Tax Treatment of Block Rewards

A Primer

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Executive Summary

- An unsettled issue of immense practical and economic importance: how to tax the new "reward tokens" created in public cryptocurrency networks.
- The wrong policy would drive innovation elsewhere. Fortunately, the correct policy is mandated by existing law: these new tokens – like *all* forms of new property – do not give rise to income until they are sold.
- Informal, seven-year-old IRS guidance – not law – geared to Bitcoin and proof of work suggests reward tokens are immediate income at their fair market value on the date "received."
- For the newer proof-of-stake technology, this would create a compliance nightmare and punitive overtaxation.
- Ethereum, Tezos, Cosmos, and many other proof-of-stake cryptocurrencies: compliance would be a daunting task – for the IRS as well as taxpayers. New taxable events would occur every few seconds.
- "Income" under such a policy would overstate taxpayers' actual economic gain – significantly, in many cases – resulting in demonstrable, systematic overtaxation.
- The overtaxation is equivalent to taxing a 21 for 20 stock split by counting the "new" share – that is, 20/21 the value of an old share – as taxable income.
- Like *any* property, cryptocurrency tokens can indeed be "income" – when received as payment or as compensation.
- But *new* property – property created or discovered by a taxpayer, not received as payment or compensation from someone else – is *never* income, and never has been.
- Cattle, corn, gold, widgets, wild truffles, artworks, novels – think of *any* new property created or discovered by the taxpayer: It's no one else's expense, and it's not income until sold.

- As a factual matter, new reward tokens are indeed created by stakers.
- Understanding how tokens are created is complicated; resorting to flawed financial analogies is easy.
- Block rewards are nothing like "stock dividends." They are not "compensation for services" – try to imagine taxable "compensation" that doesn't come from another person.
- Reward tokens cannot be taxed as immediate income under section 61 of the Internal Revenue Code. But not to worry: they'll be fairly taxed when sold.
- Policy problems remain for cryptocurrency taxation – fortunately, new reward tokens are not among them.
- It's not too late to clarify this issue before the effects of a wrong or uncertain policy are felt by millions of taxpayers and the IRS alike.

Contents

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1. Introduction

Cryptocurrency can present challenging regulatory puzzles. From different angles, cryptocurrency tokens can look like money, a security, or a commodity. Tokens have real-world value, but may also have special value within the network, such as for allocating system resources and governance power. These and other features of this novel blockchain technology can complicate clear, effective policy under existing legal rules – sometimes especially so for the newer proof-of-stake networks.

Fortunately, one consequential question – whether newly created reward tokens are immediate income, or should be taxed only when they are sold – presents less of a challenge than has been generally supposed.

The wrong policy – namely, taxing reward tokens as income at their market value at the time they are acquired by stakers – would result in a compliance nightmare for taxpayers and the IRS alike, with innumerable secondary consequences. And in proof-of-stake systems, taxing these rewards as income would systematically overstate taxpayers' gains and result in punitive overtaxation.

There is still time to clarify the taxation of block rewards before an uninformed or uncertain policy reveals its full consequences and drives innovation elsewhere.

This primer is intended for tax professionals but also the broader audience of policy-minded taxpayers who are, or may soon be, affected by this problem.[1] The focus is on U.S. law, but this is a global issue and the principles involved apply anywhere governments may seek to tax gains from cryptocurrency.

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[1] This primer cannot address every issue in depth, much less present the fundamentals of cryptocurrency technology (and of the various protocols) on which this analysis rests. These are presented in greater detail in Abraham Sutherland, *Cryptocurrency Economics and the Taxation of Block Rewards*, 165 Tax Notes 749 (Part 1; Nov. 4, 2019) and 165 Tax Notes 953 (Part 2; Nov. 11, 2019) (also available at ssrn.com/abstract=3466796); and Mattia Landoni and Abraham Sutherland, *Dilution and True Economic Gain From Cryptocurrency Block Rewards*, 168 Tax Notes 1213 (Aug. 17, 2020) (also available at ssrn.com/abstract=3672461). An abbreviated version of this second article is also available at coincenter.org.

