VALUATION OF CRYPTOCURRENCIES AND ICO TOKENS FOR TAX PURPOSES

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Cryptocurrency valuations have fluctuated wildly.[1] Valuations of bitcoin were dramatically off their peaks throughout most of 2018 and into 2019.[2] This period is referred to as "Crypto-Winter."[3] Recently, valuations have been rising.[4] Is winter nearing its end? Will a "Crypto-Spring" emerge with coin and token valuations shooting up like budding plants?

Moreover, cryptocurrencies and initial coin offering (ICO) tokens and their markets are nascent.[5] The first cryptocurrency, Bitcoin, was launched in 2009, after the last major global financial recession.[6] Day to day, valuations can vary widely from one exchange to another.[7] The validity of prices can be suspect due to concerns about particular exchanges or scams.[8]

These factors make valuation of cryptocurrencies and ICO tokens challenging.[9] And yet, appropriate valuation of these instruments is critical for a range of important reasons, including federal income, estate, and gift tax purposes.[10]

I. BACKGROUND: WHAT IS A CRYPTOCURRENCY OR AN ICO TOKEN?

A. What Is a Virtual Currency or Cryptocurrency?

A virtual currency or cryptocurrency is an asset that exists in digital, not physical form, and uses a cryptographic hash for security.[11] In general, Bitcoin and other cryptocurrencies are decentralized digital currencies,

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1. Benjamin Pirus, *What Crypto Winter? $10B in Blockchain Revenue Expected by 2023*, FORBES, (Aug. 28, 2019), https://www.forbes.com/sites/benjaminpirus/2019/08/28/what-crypto-winter-10b-in-blockchain-revenue-expected-by-2023/#19ecb711747aa [perma.cc/4FB7-2X57].

2. *Id.*

3. *Id.*

4. *Id.*

5. *A brief history on Bitcoin & Cryptocurrencies*, LEDGER ACADEMY, (Oct. 23, 2019) https://www.ledger.com/academy/crypto/a-brief-history-on-bitcoin-cryptocurrencies/ [perma.cc//P9RF-AXQN]; *see* Rommel Johnson, et. al, *The Valuation of Crypto-assets*, ERNST & YOUNG LLP (UK) (2019), https://www.ey.com/Publication/vwLUAssets/ey-the-valuation-of-crypto-assets/$File/ey-the-valuation-of-crypto-assets.pdf [perma.cc/VE9W-3AQY].

6. *See* L.S., *Who is Satoshi Nakamoto?*, THE ECONOMIST, (Nov. 2, 2015), https://www.economist.com/the-economist-explains/2015/11/02/who-is-satoshi-nakamoto [perma.cc/5E8W-6EC3].

7. *See generally* Johnson, *supra* note 5 (discussing generally the volatility of cryptocurrency valuation and different valuation approaches).

8. *Id.*

9. *Id.*

10. *Id.*

11. *See* Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, BITCOIN PROJECT, https://bitcoin.org/bitcoin.pdf [perma.cc/8L32-43FJ] (last visited Sep. 24, 2019).

unmanaged by a central bank or administrator.[12] Instead, cryptocurrencies are typically managed almost entirely by the users who buy, sell, and trade them, rather than a national bank or government.[13]

B. What Is Blockchain?

A blockchain is an organized chain of electronic blocks of data, known as a distributed ledger that is shared simultaneously and publicly.[14] The distributed ledger relies on consensus among participants to verify agreement among users about the quality and state of the data in each block.[15] A public record of all the linked blocks is maintained and updated.[16] A cryptographic hash is used to verify the authenticity of each new block added to the chain.[17]

C. Cryptocurrencies v. Blockchain?

The close relationship between cryptocurrency and its technology (blockchain) oftentimes causes confusion.[18] Cryptocurrency is a store of value that is recorded and managed in electronic data, most commonly in a distributed ledger.[19] Blockchain is the distribution system for a cryptocurrency; the system running the distributed ledger itself.[20] A cryptocurrency is one example of content that can be stored and identified via blockchain technology.[21]

The most well-known cryptocurrency, Bitcoin, has been distributed on a blockchain since 2009.[22] Moreover, blockchain has been implemented into various types of data storage other than cryptocurrency.[23] Several blockchain business applications and custody products have made their way to the market.[24] Additionally, blockchain applications relating to clearing and settlement, payments, trade finance, identity, securitization, and syndicated loans are currently in development or already in use in the finance and

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12. *Id.*
13. *Id.*
14. *Id.*
15. *Id.*
16. *Id.*
17. *Making sense of bitcoin, cryptocurrency, and blockchain*, PRICEWATERHOUSECOOPERS, https://www.pwc.com/us/en/industries/financial-services/fintech/bitcoin-blockchain-cryptocurrency.html [perma.cc/3HAV-NJKQ] (last visited October 28, 2019).
18. *Id.*
19. *Id.*
20. *Id.*
21. *Id.*
22. *Id.*
23. *Id.*
24. *See* Nikhilesh De, *Coinbase Rolls Out Crypto Custody Product for Institutions*, COINDESK (May 15, 2018), https://www.coindesk.com/coinbase-rolls-out-crypto-custody-product-for-institutions [perma.cc/2UBY-NZJH] (both Coinbase and Prime Trust have announced they have custody products aimed at aiding cryptocurrency adoption).

banking industries.[25] Author and scholar, Klaus Schwab, explains his perspective of blockchain technology in his book, *The Fourth Industrial Revolution*.[26] In his book, Mr. Schwab states that he believes blockchain will be a key component in a new industrial revolution.[27]

D. What Is an Initial Coin Offering? And What are Tokens?

An initial coin offering is a modern version of traditional stock offering, but uses electronic means to raise funds.[28] Initial coin offerings (ICOs) raised substantial capital in 2017, increasing their popularity in 2018 as a powerful alternative to initial stock offerings.[29] ICO funders receive "electronic instruments [that represent] a digital asset or utility" known as tokens.[30] For example, utility tokens constitute rights to products or applications that have not yet been released, whereas equity tokens constitute equity in products or applications and are often "converted into a cryptocurrency at a later stage in the development of the funded venture."[31]

E. The Importance of Currencies and ICOs?

There is a rise of investors—more specifically, millennials—that are comfortable relying on virtual currencies rather than on traditional currencies and investment methods.[32] Additionally, as businesses continue to use ICOs as a funding mechanism, cryptocurrencies, financial derivatives, and related exchanges have increased exponentially.[33] While Bitcoin remains the most recognized cryptocurrency, there are over 1,500 cryptocurrencies in the market today.[34]

Some businesses are starting to take cryptocurrencies in exchange for goods and services, and financial markets are creating instruments that pay in cryptocurrency.[35] At the end of 2017, Bitcoin futures began trading on the

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25. *See* Martin Arnold, *Five Ways Banks Are Using Blockchain*, FINANCIAL TIMES (Oct. 16, 2017), https://www.ft.com/content/615b3bd8-97a9-11e7-a652-cde3f882dd7b [perma.cc/3MCZ-VXG5].

26. *See* KLAUS SCHWAB, THE FOURTH INDUSTRIAL REVOLUTION (World Economic Forum 2016).

27. *See id.*

28. *See generally* Ameer Rosic, *What is An Initial Coin Offering? Raising Millions in Seconds*, BLOCKGEEKS (Feb. 21, 2019), https://blockgeeks.com/guides/initial-coin-offering/ [perma.cc/H4NK-KECP] (explaining the basics of ICOs).

29. *See id.*

30. *Id.*

31. *Id.*; *see generally,* Josiah Wilmoth, *The Difference Between Utility Tokens and Equity Tokens*, STRATEGICCOIN.COM, https://strategiccoin.com/difference-utility-tokens-equity-tokens [perma.cc/6DJX-Z53M] (last visited Dec. 25, 2019) (providing a more in depth discussion regarding utility tokens and equity tokens).

32. *What Banks Need to Know*, WOLTERSKLUWERS (Jan. 15, 2019), www.wolterskluwers.com/article/virtual-currencies-what-banks-need-to-know.aspx [perma.cc/N7FR-VQH6].

