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CRYPTOCURRENCY & ROBOTS: HOW TO TAX AND PAY TAX ON THEM

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I. BACKGROUND

There have been many recent changes to technology that impact the ability to calculate, levy, and refund taxes. Computers have gotten faster. Tracking systems are more resilient than ever. Digital storage has become incredibly cheap and easily accessible. And artificial intelligence has added nuance to tracking; posed interesting questions about what a taxable entity should be; and may change fundamental assumptions of the entire taxation regime.

This Paper seeks to define and tackle some of the broader issues related to these changes in technology. This Paper examines these trends in the context of cases in the broader taxation and entitlements system. Specifically, it remarks on how a number of these taxes and entitlements can be more efficiently levied and targeted to their goals. The Paper makes two claims: (i) improved technology will create new tax bases that the government can target; and (ii) technology will enable taxes to be better targeted to the populations and behaviors desired to be taxed.

Technology has shifted activity away from traditional components of the economy to new previously untaxed activity. Two examples are virtual currency transactions and robots that provide labor and services. This shift threatens the ability of governments to maintain a steady stream of income as more economic income is shifted to categories that are not taxed. The big questions are whether and how virtual currency should be taxed—and if robots should be taxed like humans as they become more and more similar to humans? These questions are further complicated when discussed in the context of power struggles among sovereigns with their own financial and political agendas.

Additionally, technology has opened the path to targeting taxes and credits in ways that were previously unfeasible. For example, corporate integration seeks to create a unified system of taxation that would eliminate the bifurcated corporate and individual regimes in favor of a single taxation system. A harmonized model would correct giant inefficiencies and

distortions caused by the current system. Current distortions include the preference for retention of income rather than distribution and a preference for debt rather than equity. The current barrier to integrating the tax system is an inability to trace corporate income to individual shareholders. Fortunately, blockchain gives a method for tracing income and provides an avenue to achieve integration.

II. LIMITATIONS AND CONTEXT OF THE PAPER

This Paper is part of a larger scholarly agenda on technology and taxation. Existing scholarship can primarily be grouped into describing proposals for how to change particular tax provisions (without looking at technology) or those that discuss the impact of technology on certain areas of law (very little has been written at the intersection of technology and tax). The scope of this Paper focuses on postulating a broader methodology of how governments should reformulate their approaches to understanding and levying taxes in an era of improved technology. Future scholarship would aim to expand this type of scholarship. For example, there will be new opportunities for taxation in other fields with advancements, such as with renewable and sustainable energy technologies. Updated technology will likely require updated approaches and frameworks for taxation. Another example may be contributions at the intersection of tax law and other areas of law, such as tort law. Tax law could be a useful tool to resolve some of the legal and philosophical dilemmas in the assignment of liability and risk in an era of autonomous technology.

III. STRUCTURE

Part IV chronicles the biggest and most relevant changes in technology as they affect taxation. Part V expounds the current literature on the taxes and technologies to be discussed in the Paper. Part VI discusses the two primary claims of the thesis: new tax bases and better targeting. Additionally, it discusses prescriptive solutions to how the particular taxes or entitlements should be reformed to most effectively achieve their goals. Finally, Part VII synthesizes some concluding thoughts and a general methodology for reexamining the basic assumptions of our taxation regime.

IV. BIGGEST CHANGES IN TECHNOLOGY AND WHY THEY ARE IMPORTANT

A. Blockchain and the Shared Public Ledger

Perhaps the biggest technological change that has not readily been factored into the tax code as of 2017 is the advent of blockchain and the public ledger. Blockchain's revolutionary nature has earned it the title of the "new Google."[1]

In laymen's terms, blockchain is "technology that permanently records transactions in a way that cannot be later erased but can only be sequentially updated, in essence keeping a never-ending historical trail."[2] The technology changes the way that transactions can be conducted and recorded—and taxed.

Cryptocurrency—the most famous of which is Bitcoin—is one of the most commonly known uses of blockchain. Examining how Bitcoin leverages blockchain can be a helpful exercise for understanding how other technologies can practically leverage blockchain. The Bitcoin Foundation explains that a blockchain is

> a shared public ledger on which the entire Bitcoin network relies. All confirmed transactions are included in the block chain. This way, Bitcoin wallets can calculate their spendable balance and new transactions can be verified to be spending bitcoins that are actually owned by the spender. The integrity and the chronological order of the block chain are enforced with cryptography.[3]

As described, the key power of blockchain lies in the public nature of the data. Everyone can identify "a duplicate or fraudulent transaction" on a giant public spreadsheet to prevent any unauthorized duplication of Bitcoins.[4] But how exactly does the technology work to enable a level of secure communication for each party to conduct the actual transaction? The answer is that each person has two "cryptographically related keys"—one is a public key that everyone in the world can see and use—and the other is a private key that is mathematically related but not possible to guess via the public key.[5] An individual can send Bitcoins to another person by using their

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1. William Mougayar, *The Blockchain is the New Google*, TECHCRUNCH (May 11, 2016), https://techcrunch.com/2016/05/11/the-blockchain-is-the-new-google/.
2. *Id.*
3. *Id.*
4. *Id.*
5. Joshua A.T. Fairfield, *Bitproperty*, 88 S. CAL. L. REV. 805, 820 (2015).

public key.[6] Using the private key, only the recipient can *access* the contents.[7]

The public ledger is available to anyone, and they can view information about previous transactions for a given item to ensure the property is being received from the actual current owner, rather than a preposterous owner. [8]

Internal Revenue Service (IRS) agents are currently tasked to identify tax evaders by working through the public ledgers and matching public addresses with individuals.[9] However, the current tracking systems are not excellent and may not always reveal evaders.[10] But it is likely that these systems will improve over time and better tracking can be accomplished.

While cryptocurrency is the most popularly known application of blockchain, many other technologies do and can employ it.[11] Housing titles and sharing economy transactions may utilize the technology.[12] Blockchain can be used to prevent copyright infringement and give the "power to transfer anything," such as "cars and houses, digital stocks and bonds . . . and digital money."[13] The applications are wide-reaching. The breadth of applications means that many transactions which were originally difficult to track can now be much more easily tracked and taxed.

Other applications include being able to have audit-level access to records in real-time. Payroll systems on the blockchain "will allow multiple government agencies to immediately have audit-level access to all employee records, and all employer matching-payments. With a fiat cryptocurrency, a payroll application on the blockchain will allow immediate global payroll compliance at a fraction of the cost of current payroll compliance."[14] This level of automation and tracking will allow governments to much more effectively target certain behaviors for taxation and audit purposes.

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6. *Id.*

7. *Id.*

8. *Id.*

9. Kelly J. Winstead, *The North Carolina State Tax Treatment of Virtual Currency: An Unanswered Question*, 21 N.C. BANKING INST. 501, 518 (2017).

10. *Id.*

11. THE GOLDMAN SACHS GRP., PROFILES IN INNOVATION: BLOCKCHAIN: PUTTING THEORY INTO PRACTICE 4–5 (2016), http://www.the-blockchain.com/docs/Goldman-Sachs-report-Blockchain-Putting-Theory-into-Practice.pdf.

12. *Id.*

13. Fairfield, *supra* note 5, at 809.

14. Richard Thompson Ainsworth & Ville Viitasaari, *Payroll Tax & the Blockchain*, (Bos. Univ. Sch. of Law, Law & Econ. Paper No. 17-17, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2970699.

B. Cryptocurrency and ICOs (Initial Coin Offerings)

Cryptocurrency refers specifically to the set of digital currencies that employ blockchain technology to ensure proper transfer. As of January 7, 2018, there were 1,384 different cryptocurrencies.[15] They utilize a number of different blockchain networks as the technology framework that they employ. Some of the most common ones are Bitcoin, Ethereum, Bitcoin Cash, Ripple, and Litecoin.[16]

Cryptocurrencies have tried to differentiate themselves from Bitcoin with various marketing and technological differences. One such cryptocurrency, Dogecoin, was started as more of a joke based on an internet meme of a dog and gained an online community of supporters, often using it for donations to developers or content contributors.[17] The market caps for these coins is not small at all: Dogecoin went from $60 million in January 2014 to $340 million in June 2017.[18] Then there are underground pornography networks that employ cryptocurrencies such as Titcoin, which they use to hide otherwise incriminating transactional history from credit cards.[19] On the technology side, both Litecoin and Ethereum use different technologies that make them have faster block transaction times than Bitcoin (which has roughly a time of ten minutes per transaction).[20]

ICOs (initial coin offerings) refer to the first release of a new cryptocurrency that raises money through the use of crowdfunding.[21] In contrast to an IPO (initial public offering), which gives purchasers of shares a part of ownership in the company, an ICO gives purchasers a stake in the royalties of a project.[22] People purchase coins for a project with the hopes that the community and currency will prosper. There is a lot of money at stake with ICOs: from January to August 2017, there were already $1.1

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15. *List of Cryptocurrencies*, WIKIPEDIA, https://en.wikipedia.org/wiki/List_of_cryptocurrencies (last visited Mar. 1, 2018).

16. *Id.*

17. *Dogecoin*, WIKIPEDIA, https://en.wikipedia.org/wiki/Dogecoin (last visited Mar. 1, 2018).

18. *Id.*

19. *Titcoin*, WIKIPEDIA, https://en.wikipedia.org/wiki/Titcoin (last visited Mar. 2, 2018).

20. JP Buntinx, *4 Cryptocurrencies with Much Faster Block Times Than Bitcoin*, MERKLE (Feb. 19, 2017), https://themerkle.com/4-cryptocurrencies-with-much-faster-block-times-than-bitcoin/.

21. *Initial Coin Offering*, WIKIPEDIA, https://en.wikipedia.org/wiki/Initial_coin_offering (last visited Mar. 2, 2018).

22. *Id.*

billion in ICO proceeds, which is ten times the proceeds in all of 2016, so this practice is a rapidly growing phenomenon.[23]

There are numerous tax questions that surround ICOs. Should ICOs be treated as pure income? ICOs are used as an alternative to raising funding through conventional venture funding, so should there be some element of equity treatment? Typically, the party or parties that initiate an ICO will hold a portion of the coins and then keep the funds from selling all of the other coins. Should there be a requirement to mark-to-market? These currencies can fluctuate significantly from one week to the next (sometimes 1,000% or more).[24]

1. Missed Opportunity if Proper Legal Structures Not Implemented

Cryptocurrency has extraordinary upside if a regulatory and taxation system is correctly designed—but a tremendous downside if a system is poorly designed. Like all things, it is less likely to be used if it is prohibitively cumbersome to comply with regulatory and tax requirements.

