration and regulation framework for stock exchanges is both incompatible for DEXs and fails to provide adequate investor protections for using a DEX. This letter does not comment on other types of digital asset exchanges, such as vertically integrated custodial order book exchanges, or DEXs operating an order book, however, similar arguments may apply to these types of DEXs.

The following pages were prepared as a paper for a law school class due in late November 2024. The purpose of the paper was to take a position on a legal issue relating to the enforcement of the federal securities laws. In light of the Crypto Task Force's goal of providing legal clarity for blockchain participants, this paper can timely serve a dual role by informing the SEC's orientation towards its treatment of DEXs operating an AMM. Although the paper does not reflect contemporary updates since November 2024, the arguments made in this paper still apply with equal force today.

Why Decentralized Exchanges Are Not "Exchanges" Under the Securities Exchange Act of 1934

ABSTRACT

Decentralized exchanges ("DEXs") are financial instruments that enable users to buy or sell digital assets from an automated market maker ("AMM") on a blockchain. DEXs are at the heart of the cryptocurrency ecosystem: abundant liquidity, a variety of digital assets, and peer-to-peer lending activities would not be functionally achievable without DEXs. Despite billions of dollars in trading activity, no DEX has registered as an exchange under the Securities Exchange Act of 1934 ("Exchange Act"). However, the Securities and Exchange Commission ("Commission") has proposed regulations expanding the definition of "exchange," as well as issued a Wells Notice to Uniswap, the leading DEX by trading volume, claiming that Uniswap fits the definition of an "exchange" under the Exchange Act.

As the Chairman of the Commission has stated, "[the Commission] need[s] additional Congressional authorities to prevent transactions, products, and platforms from falling between regulatory cracks … [i]n my view, the legislative priority should center on crypto trading, lending, and DeFi platforms. Regulators would benefit from additional plenary authority to write rules for and attach guardrails to crypto trading and lending."[1] This paper will argue that DEXs do not meet the definition of "exchange" under the Exchange Act because peer-to-peer transaction protocols do not resemble traditional stock exchanges that the Exchange Act was intended to cover. Rather, Congress should act on the Chairman's recommendation to amend the Exchange Act and provide tailored regulatory oversight of securities transactions on a DEX.

[1] Chair Gary Gensler, *Remarks Before the Aspen Security Forum*, SEC (Aug. 3, 2021), https://www.sec.gov/newsroom/speeches-statements/gensler-aspen-security-forum-2021-08-03.

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INTRODUCTION

The invention of the first public blockchain in 2008, Bitcoin, transformed a niche theoretical subject at the intersection of cryptography and monetary policy into a competitive threat to traditional financial institutions. For the first time in history, an individual could securely store the electronic representation of economic value on the internet without a third-party, such as a bank, holding those funds on their own account. It also ingeniously created a secure system to send and receive digital assets without a financial intermediary, such as a payment processor, using cryptography. While this breakthrough technology did not receive much attention during its infancy, software developers and entrepreneurs realized the potential to expand the use of a blockchain for functions beyond the transfer of Bitcoin between individuals.

Seven years later, the Ethereum blockchain was released. Rather than functioning solely as a peer-to-peer electronic cash system, Ethereum featured a computer built into the system that could run any binary transaction encoded into the machine, through what is called "smart contracts." These smart contracts could be used for any number of areas, from derivatives to gaming to collectibles. But it was the advent of DEXs that became the centerpiece of decentralized finance ("DeFi").

DEXs consist of smart contracts – lines of code running on the Ethereum blockchain – that enable trading or exchanges between two digital assets. DEXs offer considerable advantages over traditional stock exchanges: instantaneous settlement, deeper liquidity due to constant market making functions, collateralized lending, and self-custody, to name a few. Anyone can access a DEX, create their own lending pool, act as a depositor for a lending pool, or even copy the source code of a DEX and create their own DEX. The nature of how DEXs function is a radical departure from traditional stock exchanges.

Yet, the distinctions between a DEX and a traditional stock exchange have not prevented the Commission from investigating and potentially filing a lawsuit against the largest DEX by trading volume, Uniswap.[2] This lawsuit is likely to allege that Uniswap operates similarly to a stock exchange by creating a marketplace for the trading of securities. Therefore, Uniswap operates as an unregistered exchange, in violation of the Exchange Act. While a potential enforcement action against Uniswap does not necessarily implicate other DEXs, most other DEXs are based on the same smart contracts that mirror Uniswap. The reasons as to why Uniswap may or may not be a securities exchange apply with equal force to the vast majority of DEXs.

[2] In the Matter of: Uniswap Labs, *Wells Submission on Behalf of Uniswap Labs*, HO-14137 (May 21, 2024), https://blog.uniswap.org/wells-notice-response.pdf.

The following sections of the paper are organized as follows: Section II will discuss background information regarding the history and functionality of both traditional stock exchanges and DEXs. Section III will argue that (A) the statutory definition of "exchange" under the Exchange Act does not apply to DEXs, (B) registration of DEXs is incompatible with the existing framework for registering traditional stock exchanges, (C) the Commission's regulatory framework does not adequately provide investor protection for using a DEX, and (D) Congress should amend the Exchange Act to provide tailored oversight of DEXs. Section III.A will be divided into five separate components, each interpreting and applying the text of the Exchange Act in the context of DEXs. Finally, Section IV will conclude this paper.