33. *Id.*

34. *Id.*

35. *Id.*

Chicago trading markets.[36] Virtual currency-related pooled investments and financial derivatives are also offered.[37]

Furthermore, a U.S. tax refund service, Refundo, has recently announced that they have partnered with Bitpay, a blockchain payments processor, to permit U.S. taxpayers to receive their tax refunds in Bitcoin.[38]

Note that as discussed below regarding valuation, Crypto-Winter has adversely affected confidence in cryptocurrencies.[39] The reactions of U.S. regulators (FinCEN, SEC, and CFTC), and incidents of fraud in cryptocurrency and ICO token marketing have also adversely affected this market.[40] However, cryptocurrency investment and finance-related blockchain development actively continues.[41]

II. THE ROLLER COASTER OF VIRTUAL CURRENCY VALUATION

Bitcoin's valuation has experienced significant fluctuations in its rather short life.[42] In May 20l0, at is inception, the value of a single Bitcoin was essentially nothing at $0.01.[43] By February 2011, its value rose hundredfold by $0.99 to $1.00.[44] It was not until July 2011 when the first Bitcoin bubble emerged, and the value rocketed to $31 per coin.[45] Less than six months later, in December 2011, the value of a Bitcoin plummeted back to $2.[46] In April 2013, the per coin valuation peaked at $260.[47] Just two months later the value fell to $100 per Bitcoin.[48] By November 2013 the prices rose to a high of $1,242 per coin.[49]

Prices fluctuated between approximately $1,000 and $300 until March 2015, when prices bottomed out at $200 per coin.[50] The tallest price spike occurred in 2017—from a low of $750 in January to a high of $17,900 in December.[51] In 2018, the prices were generally on a downward trend

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36. *Id.*

37. *Id.*

38. *See* Yogita Khatri, *US Income Tax Payers Can Now Get Refunds in Bitcoin*, COINDESK (May 1, 2019), https://www.coindesk.com/us-income-tax-payers-can-now-get-refunds-in-bitcoin [perma.cc/H7K9-Z9Y4].

39. *See* discussion *infra* Part II.

40. *See Virtual Currencies: What Banks Need to Know*, *supra* note 32.

41. *Id.*

42. *See* Billy Bambrough, *No One Actually Knows What Bitcoin Will Do Next*, FORBES (June 13, 2019), https://www.forbes.com/sites/billybambrough/2019/06/13/whats-moving-bitcoin-markets-and-prices-not-much-it-seems/#691cfe7158c1 [perma.cc/2SUN-UD6U].

43. *See Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price (BTC)*, COINDESK, https://www.coindesk.com/price/bitcoin [perma.cc/J4BC-JCBK] (last visited Sept. 20, 2019).

44. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

45. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

46. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

47. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

48. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

49. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

50. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

51. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

reaching a price of $6,560 per coin in early July, and finishing the year below $4,000 per coin.[52] In 2019, values have trended generally upward to around $5,300 in mid-April; a hallmark of Bitcoin's price volatility is that this 30% change in price has not been perceived as particularly quick.[53] A recent article noted that Bitcoin's 457% two-year returns demonstrate much greater growth than major stock indicates.[54] As of April 24, 2019, Bitcoin was valued at $5,443.14.[55] The high price volatility of Bitcoin and other cryptocurrencies is attractive to investors and other market participants despite the financial risks.[56] In addition to the high volatility risk of virtual currencies, it is important to note that over 800 virtual currencies are reported to be dead or have a current valuation of a penny or less.[57]

A. Where is the Value? The Importance of the Private Key

Cryptocurrencies and ICO tokens are intangible property.[58] Ownership of an intangible cryptocurrency coin or an ICO token is controlled with two keys: a public key and a private key.[59] The public key generally identifies specific coins or tokens.[60] Every coin or token address has a matching private key.[61] The private key proves that you are the owner of the identified coins or tokens.[62] The private key is an alphanumeric password that is cryptographically determined.[63] For Bitcoin, a private key is a 256-bit number.[64] A 256-bit number can be represented in different ways.[65] As computers became prevalent in the 1960's and 70's, an 8-bit memory system based on 8-bits (or binary numbers, each bit being a "1" or a "0") was adopted and became the standard.[66] A common number system used in computer

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52. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

53. *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price*, *supra* note 43.

54. *See* Gerelyn Terzo, *Bitcoin's Mesmerizing 457% Two-Year Returns Leave the Dow in the Dust*, YAHOO FINANCE (Apr. 25, 2019), https://finance.yahoo.com/news/bitcoin-mesmerizing-457-two-returns-203008181.html [perma.cc/UU77-2M5X]; *Bitcoin Price*, *supra* note 43.

55. *Virtual Currencies: What Banks Need to Know*, *supra* note 32.

56. *Id.*

57. *Id.*; *see* Arjun Kharpal, *Over 800 cryptocurrencies are now dead as bitcoin is 70 percent off its record high*, CNBC TECH (July 2, 2018), https://www.cnbc.com/2018/07/02/over-800-cryptocurrencies-are-now-dead-as-bitcoin-feels-pressure.html [perma.cc/VFS9-ZT2Q].

58. *See* George Daniel & Amanda Green, *Accounting for Crypto-assets*, ERNST & YOUNG GLOBAL LTD., (2018), https://www.ey.com/Publications/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf [perma.cc/D9M8-ZEMV].

59. *See* Jake Frankenfeld, *Private Key*, INVESTOPEDIA (July 30, 2018), https://www.investopedia.com/terms/p/private-key.asp [perma.cc/MQ2U-6MVV].

60. *Id.*

61. *Id.*

62. *Id.*

63. *Id.*

64. *See Private Key,* BITCOIN WIKI, https://en.bitcoin.it/wiki/Private_key [perma-cc/W7FP-P8UL] (last visited on Oct. 28, 2019).

65. *See* Nika Savas, *Why do we use hexadecimal?*, MEDIUM (Sep. 23, 2016), https://medium.com/@savas/why-do-we-use-hexadecimal-d6d80b56f026 [perma.cc/ZMM9-MJUT].

66. *See id.*

systems and technology is hexadecimal notation, which has a base of 16 rather than 10.[67] Hexadecimal notation is a great way to efficiently express binary numbers.[68] A 256-bit number expressed in hexadecimal notation is 64 characters long.[69]

Many physical assets, such as houses and cars, are accessed by keys.[70] For physical assets, there appears to be a clear dichotomy between the asset's value and its control.[71] Cars and houses can be impounded or physically seized.[72] However, cryptocurrency coins and ICO tokens are composed entirely of computer code, and are completely intangible.[73] As a part of a distributed ledger, there is no single central location where the code is stored.[74] Instead, proof of ownership of a cryptocurrency coin or ICO token is determined solely by access to the related private key.[75]

Because access to the private key entirely controls ownership, a thorny question is presented: does the crypto coin or ICO token have value or does the private key?[76] Cryptocurrency-related websites stress the importance of safeguarding private keys.[77] Private keys are often stored in digital "wallets" for safekeeping.[78] There are different kinds of digital wallets, including "hot" and "cold" wallets.[79] Cold wallets are generally offline and kept secure.[80] They are only connected when the private keys for the related coins or tokens are needed for sale, transfer, or otherwise.[81] Of course, keeping private keys offline and secure limits access, which is the idea.[82] Nevertheless, this approach does somewhat negate the speed and access benefits of digital currencies.[83] Furthermore, there are cases where private keys are correctly "guessed" by computer algorithm and the key is used to

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67. *See id.*

68. *See id.*

69. *See Perfect Passwords*, https://www.grc.com/passwords.htm [perma.cc/9DPG-H7AG] (last visited Nov. 6, 2019).

70. *See* Jamie Redman, *How to Prove Ownership with a Bitcoin Cash Address and Digital Signature*, BITCOIN (May 18, 2019), http://news.bitcoin.com/how-to-prove-ownership-with-a-bitcoin-cash-address-and-digital-signature/ [perma.cc/FEN3-68JX].

71. *See id.*

72. *See id.*

73. *See id*

74. *See id.*

75. *See id.*

76. *See* Blake Neuman, *Crypto 101: Storing Your Cryptocurrency*, CASA BLOG, https://blog.keys.casa/crypto-101-storing-your-cryptocurrency [perma.cc/WMC5-E5ME] (last visited Oct. 23, 2019).

77. *See id.*

78. *See id*.

79. *The Difference Between Hot and Cold Wallets in the Digital Currency World*, COTI NETWORK MEDIUM (Jan. 11, 2018), https://medium.com/cotinetwork/the-difference-between-hot-and-cold-wallets-in-the-digital-currency-world-1aa6f957ddd1 [perma.cc/2SY7-3RJG].

