Staking Out New Territory: Taxation of Proof-of-Stake Protocols

by Brian Hamano

Brian Hamano is an associate at Gibson, Dunn & Crutcher LLP. He thanks his colleagues Jeff Trinklein, Eric Sloan, and Jeffrey Steiner, as well as Joshua Garcia of Ketsal Consulting and Conor O'Hanlon of Perkins Coie, for their helpful contributions.

In this article, Hamano describes the basics of blockchain transactions and considers the potential tax treatment of key transactions involved in proof-of-stake protocols.

I. Introduction

The blockchain area continues to evolve and develop, even though prices for many cryptocurrencies plummeted after unprecedented increases at the end of 2017.[1]

One highly anticipated development is the transition by ethereum — the second-largest cryptocurrency by market capitalization as of this writing[2] — from a proof of work (PoW) consensus algorithm to a proof of stake (PoS) consensus algorithm. That transition is representative of the proliferation of PoS in the blockchain area and highlights the need for clear guidance on the appropriate tax treatment of transactions in PoS protocols.[3]

This article discusses blockchain basics and describes PoW and PoS protocols and their relative advantages and disadvantages. It then turns to the existing guidance from Treasury and the IRS on blockchain transactions and considers the potential tax treatment of specific transactions in PoS protocols.

II. Blockchain Basics

The term "blockchain" refers to a digital ledger composed of blocks of data that are linked together in a sequential chain through cryptographic hashes.[4] The ledger is maintained by a network of computers (each computer is referred to as a "node"), and each node has an identical copy of the ledger. The ledger and information regarding all transactions on the blockchain are publicly available at all times.[5]

The blockchain and the network are governed by a set of rules called a "protocol," which is built into the software with which both end users (for example, holders of bitcoin or ethereum) and developers interact.[6] Although unverified transactions in some cryptocurrencies are made public as they occur, the blockchain is updated only when there is a consensus among the nodes

[1] For example, bitcoin was trading at more than $19,350 per bitcoin on December 16, 2017, and, on January 3, 2019, it was trading at approximately $3,794 per bitcoin, according to CoinMarketCap.com.

[2] "Top 100 Cryptocurrencies by Market Capitalization," CoinMarketCap.com.

[3] The term "protocol" is defined and discussed in further detail in Section II.

[4] Although there is no universally accepted definition of blockchain, the characteristics described in this section are generally accepted as fundamental elements. A cryptographic hash is the output obtained by running an input through a hashing algorithm. Hashes have the same fixed length regardless of the length of the input. Even a small change to the input results in a dramatically different output. Each new block contains a hash of the preceding block in the chain, thereby linking the new block to the preceding block.

[5] For example, information regarding any transaction on the bitcoin blockchain is publicly available.

[6] Blockchain protocols are developed by a team of programmers. Unlike traditional tech ventures, the underlying intellectual property is generally open-source and available to the public. In certain instances, the intellectual property is not owned by the development team, rather by an affiliated tax-exempt organization. To raise start-up capital to fund development of the protocol, the development team will generally publish a whitepaper online. The whitepaper pitches the development team's blockchain idea to the public and describes the characteristics and rights associated with the token for its blockchain protocol.

regarding new data and a block of data is verified.[7]

Users are typically drawn to blockchain projects because they want to invest in digital assets or use a blockchain-based business.[8] Records of the users' rights to the digital assets or licenses to interact with the blockchain (or the business associated with the blockchain) are called "tokens." Users generally interact with the blockchain through software applications or hardware called "wallets" that allow the user to view, and send messages to, the blockchain.

Although blockchain technology can be used in a broad range of environments, its mechanisms can be illustrated in their simplest form in the context of cryptocurrency. The following is an example of the steps involved in a simple blockchain transaction involving cryptocurrency:

1. Person A purchases 10 digital coins (DCs).[9]
2. Person A wishes to transfer six DCs to Person B.
3. Person A broadcasts an encrypted message regarding step 2 to the network of nodes for the DC blockchain (the DC network).[10]
4. The nodes in the DC network validate that Person A (1) has at least six DCs at the network address identified in the encrypted message described in step 3;[11] and (2) has authorized the transfer described in step 2.[12]
5. If a node can validate that the requirements described in step 4 have been met, the node (1) broadcasts proof that those requirements have been met to the DC network and (2) receives DCs from the DC blockchain protocol or transaction fees from Person A.[13]
6. Once the transfer described in step 2 has been validated and broadcast, all the nodes in the DC network update their local copies of the ledger to reflect such transfer.