II. Background

A. Centralized Exchanges

Securities exchanges in the United States trace their roots to New Amsterdam, the area now known as the Financial District in New York City. Along a street that divided the colony from the Native Americans, stockbrokers would gather to exchange a small number of stocks. The trading on this street, famously known as Wall Street, continuously grew in proportion to the growth of the colonies. Not too long after the newly born Nation gained independence from Great Britain, the Financial Panic of 1792 sent the Nation's fragile economy into shock, resulting in securities prices dropping by 25% in two weeks.[3] Stockbrokers convened underneath a buttonwood tree on Wall Street and agreed to set rules for how stocks could be traded and established commissions, as formalized in the Buttonwood Agreement of 1792.[4] This Agreement marked the foundation of the New York Stock Exchange (NYSE).[5]

[3] Richard Sylla, et al., *Alexander Hamilton, Central Banker: Crisis Management During the U.S. Financial Panic of 1792*, 83 BUS. HIST. REV., 61, 61 (2009).
[4] *The History of the NYSE*, NYSE, https://www.nyse.com/history-of-nyse (last accessed Oct. 5, 2024).
[5] *Id.*

Fast forward to 2024 and securities exchanges represent the cornerstone of the US financial system. The iconic NYSE has the largest market capitalization of publicly listed companies in the world, at over $28 trillion.[6] The National Association of Securities Dealers Automated Quotations (NASDAQ) was established in 1971 and sits at a close second, at over $25 trillion in market capitalization of publicly listed companies.[7] These two exchanges represent the vast majority of trading for publicly registered companies in the United States.[8] Many of the smaller stock exchanges, such as the Chicago Stock Exchange, Boston Stock Exchange, and Philadelphia Stock Exchange, have all been acquired by either the NYSE or NASDAQ.[9]

Securities exchanges operate by matching the orders of a buyer and seller. Brokers, who placed orders on the behalf of their clients, would meet with other market participants on the trading floor of an exchange to match orders. This can be in the form of an auction market, such as the NYSE, where buyers and sellers enter competitive bids simultaneously.[10] A cornerstone of the NYSE auction model is the use of a designated market maker to facilitate price discovery during market opening, closing, and periods of trading imbalances or instability.[11] In contrast, a dealer market model, such as the NASDAQ, continuously updates buy and sell prices throughout the trading day.[12] Rather than interact with a direct counterparty, brokers in a dealer market model trade against dealers who buy and sell securities for their own account.[13]

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[6] *Largest Stock Exchange Operators Worldwide as of March 2024*, by Market Capitalization of Listed Companies, STATISTA (May 2024), https://www.statista.com/statistics/270126/largest-stock-exchange-operators-by-market-capitalization-of-listed-companies/.
[7] *Id.*
[8] *Id.*
[9] Martín Slipczuk, *Financiers Plan to Launch a Texas-Based Stock Exchange*, FORBES (June 6, 2024, 5:30PM), https://apnews.com/us-news/texas-financial-markets-dallas-general-news-62e663cb82a8338079ec544b7f7e2d5a.
[10] Kat Tretina, *The New York Stock Exchange (NYSE)*, FORBES (Mar. 27, 2023, 11:26PM), https://www.forbes.com/advisor/investing/nyse-new-york-stock-exchange/.
[11] *Trading Information*, NYSE, https://www.nyse.com/markets/nyse/trading-info (last accessed Oct. 5, 2024).
[12] *Id.*
[13] Adam Hayes, *The NYSE and NASDAQ: How They Work*, INVESTOPEDIA (Mar. 14, 2024), https://www.investopedia.com/articles/basics/03/103103.asp.

Although the NYSE still retains trading on its physical floor, most of the trading today is done electronically. NASDAQ trading is done exclusively electronically. While the days of exchanging stocks under the buttonwood tree are long gone, both the NYSE and NASDAQ operate massive data facilities in Northern New Jersey that provide the electronic servers used to trade securities.[14] Buy and sell orders may be placed from anywhere in the world so long as an internet connection is available, but market participants are solely dependent on the facilities' infrastructure, as well as the fiber-optic cable that connect it to the outside world to maintain efficient, reliable, and secure trading platforms.

B. Decentralized Exchanges

A decentralized exchange ("DEX") is a peer-to-peer electronic system built on a blockchain where users can trade digital assets without transferring custody of the digital assets to a third-party or intermediary.[15] Prior to the invention of the first DEXs in 2016, public blockchains like Bitcoin could only be used to send and receive digital assets. The Bitcoin blockchain has no native technological capacity to host or exchange other digital assets. Third parties took on that role, using their own accounts to trade against consumer accounts outside of the Bitcoin blockchain. All that changed with the invention of the Ethereum blockchain.

The Ethereum blockchain went live in 2015 and offered significant advantages over the Bitcoin blockchain, notably with the advent of smart contracts. Ethereum featured the Ethereum

[14] Rich Miller, *The NJ Trading Hub Powering the Financial Markets*, DATA CENTER KNOWLEDGE (Oct. 14, 2013), https://www.datacenterknowledge.com/investing/the-nj-trading-hub-powering-the-financial-markets. The NYSE also operates a backup data facility in Chicago. *Disaster Recovery FAQs*, NYSE, https://www.nyse.com/publicdocs/support/DisasterRecoveryFAQs.pdf (last accessed Oct. 5, 2024). The NASDAQ, too, operates a backup data facility in Chicago. Jason Verge, *Nasdaq DR Data Center to Move from Ashburn to Chicago*, DATA CENTER KNOWLEDGE (Apr. 29, 2015), https://www.datacenterknowledge.com/business/nasdaq-dr-data-center-to-move-from-ashburn-to-chicago.

[15] *See generally What Is a DEX (Decentralized Exchange)?*, CHAINLINK (Aug. 14, 2024), https://chain.link/education-hub/what-is-decentralized-exchange-dex#:~:text=A%20DEX%20(decentralized%20exchange)%20is,transfer%20and%20custody%20of%20funds.

Virtual Machine (EVM) where programmers could encode functions embedded into the execution client of the Ethereum blockchain. Rather than being limited to running simple transactions, such as on the Bitcoin blockchain, the Ethereum blockchain could run sophisticated platforms that offered a variety of financial services, from options trading to lending and borrowing to exchanges. The first DEXs emerged on Ethereum in 2016, and although they offered a proof of concept, they struggled with order matching, liquidity, and scaling.[16]

The launch of Uniswap in 2017 catapulted DeFi to support the billions of dollars in trading of digital assets today. The developers behind Uniswap deployed a set of smart contracts, i.e., protocol, on the Ethereum blockchain, that enabled any user to create a trading pool between two digital assets. The trading pool, or "liquidity pool," functioned as an automatic market maker (AMM) that algorithmically set prices of a digital asset based on a formula, x*y=k, where x and y represent a pair of digital assets, and k represents a constant quantity of digital assets. The purpose of the liquidity pool is to prevent changes in liquidity from affecting the relative price of the digital assets. Anyone can participate to either (1) provide liquidity in the form of a digital asset, in which they would earn a small fee from every user executing a trade, or (2) exchange digital assets. Users who deposit liquidity receive a token that represents the pro-rata share of ownership of the assets in the liquidity pool. Depositors are free to redeem this token at any time and can use the token for any purpose within DeFi, such as lending and borrowing.