80. *Id.*

81. *Id.*

82. *Id.*

83. *See id.*; Rhys Skellern, *Keep Your Private Keys Safe—Why It's so Important to Store Them Offline*, ECOMI NETWORK MEDIUM (Sept. 20, 2019), https://medium.com/ecomi/keep-your-private-keys-safe-why-its-so-important-to-store-them-offline-8a85d946a3b2 [perma.cc/39DD-ZEG7].

scoop up and steal the related cryptocurrency coins from their owners, regardless of where the key itself is stored.[84]

This issue of whether the value resides in the coin or the key has been considered, but not fully resolved in the context of the federal securities laws relating to custody.[85] There is presently a lack of clarity regarding whether public blockchain networks of the type that are used for cryptocurrency coins or ICO tokens can be adequately secured to satisfy various federal securities laws and regulations relating to securities safeguarding.[86]

This issue has also been addressed by legislative fiat in the context of secured transactions law in certain states.[87] On February 16, 2019, Wyoming enacted legislation (the "Wyoming Digital Assets Act") that addresses the status of digital assets including cryptocurrencies, and in part provides for their treatment as general intangibles and money solely for purposes of section 9 of Wyoming's Uniform Commercial Code, effective beginning July 1, 2019.[88] More importantly, the Wyoming Digital Assets Act also specifies how a security interest in a digital asset, including a cryptocurrency, can be perfected.[89] This newly enacted legislation recognizes the importance of control and the related private key.[90] It requires the execution of a smart contract that transfers the digital asset's private key "based on the occurrence or nonoccurrence of specified conditions."[91] Other states are in the process of considering favorable digital asset legislation similar to Wyoming.[92]

III. DIGITAL ASSETS OF DECEDENTS & TEXAS LAW

Forty-six states have enacted legislation since 2013 addressing the ownership of digital assets of decedents.[93] Texas enacted such a law in 2017.[94] However, Texas law does not specifically address cryptocurrency

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84. *See* Elena Lacey, *A 'Blockchain Bandit' Is Guessing Private Keys and Scoring Millions*, WIRED (Apr. 23, 2019), https://www.wired.com/story/blockchain-bandit-ethereum-weak-private-keys/ [perma.cc/CQ5M-JMG2].

85. *See* Andrew Shipe, *Custody of Blockchain Securities Under the Federal Securities Laws*, 21 FINTECH LAW REP. 4, 5 (July/Aug. 2018).

86. *See id.*

87. David Olarinoye, *Digital Assets Now Legally Recognized as Property in Wyoming State,* INVEST IN BLOCKCHAIN (Feb. 16, 2019), https://www.investinblockchain.com/digital-assets-legally-recognized-property-wyoming/ [perma.cc/2JDN-U9X2] (last visited Sept. 20, 2019); Kristin Alford, *Digital Assets a General Intangible under Wyoming's UCC*, NCS (Apr. 12, 2019), https://www.ncscredit.com/education-center/blog/digital-assets-general-intangible-ucc/ [perma.cc/TA7W-FLJN].

88. WYO. STAT. ANN. § 34-29-102 (West 2019).

89. *See id.* § 34-29-103.

90. *See id.*

91. *See id.* § 34-29-103(e)(i)(B).

92. *See* Alford, *supra* note 87.

93. *See Access to Digital Assets of Decedents*, NCSL (May 23, 2019), http://www.ncsl.org/research/telecommunications-and-information-technology/access-to-digital-assets-of-decedents.aspx [perma.cc/534D-NNCY].

94. *See* TEX. EST. CODE ANN. §§ 2001.002–.232.

coins, ICO tokens, or private keys.[95] It is much broader and applies generally to all kinds of digital assets.[96] Section 2001.002(8) of the Texas Estates Code defines a digital asset as "an electronic record in which an individual has a right or interest."[97] Because this definition is so general, it does not provide helpful guidance relating to valuation.[98]

IV. REVIEWING FEDERAL ESTATE TAX RULES FOR INTANGIBLE ASSETS

Federal estate taxation turns in significant part on valuation.[99] Section 20.2031-1(b) of the Treasury Regulations generally provides that the value of every item includable in the decedent's estate "is its fair market value at the time of the decedent's death . . . ."[100] Forced sale, uncommon, and nonpublic market prices cannot be used, and there is other relevant guidance clarifying how an item's fair market value can and cannot be determined.[101]

There are regulations that provide specific valuation rules for business assets, including those constituting intangible property.[102] Treasury Regulation section 20.2031-2 provides valuation rules for stocks and bonds; section 20.2031-3 addresses the valuation of interests in a business; section 20.2031-4 covers notes; section 20.2031-5 provides rules for cash on hand and deposits; and section 20.2031-7 addresses annuities and certain other property interests.[103] Importantly, there is inadequate guidance regarding the valuation of cryptocurrencies or ICO tokens for federal income tax and estate tax purposes.[104] Existing tax law guidance on certain tax issues of limited types of cryptocurrencies is discussed below.[105]

A. Valuation of Foreign Currencies

The Tax Court and the IRS have considered the issue of valuing foreign currency denominated interests for estate tax purposes.[106] Similarly, in

95. *See id.*
96. *See id.*
97. *See id.* § 2001.002(8).
98. *See id.*
99. Treas. Reg. § 20.2031-1(b) (1976).
100. *See id.*
101. *See id.*
102. *See* Treas. Reg. §§ 20.2031-2–2031-7 (2011).
103. *Id.*
104. *See* Letter from Annette Nellen, CPA, CGMA, Esq., Chair, AICPA Tax Executive Committee, to the I.R.S. (May 30, 2018) (letter can be found at: https://www.aicpa.org/content/dam/aicpa/advocacy/tax/downloadabledocuments/20180530-aicpa-comment-letter-on-notice-2014-21-virtual-currency.pdf [perma.cc/7FTP-R64W]).
105. *See* discussion *supra* Part IV.
106. *See* Christine Lane, Gene Magidenko & Hogan Lovells, *The U.S. Federal Taxation of Bitcoins and Other Convertible Virtual Currencies*, SEC. ON TAX'N (2014), http://www.fedbar.org/Image-Library/Sections-and-Divisions/Tax/summer2014.pdf [perma.cc/HV8V-9MSH].

Private Letter Ruling 8927038, the Service indicated that valuation of certain Canadian dollar assets is:

> . . .determined by the fair market value of the foreign currency on the date of the decedent's death. The fair market value of the foreign currency is based on the amount of United States dollars the foreign currency could have purchased in an exchange between a willing buyer and a willing seller.[107]

The private letter ruling further provides that "the exchange rate is determined by the commercial (or retail) exchange rate, stated in United States dollars, established by the United States financial centers on the valuation date."[108]

B. Are Cryptocurrencies or ICO Tokens Like Foreign Currencies?

In 2014, the IRS issued Notice 2014-21, which provides limited guidance on certain tax issues regarding certain cryptocurrencies.[109] Commentators have criticized the IRS because many important tax issues, including valuation, are not adequately addressed in the Notice.[110] Moreover, the Notice does not cover all digital assets of value, merely "convertible virtual currencies" (as defined therein) that "ha[ve] an equivalent value in real currency or [act] as a substitute for real currency . . . ."[111] The Notice includes Bitcoin as one example of a convertible virtual currency.[112] Although Notice 2014-21 is limited in both its scope and its guidance, it explicitly provides that convertible virtual currency is treated as property, not currency for federal income tax purposes.[113] Note that twenty-one U.S. legislators have written to the IRS requesting simpler and more comprehensive tax rules for cryptocurrencies.[114] Legislation has been introduced to provide favorable federal income tax treatment.[115] Moreover,

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107. I.R.S. Priv. Ltr. Rul. 8927038 (July 7, 1998) (citing American Home Prods. Corp. v. U.S 601 F.2d 540 (Ct. Cl. 1979) (involving in part the valuation of British Pounds Sterling in support of this statement. Pursuant to section 6110 (j)(3) of the International Revenue Code, private letter rulings cannot be used or relied upon as precedent)).

108. *Id.*

109. *See* I.R.S. Notice 2014-21, 2014-16 I.R.B. 938 (Mar. 26, 2014); *see also* Stevie D. Conlon, Anna Vayser, & Robert Schwaba*, Taxation of Bitcoin, Its Progeny, and Derivatives: Coin Ex Machina*, TAX NOTES (2018) (discussing the various tax issues that arise with certain cryptocurrencies).

110. See I.R.S. Notice 2014-21, 2014-16 I.R.B. 938; *See* Mike Orcutt, *How the hell are cryptocurrency holder supposed to file their taxes?*, MIT TECH REV. (Apr. 16, 2019), https://www.technologyreview.com/s/613315/how-the-hell-are-cryptocurrency-holders-supposed-to-file-their-taxes/ [perma.cc/8QLK-EDRZ].