Although steps 1 through 3 and step 6 are achieved through substantially similar mechanisms across blockchain protocols, there is significant variation in the method used to achieve steps 4 and 5 (referred to in this article as "validation") and the persons carrying out the process of validation (referred to in this article as "validators"). Networks generally use either a PoW or a PoS consensus algorithm to implement validation.

A. PoW Protocols

For protocols that use a PoW consensus algorithm (PoW protocols), validation is carried out by miners, which can be persons or entities, in exchange for block rewards,[14] transaction fees,[15] or both (referred to in this article, collectively, as "mining rewards"). Any person can install the software for the PoW protocol and begin mining a PoW blockchain.[16]

The validation process for a PoW protocol requires a miner to solve a cryptographic puzzle. The first miner to solve the cryptographic puzzle is entitled to the corresponding mining rewards

[7] The tax treatment of forks — changes to a protocol that create two separate versions of the blockchain with a shared history — is beyond the scope of this article. It has been discussed in many articles and comments. *See*, *e.g.*, Peter J. Connors, "Taxing a Moving Target: Tax Issues Involving Cryptocurrency," *Tax Rev.* (Nov. 12, 2018); and American Bar Association Section of Taxation, "Tax Treatment of Cryptocurrency Hard Forks for Taxable Year 2017" (Mar. 19, 2018).

[8] In each use case, the general purpose of the blockchain is to "provide a distributed mechanism to lock in data, making data verifiable and independently auditable." Paul Snow et al., "Business Processes Secured by Immutable Audit Trails on the Blockchain" (Nov. 17, 2014) (whitepaper for factom).

[9] The protocol creates a unique private key for Person A in connection with her purchase of the 10 DCs. The private key is a string of alphanumeric characters analogous to a password that is used to generate a digital signature that other nodes can use, together with a public key (a string of alphanumeric characters derived from the private key) to confirm that the actual owner of the applicable DCs has authorized a particular transaction. A hashed version of the public key is shared with other nodes as an "address."

[10] The message includes the digital signature generated from Person A's private key and a public address.

[11] The transaction would actually be recorded as a transfer by Person A of six DCs to an address associated with Person B, and a transfer of the four other DCs to an address for Person A.

[12] A node can determine that a transaction was authorized by Person A by checking that the digital signature and applicable public key correctly pair with the private key for the designated network address.

[13] The DCs and transaction fees are intended to encourage nodes to participate in the validation process.

[14] Miners who successfully validate transactions are rewarded by the protocol with block rewards. Block rewards are newly generated tokens that are built into the blockchain and transferred to the miners in so-called "coinbase transactions."

[15] Transaction fees (referred to as "gas" in ethereum) are paid by the parties to the transaction, often in the form of widely traded cryptocurrencies such as bitcoin and ethereum.

[16] A miner need not own any tokens corresponding to the PoW protocol to begin mining.

for the validated transactions. To solve the cryptographic puzzle, the miner must discover the arbitrary number (called a "nonce") that, when appended to the other data points in a block of validated transactions and run through the protocol's hashing algorithm, yields a hash that meets the protocol's requirements.

The correct nonce can be discovered only through a costly and time-consuming trial-and-error process that generally requires (1) physically scarce resources — namely, specialized hardware (application-specific integrated circuits (ASICs)) to run hashing algorithms and (2) electricity to power the hardware.[17] The cost and time of the nonce discovery process prevent miners from colluding to broadcast and validate blocks that have fraudulent transactions. Moreover, to limit the creation of newly minted tokens as more participants join the network or engage in mining activities (that is, adoption increases), PoW protocols generally provide for periodic changes in the difficulty of discovering the correct nonce. In practice, this has generally resulted in continually increasing costs for miners and increased incentives to pool resources.

Although PoW protocols are prevalent in the blockchain space (notably, bitcoin uses a PoW protocol), they have a few major downsides. First, the process of maintaining a PoW protocol consumes a tremendous amount of electricity. In the aggregate, ASICs used by bitcoin miners are estimated to use as much electricity annually as the entire population of Nigeria.[18]

Second, significant resources are spent to build and optimize computer hardware and peripherals to run hashing algorithms. Those costs create a high barrier to entry in the mining business, which, in turn, encourages centralization (for example, miners forming cartels, pooling resources, and acting in coordination) and arguably creates vulnerabilities in the PoW protocol.[19]

Third, mining puts downward price pressure on tokens because miners typically must convert tokens into government-issued, hard currency to pay for electricity and mining equipment.

