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Bitcoin and the Uniform Commercial Code

Jeanne L. Schroeder
Benjamin N. Cardozo School of Law, schroedr@yu.edu

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Much of the discussion of bitcoin in the popular press has concentrated on its status as a currency. Putting aside a vocal minority of radical libertarians and anarchists, however, many bitcoin enthusiasts are concentrating on how its underlying technology – the blockchain – can be put to use for wide variety of uses. For example, economists at the Fed and other central banks have suggested that they should encourage the evolution of bitcoin's blockchain protocol which might allow financial transactions to clear much efficiently than under our current systems. As such, it also holds out the possibility of becoming that holy grail of commerce – a payment system that would eliminate or minimize the roles of third party intermediaries. In addition, the NASDAQ and a number of issuers are experimenting with using the blockchain to record the issuing and trading of investments securities.

In this article I examine the implications for bitcoin under the Uniform Commercial Code (the "U.C.C."). Specifically, I consider three issues. In Part 1, I discuss the characterization of bitcoin – which I am using generically to refer to any virtual or cryptocurrency – under Article 9. The bad news is that it does not, and cannot be made to fit into, the U.C.C.'s definition of "money". If held directly by the owner, bitcoin constitutes a "general intangible". Unfortunately, general intangibles are non-negotiable. This could greatly impinge on bitcoin's liquidity and, therefore, its utility as a payment system.

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* Professor of Law, The Benjamin N. Cardozo School of Law, Yeshiva University, New York City. I'd like to thank David Gray Carlson and Aaron Wright for their comments.

In Part 2, I show how this may be mitigated by the rules of Article 8 governing investment securities. If the owner of bitcoin were to choose to hold it indirectly through a financial intermediary, then she and the intermediary could elect to have it treated as a "financial asset" which is super-negotiable. Unfortunately, this comes at the cost of eliminating one of the primary attractions of cryptocurrency, namely the ability to engage in financial transactions directly without a third-party intermediary. However, Article 8, may already provide a legal regime for another contemplated use for the blockchain – namely as a readily searchable means of recording the ownership and transfer of property generally.

In Part 3, I explain how cryptosecurities fall squarely within Article 8's definition of "uncertificated securities." Ironically, therefore, the creation of bitcoin securities may finally breathe life to little used provisions that were invented almost 40 years ago in a failed attempt to solve a completely different problem.

INTRODUCTION

Bitcoin has garnered tremendous attention in the 6 years since it was launched by its almost certainly pseudonymous creator Satoshi Nakamoto.[2] In "his" manifesto, Nakamoto describes bitcoin as a virtual

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[2] Joshua Davis chronicled his unsuccessful attempt to track down the programmer, or, more likely, team of programmers, who posted under the Nakamoto name. Joshua Davis. *The Crypto-Currency, Bitcoin and its mysterious inventor*, THE NEW YORKER 62, Oct. 10, 2011. Although "Nakamoto" claims to be a Japanese man, his/their English makes some suspect that he is (or they are) British or Irish. *Id.* at 68.

In the March 2014, the magazine *Newsweek* attempted to make a triumphant return to print publication with a cover story claiming to have identified the real Satoshi Nakamoto—a Japanese American engineer who is actually named Satoshi Nakamoto. Leah McGrath Goodman, *The Face Behind Bitcoin*, NEWSWEEK, March 6, 2014, *available at* http://www.newsweek.com/2014/03/14/face-behind-bitcoin-247957.html. This Nakamoto denied that he was the notorious Nakamoto and the supposed revelation was met with skepticism. *See, e.g.*, Matthew Herper, *Linguistic Analysis Says Newsweek Names the Wrong Man As Bitcoin's Creator*, FORBES (March 20, 2014) http://www.forbes.com/sites/matthewherper/2014/03/10/data-analysis-says-newsweek-named-the-wrong-man-as-bitcoins-creator; Joe Mullin, *The colossal arrogance of Newsweek's Bitcoin "scoop,"* ARSTECHNICA (March 20, 2014) http://arstechnica.com/tech-policy/2014/03/the-colossal-arrogance-of-newsweeks-bitcoin-scoop/.

Other more plausible identifications of Nakamoto include Hungarian-born American, Nick Szabo (Nathaniel Popper, *Decoding the Enigma of Satoshi Nakamoto*

currency that would avoid the inflationary and other real or imagined risks of "fiat currencies."[3] Some proponents hope it might undermine the control of the Federal Reserve Bank ("the Fed") and other central banks.[4] Much of the discussion in the popular press has concentrated on its status as a currency and such scandals as the collapse of Mt. Gox, at that time the biggest bitcoin exchange,[5] the conviction of Ross Ulbricht for

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and the Birth of Bitcoin, N.Y. TIMES (May 15, 2015) http://www.nytimes.com/2015/05/17/business/decoding-the-enigma-of-satoshi-nakamoto-and-the-birth-of-bitcoin.html?_r=0) and, most recently, Australian Craig Steven Wright (Andy Greenberg & Gwern Branwen, *Bitcon's Creator Satoshi Nakomoto Is Probably This Unknown Australian Computer Genius*, WIRED (Dec. 8, 2015) http://www.wired.com/2015/12/bitcoins-creator-satoshi-nakamoto-is-probably-this-unknown-australian-genius/). Wright first claimed, then subsequently and mysteriously seemed to disclaim, this distinction. Paul Vigna, *Bitcon's Mr. Wright Now Says We Won't Prove He Started Currency,* WALL ST. J. (May 5, 2016) http://www.wsj.com/articles/bitcoins-purported-father-withdraws-offer-of-more-evidence-1462456086. Andrew O'Hagan, the novelist and editor at large for Esquire and the London Review of Books was hired to write a biography of Wright as Nakamoto by an investor group that sought to patent and monetize his inventions. He recounts this bizarre episode that ended when Wright was unable or unwilling to substantiate his claims in Andrew O'Hagan, *The Satoshi Affair*, 38 LONDON REV. OF BOOKS 7 (JUNE 30, 2016).

[3] In Nakamoto's words "The root problem with conventional currency is [that] the central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust." Quoted by Davis, *supra* note 2, at 62.

Bitcoin supporters tend to argue that bitcoin is not a fiat currency because it is not adopted by a country with a central bank. Indeed, this is how the term is defined in New York's so-called "bit-license" rule governing virtual currency businesses. 23 CRR-NY § 200.2 (1986).

Nevertheless, bitcoin can be considered a fiat currency in that it also has no underlying asset. Its value consists of trust. The term alludes to God's word of command in the *Vulgate* (e.g. *"fiat lux,"* or "let there be light") through which He created the world *ex nihilo*. BIBLIA SACRA VULGATA, GENESIS 1:3.