While Uniswap is just one of the many varying DEXs now in existence, it remains the leader by trading volume and many exchanges are modeled after Uniswap. The popularity of the DEX is due to its deep liquidity, fast settlement, security, and reliability. However, the DEX is special in that it exists autonomously and automatically on every node running the Ethereum

[16] Prateek Tripathi, *The Rise of Decentralized Exchanges: A Timeline*, MEDIUM (Sep. 4, 2023), https://medium.com/coinmonks/the-rise-of-decentralized-exchanges-a-timeline-60d11a37677e.

blockchain.[17] This includes both the site where transactions are executed and authenticated, as well as the where the protocol is stored. The AMMs will continue to run indefinitely without any human intervention as long as the protocol is secure and the Ethereum blockchain continues to operate. Although a core group of software developers created Uniswap, the control of the protocol is governed by its token holders. Any token holder can propose and vote on modifications to the structure of the DEX, depending on their community's agreed upon rules. Uniswap publicly announced on April 10, 2024, that they received a Wells Notice from the Commission alleging that Uniswap operates as an unregistered exchange.[18]

III. ANALYSIS

A. The Plain Language of the Definition of an Exchange Does Not Extend to Decentralized Exchanges.

The Exchange Act defines an "exchange" to mean

> Any person, organization, association, or group of persons, whether incorporated or unincorporated, which constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by a stock exchange as that term is generally understood, and includes the market place and the market facilities maintained by such exchange.[19]

Regulations pursuant to the Exchange Act apply that definition to

> Such organization, association, or group of persons [who] (1) [b]ring[] together the orders for securities of multiple buyers and sellers; and (2) [u]ses established, non-discretionary methods (whether by providing a trading facility or by setting rules) under which such orders interact with each other, and the buyers and sellers entering such orders agree to the terms of a trade.[20]

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[17] Nodes are the centerpiece of a blockchain. Nodes are responsible for collecting new transactions into a block, solving complex mathematical equations to authenticate that a digital asset has not been double-spent, and agreeing to include that block on the previously verified chain of blocks. Ethereum nodes have two parts: an execution client that runs transactions on the EVM and a consensus client that enables the network to achieve agreement that the transaction has been properly authenticated. A validator can be added to a consensus client to participate in verifying the authenticity of transactions. Any computer with enough GPU power can run an Ethereum node. @Wackerow, *Nodes and Clients*, ETHEREUM FOUNDATION (Sept. 29, 2024), https://ethereum.org/en/developers/docs/nodes-and-clients/.

[18] *Fighting for DeFi*, UNISWAP (Apr. 10, 2024), https://blog.uniswap.org/fighting-for-defi.

[19] 15 U.S.C. § 78c.

[20] 17 C.F.R. § 240.3b-16(a).

Qualifying exchanges must register with the Commission unless it is subject to an exemption.[21]

In January of 2022, the Commission issued a proposed rule amending Exchange Act Rule 3b-16 to apply to organizations, associations, or group of persons who

> bring[] together buyers and sellers of securities using trading interest; and (2) makes available established, non-discretionary methods (whether by providing a trading facility or communication protocols, or by setting rules) under which buyers and sellers can interact and agree to the terms of a trade."[22]

Although the proposed regulations amend the Commission's rule interpreting the definition of exchange, it was not proposed for the purpose of applying the definition to DEXs.[23] Rather, the Commission maintains the position that the existing authority under both the Exchange Act and Rule 3b-16 covers "so-called 'DeFi' systems," despite concerns from commentators that the new definition purports to expand the Commission's jurisdiction.[24]

In the context of the federal securities laws, the Supreme Court has broadly construed the text of these statutes to achieve their remedial purpose: protect investors, facilitate capital formation, and maintain fair, orderly, and efficient markets.[25] The Court has used this principle of statutory interpretation in deciding cases in which the statute, by itself, is ambiguous towards the answer. This includes defining a "security,"[26] "insurance," [27] and fraudulent practices.[28] In

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[21] 15 U.S.C. § 78e.
[22] Supplemental Information and Reopening of Comment Period for Amendments Regarding the Definition of "Exchange," 87 Fed. Reg. 29448, 29449 (proposed May 5, 2023) [hereinafter Reopening of Comment Period Release] (to be codified at 17 C.F.R. pts. 232, 240, 242, 249).
[23] Amendments Regarding the Definition of "Exchange" and Alternative Trading Systems (ATSs) That Trade U.S. Treasury and Agency Securities, National Market System (NMS) Stocks, and Other Securities, 87 Fed Reg. 15496 (proposed Mar. 18, 2022) (to be codified at 17 C.F.R. pts. 232, 240, 242, 249) (the 201 page release contains no reference to trading through decentralized exchanges, crypto, or blockchain).
[24] Reopening of Comment Period Release, *supra* note 19, at 29450, 29453. Relatedly, the Commission's proposed Dealer Rule, which would have expanded the scope of qualified broker-dealers, was struck down as exceeding its statutory authority untethered from the text, history, and structure of the Exchange Act. *Crypto Freedom All. of Tex. v. SEC*, No. 4:24-cv-00361, at *4 (N.D. Tex. Nov. 21, 2024).
[25] *See SEC v. Koscot Interplanetary, Inc.*, 497 F.2d 473, 480 (5th Cir. 1974).
[26] *SEC v. W.J. Howey*, 328 U.S. 293, 299 (1946); *Landreth Timber Co. v. Landreth*, 471 U.S. 681, 688 (1985). *Tcherepnin v. Knight*, 389 U.S. 332, 336 (1967); *SEC v. Forman*, 421 U.S. 837, 847-48 (1975).
[27] *SEC v. Variable Annuity Life Ins. Co. of Am.*, 359 U.S. 65, 80 (1959) (Brennan, J. concurring).
[28] *SEC v. Cap. Gains Rsch. Bureau, Inc.*, 375 U.S. 180, 196 (1963); *Superintendent of Ins. of State of N.Y. v. Bankers Life & Cas. Co*, 404 U.S. 6, 13 (1971).

contrast, the definition of an "exchange" under the Exchange Act is comprehensive, specific, and offers courts a method of resolving lingering ambiguity in the definition: examining the "general[] underst[anding]" of the functions of a stock exchange.[29] Therefore, a textualist approach is preferrable to resolve questions of statutory interpretation in this context.