Fourth, PoW protocols generally do not scale well because, as adoption increases, transaction confirmations take longer (blockchain protocols generally limit block size, which in turn limits the number of transactions that the network can process per increment of time).[20]

B. PoS Protocols

For protocols that use a PoS consensus algorithm (PoS protocols), validation is carried out by holders of tokens and is based on economic investment in the protocol, as opposed to computing power.

In a PoS protocol, to participate in validation (called "forging" or "minting") and become a validator, a token holder must first "stake" tokens associated with the protocol by depositing the tokens into a smart contract (that is, a software application that prevents the tokens from being transferred, so the tokens can serve as a form of collateral). Staked tokens are inaccessible to the validators for a period of time — usually ranging from months to several years. Many PoS protocols require a minimum number of tokens to be staked for a token holder to participate in validation (referred to in this article as a "staking threshold").[21]

[17] Some protocols (*e.g.*, bitcoin gold, litecoin, and monero) have implemented various measures to deter ASICs and limit the participation (and influence) of ASIC miners and cartels, so that even smaller participants with desktops purchased from consumer retailers can successfully mine the protocol's blockchain.

[18] Jonathan Tironem, "This Cryptocurrency Miner Says It Solved Bitcoin's Power Problem," Bloomberg.com, Nov. 16, 2017. *See also* Camilo Mora et al., "Bitcoin Emissions Alone Could Push Global Warming Above 2°C," 8 *Nature Climate Change* 931, 933 (2018).

[19] *See* Vitalik Buterin, "The Meaning of Decentralization," Medium, Feb. 6, 2017. One concern is the risk of a so-called 51 percent attack, in which a miner (or coordinated group of miners) controls more than 50 percent of a network's computing power and thus has the ability to (1) prevent the validation of legitimate transactions and (2) validate fraudulent transactions that increase wealth for the miner or coordinated group. *See* Bitmain Technologies Holding Co., "Application Proof," at 44, 51 (Sept. 26, 2018) (application for an initial public offering in Hong Kong).

[20] As adoption increases, the incentives for mining also increase because there is more liquidity for mining rewards. To prevent increased mining activity from flooding the market with mining rewards, protocols raise the difficulty level for discovering the correct nonce, which in turn slows down transaction validation speed. Many protocols provide for mining rewards to decrease over time.

[21] For example, the cryptocurrency DASH requires validators to stake a minimum of 1,000 DASH units to participate in validation and earn staking rewards.

Validators are then selected by the PoS protocol to either (1) validate proposed transactions or (2) propose a block of transactions to be voted on by the other validators.[22] Some PoS protocols provide that a validator is more likely to be selected if it has deposited a larger stake or has agreed to lock its stake for a longer period.[23] The validator selected by the PoS protocol receives additional tokens (staking rewards) for participating in validation.[24] Staking rewards are transferred to a network address associated with the validator and can be transferred by the validator shortly after receipt.

Instead of relying on the costs of the nonce discovery process to incentivize miners to behave benevolently, PoS protocols impose "slashing" rules that cause a validator to forfeit its stake if it validates a fraudulent transaction (for example, signing two competing blocks) or engages in other behavior that has detrimental effects on the protocol (for example, failing to keep its node connected to the network). By removing the nonce discovery process, PoS protocols eliminate a drain on public resources (that is, they reduce electricity consumption),[25] reduce barriers to entry in the forging business (for example, in many PoS protocols, there are no economies of scale because a validator does not have additional disproportionate gains as the validator increases its stake beyond the staking threshold, if any), which, in turn, limits centralization and vulnerabilities in the protocol[26] and increases transaction processing speed.[27]

There are, however, three major downsides to PoS protocols. First, they create an incentive for token hoarding because one's coin balance directly contributes to one's wealth, which may prevent the widespread adoption and implementation of the protocol and any related applications.