111. I.R.S. Notice 2014-21, 2014-16 I.R.B. 938.

112. *Id.*

113. *Id.*

114. *Id.*

115. H.R. 2144, 116th Cong. (2019).

there are no specific court decisions addressing federal income tax or estate tax issues involving cryptocurrencies.[116]

It does not seem appropriate to treat cryptocurrencies or ICO tokens as similar to foreign currencies for federal income or estate tax purposes in light of IRS Notice 2014-21 (which explicitly provides that convertible virtual currencies should be treated like property rather than currency) and the lack of guidance to the contrary.[117]

C. Limited but Inadequate IRS Valuation Guidance for Cryptocurrencies

Notice 2014-21 does provide limited guidance regarding valuation of convertible virtual currency.[118] It provides in part that:

> [I]f a virtual currency is listed on an exchange and the exchange rate is established by market supply and demand, the fair market value of the virtual currency is determined by converting the virtual currency into U.S. dollars (or into another real currency which in turn can be converted into U.S. dollars) at the exchange rate, in a reasonable manner that is consistently applied.[119]

This general guidance has been criticized as inadequate because the prices of convertible virtual currency can differ widely from one exchange to another; furthermore, commentators have raised concerns regarding which exchanges' valuations should be controlling.[120]

D. Challenges with the Valuation of Intangible Assets

Convertible virtual currencies are intangible property as a matter of property law.[121] Accordingly, it should be considered whether there are

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116. *See* Mordecai Lerer, *The Taxation of Cryptocurrency Virtual Transactions Bring Real Life Tax Implications*, THE CPA J. (Jan. 2019), https://www.cpajournal.com/2019/01/24/the-taxation-of-cryptocurrency/ [perma.cc/8PCP-MBAS] (explaining that questions regarding cryptocurrencies remain unanswered).

117. *See Virtual Currencies: What Banks Need to Know*, *supra* note 32; I.R.S. Notice 2014-21, 2014–16 I.R.B. 938.

118. *See* Sahel Ahyaie Assar, *Insight: Taxation of Cryptocurrencies—In Anticipation of the IRS's Call—Part 2*, BIG L. BUS. (Sept. 13, 2019), https://biglawbusiness.com/insight-8 [perma.cc/L39A-PSTL].

119. I.R.S. Notice 2014-21, 2014-16 I.R.B. 938.

120. *See* Nellen, *supra* note 104.

121. *See* American Institute of CPAs, *Updated Comments on Notice 2014-21: Virtual Currency Guidance*, at page 5 (June 10, 2016) https://www.aicpa.org/Advocacy/Tax/DownloadableDocuments/AICPA-Comment-Letter-on-Notice-2014-21-Virtual-Currency-6-10-16.pdf [perma.cc/L39A-PSTL]; A.B.A. Section of Taxation, *Comments on Notice 2014-21*, at 3 (Mar. 24, 2015) https://www.americanbar.org/content/dam/aba/administrative/taxation/policy/032415comments.authcheckdam.pdf [perma.cc/L7M7-UW57].

existing valuation rules for intangible property that might be informative in determining valuations of cryptocurrency coins or ICO tokens.[122]

The courts have noted the difficulties in valuing intangible assets.[123] A U.S. District Court case involving the valuation of closely held stocks, cited a non-estate tax decision which notes:

> Pinpointing the issue does not in itself solve our difficulties. The valuation of an intangible asset as of a certain date is one of the most complex problems with which courts are forced to deal . . . We can derive from the substantive law only formal definitions, so broad as to leave the close questions of meaning entangled with inquiries as to the relevance and the weight of evidence. For instance, the present Revenue Code provides that all property, except inventories, shall be appraised at 'fair market value', 26 U.S.C.A. § 113(a)(1) to (22). The ambiguities of this definition of value becomes immediately apparent. What is the 'market' value is not always the 'fair' value, and vice versa. In many situations there is no market for the property in question. What test should govern then? The law tells us that fair market value is a question of fact and in determining . . . fair market value of stock in a corporation due regard should be given to the fair market value of the corporate assets on that date . . . Let us assume that this standard removes all of the confusion as to exactly 'what value' we are searching for. The appraisal of the stock in question is still fraught with difficulty. 'This is necessarily true because valuations involve economic prophecies based on a complex and highly controversial technique of inferences from the known to the unknown.'[124]

E. Valuation of Stocks and Bonds

Treasury Regulation section 20.2031-2 sets forth the general valuation rules for stocks and bonds.[125] In general, "the mean between the highest and lowest quoted selling price on the valuation date is the fair market value per share or bond."[126] This rule applies if there is a market for such stocks or bonds: (1) on a stock exchange; (2) in an over-the-counter market; or (3) otherwise.[127] Note that this is the average price for the day, not the closing price.[128] This can be confusing for investors and other market participants that may use the closing price for other purposes.[129] The federal estate tax

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122. *See generally id.* (noting valuation difficulties with cryptocurrency and suggesting pre-existing tax regulations available as remedies).

123. *See, e.g.*, South Carolina Nat'l Bank v. McLeod, 256 F. Supp. 913, 916 (D.S.C. 1966).

124. *See id.* (citing Ames v. O'Malley, 91 F. Supp. 463, 463–64, (D. Neb. 1950), aff'd 197 F.2d 256 (8th Cir. 1952)).

125. Treas. Reg. § 20.2031-2 (2006).

126. *Id*. § 20.20131-2(b)(1).

127. *See* South Pacific Co. v. U.S., 110 F. Supp. 637 (1953); I.R.S. Priv. Ltr. Rul. 7511171700A (Nov. 17, 1975).

128. *See South Pacific Co.*, 110 F. Supp. at 638; I.R.S. Priv. Ltr. Rul. 7511171700A.

129. *See South Pacific Co.*, 110 F. Supp. at 638; I.R.S. Priv. Ltr. Rul. 7511171700A.

regulations only permit the use of a daily closing price (instead of the average) under limited circumstances for certain mutual fund shares.[130]

There is a special rule for the valuation of shares of stock in open-end investment companies (a type of mutual fund).[131] In general, the valuations of shares in such companies is their public redemption price at the time of death.[132] If a time of death price cannot be shown, the regulations further provide that "the last public redemption price quoted by the company for the date of death shall be presumed to be the applicable public redemption price."[133]

The general valuation rules for stocks and bonds include special provisions for when there are no sales on the valuation date, where the selling, bidding, or asking prices are incomplete or unavailable, or where prices do not reflect fair market value.[134] Special rules are also included for pledged securities, securities subject to an option or purchase contract and stock sold ex-dividend.[135]

The court in *W.T. Grant Co. v. William Duggan* held that valuation of stocks based on trading prices on the New York Stock Exchange on October 25, 1929, was controlling even though this date fell before "Black Tuesday" (Oct. 29, 1929), the date of the stock market crash that preceded the Great Depression.[136] The Appellate Court noted the fact that the market crashed shortly after October 25th was immaterial.[137] In *Estate of Prentice v. Comm'r*, the valuation of a large block of stock at $147 per share was based on trading prices for small lots of stock, even though there were discussions of a potential merger (as of the date of death) that ultimately resulted in payments to holders based on a valuation of $250 per share.[138] Statements set forth in the decedent's will contending that the valuation of the stock should be higher than evidenced by market trading were also ignored by the Tax Court.[139]

Stock in closely held corporations can present valuation challenges because of ownership by a limited number of persons, and the lack of trading.[140] Revenue Ruling 59-60, 1959-1 CB 237 sets forth the general approach for valuing the stock of closely held corporations.[141] In general, a factual analysis of the business and relevant financial data is necessary.[142]

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130. *See* Treas. Reg. § 20.2031-8(b)(1).
131. *Id.*
132. *Id.*
133. *Id.*
134. *Id.* §§ 20.2031-2(b)(1), (d)–(f).
135. *Id.* §§ 20.2031-2(g)–(i).
136. *See* W.T. Grant Co. v. Duggan, 94 F.2d 859, 861 (2nd Cir. 1938).
137. *Id.*
138. *See In re* Estate of Prentice v. Comm'r, 15 TCM 14 (1956).
139. *Id.*
140. Rev. Rul. 59-60, 1959-1 C.B. 237 (1959) (as detailed in Sec. 2.03).
141. *See id.*
142. *See id.*

Although this guidance is specific to stocks and bonds, the consideration by the courts regarding whether trading prices are controlling in light of other data or subsequent market changes is particularly relevant, due in large part to the cryptocurrency valuations that occurred in 2017 and 2018 and the likelihood of recurrence given the nature of cryptocurrency markets.[143]

F. Valuing Cryptocurrency: Challenges

Although valuation of intangible property can present various challenges, some of which have been addressed through tax law guidance, cryptocurrency still has its own unique set of challenges.[144] Some of these challenges stem from the nature of cryptocurrency itself, some are due to specific actions taken by cryptocurrency market participants, and some have arisen due to the relatively unique regulatory environment (or lack thereof) governing cryptocurrency.[145] One proposed solution to some of these challenges is that crypto-assets be first bifurcated into crypto-capital and crypto-commodities.[146] Subsequent to bifurcation, different valuation models could be applied to the two asset types.[147]

G. Exchange Data Concerns

Many traditional equity securities are traded on established, well-regulated markets such as the NYSE or NASDAQ.[148] Trading of cryptocurrencies such as Bitcoin or Ethereum are dispersed across numerous exchanges in different countries.[149] This is due to a variety of factors such as: the cryptocurrency market being new, the technologists being located all over the world, and the desire of participants to find locations with low regulatory risks and costs of entry.[150] Moreover, cryptocurrency can be traded directly by market participants (or with the help a facilitator) by means of a smart contract.[151] This type of trading is often referred to as "atomic

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143. *See id.*; *Virtual Currencies: What Banks Need to Know*, *supra* note 32; *Bitcoin Price, supra* note 43.