[4] According to Alan Feuer in *The New York Times:*

> Elizabeth Ploshay, a regular writer for *Bitcoin Magazine,* . . . explained it, bitcoin isn't merely money; it's "a movement"—a crusade in the costume of a currency. Depending on whom you talk to, the goal is to unleash repressed economies, to take down global banking or to wage a war against the Federal Reserve.

Alan Feuer, *The Bitcoin Ideology,* N.Y. TIMES (Dec. 13, 2014), http://www.nytimes.com/2013/12/15/sunday-review/the-bitcoin-ideology.html?module=Search&mabReward=relbias%3As. Feuer continues:

> The hard-line bloc is exemplified by the crypto-anarchist developers of a bitcoin product called Dark Wallet, which is scheduled to be introduced next year and will include extra protections to ensure that bitcoin transactions remain secure, anonymous and difficult to trace. "*We see this as part of the total sublation of the state*," said Cody Wilson, Dark Wallet's director.

Id. (emphasis added).

[5] When it closed in February of 2014, Mt. Gox announced that bitcoin then valued at around $500 million could not be found. Ben McLannahan, *MtGox 'lost coins' long*

founding and operating the Silk Road on-line illegal drug marketplace that accepted bitcoins as payment[6] and the arrest of Charlie Shrem, one of the most well-known bitcoin promoters, for helping Ulbricht launder money.[7]

Putting aside a vocal minority of radical libertarians and anarchists, however, many bitcoin enthusiasts are concentrating less on its use as an alternative currency, per se, but on how its underlying technology—the blockchain—can be put to use for wide variety of uses,[8] ranging from smart contracts[9] to securities trading.[10] For example, although the U.S. Treasury and its state counterparts are concerned about the use of bitcoin for money laundering and for financing terrorism, to date, they are not seeking to prohibit it as a rival to the U.S. dollar, but merely regulating

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before collapse, FIN. TIMES (April 19, 2015), http://www.ft.com/cms/s/0/0694b99c-e647-11e4-ab4e-00144feab7de.html#axzz3e11ThTvw.

6 Ulbricht received a life-sentence. Nicole Hong, *Silk Road Founder Ross Ulbricht Sentenced to Life in Prison*, WALL ST. J. (May 29, 2015), http://www.wsj.com/articles/silk-road-founder-ross-ulbricht-sentenced-to-life-in-prison-1432929957?KEYWORDS=Ulbricht.

7 Shrem was one of the founders of Bitinstant, a bitcoin exchange. He eventually pled guilty to charges relating to an unlicensed money service business and was sentenced to 2 years in prison. Robin Sidel, *Bitcoin Entrepreneur Charlie Shrem Reports to Prison,* WALL ST. J. (March 30, 2015), http://blogs.wsj.com/moneybeat/2015/03/30/bitcoin-entrepreneur-charlie-shrem-reports-to-prison/?KEYWORDS=shrem.

8 For a far ranging discussion of the wide variety of potential uses for the blockchain technology, *see* Aaron Wright & Primavera Filippi, *Decentralized Blockchain Technology and the Rise of Lex Cryptographia*, SOC. SCI. RESEARCH NETWORK (Jan. 17, 2015), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2580664.

For general introductions to legal interests concerning cybercurrency and blockchains *see* Joshua A.T. Fairfield, *Bitproperty*, 88 S. CAL. L. REV. 805 (2015); Larissa Lee, *New Kids on the Blockchain: How Bitcoin's Technology Could Reinvent the Stock Market*, S.J. QUINNEY C. OF L., U. OF UTAH LEGAL STUD. RES. PAPER SERIES PAPER NO. 138, (2016), http://ssrn.com/abstract=2656501; Hillary J. Allen, *$ = € = Bitcoin*, SUFFOLK U. L. SCH. LEGAL STUD. RES. SERIES PAPER NO. 15-33 (Sept. 12, 2015), http://ssrn.com/abstract=2645001; Juliet M. Moringiello, *Electronic Issues in Secured Financing*, WIDENER U. COMMONWEALTH L. SCH. LEGAL STUD. RESEARCH PAPER SERIES PAPER NO. 15-20 (Jan. 17, 2015), SOC. SCI. RES. NETWORK, http://ssrn.com/abstract=2657551; Stephen T. Middlebrook & Sarah Jane Hughes, *Regulating Cryptocurrencies in the United States: Current Issues and Future Directions*, 40-2 WM. MITCHELL L. REV. 813 (2014) (survey of regulation of Bitcoin and other virtual currencies through 2013); Joshua J. Doguet, *The Nature of the Form: Legal and Regulatory Issues Surrounding the Bitcoin Digital Currency System*, 73-4 LA. L. REV. 1119 (2013); and Nikolei M. Kaplanov, *Nerdy Money: Bitcoin, the Private Digital Currency, and the Case Against its Regulation*, TEMPLE U. LEGAL STUD. RES. PAPER (2012), SOC. SCI. RES. NETWORK, http://papers.ssrn.com/ abstract_id=2115203.

9 *See, e.g.*, *A Next-Generation Smart Contract and Decentralized Application Platform*, ETHEREUM WHITE PAPER, https://github.com/ethereum/wiki/wiki/White-Paper.

10 *See infra* text at notes 17-18, 160-68.

certain bitcoin exchanges as Money Service Businesses ("MSB's").[11] Indeed, economists at the Fed and the Bank of England have suggested that they should encourage the evolution of bitcoin's blockchain protocol which might allow financial transactions to clear much efficiently than under our current systems.[12] It also holds out the possibility of becoming that holy grail of commerce—a payments system that would eliminate or minimize the roles of third party intermediaries.[13]

The World Bank reports that, although they have fallen in recent years, international remittance fees (i.e. the money transmittal fees charged by intermediaries to migrants, frequently sending money to their families back home) average well over 7%.[14] If a bitcoin transaction could be achieved for 1%, we could increase the aggregate family income of these typically impoverished people by billions of dollars virtually overnight.[15] Blockchain transactions could also potentially be a god-send to the 27% of U.S. households who are sometimes referred to as un-banked or under-banked—that is, those overwhelmingly lower-

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[11] DEP'T OF THE TREASURY FIN. CRIMES ENFORCEMENT NETWORK, FIN-2013-G001, GUIDANCE: APPLICATION OF FINCEN'S REGULATIONS TO PERSONS ADMINISTERING, EXCHANGING, OR USING VIRTUAL CURRENCIES (2013); *see also New FinCEN Guidance Changes Regulatory Landscape for Virtual Currencies and Some Prepaid Programs,* PERKINS COIE (Mar. 22, 2013), https://www.perkinscoie.com/en/news-insights/new-fincen-guidance-changes-regulatory-landscape-for-virtual.html.