Second, if the PoS protocol imposes a staking threshold, that threshold will promote centralization of validation power (which can create vulnerabilities for the same reasons that apply to centralized mining power in PoW protocols).[28]

And finally, there has been limited deployment of PoS protocols at scale. Academics and commentators have raised significant concerns that PoS protocols are not as secure as PoW protocols.[29]

III. Taxation of Virtual Currencies — Notice 2014-21

The only published guidance from Treasury and the IRS regarding blockchain transactions is Notice 2014-21, 2014-16 IRB 938, which is limited in scope. The notice covers only virtual currencies and convertible virtual currencies (both of which are broadly defined[30]) but no other applications of blockchain technology. The notice states that

[22] There is significant variation in the staking requirements and validator selection processes used by PoS protocols. The two main types of PoS protocols are "chain-based" and "byzantine fault tolerance-style." Chain-based protocols involve pseudo-random selection of a validator, whereas byzantine fault tolerance-style protocols involve a random assignment of the right to propose blocks, followed by a multi-round voting process.

[23] The amount of staking rewards that a validator can expect to receive is generally published in the whitepaper for the protocol (or else on a blog run by the development team). It is generally possible for a validator to calculate the maximum amount of staking rewards it could earn for a given number of tokens for a specified period.

[24] Some PoS protocols provide for the issuance of tokens that differ from the staked tokens. This article focuses on PoS protocols that provide for the issuance of tokens that are identical to the staked tokens (such as ethereum's casper protocol).

[25] *But see* Paul Sztorc, "Nothing Is Cheaper Than Proof of Work," Truthcoin, Aug. 4, 2015 (arguing that the same issue of "waste" arises in PoS protocols because staked tokens are nonproductive and illiquid).

[26] Proponents of PoS protocols have argued that the cost to a hacker of acquiring a sufficiently large stake to influence the protocol would generally exceed the economic benefit. *See*, *e.g.*, Buterin, "Minimal Slashing Condition," Medium, Mar. 2, 2017.

[27] *See*, *e.g.*, Rayah Major, "Proof-of-Stake (POS) Outperforms Bitcoin's Proof-of-Work (POW)," Hackernoon, Mar. 12, 2018.

[28] There have been various attempts to address these first two downsides, including (1) delegated PoS (every wallet that contains tokens can vote for delegates that pass along staking rewards and carry out validation); (2) leased PoS (users are allowed to lease out their tokens to other users with larger stakes, who then share staking rewards with the lessors); and (3) proof of importance (validators selected based on how often validators themselves send and receive transactions).

[29] *See* Jonah Brown-Cohen et al., "Formal Barriers to Longest-Chain Proof-of-Stake Protocols" (Sept. 2018); Hugo Nguyen, "Proof-of-Stake and the Wrong Engineering Mindset," Medium, Mar. 18, 2018; and Tuur Demeester, "Critique of Buterin's 'A Proof of Stake Design Philosophy,'" Medium, July 12, 2017.

[30] The notice defines virtual currency as "a digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value." Notice 2014-21, section 2. A convertible virtual currency is defined as a virtual currency that has an equivalent value in "real currency." *Id*.

virtual currencies are property and not currency for federal income tax purposes.[31]

Importantly, the notice states that mining rewards are includable by a miner in gross income.[32] The amount of the inclusion is the fair market value of the virtual currency comprising the mining rewards, as of the date of receipt of the mining rewards.[33] Although the notice does not specify whether mining rewards would be subject to tax at ordinary or capital gains rates, commentators have suggested that mining rewards would generally be taxable at ordinary rates, on the theory that they are received in exchange for providing a service.[34]

Because the notice specifically characterizes bitcoin, which uses a PoW protocol, as a convertible virtual currency, one would expect the IRS to seek to similarly characterize the receipt of mining rewards for other PoW protocols.

The notice leaves open many key issues, however, including the treatment of blockchain transactions that do not involve virtual currencies and transactions concerning PoS protocols. Lawmakers are beginning to turn their attention to the need for guidance on the taxation of transactions in the blockchain area. On September 19, 2018, members of Congress wrote a letter urging the acting IRS commissioner to "expeditiously issue more robust guidance clarifying taxpayers' obligations when using virtual currencies."[35]

IV. Taxation of Staking Rewards

A. Are Staking Rewards Includable in Income?

The fundamental differences between mining and forging described earlier in this article raise the question of whether staking rewards should be treated differently from mining rewards for federal income tax purposes.[36] In particular, it is unclear whether the receipt of staking rewards should give rise to income for federal income tax purposes.