If certain countries become the easiest in terms of compliance and facilitate appropriate structures that inspire confidence in the use of cryptocurrencies, these countries can become havens for cryptocurrency. Many people will start using the structures and legal frameworks of that country. There is a potential for large amounts of economic activity to be routed through that country. The total market capitalization for cryptocurrencies is in the hundreds of billions and constantly growing[25]—so the potential for a single country or group of countries to capture a lot of its benefits is high.

Additionally, the acceptance of cryptocurrency is starting to become ubiquitous. Common retailers such as Target, Expedia, Victoria's Secret, Dell, and Zappos are some of the many companies that now accept Bitcoin as payment.[26] Because so many more transactions are being conducted using this new technology, it behooves the United States government to develop a

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23. *Id.*

24. Wolf Richter, *3 Charts Show the Crazy Gains of Cryptocurrencies*, BUS. INSIDER (May 15, 2017, 8:39 PM), http://www.businessinsider.com/bitcoin-price-compared-to-other-cryptocurrencies.

25. Will Martin, *The Global Cryptocurrency Market Hit a New Record High Above $700 Billion*, BUS. INSIDER (Jan. 3, 2018, 5:57 AM), http://www.businessinsider.com/bitcoin-price-global-cryptocurrency-market-capitalisation-january-3-2018-1.

26. Ellen Vessels, *Who Actually Accepts Bitcoin as a Form of Payment*, AM. GENIUS (May 26, 2016), https://theamericangenius.com/finance/bitcoin.

set of guidelines to properly tax transactions, while not shifting transactions abroad. Billions of dollars are at stake, and the United States should attempt to preserve as much of that value domestically.

Because cryptocurrency is becoming so common, it is important to not tax it in ways that make compliance very difficult for both individuals and the government to track. Currently, the treatment of cryptocurrency as property means that buying a burger at a fast food joint would incur tax liability on any gain or loss on the currency itself. This outcome is not ideal because it unduly burdens use of the cryptocurrency such that consumers may stop using it in the United States, potentially shifting popular hubs of cryptocurrency abroad and embroiling American users in complicated legal compliance.

2. Correct Legal Structures Needed to Prevent Confusion

There are currently multiple legal standards for cryptocurrency. United States courts have decided numerous cases that take differing approaches to how cryptocurrency should be taxed. Multiple courts have taken a position that Bitcoin is legally money and can count as investment contracts.[27] The court in *SEC v. Shavers* said, "Bitcoin has a measure of value, can be used as a form of payment, and is used as a method of exchange. As such, the Bitcoin investments in this case can satisfy the 'investment of money' prong set out by the Supreme Court in *Howey*."[28]

In *United States v. Ulbricht*, the court held a "money laundering statute is broad enough to encompass use of Bitcoins in financial transactions."[29] Another court confirmed the view that Bitcoin functions as money: they "function as pecuniary resources and are used as a medium of exchange and a means of payment."[30] However, *Florida v. Espinoza* takes a contrary approach that "they are not a commonly used means of exchange" and thus not money.[31]

The extraordinary diversity in the treatment of cryptocurrency is troubling. Because so many legal standards exist, there are extraordinary compliance costs in determining one's tax and regulatory liabilities. The

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27. SEC v. Shavers, No. 4:13-CV-416, 2014 U.S. Dist. LEXIS 194382, at *17 (E.D. Tex. Aug. 26, 2014).

28. *Id.*

29. United States v. Ulbricht, 31 F. Supp. 3d 540, 570 (S.D.N.Y. 2014).

30. United States v. Murgio, 209 F. Supp. 3d 698, 707 (S.D.N.Y. 2016).

31. Order Granting Def.'s Mot. to Dismiss the Information at 5, Florida v. Espinoza, No. F14-2923 (Fla. Cir. Ct. 2016).

government should implement regulations that clarify many of the ambiguities that currently plague the field.

C. Artificial Intelligence

The scope of "artificial intelligence" for this Paper specifically references "intelligence exhibited by machines or software."[32] This broad definition encompasses the likes of both intelligent machines that are capable of behaving like humans, as well as technology that allows for complex processing whereby a computer learns from a pattern, allowing it to perform incredibly difficult operations in small amounts of time.

The latest developments in the artificial intelligence scene have included the expanded rollout of Watson, the supercomputer that defeated the top *Jeopardy* champions of all-time.[33] In fact, the law firm Baker & Hostetler recently employed the services of ROSS, which is an artificially intelligent lawyer based on the Watson platform.[34] It is only a matter of time before machines will be able to make decisions autonomously, as many respondents have predicted in a Pew survey of experts.[35] These types of advances will cause complex legal challenges.

1. Artificial Intelligence May Shift the Tax Base

If artificial intelligence is not correctly taxed, a severe problem might exist, which is that the traditional tax base of workers may either make less money or may shrink to the point that less total taxes are collected. In order for the government to balance itself and appropriately incentivize corporations to use robotic labor over human labor, it must carefully develop standards for taxing artificial intelligence.

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32. *Artificial Intelligence*, WIKIPEDIA, https://en.wikipedia.org/wiki/Artificial_intelligence (last visited Mar. 2, 2018).

33. *Id.*

34. Cecille De Jesus, *AI Lawyer "Ross" Has Been Hired by Its First Official Law Firm*, FUTURISM (May 11, 2016), http://futurism.com/artificially-intelligent-lawyer-ross-hired-first-official-law-firm/.

35. Aaron Smith & Janna Anderson, *Predictions for the State of AI and Robotics in 2025*, PEW RESEARCH CTR.: INTERNET & TECH. (Aug. 6, 2014), http://www.pewinternet.org/2014/08/06/predictions-for-the-state-of-ai-and-robotics-in-2025/.

2. *No Formal Legal Standards Currently Exist*

Currently, there are no separate categories for artificial intelligence or robots in comparison to regular machinery.[36] Additionally, there are not formal legal guidelines for how companies or individuals are required to program them to ensure ethical compliance.[37] If a robot is faced with an ethical quandary of realizing profit with a risk of incurring legal liability for the person it is representing, how should it balance these two tensions? With no formal legal framework, the potential for much harm exists since autonomous robots could make decisions that cause a lot of damage to others, without a truly responsible party. Additionally, certain legal standards may need to be set as robots approximate and possibly surpass human capabilities. They may warrant their own category of taxation and legal liability.

D. Processor Speed and Big Data

Moore's Law, which is the observation that "computer power doubles every two years at the same cost," has continued to hold true.[38] As a result, the transistor capacity on a microprocessor chip was around one million in 1992 but had increased to around three billion by 2011.[39] Such a rapid rise in computing power has enabled computers to handle more tasks that were previously relegated to manual accounting practices and records.

One of the tremendous benefits of processor speed increases is big data. Big data refers to those data sets that are too large or complex to practically analyze using traditional data processing.[40] Recent innovation has enabled the parsing of these large data sets by using predictive analytics and other pattern-based correlative approaches.[41] As a result, many processes that affect taxation have become more feasible. Particularly, the ability to process large and convoluted data sets has eased blockchain analysis of public ledgers. The ability to parse large data sets has also contributed to the

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36. *See generally* Pauilius Cerka et al., *Liability for Damages Caused by Artificial Intelligence*, 31 COMPUT. L. & SEC. REV. 376 (2015).

37. *See generally* Jeremy Elman, *Artificial Intelligence and the Law*, TECHCRUNCH (Jan. 28, 2017), https://techcrunch.com/2017/01/28/artificial-intelligence-and-the-law/.

38. *After Moore's Law*, ECONOMIST (June 12, 2016), http://www.economist.com/technology-quarterly/2016-03-12/after-moores-law.

39. *Cloud Computing*, WIKIPEDIA, https://en.wikipedia.org/wiki/Cloud_computing (last visited Mar. 2, 2018).

40. *Big Data*, WIKIPEDIA, https://en.wikipedia.org/wiki/Big_data (last visited Mar. 2, 2018).

41. *Id.*

rise of robots and artificial intelligence because complex non-linear decisions can be made by a robot.

Governments are now relying on big-data algorithms to conduct robust monitoring.[42] These changes will allow governments to much more quickly and efficiently engage in compliance efforts.

V. LITERATURE REVIEW

A. Blockchain

Relatively little has been written about the impact of blockchain on the law. Many pieces referencing blockchain discuss the technology in relation to cryptocurrency since blockchain is the key technology that enables the multitude of cryptocurrency transactions.

There are some pieces that reference the impact of blockchain on contract law since blockchain technology would allow "guarantee[d] execution," increasing general trust in transactions.[43] Others have written about how blockchain will affect privacy and copyright law, especially because the permanency of the public ledger makes it difficult to erase private or copyrighted information once it is published.[44] There are also some articles that discuss the impact on the banking industry.[45] However, nothing is written on how blockchain has or will impact tax law specifically.

B. Cryptocurrency

There is slightly more scholarship on the relationship between cryptocurrency and taxation. Specifically, there is a short 2013 piece that predates the IRS guidance on taxation for cryptocurrencies arguing that cryptocurrencies are a tax haven because their appreciation is not taxed and

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42. Rory Van Loo, *Rise of the Digital Regulator*, 66 DUKE L.J. 1267, 1268 (2017).

43. *See* Reggie O'Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 178 (2017) (citing WORLD ECON. FORUM, THE FUTURE OF FINANCIAL INFRASTRUCTURE: AN AMBITIOUS LOOK AT HOW BLOCKCHAIN CAN RESHAPE FINANCIAL SERVICES 29 (2016)).

44. Garry Gabison, *Policy Considerations for the Blockchain Technology Public and Private Applications*, 19 SMU SCI. & TECH. L. REV. 327, 335 (2016) (citing Nick Vogel, Comment, *The Great Decentralization: How Web 3.0 Will Weaken Copyrights*, 15 J. MARSHALL REV. INTELL. PROP. L. 135, 148 (2015)).

45. *See generally* Madiha M. Zuberi, *A Silver ('Chain') Lining: Can Blockchain Technology Succeed in Disrupting the Banking Industry?*, 36 BANKING & FIN. SERV. POL. REP. 3 (2017).

a semblance of anonymity is preserved.[46] The piece is limited to diagnosing a problem (that no longer exists) and mentioning a couple approaches that countries might take to stop it (some of which countries have since implemented).[47]

There is also scholarship that explores various state taxation regimes for virtual currencies.[48] Another article looks at insurance coverage for virtual currencies, given the risks of fraudulent transfers or security vulnerabilities associated with them.[49] A separate article looks at the concept of basis in taxation and how it should change to a system of "basis pooling" because the current system otherwise allows users to manipulate their taxes.[50] One more article looks at basis for bitcoin mining taxation, wash sale rules, and like-kind exchange rules; however, this piece largely diagnoses issues without suggesting normative guidelines or solutions.[51] In sum, there are a handful of pieces that discuss various aspects of cryptocurrency, but this Paper attempts to differentiate itself with normative guidelines for how virtual currency taxation should be carried out and a meta-analysis on the broader framework for cryptocurrency. Unlike existing scholarship, this Paper also examines the *Howey* test with a focus on recent enforcement actions; a discussion of foreign jurisdictions' treatment of cryptocurrency; and a comparison to crowdfunding.