I. A Decentralized Exchange Is Not "Any Person, Organization, Association, or Group of Persons."

At its core, a DEX is a compilation of executable computer code stored on the EVM that enables any user to call a function. It is programmed to effectuate the transaction of digital assets between a user and an AMM. DEXs operate on multiple layers of the blockchain infrastructure: (1) the validation layer – the nodes that solve complex mathematical equations to verify that a transaction has not been double spent, (2) the protocol layer – the execution clients running on nodes that store all the code needed to run smart contracts, (3) the interface layer – the websites that present the protocol in an organized and consumer-friendly design, and (4) an optional "off-chain" layer – a blockchain running on top of a blockchain used to support higher transaction efficiency. Including all three or four layers to constitute an organization or association is broadly over-inclusive because it encompasses participants who have no control of the protocol, such as by restricting access or altering its functionality, but rather facilitate the use of the protocol.

The protocol and interface layer are the most logical places where an organization, association, or group of persons may arise. As the Commission stated in its Reopening of Comment Period Release, whether "persons act in concert," or "exercise control, or share control," over aspects of an exchange, may determine whether a group of persons form.[30] Arguably, if a DEX shares the characteristics of a centralized exchange, whereby a core group of

[29] 15 U.S.C. § 78c.
[30] *Id.* at 29454.

managers, officers, and directors control the operation of the exchange, then a DEX may be an organization, association, or group of persons. But a *decentralized* exchange can be created by anyone who simply copies the underlying source code of an existing or proposed DEX without acting in concert with other persons or controlling the smart contract. The NYSE cannot.

Yet the economic reality likely means successful DEXs that provide greater liquidity, instantaneous settlements, and a secure code, need a minimum level of management. DEXs typically provide a decentralized autonomous organization ("DAO") whereby decisionmaking is vested in owners of the DEX's native token. Pseudonymous token holders, rather than clearly identifiable shareholders, are responsible for decisions over the future of the DEX. Even assuming a group of persons can be formed without disclosing the true identity of a token holder due to their common purpose of maintaining a healthy exchange, utilizing "in concert" and "control" is still over-inclusive because it includes entities that are essential to facilitate transactions of the DEX, but cannot affect the managerial operations of the DEX.

Every node and applicable off-chain layer, acts "in concert" with the smart contract of a DEX. Each layer must act "in concert" with a request to run a transaction through the DEX, despite having no relationship to the DEX. Likewise, the DEX can be controlled by anyone. First, an upgrade to the validation or protocol layer may cause substantial changes to the operation of a DEX. Second, anyone can duplicate and deploy a parallel exchange using what is traditionally considered proprietary technology of a stock exchange. The logical extension of the Commission's view would be that every node or off-chain layer is a part of every DEX. If this view applied to the NYSE, every internet service provider providing access to an exchange would qualify as an organization within the definition of the Exchange Act. Without a limiting principle, a DEX is not a "person, organization, association, or group of persons."

II. A Decentralized Exchange Is Not a "Market Place" or "Facility."

The Exchange Act does not define "market place," likely because the drafters of the Act believed that most of the definitions in the Act, including "exchange," were "self-explanatory."[31] A market facilitates the purchase and sale of goods or services. Intuitively, this is what a DEX performs: a place to purchase and sell digital assets. However, two problems arise: (1) the "place" of the market must exist on every node, and (2) the counterparty is not a person.

First, on the NYSE by contrast, the "place" can include both the floor of the NYSE and its data processing facility in New Jersey. Only by abstracting "place" to include nodes spread across the world, can a "place" exist. Second, users seeking to purchase or sell a digital asset interact with an algorithm that maintains a constant quantity of digital assets during a transaction. The counterparty is not the depositor, but the AMM, unlike most "self-explanatory" market places. Further, the AMM would be required to register as a broker-dealer, even if the AMM runs autonomously and is beyond the control of any person.[32]

As to "facility," the Exchange Act defines "facility" to include

> [P]remises, tangible or intangible property whether on the premises or not, any right to the use of such premises or property or any service thereof for the purpose of effecting or reporting a transaction on an exchange (including, among other things, any system of communication to or from the exchange, by ticker or otherwise, maintained by or with the consent of the exchange), and any right of the exchange to the use of any property or service.[33]

Because a facility includes services used to report transactions and the right to use those services, the facilities of a DEX must include those which the DEX cannot "constitute, maintain, or provide" control over. The code of a DEX, as well as transaction history, is stored on every node.

Yet, if every node is a facility of a DEX, it is contradictory to characterize a decentralized network of an indefinite number of persons running a node as "any person, organization,

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[31] S. REP. NO. 73-2, at 14 (1934).
[32] This is because only broker-dealers are allowed to trade securities on an exchange. 15 U.S.C. § 78f(c).
[33] 15 U.S.C. § 78(c)(a)(2).

association or group of persons." The Exchange Act uses *any* to characterize a person, organization, association, or group of persons, not *every*. This outcome would produce peculiar results. Every node would be the facility of every DEX despite bearing an anonymous relationship and retaining authority to deny their transactions. These nodes would constitute the group of persons responsible for maintaining the exchange because a DEX cannot operate without a node to record and/or validate a transaction, but would have no control over the DEX. Therefore, a DEX is not a "market place" or "facility."