Section 61 defines income broadly, providing that apart from exceptions specifically enumerated elsewhere in the code, "gross income means all income from whatever source derived." The judicially developed concept of income is similarly broad, with courts narrowly construing exclusions.[37] The Supreme Court famously articulated the now-widely accepted definition of income in *Glenshaw Glass*: "instances of undeniable accessions to wealth, clearly realized, and over which the taxpayers have complete dominion."[38]

B. Accession to Wealth

The first element of this definition is an "undeniable accession to wealth," which requires the taxpayer to have gained economically from a transaction.[39] Despite the apparent breadth of this phrase, there are a few transactions that are analogous to the receipt of staking rewards for which a taxpayer isn't treated as having an accession to wealth.

First, a taxpayer generally does not have an accession to wealth when it merely changes the form in which it holds property that it already owns. For example, a taxpayer generally does not

[31] *Id.* at Q&A 1 and Q&A 2.

[32] *Id.* at Q&A 8.

[33] *Id.*

[34] *See*, *e.g.*, Jon P. Brose, "Hand Over Your Digital Wallet. Yes, Cryptocurrency Transactions Are Taxable" (Feb. 21, 2018) (Tax Club paper).

[35] House Ways and Means Committee Chair Kevin Brady, R-Texas, letter to IRS Commissioner David Kautter, "Brady Calls on IRS to Update Virtual Currencies Guidance."

[36] For purposes of this article, the term "staking rewards" refers only to tokens received by forgers that have associated rights and characteristics that are identical to the tokens staked by the forgers. The receipt of transaction fees is more clearly income for federal income tax purposes, because the fees are paid by the transacting parties in a different form of property. *See* American Institute of CPAs, "Updated Comments on Notice 2014-21: Virtual Currency Guidance" (May 30, 2018).

[37] *United States v. Burke*, 504 U.S. 229 (1992).

[38] *Commissioner v. Glenshaw Glass*, 348 U.S. 426, 429-430 (1955). Although courts and academics have often limited or otherwise rebutted this definition, the formulation in *Glenshaw Glass* is generally recognized as the standard by which income is measured. *See*, *e.g.*, Rodney P. Mock and Jeffrey Tolin, "Realization and Its Evil Twin Deemed Realization," 31 *Va. Tax. Rev.* 573, 575 (2012).

[39] Courts have often looked to the most commonly accepted economic definition of income, the Haig-Simons definition, which looks to "the algebraic sum of (1) the market value of rights exercised in consumption and (2) the change in value of the store property rights between the beginning and end of the period in question." Henry C. Simons, *Personal Income Taxation: The Definition of Income as a Problem of Fiscal Policy* 50 (1938).

have an accession to wealth when (1) the taxpayer extracts minerals or cuts timber from land that it owns; (2) the taxpayer partitions real property that it owns; or (3) pregnant livestock (or a pregnant racehorse) purchased by the taxpayer gives birth.[40] Similarly, a taxpayer does not have an accession to wealth when it receives a pro rata common stock dividend on common stock,[41] on the theory that the taxpayer has gained nothing from the transaction and has simply divided its interest in the underlying corporation among an increased number of shares.[42]

Taxpayers often purchase tokens associated with a PoS protocol for the express purpose of receiving the corresponding staking rewards.[43] As noted earlier, taxpayers can generally calculate the maximum of staking rewards that the purchased tokens could generate based on the applicable whitepaper. In light of these market realities, the purchase of any PoS token could be treated as a purchase of the corresponding staking rewards. If so, the subsequent receipt of those staking rewards would not constitute an accession to wealth because the taxpayer would be deemed to have already purchased the staking rewards (and the receipt of the staking rewards could be characterized as a mere change in form in the property already owned by the taxpayer).[44] PoS tokens are also distinguishable from other forms of investment property that generate regular taxable returns. For example, PoS tokens are distinguishable from interest-bearing debt because PoS tokens generally lack key characteristics of debt (for example, PoS tokens do not bestow on their holders any legal or security rights that are enforceable in court in the event of a nonpayment of staking rewards).[45] Moreover, staking rewards are distinguishable from interest because staking rewards arguably do not represent "compensation for the use or forbearance of money."[46]