C. Artificial Intelligence

There is also very little written about artificial intelligence that is relevant to the premises of this Paper. One of the seminal pieces on artificial intelligence is a law review article written in 1992 that predicts the phenomenon of increased artificial intelligence and explores philosophical questions that arise in attributing "personhood" to such beings.[52] The article is certainly outdated, as it represents a conception of computers and

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46. Omri Marian, *Are Cryptocurrencies Super Tax Havens?*, 112 MICH. L. REV. FIRST IMPRESSIONS 38, 39 (2013).

47. *See generally id.*

48. *See* Winstead, *supra* note 9.

49. *See* Mark J. Krone & Howard M. Bernstein, *Introduction to Bitcoin and Potential Insurance Coverage for Virtual Currencies*, 21 FIDELITY L.J. 143 (2015).

50. Adam Chodorow, *Rethinking Basis in the Age of Virtual Currencies*, 36 VA. TAX REV. 371 (2017).

51. Zachary B. Johnson, Note, *I Got 988 Problems but Bitcoin Ain't One: The Current Problems Presented by the Internal Revenue Service's Guidance on Virtual Currency*, 47 U. MEM. L. REV. 633 (2016).

52. Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231 (1992).

technology that is a couple decades old, and it uses a more philosophical framework to address the question of personhood.[53] We have the luxury today of opining about artificially intelligent beings with a much more practical sense of how they will affect modern trends in taxation and liability since they actually exist. However, that 1992 article does help to frame some of the important questions on personhood for artificially intelligent beings, which serves as a relevant foundation for many of the other key questions.[54]

Other pieces about robots and artificial intelligence discuss their growing capabilities. One such short piece briefly mentions their rising use as lawyers but does not discuss implications.[55] Another article discusses how judges discuss robots in the context of their opinions and critiques their conceptions.[56] One other piece discusses Kantian morality and makes an argument for robots to be designed to express emotion and morality as they are faced with increasingly complex and important tasks.[57]

D. Integration

The ideas behind an integrated tax system stem from a 1992 Treasury proposal.[58] The proposal documents multiple types of corporate taxation regimes.[59] Much scholarship that discusses integration is focused on normative principles about fairness.[60] Other scholarship discusses constitutional issues with integration.[61] No current scholarship addresses how technological advances might impact the feasibility of corporate integration.

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53. *Id.*

54. *Id.*

55. Kelly Phillips Erb, *Are We Ready for Robot Lawyers?*, 38 PA. LAW. 54 (2016).

56. Ryan Calo, *Robots As Legal Metaphors*, 30 HARV. J.L. & TECH. 209 (2016).

57. *See generally* Duncan MacIntosh, *Autonomous Weapons and the Nature of Law and Morality: How Rule-of-Law-Values Require Automation of the Rule of Law*, 30 TEMP. INT'L & COMP. L.J. 99 (2016).

58. *See generally* DEP'T OF THE TREASURY, INTEGRATION OF THE INDIVIDUAL AND CORPORATE TAX SYSTEMS: TAXING BUSINESS INCOME ONCE (1992), http://www.treasury.gov/resource-center/tax-policy/Pages/integration-paper.aspx [hereinafter TREASURY REPORT].

59. *Id.*

60. *See, e.g.*, Meredith R. Conway, *Money, Money, Money; It's A Rich Man's World: Making the Corporate Tax Fair*, 17 U. PA. J. BUS. L. 1181 (2015); Meredith R. Conway, *Stealth Inequity: Using Corporate Integration to Ease Unfairness in the Tax Code*, 2 WM. & MARY POL'Y REV. 53 (2010).

61. Walter Hellerstein et al., *Constitutional Restraints on Corporate Tax Integration*, 62 TAX L. REV. 1 (2008).

This Paper contributes a novel approach to integration based on technological advances. It discusses how tracking systems and electronic record-keeping will be able to track the items that made it traditionally difficult to implement.

VI. BLOCKCHAIN TECHNOLOGY'S IMPACT ON TAXATION

A. New Tax Base Opportunities

This Section discusses the impact of blockchain technology in creating new bases for taxation. On one level, advances in technology allow governments to tax items that were previously untaxable because of the logistical impossibility of taxing them. On another level, new technologies themselves can be taxed that were previously untaxable because they did not exist!

The limit for new tax bases is about equivalent to what private markets and governments decide they want to track with blockchain. If private markets begin to track physical goods, such as art, concert tickets, or athletic memorabilia, these items could become privy to easier government taxation. The particularly useful attributes about these items that make them well-suited for blockchain tracking are that they are prone to both counterfeiting and appreciation. To combat counterfeiting, the blockchain can ensure that they are publicly recognized as authentic by the public ledger. As a result, the government could gain access through the blockchain to determine when these objects are resold for a profit—and collect tax due on them. The government may also impose certain blockchain registration requirements for objects such as luxury purses to combat counterfeiting. However, any registration requirements obviously come with certain civil liberties consequences as they give governments knowledge about transactions typically reserved for the private sphere.

This Section will examine two new bases of taxation: virtual currency taxation and artificial intelligence. In both cases, important questions arise as to whether to treat the bases similar to other similarly functioning items and the wider interests that taxation may implicate, such as sovereign and economic power struggles.

1. Virtual Currency Taxation

A key area for tax reform ripening with technology increases is virtual currency taxation. Different governments have taken widely divergent approaches as to how to tax it. Part of the divergence is attributable to the most closely related and similar items to which the government likens virtual

currency—and thus taxes similarly. Other reasons for the departure in methods are sovereign and economic implications of taxing virtual currency in certain ways. This Section will discuss the different cousins of virtual currency and the various implications of taxing it in certain ways; then it will provide a recommended approach in an attempt to negotiate the various interests implicated in the decision.

a. Current Taxation of Virtual Currency as Property

The IRS issued guidance in 2014 that virtual currency should be treated as property for United States federal tax purposes.[62] For all practical purposes, it means that the currency is not treated as actual currency, despite being used as a medium for some transactions. Israel released a similar rule, treating cryptocurrency as an asset.[63] Singapore also treats cryptocurrency transactions as barter transactions with tax consequences on the appreciation of value, but it will not subject them to taxation where virtual goods are acquired in exchange.[64]

Philosophically, there are some circumstances where cryptocurrency approximates the role of property more than currency. For example, some cryptocurrencies give access to certain privileges primarily, rather than serve as mediums for exchange. One such cryptocurrency is the Legends cryptocurrency (LGD). LGD is redeemable for drinks and dances at a strip club in Las Vegas and can give special VIP privileges to those individuals who possess a large amount of it.[65] Functionally, it works more as property since its circulation is limited to use at this club—it does not have the breadth of use as normal cryptocurrency that might be widely accepted by many merchants—though it may still be redeemable for cash on major exchanges.[66] As the number of ICOs proliferate, there are many cryptocurrencies that will only have very limited use for a specific function. Many tokens and coins, for instance, are used to simply claim a share of

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62. *IRS Virtual Currency Guidance: Virtual Currency Is Treated as Property for U.S. Federal Tax Purposes; General Rules for Property Transactions Apply*, I.R.S. News Release IR-2014-36 (Mar. 24, 2014), https://www.irs.gov/uac/newsroom/irs-virtual-currency-guidance.

63. *Israel Tax Authority Deems Bitcoin a Taxable Asset*, CCN (Jan. 16, 2017), https://www.ccn.com/israel-tax-authority-deems-bitcoin-taxable-asset/.

64. John Southurst, *Singapore Government: This is How We Intend to Tax Bitcoin*, COINDESK (Jan. 9, 2014, 2:55 AM), http://www.coindesk.com/singapore-government-how-we-intend-tax-bitcoin/.

65. Corin Faife, *A Las Vegas Strip Club Is Making It Rain Cryptocurrency*, VICE MOTHERBOARD (May 1, 2007, 6:00 AM), https://motherboard.vice.com/en_us/article/qk7g8p/a-las-vegas-strip-club-is-making-it-rain-cryptocurrency.

66. *Id.*

profit distributions of certain projects, such as Solar DAO, which seeks to build PV solar plants around the world and distribute the profits entirely to owners of the coin.[67] These project-based coins and tokens appear more like property than true currency, even though they have a liquidation value on the open market, because they are not used primarily as a token for exchange but as a share of profits from a project that might be used as a barter for other items or currency. However, a large percentage of cryptocurrencies primarily seek to be alternatives to traditional currencies.[68] They seek to be used to exchange common goods and often carry no intrinsic value of their own, except that they are widely accepted by others.

Of course, the consequences of taxation as property are much worse for users of cryptocurrency. If taxed as property, then users must realize a tax gain or loss every time they transact in the cryptocurrency. This requirement becomes quite burdensome on daily users of cryptocurrency. If someone buys a burger at a fast food restaurant, they will be required to declare a gain or loss on the intrinsic movement in the value of the cryptocurrency while possessing it. This task is complicated by the fact that these cryptocurrencies can fluctuate in price tremendously within a single day.[69]

Furthermore, cryptocurrencies do not have a set rule for determining basis if there is a group with multiple bases: a consumer can currently manipulate them so he or she chooses which ones to sell and cherry-pick larger or smaller gains or losses. Such a system also allows individuals to strategically create long-term capital gains, the lowest and most favorable tax rates, and short-term ordinary losses, which are beneficial in canceling out ordinary gain.

b. Approaches of Other Countries

In contrast to the American taxation system of cryptocurrency as property, other countries have embraced cryptocurrency and Bitcoin with less penalizing tax consequences. Slovenia has classified cryptocurrency as neither a currency nor property.[70] The country taxes payments made as

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67. *Solar DAO*, LIST-ICO, https://www.list-ico.com/ico/solar-dao/ (last updated Aug. 31, 2017).

68. *Cryptocurrency*, WIKIPEDIA, https://en.wikipedia.org/wiki/Cryptocurrency (last visited Jan. 31, 2018).

69. *See* Jill Treanor, *Bitcoin Loses a Quarter of Its Value in One Day*, GUARDIAN (Dec. 22, 2017), https://www.theguardian.com/technology/2017/dec/22/bitcoin-price-plunges-2000-12-hours-year-end-rally-fizzles-out.