[12] *See, e.g.*, Robleh Ali, John Barrdear, Roger Clews & James Southable, *Innovations in payment technologies and the emergence of digital currencies*, 54-3 BANK OF ENG. Q. BULLETIN 262 (Sept. 14, 2014), http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q3digitalcurrenciesbitcoin1.pdf [hereinafter Ali et al., *Innovations*]; Robleh Ali, John Barrdear, Roger Clews & James Southable and Robleh Ali, John Barrdear, Roger Clews & James Southable, *The economics of digital currency*, 54-3 BANK OF ENG. Q. BULLETIN 276 (Sept. 14, 2014), http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q3.pdf [hereinafter Ali et al*., Economics*].

[13] Shawn Bayern, *Of Bitcoins, Independently Wealthy Software, and the Zero-Member LLC*, 108-4 N.W. U. L. REV. 1485 (2014).

[14] *World Bank Group, Finance and Markets*, 14 REMITTANCE PRICES WORLDWIDE 1 (June 2015), *available at* https://remittanceprices.worldbank.org/sites/default/files/rpw_report_june_2015.pdf.

[15] In 1999 the World Bank adopted an objective called 5x5, which aimed at lowering average remittance costs from 10% to 5% in five years. It estimated that this would decrease costs to migrants of up to $16 billion per year. *Id.* at 7 n. ii.

Unfortunately, although transaction costs for bitcoin transfers are extremely low today, a Bank of England report warns that, at least with respect to Nakamoto's original bitcoin, certain aspects of its miner-verification system would inevitably result in significantly higher fees in the future if the volume of transactions were to increase significantly. Ali et al*., Economics*, *supra* note 12, at 282-83.

income and dis-proportionately minority Americans who are not adequately serviced by the financial intermediary industry.[16]

Overstock, Inc. announced that it was issuing the first "cryptosecurity"—a Regulation D offering of bonds that will be recorded on a blockchain rather than a more traditional security transfer ledger.[17] Overstock's founder and Chief Executive Officer, Richard Byrne, known as a strong libertarian, has suggested that this may help free finance from the tyranny of the SEC and the brokerage industry or, at least, prevent naked short-selling that he believes is used maliciously to drive down the price of issuer's stock.[18]

Blythe Masters, the former J.P. Morgan Chase banker who is often credited with the invention of the credit default swap has recently become the CEO of a firm that "intends to build a software platform for sophisticated financial institutions to settle trades made on third-party sites in digital currencies and in digitized versions of more traditional financial assets."[19] In Master's words, bitcoin should not be thought of as "a store of value or an alternative currency or an investment . . . [but] as a medium for exchange and a mechanism for recording information."[20]

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[16] The FDIC estimates that 7.7% of American household are unbanked, and an additional 20.0% are underbanked. *2013 FDIC National Survey of Unbanked and Underbanked Households* (Oct. 28, 2014), https://www.fdic.gov/householdsurvey/.

[17] *Overstock.com, Inc. Press Release: Overstock.com Launches Offering of World's First Cryptosecurity*, GLOBE NEWSWIRE (June 5, 2015), http://investors.overstock.com/phoenix.zhtml?c=131091&p=irol-newsArticle&ID=2056957. John Beckerman, *Overstock Launches Corporate Bond Billed as World's First Cryptosecurity,* WALL ST. J. (June 5, 2015), http://www.wsj.com/articles/overstock-launches-corporate-bond-billed-as-worlds-first-cryptosecurity-1433549038. According to its Annual Report on Form 10-K for the Year Ended Dec. 31, 2015, Overstock.com has been experimenting in this technology. On two occasions it issued debt securities to investors (including CEO Richard Byrne) and then immediately repaid them. Overstock.Com, Inc. Annual Report on Form 10-K for year ended Dec. 31, 2015, at *67 (Dec. 31, 2015), http://www.sec.gov/Archives/edgar/data/1130713/000113071316000071/ostk-20151231x10k.htm. Overstock.com has also filed a shelf-registration that anticipates the future registration and sale of digital securities. Overstock.com, Inc. Form S-3 (Nov. 10, 2015), https://www.sec.gov/Archives/edgar/data/1130713/000104746915008523/a2226515zs-3a.htm

It is also been reported that UBS Bank has launched an "Innovation Lab" that is also exploring the possibility of so-called "smart bonds" using a blockchain. *See, e.g.*, Sid Kalla, *UBS Bank's Innovation Lab Working on 'Smart Bonds" on Bitcoin*, COINSETTER, (June 15, 2015), http://www.coinsetter.com/bitcoin-news/2015/06/15/ubs-banks-innovation-lab-working-on-smart-bonds-on-bitcoin-2367.

[18] Cade Metz, *Overstock's Radical Plan To Reinvent The Stock Market With Bitcoin* (July 30, 2014), http://www.wired.com/2014/07/overstock-and-cryptocurrency/.

[19] Michael J. Casey, *Ex-J.P. Morgan CDS Pioneer Blythe Masters to Head Bitcoin-Related Startup*, WALL ST. J. (March 11, 2015), http://www.wsj.com/articles/ex-j-p-morgan-cds-pioneer-blythe-masters-to-head-bitcoin-trading-platform-1426048878.

[20] *Id.*

R3CEV, a consortium of over 50 financial institutions, including such giants as Goldman Sachs, J.P. Morgan Chase and Bank of America, is exploring various uses of distributed ledger technology.[21] In the spring of 2016, a number of banks including Citibank and J.P. Morgan Chase, along with the Depositary Trust and Clearing Corporation ran a test replicating a month's worth of trading in Credit Default Swaps over a block chain.[22]

If these ideas sound less apocalyptic than overturning the entire international monetary system, they may, in fact, offer a real chance for significant change in financial and commercial transaction comparable to those wrought by the internet and email.[23]

In this article I examine the implications for bitcoin under the Uniform Commercial Code (the "U.C.C.").[24] Commercial law is the plumbing of finance—although most of us do not want to think about it, somebody better do so because the consequences of malfunctions can be catastrophic.

Specifically, I consider three issues. In Part 1, I discuss the characterization of bitcoin cryptocurrency under Article 9, which governs secured transactions. The bad news is that bitcoin does not, and cannot be made to fit into, the U.C.C.'s definition of "money."[25] If held directly by the owner, bitcoin constitutes a "general intangible."[26] Unfortunately, general intangibles are non-negotiable. That is, unlike virtually every other category of personal property recognized by Article 9, once a general intangible becomes encumbered by a security interest, it can never become unencumbered even by transfer to a bona fide purchaser for value. This could greatly impinge on bitcoin's liquidity and, therefore, its utility as a payment system.

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21 R3 CEV, r3CEV.com (last visited June 26, 2016).