2. Cryptocurrency Tokens Are Property

For tax purposes, cryptocurrency tokens are property. The sale of a token may be a taxable event, just like the sale of other property. A purchased token will result in a taxable gain if and when it is sold at a higher price.

Like the sale of a token, a taxpayer's receipt of an existing token may also be a taxable event. A token sent from one person to another as a payment or compensation for services will be that recipient's taxable income, at its proper dollar valuation. Once again, nothing unique here: existing property – whether an ounce of gold, a bushel of wheat, or a digital token – can be taxable income, just like dollars.

But a question with immense consequences concerns the tax treatment of newly created tokens, in particular the tokens commonly called block rewards. The question is whether such tokens are taxable when they first come into existence.

The issue has been muddied by a single sentence of informal IRS guidance issued almost seven years ago regarding the newly created bitcoins acquired by mining. The issue has also been confused by the imperfect metaphors and analogies used to make sense of this remarkable new technology. And with the advent of proof-of-stake technology, this seemingly minor tax question is far more important than was foreseen in 2014.

3. Reward Tokens Are *New* Property

Fortunately, the correct policy – taxation of block rewards at the time of their sale – is right before us, under existing law. Taxing new cryptocurrency tokens like other new property solves the problem.

New property – essentially, property not received from someone else as payment or compensation, but newly created or discovered by the taxpayer – is never immediate income to its first owner. New property in this sense comes into existence all the time: when crops are grown, livestock born, minerals mined, canvases painted, truffles unearthed, widgets manufactured, books written. New property gives rise to taxable income when it is sold, not when it is created.

There is no express provision that exempts this new wealth from income under section 61 of the Internal Revenue Code, the gross income statute. The principle is too fundamental to have attracted such attention; new property has never been income. Put simply, no one has supposed that a farmer's apple is his gross income at the moment it is picked, or that a writer's screenplay is her gross income at the moment of its final spellcheck.

4. Block Rewards and Staking

A public cryptocurrency must incentivize members of the public to help validate transactions and maintain the network. It must do this without any central administration and in a way that ensures that enough people help, so that no one person can control the network and threaten its security.

Enter block rewards, or reward tokens. As used here, these terms refer to the newly created tokens that help provide this incentive in public cryptocurrency networks. Cryptocurrency tokens are valuable pieces of digital property, and depending on a network's design, the tokens acquired by stakers may also be used to allocate system resources and for governance purposes.

Validators compete to create new blocks of transactions and, along with these blocks, new reward tokens. In proof of work, validators are often called miners. In proof of stake, they are called by various names; here we use the term stakers. The blocks and tokens created by miners and stakers are added to the blockchain, a special type of database providing a tamper-proof record. The blockchain keeps track of transactions and account balances, as well as other data arising from the technology's capacity to ensure the integrity of its operations without a single authority capable of amending the record.

5. Proof of Stake Awakens a Sleeping Issue

In March 2014, IRS guidance stated that "when a taxpayer successfully 'mines' virtual currency, the fair market value of the virtual currency as of the date of receipt is includible in gross income."[2] This guidance is not law, but as the government's only pronouncement on the issue it is understandably influential among taxpayers and tax advisors seeking to avoid controversy.

Applied to proof-of-work mining, this guidance affects a very small number of U.S. taxpayers. And, it is not particularly unfair to those it does affect. Most importantly, the tax issue is effectively moot if mined tokens are immediately sold, which is typical because mining is capital intensive. This is by design. Electricity and computer hardware must be paid for, and Bitcoin wouldn't work if they were free.

Unlike Bitcoin, most newer cryptocurrencies allocate opportunities to create new blocks and reward tokens according to validators' ownership in the network – that is, according to their proof of stake, not their computationally expensive proof of work. Many – often most – proof-of-stake token holders participate in this network maintenance, preventing the concentration of network control that would threaten the cryptocurrency's security. These token holders acquire new tokens regularly throughout the year as new tokens are added with each block.