III. A Decentralized Exchange Does Not Operate With the Purpose "For Bringing Together Purchasers and Sellers of Securities."

Securities transactions on a DEX are incidental to the predominant trading of digital assets that do not constitute securities. *Intercontinental Exchange, Inc. v. SEC*, 23 F.4th 1013 (D.C. Cir. 2022) dealt with the question of whether Intercontinental's connectivity sites constituted a "facility" under the Exchange Act. In holding that these telecommunication services were covered as a "facility," Senior Circuit Judge Ginsburg, a one-time Supreme Court nominee, stated that "by speaking of 'facilities *for* bringing together etc.,' and not of 'facilities *that* bring together,' the statute could be limited to facilities that are maintained *for the purpose* of bringing together purchasers and sellers of securities."[34] Both of these services in *Intercontinental* either served no purpose other than market activity or made no economic sense to use but for market activity, in contrast to services that are not maintained by or with consent of an exchange.[35]

Some digital assets may be offered and sold as investment contracts; however, the vast majority of trading of digital assets across all blockchains is not likely in securities.[36] Although

[34] *Intercontinental Exchange, Inc. v. SEC*, 23 F. 4th 1013, 1025 (2022). The NYSE is a subsidiary of Intercontinental Exchange, Inc. *Id.* at 1017.
[35] *Id.* at 1023.
[36] The Chairman of the Commission stated on November 14, 2024 that "[o]ur focus, rather, has been on some of the 10,000 or so other digital assets, many of which are offered or sold as securities. Putting this in context, aside from

the Commission has not issued a final agency action determining whether Bitcoin, Ethereum or stablecoins are securities, and despite it still retaining the authority to press the case, it is unlikely it would succeed. Both Bitcoin and Ethereum have no managerial group. Stablecoins, which maintain a 1:1 ratio with the US Dollar, do not offer an expectation of profit. These digital assets represent the overwhelming majority of trading on exchanges.[37] Looking to the *economic reality* of the transactions on a DEX, it is clear that the protocol operates for the purpose of bringing together purchasers and sellers of all digital assets, including ones that are securities.

Yet, interpreting "for" to require "purpose" may be problematic: so long as securities are traded on an exchange with other digital assets, akin to intertwining a commodities, foreign currency, and stock exchange into one single entity, no compliance with the Exchange Act is needed because the purpose would not be to exclusively facilitate securities transactions. True, but it still cannot avoid the contradiction that a node is a facility of an exchange. Blockchains that support DEXs use validators operated by a node to authenticate transactions. These transactions can range from transferring digital assets from one party to another, deploying a smart contract, and transacting with a smart contract. Similar to how internet service providers can support transactions with the NYSE, nodes support all types of transactions – only one of which is to trade digital assets. [38] Thus, DEXs do not operate with the purpose "for bringing together purchasers and sellers of securities."

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bitcoin, ether, and stablecoins, the rest of this market approximates $600 billion. That's less than 20 percent of the whole crypto market…." Chair Gary Gensler, *Car Keys, Football, and Effective Administration*, SEC (Nov. 14, 2024), https://www.sec.gov/newsroom/speeches-statements/gensler-remarks-pli-s-56th-annual-institute-securities-regulation-111424.

[37] *Top 100 Coins by Trading Volume*, COINGECKO, https://www.coingecko.com/en/highlights/high-volume (last accessed Oct. 8, 2024); *Explore Token*, UNISWAP, https://app.uniswap.org/explore/tokens (last accessed Oct. 8, 2024).

[38] Although this interpretation does not protect investors who do transact securities on a DEX, Congress should amend the federal securities laws to fix the lack of investor protections in the current regulatory framework. *See infra* Sections III.C., III.D.

IV. A Decentralized Exchange Does Not "Bring[] Together Purchasers and Sellers of Securities."

A centralized exchange brings together purchasers or sellers of securities, but a decentralized exchange does not. The NYSE functions as an auction market whereby buyers and sellers of securities enter competitive bids simultaneously. The NASDAQ functions as a dealer's market; purchasers or sellers of securities do not interact directly with each other, but rather through a dealer that buys and sells securities on behalf of their own account. In either market, a purchaser and seller directly trade against one another. After the trade is consummated, their accounts reflect that sale or purchase of the security. In holding that the defendant did not operate as an unregistered exchange by facilitating transactions in exempted securities, the Court in *LTV Fed. Credit Union v. UMIC Gov't Sec., Inc.*, 523 F. Supp. 819, 834 (N.D. Tex. 1981) reasoned that "an 'exchange' is a place where or means through which buyers or sellers, or their respective agents, meet to negotiate and consummate purchases."

In a DEX, the AMM replaces the trading counterparty, such that there is no longer a buyer or seller on one half of the trade. Rather, a buyer or seller interacts with an AMM – a liquidity pool composed of two digital assets that automatically rebalances the amount of digital assets in the same trade. The depositors in the liquidity pool do not purchase or sell a digital asset on behalf of their own account, such as in an auction market. Nor is the AMM ever stuck with just one of the assets being exchanged, such as in a dealer market. Depositors receive a digital asset that represents the value of their deposit in the liquidity pool. They can then use the digital asset however they want and maintain the right to redeem the corresponding value of their digital assets from the liquidity pool. No direct purchase or sale with the depositor is involved.

A potential problem with a textualist interpretation is that it relies too literally on clearly defined market roles as either a purchaser or seller. The intent of the Exchange Act, which was

passed during the Great Depression, was to regulate market manipulation, unreasonable fluctuations of security prices, and excessive speculation in the trading of securities.[39] The only type of exchange known to Congress in 1934 was one between a purchaser and seller of a security, and the sweeping intent of the of the Act should alleviate these harms regardless of the technicalities of the exchange. But interpreting the legislative intent of the Exchange Act is unnecessary when the plain language of the Act is ascertainable.[40] Exchanges, as stated in the Act, do not bring together *counterparties* of a securities transaction, but *purchasers or sellers* of securities. Unlike the terms "security," "insurance," and "fraud" that the Supreme Court has construed broadly, the terms purchasers and sellers are "self-explanatory," and do not require a liberal construction such that is to be read as equivalent to counterparties, which would include AMMs.[41] Therefore, a DEX does not "bring[] together purchasers and sellers of securities."