Alternatively, depending on the rules of the applicable PoS protocol, a validator might argue that staking rewards are akin to the receipt of a pro rata common stock dividend on common stock. Although an individual instance of the receipt of staking rewards is clearly *not* pro rata, each validator should generally maintain the same percentage of tokens relative to the other validators over time if a validator's odds of being selected for validation are proportionate to the size of its stake.[47] This analogy is not perfect, however, for a couple of reasons. First, it is unclear whether the analogy is appropriate given that a PoS protocol differs in material ways from a corporation. There is often no legal entity issuing tokens, registering tokens with regulatory authorities, or assuming liabilities in connection with the launch and operation of the protocol, and the most valuable property with respect to a PoS protocol — the underlying code — is open-source. Moreover, even if a PoS protocol was classified as an enterprise akin to a corporation, because tokens often lack the traditional indicia of equity (for example, voting rights or a right to share in the equity and profits of the enterprise), analogizing the receipt of staking rewards to the receipt of a stock dividend may be inappropriate.[48]

[40] *See, e.g.*, *Metz v. United States*, No. 1446 (E.D. Ky. 1962); *Gamble v. Commissioner*, 68 T.C. 800 (1977); and Rev. Rul. 86-24, 1986-1 C.B. 80.

[41] Section 305(a); *Koshland v. Helvering*, 298 U.S. 441 (1936).

[42] Boris I. Bittker and James S. Eustice, *Federal Income Taxation of Corporations and Shareholders*, para. 8.40 (July 2018). *Eisner v. Macomber*, 252 U.S. 189 (1920), is often cited as the genesis of this principle. As discussed in many articles, however, the Supreme Court's conclusion in that case was based on a different analysis. *See, e.g.*, Alice G. Abreu and Richard K. Greenstein, "Defining Income," 11 *Fla. Tax Rev.* 295 (2011).

[43] As more protocols launch and become fully operational, it is likely that a growing portion of investors will purchase PoS tokens for a broader range of purposes (*e.g.*, access to a service provided by the protocol or other noneconomic reasons). Given the fluid nature of the blockchain space, it is difficult to predict how investor expectations and desires may change.

[44] This argument is stronger when staking rewards are identical in form to the PoS tokens that were staked. Analogy could be made to bargain purchases, which generally do not give rise to income for the purchaser. *See Hunley v. Commissioner*, T.C. Memo. 1966-66; and Rev. Rul. 91-36, 1991-2 C.B. 17.

[45] A complete analysis of that position is beyond the scope of this article.

[46] *Deputy v. Du Pont*, 308 U.S. 488 (1940).

[47] If, however, the PoS protocol requires a threshold number of tokens to be staked for a user to participate in validation and earn staking rewards, this argument would be unavailable because the non-validator holders of tokens would be diluted over time.

[48] A complete analysis of this position is beyond the scope of this article. Some of the underlying issues are discussed in David J. Shakow, "The Tax Treatment of Tokens: What Does It Betoken?" *Tax Notes*, Sept. 11, 2017, p. 1387.

C. Realization

The next element of the *Glenshaw Glass* definition of income looks to whether there has been a "clear realization" of the accession to wealth. This requirement generally requires an identifiable event.[49] The realization requirement is effectively a concession by the tax law that a tax on the economic definition of income — without more — would create valuation and administrative difficulties.[50]

This requirement is clearly met for staking rewards, which are deposited into a network address once validation has been completed. The deposit is a clearly identifiable event that can be used as a reference point for valuing the staking rewards and determining the amount of any tax due.[51]

D. Dominion and Control

The third element of the *Glenshaw Glass* definition looks to whether the taxpayer has control over the accession to wealth. A taxpayer is treated as having dominion if it can direct the disposition of the property or funds that constitute or otherwise reflect the accession to wealth.[52]

This requirement is clearly met for staking rewards. As noted earlier, staking rewards are generally deposited into a network address associated with the validator and are freely transferable shortly after the deposit. Accordingly, the validator has complete dominion and control over the staking rewards.

E. Alternative Characterizations

The tax law provides nonrecognition treatment for some transactions, even though they would have otherwise been treated as giving rise to income (for example, section 1031 exchanges and reorganizations described in section 368). Even if staking rewards were determined to give rise to income under the analysis described earlier, a validator might argue that the receipt of staking rewards is analogous to a nonrecognition transaction and therefore entitled to similar treatment.