Proof of stake raises issues that were difficult to foresee seven years ago. To simplify, there are practical and economic problems with taxing block rewards as income. The practical problems involve the administration of the income tax and the costs of compliance. The economic problem arises from the overstatement of gain – and resulting overtaxation – if reward tokens are considered income at the time acquired.

[2] IRS Notice 2014-21, 2014-16 IRB 938, Question 8.

6. Compliance Challenges

Several examples will help convey the compliance headaches if new reward tokens are immediate income.

a. Tezos

Most people who own Tezos tokens, or tez, participate in maintaining the Tezos network: today, about 80 percent of all tez are staked. New tez come into existence every sixty seconds, when each new block is added to the blockchain. Somewhat mitigating the recordkeeping and accounting implications of this minute-by-minute creation of tokens, for security reasons these tez are initially frozen and remain subject to forfeiture for about 30 days. Each three days a batch of reward tokens becomes spendable.

A person may have multiple Tezos accounts, just as anyone may keep dollars in more than one wallet, cookie jar, and bank account. For each digital wallet, a Tezos taxpayer would have to account for about 120 taxable events each year. Each "receipt" of new tokens must then be matched to historical market price data to establish the dollar value of the tokens at the time acquired, to then be included in the taxpayer's taxable gross income.

b. Cosmos

In terms of compliance burden and enforcement uncertainty, Tezos is almost simple in comparison to Cosmos, another multi-billion dollar proof-of-stake cryptocurrency. Most people who own Cosmos stake their tokens, and each staker acquires new tokens every few seconds. About 13,000 times each day, a typical Cosmos staker has new tokens under their full ownership and control.

But the real challenge with Cosmos is not finding a spreadsheet that will accommodate five million taxable events each year (along with matching market data) for each account owned by a Cosmos staker. The bigger problem is that the number of accumulated reward tokens is not even calculated until that staker moves them to a different account. In other words, the date and time each token is acquired is not available to be reported to the IRS – much less that token's dollar value at the relevant instant.

c. Ethereum 2.0

Ethereum is now transitioning from proof-of-work to proof-of-stake, introducing this tax problem to the world's second most widely owned cryptocurrency. The transition process involving a new "ETH2" blockchain raises a host of questions that can only be touched on here. ETH2 reward tokens appear in stakers' accounts every six minutes and 24 seconds, but may not be transferable for the duration of the transition period.

Are these new ETH2 tokens income at the moment acquired, at the dollar value of the tokens trading freely on the "ETH1" network? The transition period is uncertain; it may last two years. Suppose these taxpayers lack the required "dominion and control" over their new tokens that is a prerequisite for them to be considered income. Presumably, these accumulated block rewards would become income when they become tradeable – all of them, all at once, and in reference not to their actual sale price but rather some market price snapshotted at the appropriate instant.

7. Overtaxation

Cryptocurrency is new, and its novelty makes it all too easy to model it with the wrong metaphor. Unlike proof of work, in proof of stake a staker's new reward tokens can be expressed in terms of the staked tokens. But this "yield" does not indicate the true economic gain from staking.

Consider a simple proof-of-stake cryptocurrency in which every token holder participates in network maintenance. If the token creation rate (often referred to colloquially as "inflation") is five percent, then every token holder will end the year with five percent more tokens. Analogies to finance must be used with caution, but here it is helpful to compare these five percent new tokens to a 21 for 20 stock split. The five percent increase in shares from such a split is not actual gain, and therefore is not income. The same reasoning should apply to token holders in this hypothetical example, because their stake, or share, in the cryptocurrency network has not changed.