V. A Decentralized Exchange Does Not "Otherwise Perform[] the Functions Commonly Performed by a Stock Exchange as That Term Is Generally Understood."

The operation and functionality of DEXs are too distinct from that of a stock exchange. True, there are overlapping functions: providing liquidity, enabling price discovery, and offering tradeable assets. But even small differences are enough to determine that a computerized system is not an exchange. For example, in *Bd. of Trade of City of Chicago v. SEC*, 923 F.2d 1270, 1272 (7th Cir. 1991), the Commission argued that a computerized system that allowed parties to electronically purchase and sell option contracts did not operate as an unregistered exchange. Although all participants who interacted with the system were registered entities, and despite the

[39] *See* H.R. NO. 73-1838, at 2 (1934).
[40] For example, in *Bilski v. Kappos*, 561 U.S. 593 (2010), the Court consulted "dictionary definitions," "common usage," and the interpretive canon against statutory redundancy, rather than examine the history, policies and backgrounds of the patent system to determine whether a business method can constitute a patentable "process." Jonathan R. Siegel, *Legal Scholarship Highlight: Justice Scalia's Textualist Legacy*, SCOTUSBLOG (Nov. 14, 2017, 10:48AM), https://www.scotusblog.com/2017/11/legal-scholarship-highlight-justice-scalias-textualist-legacy/#:~:text=Even%20when%20Scalia%20joined%20an,the%20intent%20behind%20the%20text.
[41] *Supra* notes 26-28; S. REP. NO. 73-2, at 14 (1934).

Court conceding that the statute was not "crystal clear," Circuit Judge Posner upheld the Commission's interpretation on the basis that the system lacked a trading floor and specialists.[42]

Although the NYSE has since evolved from the days of specialists trading on the floor of the exchange, DEXs are fundamentally different than stock exchanges. In addition to the previously discussed distinctions, blockchains like Ethereum function as an open-source computer program. Any individual, albeit one who understands computer science, can see the code of every protocol. Because of the transparency, a savvy user may duplicate and deploy that same protocol with their own upgrades. Such was the case when the DEX PancakeSwap used the code of Uniswap to create their own exchange.[43] No person is even required to run the exchange. Similar to how Bitcoin kept running after the mysterious creator of Bitcoin, Satoshi Nakamoto, disappeared a year after creating the blockchain, once a DEX has been created, it will continue to run autonomously in perpetuity, so long as the blockchain keeps running in its current state.

It can be said that the interface of a DEX, the website used to access protocols in a consumer friendly manner, has the same overall feel of a stock exchange. Complex charts depict trading volume, price movements, and time intervals with the added functionality to buy or sell digital assets within seconds. But the similarities end there. A DEX is composed of smart contracts that execute binary functions. The same smart contracts can be used to create any number of interfaces that are not maintained or controlled by the person who originally created the smart contract. Neither the NYSE, NASDAQ, nor any other stock exchange operating in the United States can operate without a group managing the exchange's operation. Likewise, the

[42] The dissent too notes that the absence of "specialists" and a trading floor are the only distinctions that the majority cites. *Bd. of Trade of City of Chicago v. SEC*, 923 F.2d 1270, 1274 (7th Cir. 1991).

[43] Samyuktha Sriram, *PancakeSwap Forks Uniswap V3, Draws $140 Million in Total Value Locked*, UNCHAINED (Apr. 6, 2023, 6:46AM), https://unchainedcrypto.com/pancakeswap-forks-uniswap-v3-draws-140-million-in-total-value-locked/#:~:text=Decentralized%20exchange%20PancakeSwap%20has%20forked,own%20versions%20for%20commercial%20use.

software underpinning these exchanges are not open-source and cannot be easily transmuted for any person who wants to improve upon the existing design of the stock exchange.

DEXs are the antithesis to the general understanding of a stock exchange. A system that has the technological capacity to operate beyond the control of any person, or share control among anonymous entities, while facilitating electronic peer-to-peer transactions, cannot be viewed as equivalent to the system it attempts to replace. Looking beyond the stock exchange to the market participants who interact with it – the brokers, dealers and clearing agents – all have been replaced in DeFi by smart contracts and interfaces for individuals to interact with each other and not a trusted third-party. Technological innovation has this power to fundamentally alter how business operates. Therefore, a DEX does not "otherwise perform[] the functions commonly performed by a stock exchange as that term is generally understood."

B. Registration Intended for Stock Exchanges is Incompatible with Decentralized Exchanges.

The Exchange Act requires securities exchanges to register with the Commission unless an exemption applies because, in the opinion of the Commission, there is a limited volume of transactions, it is not *practicable*, and not necessary or appropriate in the public interest or for the protection of investors to require registration.[44] The Commission may prescribe by rule the terms and conditions for registering as a securities exchange.[45] Form 1 specifies the information required for securities exchange applicants, including, but not limited to:

> Identifying information. (1) The applicant's primary address. (2) The applicant's mailing address. (3) The applicant's business telephone and facsimile number. (4) The name, title, and telephone number of a contact employee. (5) Name and address of counsel for the applicant. (6) Date applicant's fiscal year ends. (7) Signature for applicant.
>
> Exhibits. (1) A copy of the constitution, article of incorporation, and existing by-laws. (2) A copy of all written rules. (3) Identifying information for each subsidiary or affiliate of the applicant. (4) Unconsolidated financial statements for each subsidiary or affiliate. (5) Forms for membership application.

[44] 15 U.S.C. § 78e.
[45] 15 U.S.C. § 78f(a).