22 Telis Demos, *Bitcoin Blockchain Technology Proves Itself in Market Test*, WALL ST. J. (Apr. 7, 2016), http://www.wsj.com/articles/bitcoins-blockchain-technology-proves-itself-in-wall-street-test-1460021421.

23 Albert Wenger, *Bitcoin As Protocol*, UNION SQUARE VENTURES (Oct. 13, 2013), www.usv.com/posts/bitcoin-as-protocol?; Ali et al*, Innovations*, *supra* note 12, at 272-73. Indeed, one of the more prominent bitcoin alternates, Ripple, sees its goal as developing a universal blockchain protocol for the transfer of value comparable for the universal http internet and smtp email protocols. Bryant Gehring, *What is the Ripple Protocol*, RIPPLE (Feb. 19 2015), https://ripple.com/knowledge_center/what-is-a-protocol-how-does-ripple-fit-in-2/.

24 Unless otherwise indicated, all references to the U.C.C. are to the most recent revisions adopted by the National Conference of Commissioners of Uniform State Law. These were adopted with respect to Article 1 in 2001, Articles 2 and 3 in 2013, Article 8 in 1994 and Article 9 in 2010.

25 *See infra* text at notes 53-84.

26 *See infra* text at notes 85-86.

In Part 2, I show how this may be mitigated somewhat by the rules of Article 8 governing investment securities. If the owner of bitcoin were to choose to hold it indirectly through a financial intermediary, then she and the intermediary could elect to have it treated as a "financial asset," which is super-negotiable. Unfortunately, this comes at the cost of eliminating one of the primary attractions of cryptocurrency, namely the ability to engage in financial transactions directly without a third-party intermediary. Consequently, for bitcoin to live up to its full potential as a payment system, Article 9 would need to be amended. Article 8 as it currently exists, however, may already provide a legal regime for another contemplated use for the blockchain protocol beyond the transfer of cryptocurrency—as a readily searchable means of recording the ownership and transfer of property generally.

In Part 3, I explain how, pace Overstock's Byrne, the creation of a cryptosecurity is not as novel as he thinks. Although, obviously, bitcoin securities were not contemplated when the most recent version of Article 8 was promulgated, they fall squarely within its definition of "uncertificated securities."[27] Ironically, therefore, the creation of bitcoin securities may finally breathe life to these little used provisions that were invented almost 40 years ago in a failed attempt to solve a completely different problem.

PART 1: BITCOIN UNDER ARTICLE 9

I. Introduction.

A. Categorization.

As every historian of commercial law knows, one of the great innovations of Article 9 is that it replaced the pre-code approach to secured lending, which had a different "special device" for each category of collateral. In contrast, Article 9 created a single concept—the security interest—that applies to all forms of personal property. It thereby transformed secured lending from an esoteric practice to the relatively simple regime we have today.[28] It is easy to presume from this that the correct characterization of property is, therefore, unimportant. This would be a grave mistake.

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[27] *See infra* text at notes 175-79.

[28] Indeed, some complain that we have made secured lending *too easy* such that frequently there are no unsecured assets left to compensate unsecured creditors, such as tort victims, if a debtor becomes insolvent. *See generally, e.g.*, Lucian Bebchuk & Jessie M. Fried, *The Uneasy Case for the Priority of Secured Claims in Bankruptcy*, 105 YALE L. J. 857 (1996).

Article 9 lists at least 12 different categories of property (depending on how one counts), some of which include sub-categories as well. One reason for this multiplicity of categories is that, for both practical and historical reasons, Article 9's attachment and perfection formalities differ based on the category. Most importantly for our purposes, what I will call the "negotiation" rules—that govern the ability of a transferee of collateral from a debtor to take free and clear of adverse claims, including security interests, of a first in time party—differ by category. Some forms of collateral, such as "money," are what I will call "super-negotiable." Unfortunately, although bitcoin proponents would like it to function as currency, it is does not and cannot be made to fit within the U.C.C.'s narrow definition of money. By process of elimination, it falls within the catchall category of "general intangibles," which are almost perfectly non-negotiable.[29]

One might also at first blush think that the question as to whether bitcoin is a super-negotiable or non-negotiable form of collateral would be relatively trivial in the sense that, at least at this stage of development, it is likely that bitcoin will rarely be used as collateral at all. In those cases where a creditor requires a debtor to post "cash collateral," the parties would likely use conventional deposit accounts denominated in dollars or other conventional currencies where the law is fairly clear.

Once again, this proves incorrect at further thought. As I will discuss, although it may or may not be true that debtors are unlikely to grant "first generation" security interests in bitcoins, if bitcoin is used as a cryptocurrency or as a payment system, then it will often become "second-generation" collateral—i.e. proceeds. In light of proceeds theory, the entanglement of bitcoin with Article 9 is inevitable.[30]

B. Bitcoin.

"Bitcoin" is an open source, peer-to-peer, decentralized protocol that can be used as a payment system without the use of intermediaries such as banks, brokers, credit card companies, etc. In some environments, it can act as a digital currency. As mentioned, creation of the original bitcoin is attributed to one or more persons who wrote under the name Satoshi Nakamoto. Today, the term bitcoin is sometimes used not only for the original, but also for the hundreds of other cryptocurrencies that

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[29] *See infra* text at notes 85-109; *See also* George K. Fogg, *The UCC and Bitcoins: Solution to Existing Fatal Flaw*, BLOOMBERG BNA (April 1, 2015) http://www.bna.com/ucc-bitcoins-solution-n17179924871; Bob Lawless, *Is UCC Article 9 the Achilles Heel of Bitcoin?*, CREDIT SLIPS (Mar. 10, 2014), http://www.creditslips.org/creditslips/2014/03/is-ucc-article-9-the-achilles-heel-of-bitcoin.html#more.

[30] *See infra* texts at notes 87-109.

have been developed since then.[31] For simplicity, unless the context indicates otherwise, I will use the word "bitcoin," lower case, to refer generically to all cryptocurrencies and will refer to the protocol as the blockchain.[32] I will refer to securities that are issued and transferred on a blockchain as "cryptosecurities."

Perhaps the most innovative aspect of bitcoin and its progeny is its distributed ledger—the blockchain.[33] Like hand-to-hand money, bitcoin is peer-to-peer. That is, it can be transferred directly between two persons without the mediation of third-parties such as banks, brokers, credit-card companies, etc. Because bitcoin has no physical form, there must be some way of preventing double-spending the same bitcoin. This is solved by recording all transactions in every bitcoin in a public ledger—the blockchain.[34]

The blockchain is decentralized. No central authority, like the Fed or MasterCard, maintains the system. Rather, it exists on the computers of all those who use the system and theoretically can be viewed by anyone. With respect to the original bitcoin, the verification or transactions and recording it on the blockchain is done by persons, so-called "miners", who "voluntarily" offer their computing power in exchange for the chance of winning newly "minted" bitcoin.[35]

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[31] As of the Spring of 2016, the Crypto-Currency Market Capitalizations website was quoting prices for 700 cryptocurrencies. CRYPTO-CURRENCY MARKET CAPITALIZATIONS (last visited June 14, 2016), http://coinmarketcap.com/all/views/all/.