In the real world, stakers often do have an economic gain from staking. To use simplified numbers drawn from Tezos, during 2019 an average of 70 percent of tokens were staked. The token creation rate was five percent, so on average stakers could expect to end the year with about seven percent more tokens.[3] A staker who started the year with 1,000 tez would therefore end the year with about 1,070.

Unfortunately, this “return” of seven percent on one’s staked tokens is still sometimes misunderstood by the public – and even finance and technology writers – to mean “income” or economic gain. This is indeed regrettable. On the bright side, even confused token holders are likely to understand what really matters, which is the value of their share in the Tezos network over time. The value of their holdings is simply their number of tokens multiplied by the value of each.

This same mistake is much more consequential, however, if made by Congress or the Treasury Department. Applied to tax policy, this error could lead to the taxation of reward tokens as though they were income, on the mistaken impression that such tokens represent taxpayers’ economic gain. And here, the error would not be trivial: the mentioned seven percent “gain” in tokens equates to a true economic gain of just two percent.[4]

This error can be difficult to catch in the real world. A cryptocurrency’s value can be quite volatile against the U.S. dollar, and variables affecting stakers’ gains fluctuate over time. This makes the calculation of true economic gain from staking quite complicated. Indeed, there is no single best way to calculate this gain.

This problem is addressed at length elsewhere, in an article evaluating a real taxpayer’s gain from staking Tezos tokens during 2019.[5] In short, if the 2014 IRS guidance on mining rewards were applied to this taxpayer’s Tezos

[3] This is because the five percent new tokens are shared among the 70 percent, and 0.05/0.7 = 7.14%.

[4] (1 + 0.07)/(1 + 0.05) = 1.02.

[5] *Dilution and True Economic Gain From Cryptocurrency Block Rewards*, see note 1 above.

reward tokens acquired during 2019, the IRS would find income of $9,407 based on the taxpayer's 8,876 new reward tez. But this figure of $9,407 grossly overstates the taxpayer's gain. On the most accurate accounting, his gain from staking was just $1,339. Finding taxable income of $9,407 would overstate the actual gain by 600 percent.

8. Mistaken Metaphors and Analogies

The perception that block rewards should be immediate income is supported by analogies to other (taxable) phenomena such as dividends or compensation for services. It is important to see why these comparisons are misleading.

a. Block Rewards Are Not Like Dividends

A stock dividend – that is, a corporation's dividend paid to shareholders in the form of property, namely shares of stock – can be taxable income. Of course, a cryptocurrency is not a corporation, but it is important to see why this example fails even as an analogy. In fact, the taxation of corporate "distributions" of property (which include stock dividends) shows why reward tokens *cannot* be fairly taxed as income at their fair market value on the date acquired.

In short, the return of capital to a taxpayer is not income. The provisions that govern dividend taxation would prevent the overtaxation of reward tokens, because only taxpayer *gains* may be taxed. A dividend, by definition, is paid out of a corporation's earnings and profits, and only distributions that are dividends are gross income.[6] Cryptocurrencies have no earnings or profits, so reward tokens would not be gross income.

And critically, distributions that are *not* dividends are not gross income. Reward tokens would be "applied against and reduce the adjusted basis of" the taxpayer's stake in the network, with non-dividend distributions beyond basis taxable as capital gain.[7] From a fairness perspective, taxing reward tokens as income is wrong because some – indeed, in the Tezos

[6] IRC sections 316(a) and 301(c)(1).
[7] IRC section 301(c)(2) and (c)(3).

example just given, most – of the tokens' value is appropriately viewed as a return of the taxpayer's own capital. The example of dividend taxation does not undermine this concern; it validates it.

b. Block Rewards Are Not Compensation for Services

Stakers do indeed provide a "service" – they help maintain the cryptocurrency network – so it is important to emphasize why reward tokens are not taxable "compensation for services" under section 61(a)(1) or "property transferred in connection with performance of services" under section 83. Of course, a cryptocurrency is not a person or corporation or any sort of entity for tax purposes. The fact that a staker's new reward tokens cannot be matched to an equivalent expense in some other ledger does indeed help show that such tokens are not compensation, because there is no payor, compensator, or transferor to be found. But the importance of this point goes deeper than just the observation that "Bitcoin" and "Tezos" are incapable of signing Form 1099s. *The whole point* of decentralized block and token creation is to prevent any such entity from establishing control over blocks and tokens.