> (6) Audited financial statements. (7) A list of the officers, governors, members of all standing committees or persons performing similar functions. (8) A list of all members, participants, subscribers or other users. The Form provides that if an exhibit is inapplicable, a statement must be furnished in lieu of the exhibit.[46]

These requirements are reasonably adapted to comply with traditional stock exchanges, but unambiguously illustrate that a DEX with no physical address, location, or persons maintaining the exchange cannot comply. It is of no surprise that rulemaking requiring the use of Form 1 was promulgated on December 22, 1998 – about ten years prior to the release of the Bitcoin.[47]

Unless rulemaking is undertaken to allow DEXs to comply with Form 1, DEXs will be de facto banned from operating in the United States. Besides Form 1, only centralized entities could use a DEX if the entity is registered as a broker-dealer because only registered broker-dealers and associated persons are allowed to use an exchange.[48] But the purpose of a DEX is to facilitate peer-to-peer transactions without an intermediary. Both the requirements under the Exchange Act and Form 1 require intermediation. Similarly, a DEX would serve little public purpose because no actively traded digital asset has publicly registered as a security as of March 23, 2023.[49] The Commission's mandate to protect investors cannot be rightfully accomplished by eliminating most consumer choices.

Preventing incumbent firms from competitive and innovative threats was never the intent of the Exchange Act. In *Board of Trade of City of Chicago v. SEC*, 923 F.2d 1270, 1273 (1981), Circuit Judge Posner upheld the Commission's interpretation that the petitioner's computerized

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[46] *Application for, and Amendments to Application for, Registration as a National Securities Exchange or Exemption from Registration Pursuant to Section 5 of the Exchange Act*, SEC, https://www.sec.gov/files/form1.pdf (last accessed Oct. 13, 2024); 15 U.S.C. § 78l.
[47] 17 C.F.R. § 249.1 (1998).
[48] 15 U.S.C. § 78f(c).
[49] This is the most recent information on the registration of digital assets to the author's knowledge. Rodrigo Seira, et al., *Lessons from Crypto Projects' Failed Attempts to Register with the SEC*, PARADIGM (Mar. 23, 2023), https://policy.paradigm.xyz/writing/secs-path-to-registration-part-ii. The topic of registration of digital assets is a separate and debatable question. Congress has proposed legislation that would aid the process of registering digital assets with the Commission due to complaints that the Commission's Form S-1 registration framework does not comply with blockchain technology. *See generally* Financial Innovation and Technology for the 21st Century Act, H.R. 4763, 118th Cong. (2023).

option contract trading system was not an unregistered exchange because of the limitation on access to registered entities and the lack of a trading floor and specialists. He stated that "[o]ne must question an interpretation of the definitional provision that would automatically prevent competition for the exchanges from an entity that the exchanges are unable to show poses a threat to the safety of investors by virtue of not being forced to register and assume the prescribed exchange format."[50] Interpreting the definition of an exchange to include a DEX would do exactly this – prevent DEXs from competing with incumbent firms, such as the NYSE and NASDAQ. Thus, registration intended for stock exchanges provides additional statutory weight that DEXs do not fit the definition of an "exchange" under the Exchange Act.

C. The Commission's Regulatory Framework Does Not Adequately Provide Investor Protection for Using a Decentralized Exchange.

The Exchange Act was enacted in response to the failure of stock exchanges to self-regulate during 1920s. Market speculation, manipulation, and unreasonable price fluctuations resulted from the failure of stock exchanges to oversee a substantial and consequential part of the economy. While exchanges would still retain authority to issue regulations governing the conduct of their members, the Commission would have the final say to determine if the exchange's rules were necessary or in the interest of the public or investors.[51] Yet, it is no coincidence that the rules governing exchanges have been effective in part due to the fact that Congress designed the Exchange Act with an acute awareness of the functionality of a stock exchange. Unsurprisingly, these requirements do not adequately provide investor protection for using a DEX.

Ignoring for the purposes of argument that the previously mentioned incompatibilities could be resolved – DEXs could register on Form 1, only registered members of an exchange

[50] *Board of Trade of City of Chicago v. SEC*, 923 F.2d 1270, 1273 (1981).
[51] 15 U.S.C. § 78f.

could access its services, and many registered securities did trade on a DEX – the Commission offers no guidance on how a DEX may prevent fraud, promote equitable principles of trade, perfect the mechanism of a free and open market, and protect investors.[52] The following list is a small sample of relevant questions that may inform the best practices for the regulation of DEXs:

1. Control – How is control of the platform determined? Is there a core managerial group? Do token holders vote on upgrades? Is there an administrative key to make changes to the DEX? What is the role of the initial developers?
2. Hacking – Have the smart contracts underlying the DEX been audited by a registered public accountant? How many audits have been performed? What is the likelihood of the DEX failing? What are the policies in place to recover digital assets from a hack?
3. Network Upgrades (i.e., "forks") – How does the DEX account for exogenous changes due to a network change? Will there be managerial oversight on an older, but continuously running blockchain?
4. 51% Attacks – How does the DEX account for the impact that a malicious actor will gain more than 50% of the blockchain computing power? Who holds legal title to the digital assets following a 51% attack?
5. Algorithmic Formula – How do the liquidity pools automate the purchase and sale of digital assets? What are the mathematical ways to improve the provision of liquidity? How does the DEX address fluctuations of price?
6. Staked Tokens – Does the DEX issue tokens that represent a pro-rata share of ownership in the liquidity pool? What are the functionalities of the token? How can the token be redeemed?
7. Management – What are the intentions of the management of the DEX? Actively develop the DEX and improve services? Apply a passive approach? Do managers exist?
8. Privacy – How traceable are the DEX's services? Are they compatible with the requirements of the Bank Secrecy Act (BSA)? Can brokers retain anonymity for trades?

These questions are not intended to be an all-encompassing list of how an exchange should be regulated to minimize the aforementioned goals of the Exchange Act. Rather, it highlights a few important issues that the Commission must answer through a highly collaborative approach with DEXs to ensure investors have faith that the services of a DEX are under the conspicuous oversight of a prudent regulator. These concerns have never been

[52] An exchange must adopt rules that are designed to address these goals. 15 U.S.C. § 78f.

addressed in the Exchange Act, any regulations promulgated thereunder, or in any policy guidance from the Commission. DEXs would have to unknowingly create their own rules with the hope that they fit into the regulatory framework of the Commission.