[32] There is disagreement as to if and when one should capitalize term "Bitcoin." I tend towards the *Wall Street Journal's* house style. Paul Vigna, *BitBeat: Is It Bitcoin, or bitcoin? The Orthography of the Cryptography*, WALL ST. J. (Mar. 14, 2014), http://blogs.wsj.com/moneybeat/2014/03/14/bitbeat-is-it-bitcoin-or-bitcoin-the-orthography-of-the-cryptography/.

[33] Ali et al, *Innovations*, *supra* note 12; Ali et al., *Economics*, *supra* note 12. That is, rather than being recorded on a single ledger maintained by a single central authority—whether the Fed, the Depositary Trust and Clearing Corporation, Visa or MasterCard, or whomever—it is maintained on the computers of numerous unrelated verifiers known, with respect to the original bitcoin, as "miners."

[34] Bayern, *supra* note 13.

[35] Ali et al, *Innovations*, *supra* note 12; Ali et al., *Economics*, *supra* note 12; Davis, *supra* note 2, at 64.

Although bitcoin is a "fiat" currency in the sense that it is not backed by gold or any other commodity, Nakamoto's original bitcoin was designed to replicate the supposed advantages of a gold system. The amount of gold on the earth is necessarily limited (although not all of it has been discovered or mined yet). A gold-based currency, therefore, limits a government's ability to cause inflation by "printing" more money. Similarly, the original bitcoin program limits the maximum number of bitcoin that can ever be outstanding, thereby supposedly eliminating the risk of inflation (but not deflation). Nevertheless, to date, the value of the original bitcoin in U.S. dollars and other conventional currencies has fluctuated wildly.

Nakamoto's original bitcoin cryptocurrency might be being undone by its own success. Although the original idea was that anyone with a computer could become a miner, over time the algorithms that miners need to solve have become increasingly difficult so that now a relatively small number of miners (which are no longer individuals, but well financed companies) with massive computing power dominate, that could theoretically collude to try to change the underlying program.[36] This arguably threatens the integrity of the fundamental principle of bitcoin—that it be decentralized and impervious to manipulation. Moreover, the bitcoin blockchain is becoming too big to fit on a personal computer.[37] Consequently, some more recent developers of cryptocurrencies are using different means of maintaining the integrity of the blockchain.[38]

Once again, these fascinating details are not our concern. What *does* interest us for commercial law purposes is that ownership of bitcoin is infinitely traceable and that the blockchain technology can be used for transactions other than the transfer of cryptocurrency. I will discuss in detail the use of the blockchain to create so-called cryptosecurities later in Part 3 of this Article.[39] The blockchain could, potentially, be used to record any legal interest in any form of property. For example, it could

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The term "mining" is a metaphor based on the California gold rush, at least at it exists in popular imagination. "Everyone" knew that there was gold in "them thar hills," but not precisely where. Moreover, until it was discovered and claimed it was not owned by anyone. Claims could be made on a first-in-time basis, but discovery of a claim required a combination of luck and pluck.

With respect to the original bitcoin, the program periodically generates new bitcoin that can be claimed on a first-in-time basis. However, it takes a combination of chance and effort to do so. Specifically, new bitcoin can be discovered by devoting the time of a powerful computer to solve an algorithm. The first solver gets the bitcoin. Davis, *supra* note 2, at 69-70. The system depends on the equilibrium caused by the factors that (i) on the one hand, these algorithms take a lot of computer power to solve so that only a limited number of miners have any chance to claim a bitcoin, and (ii) on the other, solving the algorithms takes shear computer power rather than skill. This means that the system is a lottery with a limited number of players assuring that each player has a reasonable chance of winning occasionally, but no player can game the system so that he wins every round. The algorithms are designed to become increasingly difficult over time to keep the equilibrium in place as computing power increases.

[36] Stephanie Lo & J. Christina Wang, *Bit Coin as Money?,* FED. RESERVE BANK OF BOS., CURRENT POLICY PERSPECTIVES NO. 14-4 (Sept. 14, 2014).

[37] *Id.*

[38] For example, Ehereum, among others, uses a "proof of stake consensus" mechanism. *See, e.g.*, Hans Lombardo, Synero, Ethereum Collaborating to Formalize Proof-of-Stake Protocol "Casper," ALLCOINNEWS (July 25, 2015), http://allcoinsnews.com/2015/07/25/ethereum-synereo-collaborating-to-flest-out-proof-of-stake-protocol-casper/.

[39] *See infra* text at notes 160-83.

become the basis for a more efficient nation-wide filing system to replace Article 9's current, cumbersome state-by-state regime.

The blockchain means that, although bitcoin is sometimes described as anonymous, it is in fact, at most, pseudonymous.[40] To transfer bitcoin out of one's digital wallet, the owner must enter in an account number, known as a public key, and a password or private key.[41] Obviously, one could hide one's actual identity behind these numbers, but sophisticated computer analyses have enabled large transactions to be tracked.[42] Moreover, although owners theoretically do not need intermediaries to transfer bitcoins, in fact, a variety of intermediaries and exchanges have developed. The Financial Crime Enforcement Network ("FinCEN") has advised that some of these intermediaries are MSB's within the meaning of the Bank Secrecy Act subject to its requirements that they gather and, in some circumstances, report identifying information on their customers in order to prevent money laundering.[43] In 2015, New York State adopted "bitlicense" rules with similar reporting requirements.[44]

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[40] CRAIG K. ELWELL ET AL., BITCOIN: QUESTIONS, ANSWERS, AND ANALYSIS OF LEGAL ISSUES, CONGRESSIONAL RESEARCH SERVICE REPORT 43339 (2015). A simple internet search will find numerous papers discussing how this can be done through transaction graph analysis. *See, e.g.*, MICHAEL FLEDER ET AL. BITCOIN TRANSACTION GRAPH ANALYSIS (2014), http://people.csail.mit.edu/spillai/data/papers/bitcoin-transaction-graph-analysis.pdf.