Reward tokens can look like compensation because *any* form of property can be taxable compensation. If a farmer pays a farmhand in apples for the latter's service of irrigating the apple trees, those apples are indeed the farmhand's taxable income (and his employer's expense). But regardless of who performs the service of irrigating those trees, the apples are not *the farmer's* taxable income (and in the farmer's hands, the apples are no one's expense). The fact that an economic activity can be framed as the provision of a service – irrigating trees, maintaining a network – does not make the resulting property taxable compensation. What matters is whether the property is received (from someone else) or created by the taxpayer.

9. Block Rewards Are Indeed Created by Miners and Stakers

The mechanics of decentralized block and token creation are too involved to present here. Plus, important details vary from protocol to protocol. This complexity poses quite a challenge, because how (and why) these tokens come into existence is indeed a critical and fact-intensive question. (This complexity is also one reason it is easy to resort to the wrong financial metaphor and analogy to make sense of this tax question.) So this important and ultimately empirical point must be emphasized: miners and stakers in public cryptocurrencies such as Bitcoin, Ethereum, and Tezos do indeed create new blocks and with them new reward tokens.[8]

For present purposes, it is enough to note that if stakers and miners stopped staking and mining, no new tokens would be created (and the networks would grind to a halt). And, whether a validator is eligible to create new tokens due to her proof of work or her proof of stake, that eligibility can be forfeited, leaving the validator empty-handed and leaving the universe with fewer tokens than otherwise would exist. In Tezos, for example, on 13,145 occasions during 2019 the staker with the first right to create a new block failed to do so. In each case, a new block was delayed until another staker could step up to create it.

10. Changing the Law to Tax New Reward Tokens Would Be Inequitable

Although it would be unprecedented under U.S. law, one could imagine a new statute that included a farmer's apples in his gross income, for example through a snapshot of the apples' fair market value at the moment of their harvest. Or, a statute that included newly mined gold in the miner's income, valued against the spot price on the date it is removed from the ground or perhaps processed to a certain purity.

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[8] The role of "delegators" and "bakers" in keeping the proof-of-stake Tezos blockchain operational and secure is developed in *Cryptocurrency Economics*, see note 1. The article also addresses the common ground between proof of stake and proof of work as methods of network maintenance through competitive, decentralized block and token creation.

Leaving aside the obvious administrative problems (as well as a less obvious constitutional problem[9]), arguably such a provision would be fair – at least as applied to apples, or gold. After all, the apple farmer and gold miner seem to have new wealth. Under current law, it just hasn't yet been "realized," turning it into income.

But it would be manifestly unfair to tax newly created proof-of-stake reward tokens the same way. If *every* token holder acquires five percent new tokens, taxing them as income is clearly wrong, just like it would be wrong, following a 21 for 20 stock split, to tax the value of the "new" share – that is, 20/21 of the value of an old share – as income.

It's still wrong if fewer than 100 percent of token holders share in the creation of these new tokens. Economically, any gain from staking can be viewed as a transfer of economic value from those token holders who do not obtain the new reward tokens. New tokens dilute existing tokens; only those who obtain new tokens offset this dilution – and perhaps, like our example taxpayer introduced above, end up with a gain.

This taxpayer's true economic gain from his 8,876 reward tokens arose because a minority of Tezos holders did not stake their tokens and therefore did not share in the five percent new tokens created in 2019.[10] For a tax on these reward tokens to be fair, the amount subject to tax would not be $9,407, which is the sum of these new tokens' market value on the dates "received." Instead, the gain subject to tax would have to be calculated using an accounting convention. As explained above, one such formula results in a gain of $1,339, but other conventions would result in a different taxable gain. For lawmakers, this approach has little to recommend it, and such a policy certainly cannot be derived from existing law.