144. *See Virtual Currencies: What Banks Need to Know*, *supra* note 32.

145. *Id.*

146. Chris Burniske, *Value Capture and Quantification: Cryptocapital vs. Cryptocommodities*, PLACEHOLDER.VC (Apr. 26, 2019), https://www.placeholder.vc/blog/2019/4/26/value-capture-and-quantification-cryptocapital-vs-cryptocommodities [perma.cc/5HWL-E7TM].

147. *Id.*

148. *See* David R. Harper, *Getting to Know the Stock Exchanges* (June 25, 2019) https://www.investopedia.com/articles/basics/04/092404.asp [perma.cc/S5NR-LHAL].

149. Justin Cook, Richard Cohen, & Jason Denisenko, *Initial Coin Offerings: A comparative overview of securities regulatory environments in the US, UK and Asia Pacific*, GLOBAL LEGAL INSIGHTS – BLOCKCHAIN & CRYPTOCURRENCY REGULATION (1st ed. 2019).

150. *See id.*

151. *See id.*

swaps" of cryptocurrencies.[152] There are listings of specific cryptocurrencies across multiple exchanges around the world.[153] Unlike the way in which non-U.S. stocks are traded by way of depositary receipts on U.S. stock exchanges, there is not a U.S. Bitcoin, a French Bitcoin, or a Korean Bitcoin with a depositary receipt traded on other countries' markets.[154]

Given that the same cryptocurrency coins are traded on different exchanges, there should be a certain degree of market pricing reconciliation (subject to temporal and currency related arbitrage).[155] If the market data between multiple exchanges diverges, traders seeking arbitrage gains should force a convergence, harmonizing prices, except in situations where markets are artificially closed off from the rest of the world.[156]

Surprisingly, however, researchers have not yet observed such convergence in cryptocurrency valuations based on real-world trading information.[157] In analyzing Bitcoin trading data from the largest eighty-one cryptocurrency exchanges, totaling $6 billion in daily trading volume, researchers have claimed that large portions of the observed trading activity appears to be wash trading, attempting to "create the appearance of activity in the market."[158] Based on the researchers' methodology, as little as 5% may be actual trading .[159] Some exchanges report as little as a $0.01 spread between bid and ask prices, while other larger exchanges report a spread as large as $15; logically, the larger exchange should have a much smaller spread, not a spread almost 1,500 times larger.[160]

The lack of convergence in cryptocurrency valuations appear to be relatively well-known to cryptocurrency cognoscenti; it has been reported that some of these exchanges are effectively traps, faking high trading volume without going through full regulatory processes.[161] While the claim can be made that this is simply an effort to entice ICOs to list ICO tokens rather than sell them directly to investors, the potential adverse impact on determining appropriate and fair market valuation generally remains.[162] In general, the refrain is consistent: economic rules that apply to other intangibles still apply to cryptocurrency, and if it seems too good to be true,

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152. *See id; What Are Atomic Swaps? The Most Comprehensive Guide Ever*, https://blockgeeks.com/guides/atomic-swaps/ [perma.cc/9N7C-7CE8] (last visited October 29, 2019).

153. *See* Cook et al., *supra* note 149.

154. *See id.*

155. *See id.*

156. *See id*

157. Kate Rooney, *Majority of bitcoin trading is a hoax, new study finds*, CNBC (Mar. 22, 2019), https://www.cnbc.com/2019/03/22/majority-of-bitcoin-trading-is-a-hoax-new-study-finds.htm [perma.cc/R7YF-NWUJ].

158. *Id.*

159. *Id.*

160. *Id.*

161. *Id.*

162. David Hundeyin, *Most of Bitcoin's Trading Volume is FAKE: Time to Wake the F*** Up?*, CNN.com (Mar. 24, 2019), https://www.cnn.com/most-of-bitcoins-trading-volume-is-fake-time-to-wake-the-f-up [perma.cc/8WFW-4NK3].

it probably is.[163] "Better" regulated exchanges such as Binance, Kraken, Coinbase, or Gemini all demonstrate similar pricing patterns when charts are overlaid; there appears to be a real risk that exchanges showing significant pricing outliers might be artificially manipulated.[164]

V. VALUATION AND FORKS

Like stock, a cryptocurrency coin represents a specified economic interest in a particular cryptocurrency.[165] Stock prices and valuations are affected when stock shares are transformed through transactions generally known as "corporate actions."[166] Examples of corporate actions that can affect stock valuations are stock splits (and reverse splits), dividends (both cash and stock dividends), and corporate reorganizations and divisions (such as spin-offs and splits).[167] Corporate actions occur for a variety of reasons, such as management of share price, business consolidations, or transformations.[168] As digital assets, cryptocurrency coins and ICO tokens can also be transformed.[169] Some of these transformations are commonly referred to as "forks" (hard and soft) and "drops."[170] These transformations can occur for the same reasons as corporate actions.[171] They can also occur for technological reasons.[172] It might be desirable to update or change the digital blockchain structure of a particular cryptocurrency coin or ICO token to make it faster, hold more data, or for other technological reasons.[173]

A. What Is a Fork?

Each block of transaction data in a cryptocurrency's blockchain effectively links (according to rules prescribed by the chain's code protocol) to the preceding and succeeding blocks eventually linking to every other block in the chain.[174] These prescribed rules are subject to updates and

163. *Id.*

164. *Id.*

165. *See* Jake Frankfield, *Cryptocurrency*, INVESTOPEDIA (Feb. 12, 2019), https://investopedia.com/terms/c/cryptocurrency.asp [perma.cc/4HVU-D6DK].

166. *See* Reem Heakal, *What are Corporate Actions?*, INVESTOPEDIA (Jan. 25, 2019), https://www.investopedia.com/articles/03/081303.asp [perma.cc/P64P-8PB4].

167. *Id.*

168. *See* James Chen, *Corporate Action*, INVESTOPEDIA (June 16, 2019), https://www.investopedia.com/terms/c/corporateaction.asp [perma.cc/X4QT-YSBM].

169. Nathan Reiff, *Cryptocurrency Forks v. Airdrops: What's the Difference?*, INVESTOPEDIA (July 3, 2018), https://www.investopedia.com/tech/cryptocurrency-forks-vs-airdrops-whats-difference/ [perma.cc/LBR4-BN24].

170. *See id*.

171. *See id.*

172. *See id.*

173. Arjun Kharpal, *Everything You Need to Know About the Blockchain*, CNBC (June 18, 2018), https://www.cnbc.com/2018/06/18blockchain-what-is-it-and-how-does-it-work.html [perma.cc/N32H-HGU8].

174. *See id*

changes as the technology continues to develop.[175] However, after a change, some aspect of the old blocks may not fit within the new rule set.[176] This can create a fork, like a fork in a road, or the creation of two different potential paths: a path where post-change blocks simply follow the old rules, and another potential path where post-change blocks link based on the updated or changed rules.[177] As there is no central source of authority managing Bitcoin, each participant can decide which path they want to take; each path's viability depends on both relevant trading activity and the total amount of computer power devoted to mining.[178]

Forks can be "soft," where the new blocks comply with both old and new rules, or they can be "hard," resulting in more substantial changes that will render new blocks unintelligible to users running software with the old rules.[179]

B. What Is a Drop?

A drop is in some ways similar and related to a fork; in other ways, it is completely different.[180] Put simply, a drop is a means of distributing some amount of a new, untested Cryptocurrency B to every address on another, different blockchain (for example, Cryptocurrency A) to all holders that currently hold Cryptocurrency A, with or without warning.[181] The new coin might be completely unrelated to Cryptocurrency A, and the timing of drops can be opportunistic.[182] For example, a person might believe that by simply giving away their new cryptocurrency it might take off.[183] That person could decide the best group to give their currency away to in order to induce proliferation (*i.e.*, building awareness or hype).[184] Cryptocurrency A and Cryptocurrency B will likely have different rules, analogous to a fork; however, a drop is not intended to be a continuation of the blockchain onto which the new coin is "dropped."[185]

C. Taxation Issues with Forks and Drops

As with many other aspects of cryptocurrency taxation, there are no clear governing laws or regulations which roundly answers every question