70. Nermin Hajdarbegovic, *Slovenia Clarifies Position on Cryptocurrency Tax*, COINDESK (Dec. 23, 2013, 5:30 PM), http://www.coindesk.com/slovenia-clarifies-position-cryptocurrency-tax/.

income to individuals (as money paid to individuals would be taxed), and there is no capital gains tax due on any increase in its value.[71] Germany takes a similar approach, classifying it not as currency (but classifying it as a financial instrument).[72] Switzerland takes one of the most favorable stances towards cryptocurrency. The government sees cryptocurrency as neither a "good or service."[73] In fact, it takes the position that cryptocurrency is in fact a "currency."[74] It also means no value-added tax (VAT) or exchange-related fees on transactions.[75]

One of the most popular sites for blockchain and cryptocurrency startups has been the lakeside town of Zug, Switzerland.[76] Some estimate that of cryptocurrency fundraising, "a quarter of the global capital now raised sits in Swiss foundations."[77] The key reason for this trend, beyond Switzerland's tax favorable approach to cryptocurrency, is the favorable regulatory framework of these Swiss foundations.

Swiss law allows for these foundations to be established for a broad purpose that allows them to justify an investment in the underlying ICO.[78] The foundation itself is independent and features an appointed board to oversee management and operations.[79] The foundation issues coins or tokens in exchange for money that it then uses towards the development of platforms and technologies for the cryptocurrency's success.[80]

Of course, this model is controversial. For starters, the assumption is that these tokens are technically considered to be "souvenirs" in exchange for a donation rather than purchasable assets that acquirers are using to speculate.[81] But because many, if not most, of the foundation "donations"

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71. *Id.*

72. Emily Spaven, *Germany's Government and Media Are Bolstering Bitcoin Popularity*, COINDESK (Sept. 27, 2013, 10:27 AM), http://www.coindesk.com/germanys-government-media-bolstering-bitcoin-popularity/.

73. Benscha, *Good News: No VAT on Bitcoin in Switzerland*, PAYMENT 21 (Apr. 15, 2016, 9:05 AM), https://payment21.com/blog/good-news-no-vat-bitcoin-switzerland.

74. *Id.*

75. *Id.*

76. Matthew Allen, *Crypto Piggybank Foundations Proliferate in Zug*, SWISSINFO (Sept. 7, 2017, 11:00 AM), https://www.swissinfo.ch/eng/500-million-business_crypto-piggybank-foundations-proliferate-in-zug/43494680.

77. *Id.*

78. Rhodri Davis, *I See...Oh!: ICOs, Crypto Tokens, Swiss Foundations and Philanthropy*, CHARITIES AID FOUND. (Nov. 2, 2017), https://www.cafonline.org/about-us/blog-home/giving-thought/the-future-of-doing-good/i-see-oh-crypto-token-sales-swiss-foundations-and-philanthropy.

79. *Id.*

80. *Id.*

81. *Id.*

are given with this sort of expectation in mind, the foundations are reaping tax benefits by functioning as high-risk social investments rather than truly charitable causes with no expectation of return.[82] Swiss foundations are not automatically tax-exempt—they must be for charitable purposes to get that status—and the sheer number and proliferation of these foundations makes it likely that they are tax-exempt and not paying the exorbitant Swiss corporate tax rates.[83] This practice implicates an important principle in governance, which is how to appropriately incentivize certain technologies and whether these incentives should arise from tax-shelter policies. Switzerland and a few other countries have chosen to be tax havens for cryptocurrency startups and have played host to the huge boom in the space.

One other country known for its regulatory sandbox policies is Mauritius. Mauritius has come to be known colloquially as "Ethereum Island" for its friendly policies towards cryptocurrency startups.[84] The country has allowed innovation in interesting partnerships such as that of Mauritius' second largest bank with a blockchain lender called SALT.[85] The partnership featuring the State Bank of Mauritius (SBM) will allow SALT to lend fiat assets backed by cryptocurrency as collateral.[86] From a tax perspective, the country allows for a very useful tax structure known as a GBC2 ("Global Business Company" with a "Category 2" designation).[87] Companies with a GBC2 license must conduct business outside of Mauritius and are exempt from taxation—making them a solid choice for ICOs, which typically are not tethered to a geographic locale.

c. Should Cryptocurrency Be Treated as Currency?

There are many economic effects that will occur and have already occurred with treatment as property for tax purposes. These effects can be better measured and analyzed if a holistic approach is taken in determining what the proper tax treatment should be. Discussion follows of (i) the unique characteristics of currencies; (ii) treatment of cryptocurrency by different

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82. *Id.*

83. *Id.*

84. *See, e.g.*, Olusegun Ogundeji, *Cryptocurrency Startup Wants to Make Mauritius an 'Ethereum Island'*, ITWEB AFR. (July 17, 2017), http://www.itwebafrica.com/fintech/876-mauritius/238781-cryptocurrency-startup-wants-to-make-mauritius-an-ethereum-island.

85. Michael Kimani, *SALT Lending and Mauritius State Bank Partner on Blockchain Backed Cash Loans*, CRYPTOVEST (Oct. 15, 2017), https://cryptovest.com/news/salt-lending-and-mauritius-state-bank-partner-on-blockchain-backed-cash-loans/.

86. *Id.*

87. *Choice of Business Structure*, MCCI, https://www.mcci.org/en/doing-business/start-a-business/choice-of-business-structure/ (last visited Mar. 2, 2018).

agencies; (iii) economic and political implications; (iv) loophole of like-kind exchanges; and (v) loopholes in basis rules.

i. What Makes Currencies Different?

Currencies are a unique good. They represent the pinnacle of liquidity (typically). According to Merriam-Webster, currency is "circulation as a medium of exchange."[88] Bitcoin and other cryptocurrencies would seem to meet this definition, as they are widely accepted as a medium of exchange and are in circulation.

More philosophically, currencies have certain advantages over commodities. Unlike commodities, they do not spoil and can be used indefinitely without fear of them intrinsically devaluing.[89] While the ancient Egyptians used metal rings for money back in 2500 B.C., the Tang Dynasty of China was the first to introduce paper money around the 7th century A.C.E., and Western Union completed the first electronic money transfer in 1871.[90] Most major currency in the world is now fiat money, which does not have a backing of any firm commodity but simply has value because other parties accept it.[91] Similarly, Bitcoin and other cryptocurrencies would be akin to fiat currencies because they have no intrinsic value.

At least one court has examined the very question of whether Bitcoin is "money." In *United States v. Faiella*, the court examined the definition of "money" (which contains the exact language above for currency) and determined that Bitcoin did constitute money because it is used as a medium for exchange and in wide circulation, and thus falls under the purview of anti-money-laundering statute Section 1960.[92]

Because Bitcoin seems to fall neatly within the purview of this definition, it seems more appropriately classified as money and as a currency. The same should be the case for other mainstream cryptocurrencies such as Litecoin and Ethereum, which are standard coins used primarily for transacting and without an underlying business platform backing it up.[93]

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88. *Currency*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/currency (last updated Jan. 27, 2018).

89. Daniel Kurt, *How Currency Works*, INVESTOPEDIA (Aug. 1, 2016, 12:02 PM), http://www.investopedia.com/articles/investing/092413/how-currency-works.asp.

90. *Id.*

91. *Id.*

92. United States v. Faiella, 39 F. Supp. 3d 544, 545 (S.D.N.Y. 2014).

93. *The Cryptocurrency for Payments*, LITECOIN, https://litecoin.org/ (last visited Jan. 30, 2018); *Ethereum: Blockchain App Platform*, ETHEREUM FOUND., https://www.ethereum.org/ (last visited Jan. 30, 2018).

ii. Treatment by Other Agencies

The Securities and Exchange Commission (SEC) treats cryptocurrency as an investment, and the Commodity Futures Trading Commission (CFTC) treats it as a commodity.[94] The CFTC decision is in line with the treatment by the IRS as property because most commodities are treated very similarly to property.[95] But the treatment is somewhat unharmonious to the treatment by other financial regulatory and enforcement agencies, such as FinCEN, which classify cryptocurrency as a currency so that they can regulate it on the basis of being a "substitute for real currency."[96] The disparate treatments of cryptocurrency have the primary effect of meaning that many different agencies have some level of regulatory power over cryptocurrency. From a tax perspective, trading cryptocurrency is still disadvantageous because of its ultimate tax treatment as property.

iii. Economic and Political Implications of Currency Treatment

If cryptocurrency were not treated as property but instead as currency, there would be a number of various economic effects. First, its value would increase because it would be a vehicle for transacting without the negative tax implication of needing to recognize gain or loss on every transaction. It would also increase in value because of presumably less regulation by the CFTC, such as the commodity pool operator rules.[97] The second big effect would be that the United States government would be aiding Bitcoin's quest to become a world reserve currency.[98] The International Monetary Fund (IMF) selects benchmark currencies based on their global financial importance and creates a Special Drawing Rights basket to indicate their opinions.[99] Because the United States dollar currently enjoys a somewhat prominent place as the leading currency, China and other countries would

94. *CFTC Asserts Jurisdiction Over Bitcoin Derivatives*, SIDLEY (Oct. 15, 2015), http://www.sidley.com/news/10-15-2015-derivatives-update.

95. *Id.*

96. *Id.*

97. *See id.*

98. *See* Jacob J., *Yuan Becomes World's Fifth Reserve Currency, Can Bitcoin Be Sixth?*, COIN TELEGRAPH (Oct. 2, 2016), https://cointelegraph.com/news/yuan-becomes-worlds-fifth-reserve-currency-can-bitcoin-be-sixth.

99. *Id.*

prefer a system where a neutral currency would be more dominant and U.S. influence would be slightly more limited.[100]

Additionally, such a system would mean that the United States central bank would have less power to manipulate financial cycles and the economy more broadly. Furthermore, speculation by banks would be limited. Currently, there is a large amount of money that is essentially created by banks and added to the money supply because they are allowed to lend any money they receive in deposits, except for the small percentage required for reserves.[101]

So not taxing cryptocurrency as property would strengthen the uses and popularity of cryptocurrency. It would also weaken a United States grip on global financial power, as well as its ability to control financial cycles domestically. The IRS also is currently able to more easily collect revenues from any uses of cryptocurrency. A shift in policy may mean that people would more likely use cryptocurrency, having a mixed effect. On one end, online transactions might be more easily tracked and accounted for with the right technology. However, transactions with cryptocurrency have been linked to money laundering. So, the net effect will depend on how well the technology is able to prevent fraud.

iv. Loophole of Like-Kind Exchanges

One area that remains unclear is whether cryptocurrency is eligible for like-kind exchanges under Section 1031.[102] Traditionally, the rule is used for the exchange of tangible capital property, such as real estate. For example, exchanging a $100,000 property for another $100,000 property would result in no immediate tax event; the tax is only paid when there is a disposition of the newly acquired property.[103] And if the exchanged property were lower in value, then there would be a tax event on the difference, which would be a realized gain.[104]

Theoretically, speculators in cryptocurrency markets can continue to speculate into different cryptocurrencies with completely free transitions

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100. *By 2030, Bitcoin Could Be the Sixth Largest Reserve Currency in the World*, VALUEWALK (Feb. 13, 2017, 6:59 PM), http://www.valuewalk.com/2017/02/bitcoin-replace-usd/.