That is not to say that the Commission's oversight of exchanges would serve no benefits. For example, a DEX would be required to delist any unregistered security. Thousands of digital assets are traded on DEXs and many of them can be fairly characterized as a security subject to registration. Some of these digital assets are also offered and sold fraudulently. Likewise, the BSA would require the exchange to adopt an anti-money laundering program reasonably designed to detect and prevent transactions relating to illicit activity and terrorism financing. These are important goals that would protect investors and screen out bad actors.

However, even assuming registration can be effectively accomplished, the existing regulatory framework does not adequately serve these ends. Beyond the previously identified considerations the Commission does not address, regulations pursuant to the Exchange Act mandate custody and unprecedented transparency. Only qualified members, such as brokers, may trade on an exchange. Among the many regulations applied to brokers, the Customer Protection Rule requires brokers to "have possession or control of all fully-paid or excess margin securities held for the account of customers."[53] This means that the private key (akin to a password) of an account on the blockchain must be shared with a trusted third-party, creating the same risk that enabled the CEO of FTX, one of the biggest centralized exchange platforms at the time, to misappropriate billions in customer funds. Digital self-custody, the ability to retain control of money on the internet without a third-party, eliminates the risk of misappropriation; however, regulations pursuant to the Exchange Act do not contemplate the novelty of self-custody.

[53] *Guide to Broker-Dealer Registration*, SEC DIVISION OF TRADING AND MARKETS (Dec. 12, 2016), https://www.sec.gov/about/reports-publications/investor-publications/guide-broker-dealer-registration.

The regulatory framework also unintentionally mandates unprecedented financial transparency. Brokers must comply with the BSA by instituting policies designed to disclose the identity of their customers. If the records of brokers were incapable of being exploited, then there would be no privacy issue. However, the design of most blockchains, including Ethereum, is that the user's transaction history and balance are public, while the user's identity is anonymous. In contrast to a bank, the customer's transaction history and balance are private, while the customer's identity is disclosed. In the possible event that a broker's identifying records linking a customer's name to their blockchain account were exploited, every transaction the customer has made and how much money the customer possesses would be known to the public, including for future transactions. Contrary to protecting investors, it would inadvertently pose real-world safety risks to investors – risks that do not exist for a typical bank account. Thus, the inadequacy of the Commission's regulatory framework provides additional weight that DEXs do not fit the definition of an "exchange" under the Exchange Act.

D. Congress Should Amend the Exchange Act to Provide Tailored Oversight of Decentralized Exchanges.

As outlined in Section III.B and III.C., the Exchange Act, regulations thereunder, and Commission guidance do not adequately serve to protect investors utilizing DEXs under the existing regulatory framework. Simultaneously, an interpretation that DEXs are outside the scope of the Exchange Act does little to mitigate the excessive risks that motivated Congress to pass the Exchange Act in the wake of the Great Depression. DEXs present novel and complex issues that are fundamentally distinct from a traditional stock exchange. Devising a solution to address these challenges is inextricably linked to questions of policy that Congress is best suited to answer. Such questions include the tradeoffs between privacy versus transparency, immutability versus

control, and self-custody versus third-party custody. Any approach must also regulate DEXs not in isolation, but rather in the context of blockchain as a whole.

One potential solution is to impose restrictions on the access to and functionality of nodes. Nodes are the cornerstone of a blockchain – every transaction must run through a node and the code of every protocol, including a DEX, is stored on every node. By imposing a requirement that US persons may only use nodes registered with a federal regulator, such as the Department of Treasury, nodes can serve as gatekeepers on a blockchain. Nodes can refuse to execute requested transactions from protocols unless the protocol is subject to federal oversight. Under this approach, nodes would only be allowed to execute securities transactions for DEXs that have registered with the Commission. Although evasion would be a problem, prospective investors can remain confident that their transactions are only submitted to US-based nodes.

Rather than one managerial group using Form 1 to register a securities exchange, any person could certify to the Commission that a DEX meets the minimum regulatory obligations that the Commission determines is sufficient to protect investors. This may include anything from listing standards to manipulative trading protection to code audits. If a DEX cannot maintain these obligations on a regular basis, it would be decertified, and no US-based node could accept its transactions. Alongside amending the Exchange Act to accommodate the registration of DEXs used for securities transactions, other statutes, most importantly the Securities Act of 1933 and BSA, would require an amendment to accommodate a tailored registration and ongoing disclosure form for the issuance of digital assets, as well as a framework for screening fraudulent transactions without disclosing customer identification to the public.

Under the proposed overarching legislative framework, Congress should mandate agency rulemaking to fill in the specific details of how this statute would operate, such as the

requirements of the registration form or the minimum obligations of a DEX. Although the federal agencies would have broad leeway to determine this criterion, Congress would outline the guiding policy choices that the agency ought to follow, e.g., the degree of privacy, immutability, and custody. Investor protection would still remain at the core of the regulations, but not to the extent that a regulatory obligation may have the effect of rendering the benefits of the technology immaterial as compared to a traditional stock exchange. Although it is uncertain whether this approach is feasible, it may offer a better solution than to (1) subject DEXs to the existing obligations of stock exchanges, or (2) leave it outside the scope of the Exchange Act.

IV. CONCLUSION

DEXs do not meet the definition of an "exchange" as defined in the Exchange Act. A DEX is not any "person, organization, association, or group of persons," it is not a "market place" or "facility," it does not operate with the *purpose* "for bringing together purchasers and sellers of securities," it does not "bring[] together purchasers and sellers of securities," nor does it "otherwise perform[] the functions commonly performed by a stock exchange as the term is generally understood." The regulatory framework designed and intended for stock exchanges is incompatible with DEXs. As the Chairman of the Commission has previously stated, "[the Commission] need[s] additional Congressional authorities to prevent transactions, products, and platforms from falling between regulatory cracks." Potential enforcement actions against DEXs are an ineffectual means to provide the purported protections of the federal securities laws due to the fact that any person can create an autonomous DEX with minimal costs. Congress should adhere to the Chairman's recommendation and grant additional statutory authority to the Commission so as to provide tailored regulatory oversight of securities transactions on a DEX.