In sum, if there is an argument for breaking with a century of established law to subject new apples, gold, or tokens to the income tax, the argument applies least of all to new proof-of-stake cryptocurrency tokens.

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[9] The 16th Amendment grants the federal government the power to tax *incomes*. The federal authority to tax property in general is more complicated.

[10] As it happened, this taxpayer's actual Tezos-denominated time-weighted return from staking during 2019 was 5.74 percent; see *Dilution*, note 1 above, at page 1221.

It would be uniquely unfair if such tokens were taxed at their market value at the time acquired, and uniquely complex to attempt to tax only the taxpayer's true gain.

11. Section 61 Does Not Reach New Property, Even After *Glenshaw Glass*

The tax treatment of new property is so fundamental that no statute or regulation explicitly clarifies that such property is not gross income. Regulations on farming and mining income have always made clear that new animals, vegetables, and minerals don't give rise to income until the property is sold, but even these acknowledgements arise in the context of limiting which costs may be deducted in the calculation of gross income.[11] They do not establish that new property is not income; they assume it.

But the gross income statute sweeps broadly, so it is important to establish why new cryptocurrency tokens cannot be swept up with it. The statute encompasses 14 enumerated categories of income and gain, but more importantly its catch-all clause provides that "gross income means all income from whatever source derived."[12] A century ago, income meant "the gain derived from capital, from labor, or from both combined."[13] Since 1955, it has been clear that "income derived from any source whatever" would mean gains derived from *any* source.[14] The breadth of this rule means that if there's a question whether something is income, it usually is.

But the Supreme Court's decision in *Glenshaw Glass* did not upend the tax treatment of new property or authorize the IRS to select when new property would or would not be taxed on creation. Even after *Glenshaw Glass*, "derived from [a] source" remains a statutory requirement. As a

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[11] See Treas. Reg. sections 1.61-4 and 1.61-3.
[12] IRC section 61(a).
[13] *Eisner v. Macomber*, 252 U.S. 189, 207 (1920), quoting *Stratton's Indep., Ltd. v. Howbert*, 231 U.S. 399, 415 (1913).
[14] *Commissioner v. Glenshaw Glass Co.*, 348 U.S. 426, 429 (1955) (interpreting a predecessor to today's section 61(a)).

matter of modern doctrine, gains from new property are not "realized" until the time of its sale.

Consider wages, the prototypical gain derived from labor. Labor – the source – is not itself income. Such gain does not become taxable as the labor is expended, but rather as the labor is in fact "sold": that is, as wages are paid or accrued. The immediate fruits of one's labor are not (yet) income, whether they take the form of new property created for one's employer, or new property created for oneself. Employee-created property is not income; the employee's income, derived from his labor, comes in as wages. Taxpayer-created property likewise is not income; the taxpayer's income, derived from his labor and capital, comes in from sales.

12. Conclusion

The tax code is not famous for its simplicity. Importantly for our purposes, U.S. taxes are paid in U.S. dollars. When payments or income take the form of anything other than dollars, valuation and other compliance issues often present a genuine challenge.

Tax policy should ease this challenge, not make it worse. Fortunately, *new* property is not swept up in this problem. The first step toward a coherent, practicable policy is therefore an easy one: to establish that new reward tokens, like other forms of new property, are not income when created. The millions of taxpayers who engage in the otherwise straightforward activity of securing cryptocurrency networks by holding and staking cryptocurrency tokens need not be subjected to a numbingly complicated and fact-specific accounting exercise, with demonstrable overtaxation adding insult to injury.

Indeed, as argued above, a policy of taxing new tokens as income is not permitted – much less mandated – under existing law. It is not too late to clarify this fundamental issue before the burden of complying with an unfair or uncertain policy is felt by taxpayers and the IRS alike.