101. *Reserve Requirement*, WIKIPEDIA, https://en.wikipedia.org/wiki/Reserve_requirement (last visited Mar. 2, 2018).

102. ARMANDO GOMEZ, AM. BAR ASS'N SECTION OF TAXATION, COMMENTS ON NOTICE 2014-21 (Mar. 24, 2015), http://www.americanbar.org/content/dam/aba/administrative/taxation/policy/032415comments.authcheckdam.pdf.

103. *See* I.R.C. § 1031 (2012).

104. *Id.*

across currencies. They would not be required to pay tax at all when cashing out from one investment to another. This scenario is definitely not consistent with how traditional investments currently work.

For traditional stock or securities investments, individuals are normally required to recognize a gain or loss on any appreciation or devaluation when they sell it—and they are not allowed to engage in a Section 1031 transaction with it.[105] For all effective purposes, the extreme fluctuations and liquidity of cryptocurrency make it much closer to securities than to traditional property. So this result is not ideal. Nor is the virtually similar result under Section 351, which allows for an exchange of property for stock in a company without a tax event if the person providing the stock becomes a controlling shareholder.[106] Again, this mechanism is another way for people to escape the proper taxation due upon them for these large capital gains on their investments.

An ideal result would treat cryptocurrency more as a currency—but with the implementation of certain registration requirements to ensure less possibility of fraud, especially for tokens with underlying business models. With this approach, investors can no longer engage in unfettered speculation without any tax consequences, because they would be required to pay tax every time they swap old cryptocurrency for new cryptocurrency. Additionally, with treatment as a currency, users would actually be able to purchase normal items, such as groceries, without triggering a tax event.

v. Loopholes in Basis Rules

Another potential area where cryptocurrency does not accurately fit into an appropriate tax framework is that its current treatment as property tolls some very interesting consequences because of the different basis for cryptocurrency purchased at different times. A user could completely manipulate a certain amount of loss or gain that the user wants to create by selling tokens with certain bases.[107] For instance, if a person has some Bitcoin with basis of $1 and others with basis of $5,000, then if the current price is $4,000, the person could realize a loss or gain by using one Bitcoin or the other.

The ideal cure to this loophole is to enforce pooling rules or inventory rules such as last-in-first-out (LIFO) or first-in-first-out (FIFO).[108] Pooling all of the cryptocurrency reserves together would work by averaging out a

105. *Id.*
106. I.R.C. § 351 (2012).
107. Johnson, *supra* note 51, at 656.
108. 46 U.S.C. § 53512 (2012).

basis based on total holdings. Any sale of cryptocurrency would use this average basis, preventing manipulation of basis. The other alternative would be to create a consistent system, similar to inventory rules of LIFO or FIFO. LIFO would make the basis of a sale the last item(s) purchased. FIFO would make the basis of the sold item equivalent to the purchase price of the first item(s) purchased. This consistency of ensuring a determined system of how basis is to be decided would ensure that no manipulation occurs any longer.

d. Is Cryptocurrency an Investment Contract?

The implications for cryptocurrency markets would be dire if cryptocurrencies were treated as investment contracts. Offerors of these investment contracts would need to register them as securities and be subject to any SEC regulation that may apply. Many ICOs and token sales already ban any investors or participants from the United States out of fear that they may be subject to SEC regulation in the form of registration and other compliance obligations, such as the need to list on a public exchange unless the private placement offering is limited to accredited investors.[109] The SEC has not yet issued formal bright-line rules about whether these cryptocurrencies are subject to requirements for securities. In fact, there is much confusion about the SEC's stance. On one end, there is the classic *Howey* test, which the SEC relies on in some of its adjudications that hold cryptocurrency offerings to be securities, such as for the DAO currency offering.[110] In this Subsection, the Paper will first discuss the *Howey* test and then some of the recent adjudications, like DAO. The Paper will then provide analysis on the current state of the law, in addition to recommendations for both the SEC on how to regulate these offerings and for offerors to avoid classification as securities.

The famous *Howey* test to determine if a contract is an "investment contract" under Section 2(a)(1) of the Securities Act of 1933 (and thus requires registration) arose from a Supreme Court case in 1946 involving a Florida citrus farm.[111] The Howey Company sought to lease half of the farm to the public to finance additional development, while maintaining half for itself. It offered potential customers the land at "uniform purchase price per acre or fraction thereof," only adjusted for the number of years that citrus

109. JP Buntinx, *Why Can't US Citizens Participate in Cryptocurrency ICOs?*, MERKLE (June 29, 2017), https://themerkle.com/why-cant-us-citizens-participate-in-cryptocurrency-icos/.

110. *See, e.g.*, The DAO, Exchange Act Release No. 81207 (July 25, 2017) [hereinafter DAO Investigation].

111. SEC v. W.J. Howey & Co., 328 U.S. 293, 298–99 (1946).

trees had been planted on the specific plot. Once customers had purchased the land, they were offered to lease it back to the service company Howey-in-the-Hills, which would harvest and market the crops, giving investors their proportions of the pooled return. There was no right to entry or specific fruit in these contracts.

In light of these facts, the Supreme Court created a test in *Howey* to determine whether future schemes would be investment contracts. They defined an investment contract as "a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party."[112] Within this definition, there are four underlying elements: (i) investment of money; (ii) common enterprise; (iii) expectation of profits; and (iv) profits are solely from the efforts of the promoter or third party.

There is no question that all ICOs and token sales will involve prongs one and three: there is typically an investment of money in expectation of profits.[113] The key questions will typically be prongs two and four. Was there a common enterprise? And are the profits solely from the efforts of the promoter or third party? Pure currencies that have no underlying business—only functioning as a tool of exchange, such as Bitcoin, Ethereum, or Litecoin—would seem to escape the "common enterprise" prong and thus avoid classification as a security. The grand majority of offerors—those that do integrate a business model of some sort—will typically be relegated to the fourth prong of the test.

In looking at the fourth prong, the SEC looks to two important factors that doomed DAO in that adjudication: the essential efforts of the managerial team and the limited voting rights of token holders.[114]

In terms of the "essential efforts" prong, the SEC notes that the key question is "whether the efforts made by those other than the investor are the undeniably significant ones, those essential managerial efforts which affect the failure or success of the enterprise."[115] The SEC stated that in the case of DAO, it was the essential efforts of the management team upon which investors were relying, specifically in putting forth project proposals and in marketing efforts (with the website, white paper, and other means of

112. *Id.* at 298–99.

113. Theoretically, there could be a non-profit ICO or token sale, which might complicate matters because there could still be an expectation of profit based on the success of the non-profit.

114. DAO Investigation, *supra* note 110, at 12–15.

115. *Id.* at 12 (quoting SEC v. Glenn W. Turner Enters., Inc., 474 F.2d 476, 482 (9th Cir. 1973)).

advertising the product).[116] It was additionally important that they held themselves out as experts in blockchain and cryptocurrency to the point that investors relied on them to make decisions.[117] The management team selected Curators that selected the project proposals on which to conduct votes for investment and adoption.[118] The SEC found this power was substantial and made the management team's efforts "essential" to the success of the venture.[119]

In terms of the "limited voting rights" prong, the SEC found that the shareholders did not have meaningful control.[120] The SEC cited two main factors for this finding: (1) the voting rights were "largely perfunctory"; and (2) the token holders were "widely dispersed" and were "limited in their ability to communicate with one another."[121] The SEC found the rights perfunctory because holders could only vote on proposals that had already been cleared by Curators, and these proposals were often intentionally left vague to deprive voters from meaningful control.[122] In terms of the limited ability to communicate, the SEC cited to the pseudonymity of the platform: no real-world identifiers are shared on the platform, making it difficult for token holders to consolidate their voting power in a bloc.[123]

The SEC also recently engaged in an enforcement action against the founders of PlexCoin, seeking a temporary restraining order and a preliminary injunction.[124] The facts in the PlexCoin case seem especially egregious. The two personally named defendants, Dominic Lacroix and Sabrina Paradis-Royer, are two individuals from Quebec who ran a seemingly fraudulent ICO.[125] Lacroix had pled guilty to securities fraud in Quebec in the past and did not disclose that information during the ICO, justifying the anonymity of the executives as fear that they would get poached by competitors.[126] They made outlandish promises such as returns of "between 200% and 1,354%" within twenty-nine days.[127] And instead of

116. *Id.*
117. *Id.*
118. *Id.* at 7.
119. *Id.* at 12.
120. *Id.* at 14.
121. *Id.*
122. *Id.*
123. *Id.*
124. Complaint, SEC v. Plexcorps, No. 17-7007 (E.D.N.Y. Dec. 1, 2017).
125. *Id.* at 1.
126. *Id.* at 4, 18.
127. *Id.* at 21.

using the funds for development of the technology and underlying platform, the defendants used the proceeds for their personal expenses.[128]

Even though the facts in *Plexcorps* are egregious, this action is an indication by the SEC that it intends to vigorously regulate against any fraudulent ICOs engaged in pump-and-dump schemes in which the executives attempt to raise a large amount of capital through misleading or fraudulent claims.

e. Privacy and Tax Enforcement

On the very issue of preventing money laundering and ensuring proper tax collection, there are very intricate questions of privacy at stake. The current approach does not effectively capture the opportunities available in the blockchain technology associated with most virtual currencies.

One important question for the government will be how it will ultimately balance the enforcement benefits of being able to track all property and every unit of currency that possesses a blockchain (which could eventually be almost all currency and property) with the privacy drawbacks to its citizenry. Bitcoin in its current conception is already not an anonymous form of transacting because most transactions can be linked to a public ID, which can be tracked to individuals by their registrations on a transaction site.[129] As a result, the history of a given Bitcoin can already be tracked with relative ease.[130]

It is worth mentioning that particularly savvy individuals may be able to escape tracking by taking extra precautions to hide their transactions, and this sort of activity and anonymity is the basis for much of the money laundering that occurs through the use of cryptocurrencies.[131] If the government required registration of public IDs that are tied to assets, whether with a government agency or with financial institutions, it would be a particularly sensitive data request but one that could have the potential to combat money laundering significantly, thereby increasing collections and making the system more equitable since less people would escape tax liability.

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128. *Id.* at 5.

129. *Some Things You Need to Know*, BITCOIN, https://bitcoin.org/en/you-need-to-know (last visited Mar. 2, 2018).