175. *See id.*
176. *See id.*
177. *See id.*
178. *See* Conlon et. al., *supra* note 109.
179. *Id.*
180. Harsh Agrawal, *Airdrops in Cryptocurrencies: Everything a Beginner Needs to Know,* COINSUTRA (Oct. 13, 2018), https://coinsutra.com/what-is-airdrop/ [perma.cc/J7F9-CSGQ].
181. *See id.*
182. *See id.*
183. *See id.*
184. *See id.*
185. *See id.*

about taxation of forks.[186] Indeed, Notice 2014-21, the only concrete guidance, makes no mention of forks, only discussing convertible virtual currency received as payment for goods and services or in mining transactions.[187] Several industry advocate groups, including the ABA Section of Taxation and the AICPA have requested further clarification.[188]

1. Timing and Character of Income

The following discussion begins with the assumption that receipt of cryptocurrency in a fork or drop will likely be construed to constitute income.[189] In requesting a safe harbor for hard fork taxation, the ABA Section of Taxation presented arguments both for and against hard forks as realization events.[190] The primary argument "for" is rooted in the broadly liberal construction of the term "gross income" in *Glenshaw Glass*, which encompasses clear accessions to wealth in combination with a taxpayer's complete dominion.[191] Here, a hard fork or a drop results in receipt of a new, distinct cryptocurrency, separate from that originally held.[192] The original cryptocurrency also remains in existence for some measurable period of time.[193]

When cryptocurrency income is recognized for tax purposes is critical because the value of cryptocurrency must be determined at such time. Given cryptocurrency's notable price volatility, determining the appropriate valuation at the time of recognition is vital.[194] Recognition of income under *Glenshaw Glass* occurs at the time the taxpayer has *complete dominion* over something.[195] Complete dominion can be a difficult concept as applied to cryptocurrency, in contrast to more traditional assets such as those of "found property."[196] For example, in one revenue ruling, a taxpayer who worked as a book reviewer received numerous unsolicited books in hopes he would review them.[197] Under Section 61(a) and the attendant regulations, when the

186. *See* Conlon, et al., *supra* note 109.

187. *See* I.R.S. Notice 2014-21, 2014-16 I.R.B. 938 (Mar. 26, 2014).

188. *See Comments on Notice 2014-21, supra* note 121; *Comments on Notice 2014-21: Virtual Currency Guidance*, *supra* note 121.

189. *See* discussion *infra* Section V.C.1.

190. Karen L. Hawkins, Chair, ABA Section of Taxation, *Tax Treatment of Cryptocurrency Hard Forks for Taxable Year 2017* (Mar. 29, 2018).

191. *Id.* (citing Comm'r v. Glenshaw Glass Co., 348 U.S. 426, 431 (1955)) (noting that the letter also presents an argument distinguishing the proposition in Eisner v. Macomber, 252 U.S. 189, 207 (1920), that realization represents a key part of the concept of income).

192. *See id.*

193. *See id.*

194. *See id.*

195. *See id.*

196. *See id.*

197. Rev. Rul. 70-498, 1970-2 C.B. 6.

book reviewer took control of the books to donate them to charity, he realized income in the amount of the value of the books.[198]

Note that timing concerns unique to cryptocurrency and the way it is held inform these considerations.[199] Coins that are being held by an exchange on a customer's behalf (as opposed to an exchange merely facilitating transfers for a holder) may result in the delay or prevention of a holder's ability to access the new property received in the fork.[200] For example, a particular cryptocurrency exchange may not have in place the technology to allow its customers access to new coins until several months after the fork or drop occurs.[201] Contrast this delayed access to holders via exchanges with immediate access for those who hold coins directly.[202] Furthermore, a holder with their own electronic wallet who never upgrades their software may never actually notice the new coins or may unintentionally "destroy" them.[203]

Returning to the holder of a cryptocurrency prior to a hard fork event, it seems most in line with the found property cases to attribute income to the point in time where the holder of the forked cryptocurrency exercises dominion and control over the new cryptocurrency.[204] Unfortunately, this presents an entirely separate set of practical and technological problems, particularly for custodial technological systems that may balk at each individual receiving a "distribution" on a discrete day (and with discrete, differing valuations).[205] Conceptually, recognition of income on different dates for different holders (that would likely be based on different valuations) creates practical determination challenges.[206]

2. But What If It Isn't Income?

One argument against immediate realization of income from forked cryptocurrency is based on authority concerning pregnant racehorses and cattle.[207] Much as the animals in the cases always hold the "potential" to give birth to offspring, cryptocurrencies always have the potential to fork, resulting in new, separate assets.[208] Therefore, a hard fork would instead

198. *Id.*
199. *See* Hawkins, *supra* note 190.
200. *See id.*
201. *See id.*
202. *See* Conlon, et al., *supra* note 109.
203. *Id.* (citing Jordan Pearson, *People Are Losing Bitcoin Cash by Accidentally Sending It to Bitcoin Addresses*, MOTHERBOARD (Sept. 12, 2017), https://motherboard.vice.com/en_us/article/j55ywg/people-are-losing-bitcoin-cash-by-accidentally-sending-it-to-bitcoin-addresses [perma.cc/F3NJ-CKTM]).
204. Conlon, et al., *supra* note 109, at 1016; *see* Rev. Rul. 70-498, 1970-2 C.B.6.
205. Conlon, et al., *supra* note 109, at 1017.
206. *See id.* at 1010–11.
207. *Id.* at 1004; *see* Rev. Rul. 86-24, 1986-1C.B. 80; *see also* Gamble v. Comm'r, 68 T.C. 800 (1977).
208. Conlon, et al., *supra* note 109, at 1014.

result in immediate valuation and allocation of the forked cryptocurrency's basis between the old and new, according to fair market value.[209]

However, upon closer examination, the analogy breaks down.[210] The racehorses and cattle in the cited revenue ruling and case were pregnant at the time of the purchase and there were market prices for pregnant horses and cattle that were taken into the value of the unborn foal; indeed, the theoretical value of the offspring was, in effect, "priced into" the transaction.[211] Cryptocurrency holders generally aren't typically aware of potential future forks at the time they acquire their cryptocurrency.[212] Although it could be argued that all future events (such as forks and drops) are priced into existing coins, this has clearly not been true with regard to stocks or bonds.[213] The Black-Scholes option pricing model (for which Fischer Black and Myron Scholes were awarded the Nobel Prize) does not take into account the impact of dividends and stock mergers on valuation, which had adverse practical consequences on Black and Scholes early use of the pricing model in their own trading activities.[214]

3. Need for Valuation

Despite a lack of clearly governing law or regulation regarding taxation of forks and drops, the ability to value newly received cryptocurrency in a fork or drop is crucial.[215] Proper valuation is important whether the receipt of cryptocurrencies is considered taxable or nontaxable.[216] If receipt is deemed to be taxable, the value of the coins is considered taxable income.[217] If the receipt is determined to be nontaxable, valuation is necessary in order to determine proper basis allocation between the old and new cryptocurrency (to the extent a basis allocation can be justified under the tax law).[218]

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209. *See* Hawkins, *supra* note 190 at 10.

210. Conlon, et al., *supra* note 109.

211. *See, e.g.*, Rev. Rul. 86-24, 1986-1 CB 80, (Jan. 1, 1986); *see also Gamble*, 68 T.C. at 801.

212. Conlon, et al., *supra* note 109.

213. *See* Ronald J. Gilson & Reiner H. Kraakman, *The Mechanics of Market Efficiency*, 40 VA. L. REV. 549 (1984) (discussing the dangers of using future events to determine prices in the market).

214. *See, e.g.*, Shobhit Seth, *Circumventing the Limitations of Black-Scholes*, INVESTOPEDIA, https://www.investopedia.com/articles/active-trading/041015/how-circumvent-limitations-blackscholes-model.asp [perma.cc/6NGU-22CQ] (last modified Feb. 16, 2018).

215. *See* Conlon, et al., *supra* note 109, at 1016.

216. *See id.* at 1016–17.

217. *See id*. at 1010.

218. *See id.* at 1021.