Although transactions in bitcoin are not necessarily anonymous, users can arrange them so that they are nearly so. BITCOIN WIKI, https://en.bitcoin.it/wiki/Anonymity (last visited Jan. 17, 2016). However, Bitcoin exchanges often fall within the definition of a Money Services Business ("MSB") subject to extensive reporting requirements under the Bank Secrecy Act. *See supra* note 11. They also may be money transmitter businesses for the purposes of state licensing law. *See id.*; Charlie Shrem, co-founder of the now defunct BitInstant bitcoin exchange, had emphasized to me that although bitcoin transactions were more discrete than conventional electronic commerce, the goal of complete anonymity was illusory. Interview with Jeanne Schroeder (Jan. 23, 2013); interview with Charles Shrem, Co-founder of BitInstant, (Feb. 7, 2013). It is perhaps, therefore, ironic that he soon learned how true this the hard way when he was indicted for conspiracy for using bitcoin for money laundering by advising the founder of Silk Road how to get around BitInstant's compliance rules.

[41] Lo & Wang, *supra* note 36; *see also*, Doguet, *supra* note 8; Kaplanov, *supra* note 8; Allen, *supra* note 8.

[42] Elwell et al., *supra* note 40; *see also* Jason Luu & Edward J. Imwinkelried, *The Challenge of Bitcoin Psuedo-Anonymity to Computer Forensics*, UC DAVIS LEGAL STUD. RES. PAPER SERIES, Res. Paper No. 462 (2015), http://ssrn.com/abstract=2671921.

[43] Elwell et al., *supra* note 40. In May 2015, FinCEN imposed a $700,000 penalty on Ripple Labs, Inc., for violation of the Anti-Money Laundering provisions of the BSA. Ryan Tracy, *Treasury Penalizes Ripple Labs, in First Action Against Virtual Currency Exchange*, WALL ST. J. (May 5, 2015), http://www.wsj.com/articles/treasury-penalizes-ripple-labs-in-first-action-against-virtual-currency-exchange-1430864628?KEYWORDS=ripple+labs.

[44] 23 CRR-NY §§ 200 *et seq* (2015). The New York "bit-license" law goes further than the federal statute in that it also applies to anyone who controls, administers or

Nakamoto himself, and many of his libertarian and anarchist followers no-doubt were drawn to the relatively private nature of the original bitcoin cryptocurrency. In contrast, the financial industry, merchants and central banks that are interested in the commercial uses of the blockchain, probably care little about these issues. Indeed, as I have already implied its utility as a medium for trading cryptosecurities or as a filing or recording ledger depends precisely on the traceability of transactions.

II. Money.

Because its proponents refer to bitcoin as a form of digital currency, and because it is correctly treated as equivalent to money under the reporting requirements of the Bank Secrecy Act, it is tempting to try to argue that one should be able to find a way to fit it into the U.C.C.'s defined word "money." If so, bitcoin would be super-negotiable. Unfortunately, it is not. Consequently, bitcoin may not be able to meet its full potential as a cryptocurrency until the U.C.C. is amended.

A. Negotiation.

U.C.C.'s various property regimes reflect the familiar tensions between rights of possession and alienation. Although, the U.C.C. uses the term "possession" in an arguably retrograde way to mean the *fact* of physical custody of tangible things, jurisprudentially, the legal *right* to possession can be thought of (for our purposes) as the right of an earlier-in-time claimant to exclude later-in-time claimants from an identifiable object.[45] Both the competing values of possession and market alienation are essential to the functioning of capitalism. On the one hand, owners of property must be secure in their title. On the other hand, markets cannot function efficiently unless buyers can be assured that they are acquiring good title without having to engage in burdensome searches. Conflicts arise when one party, *X*, purports to transfer property that belongs to an innocent second party, *O*, to an innocent third party, *P*. It is clear that the double-dealing *X* has legal liability to make *O* and *P* whole by paying damages, but such fraudsters tend to leave the jurisdiction, are judgment

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issues a virtual currency. *See* Allen, *supra* note 8, at 38-41. Bitcoin service companies also frequently fall within the jurisdiction of state money transmitter licensing laws. *See, e.g.*, Money Transmitter Law, http://moneytransmitterlaw.com/ (last visited Jan. 17, 2016). State and federal licensing requirements are beyond the scope of this article.

[45] Note, the jurisprudential term "object" should not be confused with tangible things, but as anything that is not a subject, thought of that which is recognized as being capable of bearing legal rights and duties. As such, intangibles, like bitcoin, can be objects. JEANNE LORRAINE SCHROEDER, THE VESTAL AND THE FASCES: HEGEL, LACAN, PROPERTY AND THE FEMININE 35-37 (1998) [hereinafter SCHROEDER, VESTAL].

proof or both. Conveyancing and priority rules, therefore, are needed to decide which of two innocent parties, *O* or *P*, shall be recognized as the superior claimant and which shall bear the loss.

Most conveyancing rules of the U.C.C. reflect the traditional compromise that favors possessory claims. That is, at least as a *formal* matter, the default rule is that first-in-time claimant prevails over a subsequent transferee.[46] I refer to this as a derivation rule[47] because the rights of a transferee derive from, and cannot exceed, those of the transferor. The harshness of derivation rules is modified by what I call "negotiation rules" designed to protect transferees in favored market transactions. That is, if the transferee can show he satisfies certain conditions, then he will take free and clear of the possessory rights (adverse claim) of the earlier-in-time claimant. These conditions typically require the transferee to meet an appropriate standard of good faith and to give value, but sometimes also require lack of notice, or specific market conditions. For example, under Secs. 2-403(2) and 9-320(a) an entrustor of goods, and a secured party with a security interest in goods will prevail over a transferee of those goods *unless* the transferee can show that he is a buyer in the ordinary course of business, in which case he takes free of these adverse claims.

In a few cases, however, the U.C.C. reverses this rule, adopting a default rule favoring subsequent transferees over prior claimants. For example, Sec. 9-332(a) provides with respect to money that:

> A transferee of money takes the money free of a security interest unless the transferee acts in collusion with the debtor in violating the rights of the secured party.

I call such a rule "super-negotiation." Note that under a negotiation rule, a transferee will lose unless she can establish that she has a favored state of mind (e.g. good faith), but under a super-negotiation rule she prevails unless the prior claimant can establish that the transferee had an affirmatively disfavored state of mine (i.e. she acted in collusion).

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[46] I say "formal" in the sense that, as an empirical matter, the transferee will easily meet these tests in the vast majority of cases. For example, virtually all customers who buy merchandise in a department store will be buyers in the ordinary course who take free and clear of the security interests of the stores suppliers and inventory lenders; the vast majority of depository banks will qualify as holders in due course of their customer's deposited checks, etc.