130. *Id.*

131. Adam Ludwin, *How Anonymous Is Bitcoin? A Backgrounder for Policymakers*, COINDESK (Jan. 25, 2015), http://www.coindesk.com/anonymous-bitcoin-backgrounder-policy makers/.

f. Official Sovereign Adoption of Cryptocurrency Could Pose Legal Complications

MazaCoin may complicate the current approach that treats cryptocurrency as property. MazaCoin is a cryptocurrency started by a Native American activist and may be adopted as an official currency of the Oglala Sioux Tribe.[132] Because Native American tribes are considered sovereign nations, the United States government would have to recognize MazaCoin as an actual currency under U.C.C. § 1-201(b)(24).[133] A finding as an actual currency would mean that virtual currency would not be treated as property but instead subject to currency rules, which dictate recognition of capital gains appreciation if more than $200 per transaction.[134]

A similar problem may already be in existence, as Dubai has already launched an official state cryptocurrency, emCash, to be used for things as simple as coffee to even paying for government services.[135] Venezuela may also follow suit, with plans to launch an official state currency backed by its oil and other natural resource reserves.[136] At the very least, the United States may need to recognize official state currencies as currencies rather than property. The other possibility would be to completely depart from the characterization as property.

g. Possible Tax Approaches

A *North Carolina Banking Institute* document outlines two primary approaches to current state treatment of cryptocurrency. One is the "barter approach,"[137] and the other is the "advertised price approach."[138]

Under the barter approach, Kentucky, New Jersey, New York, and Wisconsin tax virtual currency as property in line with federal regulations.[139]

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132. Timothy Bierer, *Hashing It Out: Problems and Solutions Concerning Cryptocurrency Used as Article 9 Collateral*, 7 CASE W. RES. J.L., TECH., & INTERNET 79, 91 (2016).

133. *Id.*

134. I.R.C. § 988 (2012).

135. Jon Buck, *Dubai Will Issue First Ever State Cryptocurrency*, COIN TELEGRAPH (Oct. 1, 2017), https://cointelegraph.com/news/dubai-will-issue-first-ever-state-cryptocurrency.

136. Alexandra Ulmer & Deisy Buitrago, *Enter the 'Petro': Venezuela to Launch Oil-Backed Cryptocurrency*, REUTERS (Dec. 3, 2017, 12:36 PM), https://www.reuters.com/article/us-venezuela-economy/enter-the-petro-venezuela-to-launch-oil-backed-cryptocurrency-idUSKBN1DX0SQ.

137. Winstead, *supra* note 9, at 520.

138. *Id.* at 521.

139. *Id.* at 520.

Sales tax is calculated based on the exchange rate value of the virtual currency used in the transaction on the day of the transaction.[140]

California and Washington use the advertised price approach.[141] The advertised approach method does not subject the tax calculation to complicated average exchange rates. Sales tax is calculated based on the price in U.S. dollars that the seller would have received normally.[142] This method is easier to implement for vendors because it is less calculation intensive.

h. Recommended Approach

There are many different factors at play in determining the proper taxation of cryptocurrency. This Paper proposes an approach that aims for logical consistency in the Code while also factoring in the broader economic effects at play. The potential inconsistencies that may occur with the official adoption of a cryptocurrency as official currency of another nation or Native American tribe prove to make the current regime difficult.

A more proper approach would perhaps seek to differentiate between cryptocurrency held for investment or speculation and cryptocurrency held for use as currency. Unfortunately, this task might be extremely difficult because of the formulas and tracking that would be needed to enforce such a rule. Presumably, an individual might need to show a certain percentage of churn on their account to demonstrate that the account is not an investment account. Enforcing such a rule might be logistically difficult at the moment but possibly easier in the future as technology improves. Of course, if a regime successfully differentiates the two, investment or speculation cryptocurrency should be taxed like the current regime (as property), and cryptocurrency used as currency should be taxed like currency.

Further, the decision between the barter and advertised price approaches is also not insignificant. Because official spot prices of cryptocurrency are required for the barter method, it is likely that merchants will choose to only accept the most popular virtual currencies, such as Bitcoin, but not the lesser-used varieties.[143]

The advertised price approach is also superior to the barter approach because of the accuracy of transactions made close to the midnight hour.[144] Under the barter regime, transactions would use the average market value of

140. *Id.*
141. *Id.* at 521.
142. *Id.*
143. *Id.* at 530–31.
144. *Id.* at 529–30.

the day of the transaction, so transactions one second apart could have fairly different tax rates.[145]

Additionally, there should be a de minimis exception for cryptocurrency similar to foreign currency (only required to report after realizing more than $200 in gains).[146] Such a rule will give increased notice to individuals about their requirements—and they will be more likely to report the larger transactions since there is no longer a burden of compliance associated with very small transactions.[147]

The SEC should more adequately distinguish between "vanilla" coins—which function exclusively as currency—and tokens, which add layers of a platform or business. Plain coins with no functionality except use as a currency should be treated as currency, and the SEC should recognize that these coins are not securities because there is no underlying business. Of course, the stability and security of the code and the marketing efforts of the managers of the currency to increase its adoption certainly play a role in the value of the coin. Importantly, there may be no expectation of profit in many cases—as the primary purpose may be to join the ecosystem to buy and sell items using the coin. A purchase of a coin is not an investment in a business, but rather better characterized as a change to a new currency. Similar to currencies in many developing countries, the probability that the currency continues to be in existence, the country's economic ecosystem, and policies for money supply can all have an impact on the value of the currency. If it is purely a coin with no underlying business, it should be treated as such—as currency. In fact, it would behoove the SEC to create regulatory safe harbors for these sorts of cryptocurrencies.

The question of how the SEC should regulate tokens is more interesting and complicated. Some tokens are almost certainly securities, but some of them may elude the classification à la the *Howey* test. However, the status quo is that token startups are completely guessing right now whether they are securities or not.

The SEC should create some safe harbors for tokens to escape classification as securities. If the SEC decides to remain loyal to the *Howey* test, one of the safe harbors should be for tokens that are not profit-seeking business ventures. If the token does not create an underlying business model that seeks to make money, the SEC should exclude it from a definition as a security. Additionally, if the token allows for significant voting and participation rights in the underlying business for all holders of the coin—in

145. *Id.* at 529.
146. *Id.* at 533.
147. *Id.*

addition to broad communication channels and the building of effective power across coin holders—then this situation should be a safe harbor against classification as a security. Of course, it may be difficult for a token to reach that level of compliance, especially if it aims to be anonymous, but it would present a way for the SEC to incentivize identity-sharing and ensure that purely speculative instruments are not going unregulated. Additionally, many tokens serve as literally means to buy services or products within the token-based ecosystem. These should also be exempted.

The SEC might also incentivize token developers to launch an actual underlying product or ecosystem prior to an ICO because it is both more likely that it is not a pump-and-dump scheme and that it would be less speculative of an instrument.

In fact, some have noted that the "efforts of others" prong might not be triggered if the product or ecosystem is already built out before there is sufficient community activity since people would be buying into a system that no longer focuses on the managerial efforts of others to drive the value for the tokens.[148]

An interesting model for comparison to ICOs is the system of regulations for crowdfunding campaigns, which have special restrictions imposed by the SEC.[149] Crowdfunding restricts the ability of both fundraisers and donors to participate in the scheme. Fundraisers are limited by how much they can raise in a given year. Companies are only allowed to raise a maximum of $1,070,000 in a given year.[150] Donors are limited by income and net worth, with the lowest limit being $2,200 and the highest limit for the wealthiest individuals at $107,000.[151] The SEC also requires that each crowdfunding offering be conducted exclusively through one online platform that is registered with the SEC and FINRA.[152] As the limits are quite low for corporate crowdfunding campaigns, these should not be replicated for ICOs because ICOs are typically more targeted to a worldwide audience than crowdfunding campaigns, and the primary effect might be to deprive U.S. citizens of potentially lucrative investing opportunities. However, there would be great reason to demand that tokens that will be classified as securities register their ICO with an intermediary registered

148. JUAN BATIZ-BENET ET AL., PROTOCOL LABS, THE SAFT PROJECT: TOWARD A COMPLIANT TOKEN SALE FRAMEWORK 9 (Oct. 2, 2017), https://saftproject.com/static/SAFT-Project-Whitepaper.pdf.

149. *Regulation Crowdfunding: A Small Entity Compliance Guide for Issuers*, SEC (Apr. 5, 2017), https://www.sec.gov/info/smallbus/secg/rccomplianceguide-051316.htm.

150. *Id.*

151. *Id.*

152. *Id.*

with the SEC or FINRA. This scheme would ensure that an independent registered company liable to U.S. authorities would oversee the ICO and prevent the occurrence of fraudulent activities.

2. Taxation Issues with Artificial Life

Specifically, the law will need to grapple with a number of questions related to artificial intelligence, such as whether to treat artificially intelligent beings as "persons," similar to the tax treatment of humans and corporations.[153] This is an important question because treating artificially intelligent beings as persons in a tax context would require them to be responsible for tax filings and potentially liable for any crimes, including for incorrectly filing taxes. While other tax papers have approached the question of whether to treat these beings as persons, they have used philosophical criteria such as the possession of "consciousness" or "souls" to be a determining factor of personhood.[154] In a slightly different approach, this Paper will explore the question of personhood through the examination of the practical consequences of such treatment in the context of criminal liability and jurisdictional determination.

a. Can Artificial Intelligence Be Held Criminally Liable for Cheating on Taxes or Advising Others to Cheat?

An interesting theoretical question—which will cease to be "theoretical" in the near future—is about who would maintain liability in the case that an autonomous robot *intentionally* filed its own tax return incorrectly, because it determined the probability of being discovered was low relative to the benefits of the evasion? More simply put, is there such a thing as *mens rea*, or criminal intent, for artificially intelligent beings? Can they even have intention?

i. Current Technology Does Not Enable Any of the Main Objectives of the Criminal System by Holding Robots Criminally Liable

Whether the role of criminal law is retributive, deterrent, rehabilitative, or incapacitating,[155] we potentially compromise these goals in a system with

153. Solum, *supra* note 52, at 1231.

154. *Id.* at 1258.

155. *The Five Objectives of Criminal Law*, SWINDLE LAW GRP. (Jan. 18, 2014), http://www.swindlelaw.com/2014/01/the-five-objectives-of-criminal-laws/.

autonomous machine beings. As of current developments, they cannot foreseeably express the fundamental human emotions that cause humans to be deterred or rehabilitated—and it would be difficult to argue that exacting vengeance on a machine will successfully vindicate human injury. And while a machine can be "incapacitated" by updating its code, pinpointing the exact portion of code that caused it to respond and learn such behavior may not be easily discoverable.