One potential argument would be that a validator should be treated as a partner in a partnership and that the receipt of staking rewards should be treated as (1) a distribution of property governed by section 731 or (2) as a recapitalization of the partnership. For an arrangement to be treated as a partnership for federal income tax purposes, there must be two or more persons who carry on a business as co-owners for profit. A complete analysis of whether a PoS protocol could be treated as giving rise to a partnership, and whether a validator for the PoS protocol could be treated as a partner in the partnership, is beyond the scope of this article. If, however, a validator were to be properly characterized as a partner, the receipt by a validator of staking rewards arguably would not be taxable to the validator under section 731(a)(1) if the receipt were treated as a distribution of property,[53] or under the principles of Rev. Rul. 84-52, 1984-1 C.B. 157, if the receipt were treated as part of a recapitalization of the partnership.[54]

Another potential argument that would depend on the applicable PoS protocol would be to analogize the receipt of staking rewards to a lessor's receipt of improvements made by a lessee upon leased property at the expiration of the lease, which is not treated as income under section 109.

[49] *Glenshaw Glass*, 348 U.S. 426.

[50] *See* Bittker, "A 'Comprehensive Tax Base' as a Goal of Income Tax Reform," 80 *Harv. L. Rev.* 925, 932 (1967); and Mock and Tolin, *supra* note 38, at 578. *See also San Antonio Savings Association v. Commissioner*, 887 F.2d 577, 582 (5th Cir. 1989) (realization requires "some event that freezes or fixes the gain with sufficient certainty so that it is proper to tax it").

[51] Separately, the blockchain industry continues to grapple with, and parse through, the complex issues of valuation generally. Valuation standards and methods differ dramatically largely because (1) cryptocurrencies and tokens are listed at different prices on the various blockchain exchanges (even at the same moment) and (2) blockchain exchanges operate around the clock, so there is no universal closing time that can be used as a generally recognized measuring point.

[52] *See, e.g.*, Rev. Rul. 63-225, 1963-2 C.B. 339 (ruling that a shareholder who received rights to purchase debentures and stock of an unrelated corporation didn't have income until he exercised dominion and control over those rights).

[53] The validator may be required to recognize income if the PoS tokens were determined to be marketable securities under section 731(c). Further, if the PoS protocol were determined to be a publicly traded partnership under section 7704(b), the validator would be unable to get the benefit of section 731(a).

[54] *See, e.g.*, LTR 200345007. Even if a validator were to be properly characterized as a partner, however, the IRS might seek to treat staking rewards as disguised sales proceeds that are taxable to the validator under section 707(a).

F. Character, Basis, and Holding Period

If the receipt of staking rewards is income to a validator, the staking rewards presumably would be treated in the same manner as described in Notice 2014-21 for mining rewards. That is, the amount of income would be based on the FMV of the staking rewards as of the time of receipt, the character of that income is ordinary if the validator is engaged in the trade or business of forging, and the holding period for the tokens comprising the staking rewards would begin on the date of receipt.

If the receipt of staking rewards is not income, a validator would likely be required to divide its tax basis in the staked tokens between staked tokens and tokens comprising the staking rewards, and its holding period in the staked tokens would tack onto the tokens comprising the staking rewards.[55]

G. Other Open Issues

It is unclear whether validators should per se be treated as engaged in the trade or business of validation. Because validation is carried out by self-executing software, a validator need only (1) maintain a computer with internet access; (2) download, install, and operate the software for the PoS protocol; and (3) keep the computer on and connected to the internet at all times. These limited activities do not, on their face, appear to rise to the level of a trade or business.[56] However, because Notice 2014-21 suggests that mining, an analogous activity, can rise to the level of a trade or business, one might expect the IRS to take a similar position regarding forging.

If a validator *is* treated as engaged in a trade or business, it may be entitled to claim ordinary losses if its stake is "slashed," and it should be able to deduct as ordinary business expenses the costs of maintaining and operating its computer hardware and software.

V. Final Thoughts

As noted, lawmakers have finally begun to pressure Treasury and the IRS for guidance on virtual currencies. With investments in PoS protocols pushing into the billions of dollars and investors receiving staking rewards worth millions of dollars, the stakes are quite significant for the blockchain industry — and the federal fisc. Treasury and the IRS should promulgate guidance that comports with existing tax law but is not so unduly burdensome on taxpayers that this productive and exciting technology is abandoned solely because of tax concerns. ■

[55] *See* reg. section 1.61-6(a) (providing that when part of a larger property is sold, the basis of the property must be equitably apportioned among the several parts).

[56] Many PoS protocols were specifically designed to allow individual users to participate in validation, in response to commercialization of the mining process that occurred for bitcoin and other PoW protocols.