[47] I take my derivation/negotiation vocabulary from DOUGLAS G. BAIRD & THOMAS H. JACKSON, CASES, PROBLEMS, AND MATERIALS ON SECURITY INTERESTS IN PERSONAL PROPERTY (2d. ed. 1987). "Super negotiation" is my idiosyncratic term that I adopted in Jeanne L. Schroeder, *Is Article 8 Finally Ready This Time? The Radical Reform of Secured Lending on Wall Street*, 3 COLUM. BUS. L. REV. 295, 351 (1994) [hereafter, Schroeder, *Article 8*].

If bitcoin were "money" it would be entitled to the rule of Sec. 9-332(a). Indeed, it could only truly function as money if it were governed by a similar rule because one of the hallmarks of money is precisely super-negotiability. That is, one reason why you will take a dollar bill as payment is that you can always be sure that no previous claimant could try to replevy it from you. Imagine what chaos would ensue if, instead, one needed to do a U.C.C. search before accepting cash. Unfortunately, this latter is the current regime that is applicable to bitcoins. Bitcoin transferees must yield to prior perfected security interests.[48]

B. Conveyancing.

Before I continue, let me make clear the purpose, and limits of, Article 9's regime. Nakamoto, in "his" manifesto, and many of bitcoin's most enthusiastic proponents, hope that bitcoin would eventually serve as currency, or money, that might replace, or even undermine, so-called fiat money created by governments. In this sense of the term, "money" is a very complex, and surprisingly under-theorized phenomenon. It is, among other things, a medium of exchange, unit of account and store of value.[49] Physical currency or what central bankers call "hand-to-hand"

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[48] *See infra* text at notes 85-109. Certain transferees of general intangibles do take free of *unperfected* security interests namely:

> A licensee of a general intangible or a buyer, other than a secured party of collateral other than tangible chattel paper, tangible documents, goods, instruments, or a certificated security takes free of a security interest if the licensee or buyer gives value without knowledge of the security interest and before it is perfected.

U.C.C. §

[49] *See* David Gray Carlson, *Money as Measure*, 33 CARDOZO L. REV, 2531 (2012); Lo & Wang, *supra* note 36.

The press has reported that one federal judge has held that bitcoin is money for the purposes of the Federal securities law. *See, e.g.*, Jordan Maglich, *Court Green-Lights Bitcoin Lawsuit; Rules Investment Constitutes 'Securities',* FORBES (Aug. 7, 2013). This is the true, but only in a trivial sense.

In *S.E.C. v. Shavers*, No. 4:13-CV-416 (E.D. Tex. Aug. 6, 2013) the SEC brought an anti-fraud action against a promoter for allegedly operating a Ponzi scheme in which victims would invest bitcoin on the promise that they would receive a greater amount of bitcoin in the future. The question at issue was *not* the securities-law status of bitcoin itself, but of the investment scheme. The promoter argued that the scheme was not a security under the *Howey* definition of "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"(emphasis added) on the grounds that investors were giving him bitcoin, and not money. *S.E.C. v. W.J. Howey Co.*, 328 U.S. 293, 298-99 (1946). Specifically, *Howey* defines the term "investment contract" which is the catch-all category for an investment that does not otherwise fall within one of the other sub-categories listed in the term "security" in Sec. 2(a)(1) of the Securities Act of 1933. 15 U.S.C. § 77b(a)(a); Securities Exchange Act of 1934, 15 U.S.C. § 78a(a)(10)-3(a)(10).

money (notes and coins), is not money *per se*. Rather, hand-to-hand money is a token that both represents money and can also serve as a payment system for the transfer of money. As I will discuss below,[50] the United States, deposit accounts—which are essentially electronic ledgers recording a bank's debt owed to its depositors—have replaced hand-to-hand money as the primary monetary token. Promoters who talk about bitcoin as money want it to serve all these roles—measure and store of value, unit of account, token of value and payment system. The most fervent bitcoiners, following Nakamoto, hope that bitcoin can prevent the inflationary risks that they associate with government issued fiat money or even undermine the hegemony of central banks and nation states. Although these are fascinating issues, they are not within the purview of the U.C.C. and will not concern us here.

Article 9 is a property law regime. It sets forth certain rules governing the conveyancing of, and priority of competing claims to, personal property. Article 9 is specifically concerned with "security interests," but this term can be misleading because it is not limited to "interests in personal property or fixtures which secure payment or performance of an obligation."[51] It also includes a number of other transactions including outright purchases of certain rights to payment, and consignments.[52]

Article 9 characterizes different categories of property purely for this purpose. As already stated, there are good practical, as well as historical and customary, reasons for having different conveyancing rules for different types of collateral. Most importantly, the fact of *physical* custody is usually of utmost importance to issues of the relative rights of rival claimants to *tangible* collateral, and is often one of the conditions of a negotiation rule. Consequently, although the U.C.C. tends to elevate substance over practice, in the technical areas of conveyancing, form is of the essence.

In context, it is clear that the U.C.C.'s definition of money—first promulgated in 1962—is intended to cover only hand-to-hand money. It does not even cover deposit accounts—the primary form that money takes within this country. Non-proceeds interests in deposit accounts

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Judge Amos Mazzant correctly held that bitcoin was money for this very limited purpose. His terminology was unfortunate, however, insofar as it can be misconstrued as suggesting that the federal courts recognize bitcoin as *currency*. Rather, it would have been preferable for him to have noted that courts have long interpreted the Supreme Court's reference to "money" in the *Howey* test to mean "money's worth" or something of value. Otherwise fraudsters, like Mr. Shavers, could easily skirt the law by having investors pay in kind.

50 *See infra* text at notes 62-64.

51 U.C.C. § 1-201(b)(35) (2001).

52 *Id.*

were actually expressly excluded from the scope of Article 9 until 1999.[53]

Grant Gilmore, Soia Mentschikoff, Karl Llewellyn and the other drafters of the U.C.C. could surely not have in their wildest imaginations dreamed of personal computers and the internet, let alone bitcoin, when they were working in the 1950's. Consequently, not only does their definition of money *not* apply to bitcoin, it cannot be stretched to accommodate bitcoin—nor would we want it to.

Although the most major revision of Article 9 promulgated by the National Conference of Commissioners on Uniform State Law ("NCCUSL") in 1999, with an effective date (for those states that adopted it) of 2001,[54] fell well within the internet age, the original bitcoin only went online in 2009. So, if I were a betting woman, I would wager that not a single member of the drafting committee contemplated the creation of cryptocurrency.

Moreover, the U.C.C.'s silence with respect to bitcoin is worse than the pre-1999 exclusion of deposit accounts from its scope. The original version of the U.C.C. recognized the "problem" of deposit accounts so it defined them, and then expressly excluded them from its scope (except insofar as they constitute proceeds). This allowed a common law of deposit accounts to develop.[55] In contrast, the silence of today's U.C.C. with respect to bitcoin means that it falls within the catchall definition of "general intangibles"—the least negotiable of all U.C.C. categories of property. Consequently, there can be no common law of security interests in bitcoin because Article 9 supplies the rules.