However, technology could advance to the point where computers do become capable of expressing human emotion—and potentially even learn to respond to behavior in a manner consistent with retribution or deterrence.[156] But given the uncertainty of such developments, artificially intelligent beings should not yet be treated as persons for criminal liability purposes; though, future developments may enable criminal punishment to effectively modify the behavior of robots. Such advances would make a personhood framework appropriate for such beings.

ii. Criminal Liability Also Inappropriate for Other Parties

Holding the programmer liable in such a case may also not make sense, especially if he or she did not anticipate the actions of the machine (the programmer would not possess the requisite *mens rea*). Nor would it make sense to impute intent to the corporation or individual owning the machine because the machine possesses its own independent decision-making and is programmed to learn from humans, partially via mimicry.[157] Furthermore, corporations might be disincentivized from using advanced technologies if such a liability risk exists for unknown or technologically unproven areas. As a result, actions that would normally be considered criminal, such as tax evasion, could potentially be punishable with only civil fines, or else risk an "unfair" conceptualization of criminal law liability.

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156. Osama Rizvi, *Trump vs. The Robots: US Jobs and Promises*, MODERN DIPLOMACY (Jan. 7, 2017), https://moderndiplomacy.eu/2017/01/07/trump-vs-the-robots-us-jobs-and-promises/ ("[B]ut an app can't do the most human of all things: emotionally connect with her.").

157. Stacey Higginbotham, *Why Memory and Mimicry Are the Next Big Frontiers in Artificial Intelligence*, FORTUNE (Dec. 4, 2015), http://fortune.com/2015/12/04/next-ai-frontier/.

b. Jurisdictional Questions Related to Artificially Intelligent Beings

Another question that will need to be answered is whether the government would honor the status of artificially intelligent beings as being domiciled in a foreign country if they are conducting business from tax havens—in the case that they are considered persons. The mechanism of operation for these machines will likely continue to be based on the "cloud," a reference to the phenomenon of "Internet-based computing that provides shared processing resources and data to computers and other devices on demand."[158] Cloud computing systems, like Watson, host contents on the internet rather than at specific servers in a physical location;[159] thus, artificially intelligent beings on the cloud will be deployable in any location around the world without requiring control from a source within the United States.

Furthermore, even artificially intelligent robots that are developed by a corporation based in the United States or a developer from the United States could still autonomously relocate to a tax haven and conduct business there. Should the work performed by the robot be taxed based on the location of the program's development (this could be an extraterritorial violation),[160] or the location of the corporation, or even the location of the actual machine in the case that it is considered a person and has established a domicile?

There seems to be no clear answer to this question because the tax law appears able to accommodate treatment of autonomous machines similarly to the way it treats corporations as persons—but such treatment may be inconsistent with the necessity to tax robots as they replace more and more taxable human labor.

c. Robot Tax

There have been many proposals for a robot tax, and even Bill Gates has called for a tax on autonomous machines that replace the jobs that individuals are currently performing.[161] More officially, the European

158. *Cloud Computing*, WIKIPEDIA, https://en.wikipedia.org/wiki/Cloud_computing (last visited Mar. 2, 2018).

159. *Id.*

160. *See Extraterritoriality*, WIKIPEDIA, https://en.wikipedia.org/wiki/Extraterritoriality (last visited Apr. 18, 2017).

161. Kevin J. Delaney, *The Robot that Takes Your Job Should Pay Taxes, Says Bill Gates*, QUARTZ (Feb. 17, 2017), https://qz.com/911968/bill-gates-the-robot-that-takes-your-job-should-pay-taxes/.

Parliament considered (although ultimately rejected) such a tax.[162] The European resolution looked at a number of various ethical and financial implications of more complex artificial intelligence capabilities.[163] One of these principles referred to the establishment of a tax to provide a "general basic income" to people to offset the losses in taxation from the workforce.[164] So while robots are currently not taxed, the more important question is whether they should be.

i. Advantages of a Robot Tax

The key idea behind a robot tax is that the displacement of human workers' jobs by robots will cause a rise in unemployment by humans.[165] The tax levied on many of these jobs are key revenue sources for governments, and the absence of them being taxed will result in a smaller revenue pool and thus potentially less resources to distribute handouts to those such as the impoverished or unemployed. Companies and their employees both pay taxes on any wages paid to employees.[166] Robots are currently exempt from any similar sort of tax, so there are currently great efficiencies for companies to replace their human labor with robots.

ii. Disadvantages of a Robot Tax

The key disadvantages are that (i) innovation in robot technology will be stifled; and (ii) taxable revenues may actually not decrease as a result of the extra productivity that robots deliver.

As discussed earlier, robots, which do not currently carry wage taxes, are replacing human labor subject to high wage taxes. This large differential results in large incentives for innovators to develop machines to replace

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162. *European Parliament Calls for Robot Law, Rejects Robot Tax*, REUTERS (Feb. 16, 2017, 2:03 PM), http://www.reuters.com/article/us-europe-robots-lawmaking-idUSKBN15V2KM.

163. *See* COMM. ON LEGAL AFFAIRS, EUROPEAN PARLIAMENT, DRAFT REPORT OF THE COMMITTEE ON LEGAL AFFAIRS WITH RECOMMENDATIONS TO THE COMMISSION ON CIVIL LAW RULES ON ROBOTICS 3, 7 (May 31, 2016), http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML%2BCOMPARL%2BPE-582.443%2B01%2BDOC%2BPDF%2BV0//EN.

164. *Id.* at 10.

165. *Why Taxing Robots is Not a Good Idea*, ECONOMIST (Feb. 25, 2017), https://www.economist.com/news/finance-and-economics/21717374-bill-gatess-proposal-revealing-about-challenge-automation-poses-why-taxing.

166. John Olson, *What Are Payroll Taxes and Who Pays Them?*, TAX FOUND. (July 25, 2017), https://taxfoundation.org/what-are-payroll-taxes-and-who-pays-them/.

human labor. As the differential decreases, there is smaller value creation by using robots. Thus, innovators cannot capture as much value and will not create technologies that may have had some value with a higher differential because there is less value to capture.

By incentivizing robot technology with little or no tax, the productivity gains may be higher than a high tax. Companies that own robots will still be required to pay corporate tax on profits derived from them. The loss in taxable revenue from the displacement of human jobs may be offset by the large gains in robot productivity. Additionally, taxes are collected on the sale of robots to companies, which could be a great revenue stream if the numbers of robots sold skyrocket in a new era of robots.

d. Recommended Approach

The potential of incentivizing invention and innovation at this early stage in the development of robots is very high. Low or no taxes is a better strategy for the early stage of the development of a new technological area.[167] It typically proves more effective to tax the technology once it has matured in its life cycle. A strategy of waiting to tax will ensure that early stage development and innovation is not hampered, and the later stage productivity benefits may be high enough that a tax might yield much more than otherwise.

A small tax may later be necessary if in fact robots do displace large swathes of the human workforce. One interesting note is that if robots do displace human labor, the owners of companies (which will presumably own most of the robots) will be the biggest beneficiaries. If the shareholders of these companies capture most of the benefits, appropriate taxes may be needed to ensure income disparity is not worsened.

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167. *See, e.g.*, PRICEWATERHOUSECOOPERS, GOVERNMENT'S MANY ROLES IN FOSTERING INNOVATION 2 (2010), https://www.pwc.com/gx/en/technology/pdf/how-governments-foster-innovation.pdf ("Countries that have been successful at fostering innovation have tended to build a tax platform that includes a number of elements for corporate owners and investors: low taxes (through an overall low tax rate, industry-specific low tax rates, or tax holidays); a regime of R&D tax incentives such as credits and/or deductions; an intellectual property/royalty payments (IP) tax regime; incentives for capital investment such as investment tax credits; and a holding company regime. In addition, these countries also focus on the investor side of taxes by, for instance, giving investors tax breaks. Certain tax incentives tend to be more effective at particular stages of an economy's development. In the early-emerging stage, when modernization of the business base is a top priority, useful tax incentives tend to focus more on capital expenditure and less on boosting profits.").

B. Better Targeting

The primary example of better targeting that this Paper proposes is the idea of an integrated tax system. Integration refers to a tax system that combines the currently separate regimes of personal and corporate income taxation into one unified system. The advantages of a unified system include removal of distortions that result from the current system, such as a preference for earned income rather than dividend distributions and a preference for debt rather than equity. The primary roadblock to achieving an integrated tax system is an ability to cheaply and effectively track the individual allocations of corporate income. Blockchain allows for advanced tracking and maintains a record of each individual prior transaction and could be employed to record the ownership records for each individual share. This system would allow governments to assess corporate tax of corporate origin to individual shareholders on a pro-rated basis across ownership percentages and time period. Because everything is digital and in real-time, this technological advancement should be employed to create an integrated tax system.

1. Integration

In 1992, the Treasury Department released a report titled, *Integration of the Individual and Corporate Tax Systems: Taxing Business Income Once* (Treasury Report), which documented the troubling nature of the two-layered corporate taxation regime in the United States.[168] Specifically, the document outlines a number of key distortions posed by the system and recommends several prototypical systems that would remedy these distortions.[169]

One of the prototypes, the "shareholder allocation" method, also known as the partnership approach, is mentioned but ultimately rejected by the committee for its administrative difficulties and its somewhat imperfect ability to address the full range of distortions that the Comprehensive Business Income Tax (CBIT) model can solve—although it attempts to fix a broader range of issues and distortions than the dividend exclusion model.[170]

The shareholder allocation method is an excellent case study for how technology can improve targeting to specific types of income and thus aid in making taxes more efficient. Implementation of the model's policies would

168. TREASURY REPORT, *supra* note 58, at 1.
169. *Id.*
170. *Id.* at 2.

reduce inefficiencies and distortions in the current taxation system. At the time the Treasury Report formally suggested the model in 1992, many of the administrative burdens associated with tracking and data compilation were seemingly insurmountable, but advances in technology have made them much more feasible to traverse.

This Subsection will first give a general overview of the model and its key goals. Then it will discuss advantages and disadvantages of its implementation, with a focus on how changes in technology affect the model's feasibility.

a. Overview of Shareholder Allocation Method

The key premise of the shareholder allocation prototype is that corporate income is allocated to shareholders as it is earned and then the corporation pays the taxes,[171] which are then allocated to shareholders.[172] Shareholders can then use the corporate taxes paid and the corporate tax credits claimed to offset their personal taxes.[173] Additionally, shareholders can use the difference between the corporate tax rate and their individual marginal tax rate to offset other personal tax liability, but they cannot claim any refund through credits.[174] Similar loss disallowances would apply to excess corporate losses, which shareholders would not be permitted to claim on a pass-through basis, in an effort to prevent the rise of corporate tax shelters.[175]

b. Key Aims of the Model

i. Eliminates the Bias Towards Corporate Retention of Earnings over Distribution

One of the foremost aims of the shareholder allocation model is that it balances the preference of a corporation to retain earnings versus distributing those earnings.[176] The model accomplishes this goal because the effective tax rate of retained earnings would be immediately allocated and taxed at exactly the individual shareholder's rate, which would be the same

171. *Id.* at 33. The prototype can alternatively be structured to require individuals to bear the burden of paying the taxes. *Id.*

172. *Id.* at 27.