VI. VALUATION CHALLENGES: SAME SCAMS, NEW TECHNOLOGY

A. Pump and Dump

The pump and dump scandal is one of the oldest types of market manipulation—and indeed a classic example can be found in the "Radio Pool" investors who organized their buying and selling amongst each other to drive up the price of Radio Corp. of America stock from $100 per share to $500 per share prior to the 1929 market crash.[219] While practices like these led to the '33 and '34 Federal Securities Acts and much more intensive regulation of the securities markets, market manipulation still presents a substantial danger to investors and obfuscates attempts to accurately value intangible assets.[220]

Many of these traditional securities valuation concerns, as applicable to cryptocurrency and ICO tokens, were addressed by SEC Chairman Jay Clayton in a 2017 public statement.[221] When considering attempting to trade or value any new asset type, questions must be asked about the status of regulations to protect investors (and whether those regulations are being complied with).[222] Furthermore, it is important to determine if the markets for the asset are fair, if the prices are or can be manipulated, if there is sufficient liquidity, and if there are other risks of loss not present in traditional asset types (such as related to data hacking).[223]

The prescience of this warning has been borne out by a variety of subsequent SEC enforcement actions.[224] One such action targeted the use of celebrities such as DJ Khaled and Floyd Mayweather Jr. to promote the Centra Tech ICO.[225] The action alleged both men had failed to disclose payments they received for such promotion; following the action, they each agreed to multi-year bans on securities promotions and paid disgorgement, penalties, and interest without admitting or denying the allegations.[226]

Other traditional deceitful practices have also made their way into the cryptocurrency arena.[227] CabbageTech presents a particularly good example;

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219. Jacob Harper, *The Most Famous Pump and Dump Stocks in Wall Street History*, EQUITIES (Nov. 13, 2013), https://www.equities.com/news/the-most-famous-pump-and-dump-stocks-in-wall-street-history [perma.cc/RX52-W5FF].

220. *Id.*

221. Jay Clayton, *Statement on Cryptocurrencies and Initial Coin Offerings*, SEC (Dec. 11, 2017), https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11 [perma.cc/2S9X-7R65].

222. *Id.*

223. *Id.*

224. Sec. Exch. Comm'n 2018–268, *Two Celebrities Charged with Unlawfully Touting Coin Offerings*, SEC (Nov. 29, 2018), https://www.sec.gov/news/press-release/2018-268 [perma.cc/P8ZX-RNRN.

225. *See id.*

226. *See id.*

227. *See* Commodity Futures Trading Comm'n 7774-18, *CFTC Wins Trial Against Virtual Currency Fraudster*, CFTC (Aug. 24, 2018), https://www.cftc.giv/pressroom/pressreleases/7774-18 [perma.cc/YGC6-43AZ].

CabbageTech, known as Coin Drop Markets, offered supposed real-time virtual currency trading advice in exchange for payment of money or virtual currencies.[228] Unfortunately, no such advice was ever offered, and the funds were misappropriated.[229] Instead of the Wall Street offices he claimed, the proprietor used social media and other online tools from a basement in Staten Island to carry out his schemes.[230]

These types of distortive practices can have an impact on the valuation of cryptocurrency markets as a whole.[231] Bad actors targeting main street investors can artificially depress interest in a wide range of intangible investment assets and adversely affect related trading activity, which has the effect of lowering prices.[232] Distortive "boiler room" style practices can affect valuations in well-regulated, mature and liquid markets; for instance, during 2017 and 2018 the markets for cryptocurrency were particularly vulnerable to these practices.[233] Intervening actions by the SEC and CFTC have improved public perception regarding the level of regulation of cryptocurrencies and their exchanges, helping to prevent future bad actors.[234]

B. Rollbacks, Error Correction, and Ambiguously Divisive Forks

One consequence of storing cryptocurrency trading records in a distributed fashion using a blockchain rather than centralized in a traditional recordkeeping mechanism is that, once recorded, transactions should be immutable.[235] Regardless of whether a transaction has an unintended destination address, whether through mistake or misdirection, once it has been added to the main blockchain, it is supposed to be set in stone.[236] What should happen, then, if a large portion of a single cryptocurrency is illicitly diverted, either through a flaw in the blockchain's programming or large-scale misdirection?[237] This could easily destroy the overall value of

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228. *See id.*

229. *See id.*

230. *See id.*

231. *See* Kate Rooney, *Crime Still Plagues Cryptocurrencies, as $1.7 Billion was Stolen from Investors Last Year*, CNBC: BITCOIN (Jan. 29, 2019, 3:41 PM), https://www.cnbc.com/2019/01/29/crime-still-plagues-cryptocurrencies-as-1point7-billion-was-stolen-last-year-.html [perma.cc/6HS4-LD98].

232. *See id.*

233. *See id.*; *see also* Rachel McIntosh, *The Oldest Trick in the Book: Why Crypto 'Boiler Room Scams' are so Effective*, FINANCE MAGNATES: CRYPTOCURRENCY (Sept. 21, 2018), https://www.financemagnates.com/cryptocurrency/news/the-oldest-trick-in-the-book-why-crypto-boiler-room-scams-are-so-effective-in-the/ [perma.cc/62F4-JML9].

234. *See* McIntosh, *supra* note 233.

235. *See* Darryn Pollack, *The Immutable And Unhackable Blockchain Still Falling To Cryptocurrency Wild West*, FORBES (Mar. 20, 2019), https://www.forbes.com/sites/darrynpollack/2019/03/20/the-immutable-and-unhackable-blockchain-still-falling-prey-to-cryptocurrency-wild-west#19f6017b1d61 [perma.cc/D6HA-RC72].

236. *See id.*

237. *See id.*

that cryptocurrency, including the coins that have not been misappropriated (yet).[238]

In the event of a programming flaw or potential exploit, the code must be corrected.[239] An additional change, however, could theoretically revert the illicit trades in the blockchain to the point in time (the last block of data) prior to the exploit.[240] In a traditional system, with a centralized arbiter of authority, the centralized authority is likely to make the decision to reverse those bad actions.[241] However, a blockchain lacks a centralized arbiter of authority; in fact, in many cases a given blockchain project might even lack a centralized team of dedicated developers.[242] One team of developers might choose to implement a hard fork and reverse the trades, while another team of developers might merely fix the potential programming flaw or exploit on a go-forward basis.[243] Which blockchain holds the original cryptocurrency, particularly if most of the community favors reversing the bad actions?[244]

Ethereum underwent a similar event with respect to DAO tokens on its blockchain; Ethereum is designed to provide a sort of substrate on which to build distributed applications.[245] A coding flaw allowed a bad actor to make off with approximately $40 million worth of Ether.[246] Developers implemented a hard fork to fix the problem and return the funds.[247] Some in the community, however, did not agree with reversing past transactions, no matter the cause for the reversion, and maintained what they call the original blockchain under the name Ethereum Classic.[248] In situations where a hard fork is undertaken for error correction, but where a significant community maintains the previously existing blockchain, the question of which coin is "new" and which coin is "existing" becomes almost a philosophical one.[249]

After the problem was discovered, Ethereum prices plummeted from around $21 per Ether to around $12 per Ether.[250] Immediately after the hard

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238. *See id.*

239. *See* Bisade Asolo, *Blockchain Soft Fork & Hard Fork Explained*, MYCRYPTOPEDIA (Nov. 1, 2018), https://www.mycryptopedia.com/hard-fork-soft-fork-explained/ [perma.cc/BYU5-HTSM].

240. *See id.*

241. *See* Nolan Bauerle, *What is the Difference Between a Blockchain and a Database?*, COINDESK, https://www.coindesk.com/information/what-is-the-difference-blockchain-and-database [perma.cc/46QB-E56A].

242. *See* Asolo, *supra* note 239.

243. *See id.*

244. *See* Nathan Reiff, *A History of Bitcoin Hard Forks*, INVESTOPEDIA (June 25, 2019), https://www.investopedia.com/cryptocurrency-4427699 [perma.cc/U2RM-UWTF].

245. *See* Conlon, et al., *If a Crypto Tree Falls in a Digital Forest, Can It Give Rise to Tax Evasion?*, 6 TAX NOTES 161 (Nov. 5, 2018) (discussing DAO tokens specifically).

246. *See id.*

247. *See* Michael del Castillo, *Ethereum Executes Blockchain Hard Fork to Return DAO Funds*, COINDESK (July 20, 2016), https://www.coindesk.com/ethereum-executes-blockchain-hard-fork-return-dao-investor-funds [perma.cc/VJ3J-KFSA].

248. *What Is Ethereum Classic?*, BLOCKGEEKS (2017), https://blockgeeks.com/guides/what-is-ethereum-classic/ [perma/cc/7PK9-T74M].