173. *Id.*

174. *Id.* at 27–28.

175. *Id.* at 28.

176. *Id.* at 29.

rate in the case of a distribution to shareholders.[177] Because the corporation and its shareholders would be indifferent from a tax perspective between a distribution and retaining earnings, it would no longer engage in either behavior for tax reasons.

ii. Reduces the Bias Towards the Noncorporate Form over the Corporate Form

The Treasury Report also identifies the current regime's distortion in terms of its preference for noncorporate equity over corporate equity.[178] In the current system, noncorporate equity maintains pass-through status and is thus taxed at the individual shareholder level.[179] This scheme is markedly different from the current taxation of S-corporations, which occurs at both the corporate and individual shareholder levels.[180] However, the shareholder allocation model would equalize the two rates by setting the taxation of corporate equity equal to the noncorporate equity rate—the individual shareholder rate.[181]

It is worth mentioning that while the new system would equalize the taxation rates for corporate and noncorporate equity, there would still be some distinct advantages for noncorporate equity. One example is the ability to pass through losses in partnerships, which the prototype does not feature for corporations because of the potential for tax shelter abuse.[182] However, despite the existence of these disparities, the corporate form does provide a number of nonmonetary benefits, such as liability protection, continuity, and structural flexibility when acquiring investors.[183] So while there exists a small number of minor differences between corporate and noncorporate equity, the main difference in the status quo's income taxation would be removed, and the result is that corporate equity would enjoy the same effective tax rate as noncorporate equity.

177. *Id.*
178. *Id.* at vii.
179. *Id.* at 29.
180. *Id.*
181. *Id.*
182. *Id.* at 30.
183. *Id.* at 1.

iii. Reduces the Bias of Corporate Debt over Equity Finance

One other key distortion that the Treasury Report identifies is the current regime's preference of corporate debt over equity for financing.[184] One of the major reasons for this distortion is that the financing party is subject to two layers of taxation if he or she buys equity from the corporation: the corporation pays tax on its profits and then the individual pays capital gains tax on the distribution (or capital gain in the case of a sale). However, an individual offering debt to a corporation only pays one layer of tax, which is levied on interest income (which is not subject to a prior level of taxation at the corporate level).

Theoretically, the shareholder allocation method provides an identical rate of taxation for both corporate debt and equity. The taxation of corporate debt does not change from the current regime in a shareholder allocation system: it is taxable to individual shareholders at their respective individual rates. However, the taxation of corporate equity changes from the current system's taxation at two levels (corporate and individual capital gains) to being a single layer of taxation at a rate identical to the taxation of corporate debt (at the individual shareholder level).[185]

As referenced, the equalization of rates for corporate debt and equity is perfect in theory but will not be perfect in practice. The key reason for a slight, remaining distortion is that corporate debt is not included in shareholder basis, as it is for partnerships; furthermore, there is no step-up for inside basis in assets to match the price for corporate shares.[186] These two benefits still significantly favor debt over equity. The inability of corporate shareholders to reap the same benefits in basis means that corporate debt is still slightly advantageous over corporate equity.

Additionally, it is worth mentioning that the distortion also partly occurs because the current system provides a deduction for corporate interest payments, but does not provide a similar benefit for equity.[187] Congress could theoretically change this system to equalize the two, which would be much easier given that they will be operating through the same regime.

184. *Id.* at vii.
185. *Id.* at 29.
186. *Id.* at 31.
187. *Id.*

2. *Advantages and Disadvantages of Integration*

a. *Key Advantages of the Model*

i. *Ease of Transition*

While the transition from the current taxation regime to the dividend exclusion model would be quite seamless and not even require a phase-in period,[188] the shareholder allocation method might be a slightly more difficult transition but would probably still be fairly simple with new technology. The Treasury Report notes that there would be a period of transition in which corporations would need "to seek shareholder approval to modify the terms of outstanding stock" to allow for the new system of allocation.[189] Following this legal transition, the Treasury's primary objections were levied against the "complex system for tracking corporate income and making share basis adjustments" that would be required in such a regime.[190] However, the changes in technology since the report eliminate much of the complexity in a tracking system. Cloud computing has allowed tracking to be virtually seamless because all relevant transactional parties can update income in real-time, and a rough estimate can always be gleaned from such data.[191] It is probably a reasonable assumption that companies could seamlessly transition their data handling in a way that could match the requirements of the shareholder allocation model at much smaller costs and greater speed than previously imagined in 1992.

ii. *Relative Intuitiveness and Low Deviation from the Status Quo*

In addition to being a fairly simple transition, the shareholder allocation model is fairly intuitive and represents a small deviation from current law. While not as minor of a change from the status quo as the dividend exclusion model, the shareholder allocation model also does not seek to completely shift the mechanisms of taxation in the way that the CBIT attempts. The key changes that will be required for the Code are the addition of rules for apportioning income and new reporting mechanisms.[192] Because technology changes since the report should allow this tracking and

188. *Id.* at 17.
189. *Id.* at 33.
190. *Id.* at 91.
191. *Infra* Section VI.
192. TREASURY REPORT, *supra* note 58, at 33.

apportioning to occur much more easily, the relative deviation from the status quo for this regime is quite low.[193]

Additionally, the premise of the new regime is quite intuitive. Simply put, all corporate and noncorporate income is taxed at individual shareholder rates.

b. Key Disadvantages

i. Difficult Administrability

Administration of the shareholder allocation regime is slightly more complicated than the dividend exclusion model. As mentioned earlier, the shareholder allocation system requires a complex tracking system that would allocate all aggregate income to shareholders.[194] In contrast, the dividend exclusion prototype requires comparably negligible change or adaption of the taxation process for corporate entities.[195] The IRS would be responsible for tracking the income-reporting down to the individual level.[196] This much wider range of tracking is certainly an added requirement for the IRS, but the advances in technology definitely mean that there is not as large of a difficulty for the agency. Specifically, big data technology has increased the auditing capabilities of the IRS; processor speed and cloud computing also enable corporations to more readily update income figures in real-time. The IRS can leverage computers to automatically perform the once difficult auditing tasks that the shareholder allocation model may have presented.

ii. Income Timing Problem

Perhaps the biggest issue with the shareholder integration model is the income timing problem. The current system functions by paying the dividend on the date of the dividend record date, and then the dividend recipient pays taxes on the distribution.[197] The shareholder integration prototype proposes to allocate taxes at the end of each of the corporation's quarters to the shareholder of record at that date.[198] But such arrangement creates uncertainty about earnings, and this uncertainty might prevent

193. *Infra* Part VI.
194. TREASURY REPORT, *supra* note 58, at 35.
195. *Id.* at 17.
196. *Id.* at 35.
197. *Id.* at 33–34.
198. *Id.* at 34.

transactions of securities from occurring.[199] While there is normally a possibility of great uncertainty and price fluctuations during quarterly earnings calls, the stakes are much higher in the context of these allocations because taxes would be paid immediately. If allocations are performed on a pro-rata basis at year-end, there could be events that happen after the sale of stock that greatly affect the seller's tax liability.[200] For instance, if a seller sold a stock in February, the seller could still be liable for an event occurring in December of that year if the corporation decides to pro-rate its tax liability across shareholders based on their dates of ownership.

In order to reduce these problems of timing, the Treasury Report suggests the possibility of releasing "true quarterly closing[s] of books" which would fundamentally change the yearly taxation system and require a level of precision in quarterly reporting that is not the norm.[201] Given that most corporations are already required to make estimated tax payments on a quarterly basis, this arrangement may not be completely untenable.[202] The technological advances in cloud computing should give much better tracking and reporting capabilities that make closing the books on a quarterly basis a much easier task than it might have been in 1992.[203]

The income timing issue is further complicated in the case of corporate shareholders because corporations cannot file their returns until they have received the information on taxes and credits from the corporations in which they own stock.[204] While the Treasury Report flags the reporting issue, it does not suggest a solution. Again, cloud computing and the ability to process live data feeds makes this reporting an easier task because of the increased ability to manage simultaneous data across companies.[205] However, there may still need to be some adjustment period or other reconciliation grace period for companies to fully balance their accounts.

iii. Underpayment Problem

One additional issue that the Treasury Report identifies is the dilemma that occurs when there is underpayment of taxes.[206] The current regime provides that any adjustment in income or tax deficiency is reattributed to

199. *Id.*
200. *Id.*
201. *Id.*
202. *Id.*
203. *Supra* Part VI.
204. TREASURY REPORT, *supra* note 58, at 35.
205. *Supra* Part VI.
206. TREASURY REPORT, *supra* note 58, at 35.

the original shareholder.[207] The report mentions that tracking down the original shareholders at a given time might be an insurmountable task and recommends a simpler regime that treats these adjustments as current year liabilities.[208] Because the liabilities should truly have been attributed to the original shareholders at the time of ownership, there are fairness and normative concerns with this proposal. While not mentioned in the report, one foreseeable problem is that this system may adversely incentivize key management to manipulate income and taxes in a period in which they sell large quantities of stock.

Fortunately, the ability to track down original investors is not as insurmountable of a task, as recordkeeping in the electronic age is quite detailed and precise. Data processing advances have led to automated calculations and easier methods to inform the original shareholders about such changes in liability.

VII. CONCLUSION

Technology invariably will impact the ability to more effectively and efficiently levy taxes. Taxes that have enjoyed historical inertia should be examined from the following dimensions to see how they can be improved: (i) better transaction tracking mechanisms (blockchain and big data); (ii) complete disruption in tradition sources of tax revenue (e.g., robots and virtual currency); and (iii) better tailoring of taxes to specific individuals and items. If properly designed and implemented, the people most deserving of refunds can be better identified and entitlements can be more accurately allocated to them, and the entitlements can be restricted to the areas that public policy dictates (such as on certain necessities).

As artificial intelligence and robots advance, many of the most basic assumptions of taxation will need to be rethought. The federal income tax revenue, of which 47% comes from individual income tax returns,[209] may need to be rethought if humans cease to constitute a labor force. It should be cautioned that wealth disparities could be exacerbated if robots are disproportionately owned by certain segments of the population—new taxes would need to be designed with these types of societal evolution in mind.

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207. *Id.*

208. *Id.*

209. *Policy Basics: Where Do Federal Tax Revenues Come From?*, CTR. ON BUDGET AND POL'Y PRIORITIES (Sept. 5, 2017), https://cbpp.org/research/policy-basics-where-do-federal-tax-revenues-come-from.

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