249. *See id.*

250. *Top 100 Cryptocurrencies by Market Capitalization*, COINMARKETCAP, http://www.coin

fork splitting the two, at the end of July 2016, the price of new Ethereum fluctuated around $12 to $15 per Ether, while the price of Ethereum Classic remained below $1 per Ether.[251] At their peaks, Ethereum Classic topped $45, while new Ethereum briefly maxed out at over $1300.[252]

Investors, then, would much prefer Ethereum Classic to be the new coin.[253] After all, it would represent a much smaller immediate accession to wealth.[254] More abstractly, much of the community chose to interact with new Ethereum and not Ethereum Classic, in accordance with the hard fork reversion and cryptocurrency exchanges which kept the tickers the same.[255] Furthermore, trading prices suggest the community seemed to value Ethereum Classic much less than old or new Ethereum; new Ethereum maintained trading prices at much the same level as Ethereum prior to the hard fork.[256] On the other hand, Ethereum Classic represented a rejection of the changes new Ethereum made to old Ethereum, and almost certainly had objectively fewer intrinsic changes made to its code.[257]

So which cryptocurrency was received, Ethereum or Ethereum Classic, and which cryptocurrency retained a user's initial tax basis from purchase before the fork?[258] Depending on the answer, the amount of gain represented by the receipt of new cryptocurrency would be drastically different.[259] Indeed, the question of whether a user who simply changed their software to transact with new Ethereum and never interacted with the Ethereum Classic blockchain at all ever exercised sufficient dominion and control to represent an accession to wealth is by no means settled.[260]

In the Ethereum example, it is relatively easy to make the argument that new Ethereum represents a continuation of the Ethereum project and that Ethereum Classic is the new coin representing a rebellious outgrowth.[261] Other examples though, are not anywhere near as clear-cut.[262] Bitcoin Cash, a hard-forked outgrowth of the original Bitcoin blockchain, recently underwent an extremely contentious hard fork that split the chain into two distinctly differing directions, Bitcoin ABC and Bitcoin SV.[263] Some argue

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marketcap.com [perma.cc/87QM-QD54] (last visited Sept. 22, 2019).

251. *Id.*

252. *Id.*

253. *See* Ameer Rosic, *What is Ethereum Classic? Ethereum vs Ethereum Classic*, BLOCKGEEKS, https://blockgeeks.com/guides/what-is-ethereum-classic/ [perma.cc/K39Y-BGSS] (last visited Sept. 24, 2019).

254. *See id.*

255. *See id.*

256. *See id.*

257. *See id.*

258. *See id.*

259. *See id*.

260. *See id.*

261. *See* Romain Dillet, *Coinbase users can now withdraw Bitcoin SV following BCH fork*, TECHCRUNCH (Feb. 15, 2019), https://techcrunch.com/2019/02/15/coinbase-users-can-now-withdraw-bitcoin-sv-following-bch-fork/ [perma.cc/EKZV-547Z].

262. *See id.*

263. *See id.*

that the level of uncertainty created by this split caused reverberations affecting values throughout the entire cryptocurrency market.[264]

Which cryptocurrency was the continuation of the original chain and which was the forked outgrowth depended, at the moment of the fork, almost entirely on viewpoint.[265] After the dust had begun to settle, commentators noted that Bitcoin ABC appeared to have more support than Bitcoin SV.[266] At least one major exchange, Coinbase, allowed users to access Bitcoin ABC immediately, but took nearly three months to allow users to withdraw their Bitcoin SV.[267] As of February 2019, Coinbase still did not support Bitcoin SV trading.[268] Given that cryptocurrency values fluctuate based on user participation, and that participation seems to be self-reinforcing, it is not difficult to conclude that exchanges throwing their weight behind one side of a hard fork can influence participation and value.[269]

C. Impact on Valuation for Estate Tax Purposes

It is unclear whether these scandals will be considered relevant to addressing challenges to the valuation of cryptocurrency coins or ICO tokens that end up before the courts.[270] It should be noted that the Second Circuit was unpersuaded that the market crash occurring on Black Tuesday at the start of the Great Depression should have an impact on the valuation of stock just a few days beforehand.[271] It seems that practitioners will need to clearly distinguish and demonstrate why market trading prices should be ignored or modified in certain cases.[272]

VII. CONCLUSION

Cryptocurrency coins and ICO tokens are a new type of digital asset.[273] Because they are also traded on new types of exchanges and there is little or uncertain regulation of trading and pricing activity, there is limited and inadequate guidance regarding their valuation for tax purposes.[274] In most cases, it will be necessary to consider the issues by way of analogy to existing valuation guidance under federal estate tax law.[275] Moreover, the value of their related private keys and the consequences of forks and drops on both

264. *Id.*
265. *Id.*
266. *Id.*
267. *Id.*
268. *Id.*
269. *Id.*
270. *Supra* Part VI.A & B.
271. *Supra* Part IV.E.
272. *Supra* Part IV.E.
273. *Supra* Part II.
274. *Supra* Part V.
275. *Supra* Part V.

valuation and taxation are significant.[276] Laws and regulatory guidance are critically needed to provide certainty and consistency.[277] The technological details must be understood by practitioners at some level of detail to understand the valuation challenges and likely results.[278] Additionally, scams and other market developments that are adversely affecting the ability to obtain clear valuations must be considered.[279] It is hoped that additional developments and guidance are forthcoming that will be relevant in determining the fair value of cryptocurrency coins and ICO tokens for tax purposes.[280]

VIII. ADDENDUM

Following the initial draft of this article in July, 2019, the IRS released substantive new guidance, on October 9, 2019, in the form of a revenue ruling and an accompanying Frequently Asked Questions (FAQ).[281] The revenue ruling focuses on whether a taxpayer receives gross income in a hard fork (and, if so, when such income should be valued).[282] The FAQ elaborates on these questions of valuation, as well as addressing numerous other issues ranging in complexity and including but not limited to receipt or payment of virtual currency in exchange for services, basic gain and loss principles, tax lot relief methods, certain information reporting considerations, and specific applications of the rules governing taxation of gifts and charitable contributions.[283]

Under the guidance, generally, where a taxpayer receives units of a new cryptocurrency as a result of a hard fork followed by an airdrop, the receipt is a taxable accession to wealth under section 61 of the Internal Revenue Code.[284] The ruling notes that such accessions to wealth are included in gross income when a taxpayer attains complete dominion over the asset.[285] For cryptocurrencies held directly, this is specified as generally when the distribution is recorded on the distributed ledger.[286] For cryptocurrencies held in a third party wallet, this is instead specified as when the taxpayer

276. *Supra* Part V.
277. *Supra* Part V.
278. *Supra* Part VI.
279. *Supra* Part VI.
280. *Supra* Part VI.
281. Rev. Rul. 2019-24; *see Frequently Asked Questions on Virtual Currency Transactions*, https://www.irs.gov/individuals/international-taxpayers/frequently-asked-questions-on-virtual-currency-transacitions [perma.cc/99AW-ZC4N] (last visited Nov. 6, 2019).
282. *See id*.
283. *See id.* (making note that this article focuses primarily on valuation, our analysis in this addendum will focus on those sections of the guidance).
284. *See* Rev. Rul. 2019-24 at 2 (nothing that the revenue ruling also provides definitions of hard fork and airdrop that may or may not diverge from the way these terms are used by cryptocurrency enthusiasts and technologists).
285. *See* Comm'r v. Glenshaw Glass Co., 348 U.S. 426, 431 (1955).
286. *See* Rev. Rul. 2019-24 at 2.

acquires the ability to dispose of the cryptocurrency.[287] Note that under the guidance, different parties receiving the same hard fork linked distribution might receive the distribution at different times (and thus presumably at different values).[288]

The FAQ released contemporaneously with the revenue ruling provides specific guidance on how to value cryptocurrency received in a variety of situations.[289] If the cryptocurrency is received in a transaction facilitated by a cryptocurrency exchange, then the fair market value is the amount recorded by the exchange in U.S. dollars.[290] For off-chain transactions facilitated by exchanges, the fair market value is the amount the cryptocurrency was trading for on the exchange at the time the transaction would have been recorded.[291]

In direct peer-to-peer transactions without a facilitating exchange (e.g., atomic swaps), the taxpayer must establish an accurate representation of the value; the guidance notes the IRS will accept use of a blockchain explorer analyzing worldwide indices and calculating the value at the date and time of the transaction (or, for off-chain transactions, the time the transaction would have been recorded).[292] If a taxpayer receives cryptocurrency that isn't publicly traded or doesn't have published values in exchange for property or services, the fair market value is equal to the fair market value of the property or services exchanged in the transaction.[293]

Despite practitioner desire for formal guidance with respect to cryptocurrency taxation, both the revenue ruling and the FAQ present relatively novel questions of procedural posture. The revenue ruling was issued without an effective date. Commentators have noted this implies retrospective as well as prospective application, which generally falls in line with the usual interpretation of revenue rulings as statements of existing IRS position rather than an attempt to articulate new regulatory guidance. Although an FAQ has no formal precedential value, the guidance here is instructive concerning the IRS's position with respect to various issues left unclear concerning cryptocurrency up to this point.

287. *Id*.
288. *Id*. at 3.
289. *See Frequently Asked Questions on Virtual Currency Transactions*, *supra* note 281.
290. *Id*. at Q25.
291. *Id*.
292. *Id.* at Q26.
293. *Id.* at Q27.