This suggests that, for bitcoin really to take off as a payment system, let alone a currency, it may be necessary to amend the U.C.C. to add a super-negotiability rule for cryptocurrency

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[53] In the sense Article 9 by its terms did not govern the grant of "first-generation" security interests in deposit accounts, which were left to the common law. Deposit accounts could, however, constitute proceeds, which I will refer to as "second-generation" security interests.

[54] Relatively minor revisions to Article 9 were adopted in 2010.

[55] Pre-1999 Article 9 stated in Official Comment 7 to Sec. 9-104, that although "deposit accounts are often put up as collateral [s]uch transactions are often quite special, do not fit easily under a general commercial statute and are adequately covered by existing law." The *real-politic* of the situation was almost certainly that, in the 1950's when the original U.C.C. was being drafted, banks were happy to have a rule clarifying the rules with respect to security interests they took in property held by others, but were wary of applying this radical new regime to assets that they held. Because the support of the banking industry was necessary to get the legislation passed, deposit accounts were excluded. By 1999, however, when security interests in cash collateral had become common, banks were no longer satisfied with the vagaries of the common law and wanted clearer statutory rules.

C. The U.C.C.'s Definition of Money.

The U.C.C.'s treatment of money and possession may seem strikingly unsophisticated from the perspective of the second decade of the twentieth-first century, unless one remembers the purpose of Article 9, which is to be a non-exclusive conveyancing law for personalty. The use of the term "possession"—which is never defined—in context means, not the legal right to exclude later-in-time claimants, but the fact of physical custody—either directly by a party or its agent or attorning bailee. This terminology is arguably unfortunate.[56] However, although U.C.C. is a common law code, to extend the term "possession" from the *fact* of physical custody to the *right* of exclusion would do great damage to the current statutory schema.

Priority and other property disputes consist almost entirely about which of two or more parties has the *right* of possession (i.e. exclusion). Under the U.C.C.'s negotiation rules with respect to *tangible* property, the *fact* of physical custody is often one of conditions that a party must satisfy to obtain the *right* of exclusion. Consequently, to read the U.C.C.'s term "possession" to mean the *right* of possession, would make these negotiation rules hopelessly circular. Indeed, this would replicate the evil that Karl Llewellyn identified in the common law of sales that Article 9 was designed to remedy.[57]

Sec. 1-201(a)(24) defines money as:

> [A] medium of exchange currently authorized or adopted by a domestic or foreign government. The term includes a monetary unit of account established by an

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[56] I discuss the persistence of the conflation of the two conceptions of possession (the right to exclude and the fact of sensuous holding) even by theorists who claim to recognize the difference, in SCHROEDER, VESTAL, *supra* note 45.

[57] The following is an abbreviated discussion of an analysis I set forth in full in Jeanne L. Schroeder, *Death and Transfiguration: The Myth That The U.C.C. Killed "Property,"* 69 TEMPLE L. REV. 1281 (1996) [hereinafter Schroeder, *Death and Transfiguration*]. According to Llewellyn, under the common law, judges purported to decide property disputes in goods by identifying the claimant who had "title" to the goods. But, as Llewellyn forcibly argued in numerous works "title" is just another word for superior rights in the goods. Consequently, to say that the claimant who has title should win a dispute, is merely the truism that the winner should be the winner of the dispute. In order to come to the intuitively right decision in cases, Llewellyn argued, judges had to engage in complex linguistic gymnastics. Karl N. Llewellyn, *Across Sales on Horseback*, 52 HARV. L. REV. 873 (1939) [hereinafter Llewellyn, *Horseback*]; KARL N. LLEWELLYN, CASES AND MATERIALS ON THE LAW OF SALES (1930) [hereinafter Llewellyn, SALES]; Karl N. Llewellyn, *The First Struggle to Unhorse Sales*, 52 HARV. L. REV. 725 (1939) [hereinafter Llewellyn, *First Struggle*].

> intergovernmental organization or by agreement between two or more countries.[58]

At first blush, this seems to imply that the only impediment in having bitcoin treated as money is that, to date, no government has adopted it as its currency. This would seem to offer a golden opportunity for some small country, perhaps one that is already a tax haven, such as Andorra or the Cayman Islands, to adopt bitcoin or another digital currency as its medium (or one of its media) of exchange. Others before me have noted that no cryptocurrency currently constitutes money under this definition because of the adoption by a government requirement.[59] I go further and argue that it *could not* be made into money for the purposes of the U.C.C. even if a government were to adopt it.

The problem is that, although inartfully drafted, in context it is clear that the term is limited to physical, or "hand-to-hand," currency. Moreover, as I discuss in the next section,[60] characterizing bitcoin as money would have a perverse effect because security interests in money can only be perfected by physical custody. This would make it impossible to create a first-generation perfected security interest in bitcoin, which would limit its ability to serve as currency in sophisticated financial transactions because it could not effectively be used as cash-collateral.

The U.C.C.'s idiosyncratic limitation of money to hand-to-hand currency can be seen by the fact that it does not include in the definition the most common form in which money is held within this country—that is, deposit accounts.

Bitcoin enthusiasts seem to presume that holding money in digital form is new. That is not the case. Rather, in this country money is usually not represented by *any form of physical currency*.[61]

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58 U.C.C. § 1-201(b)(24) (2001).

59 *See, e.g.*, Fogg, *supra* note 29, at 2; Lawless, *supra* note 29.

60 *See infra* text at notes 65-66.

61 Modern American coins are supposed to be made of metals having a market value less than the stated denomination. However, according to the U.S. mint, in 2004 the cost of producing the cent and the nickel cost the government almost as much as the face amount to produce (.93 and 4.56 cents, respectively). U.S. Mint, http://www.usmint.gov/about_the_mint/PDFs/2014-rd-biennial-report-appendix-2.pdf (last visited Jan. 18, 2016). Once again, because of high metal prices, the cost of producing the two coins reportedly exceeded their face value in 2006. Barbara Hagenbaugh, *Coins Cost More to Make Than Face Value*, USA TODAY (May 10, 2006), http://www.usatoday.com/money/2006-05-09-penny-usat_x.htm.

D. Deposit Accounts

Probably the most obvious (albeit, once again, indirect) indication that the defined term "money" as used in the U.C.C. is intended to cover only hand-to-hand money is the fact that Article 9 distinguishes "money" from "deposit accounts." M1, the basic measure of U.S. money as defined by the Fed, is not "hand-to-hand" currency. That would be M0. Rather M1 is M0 *plus* checking and other demand deposit accounts maintained by banks and other financial institutions. Another measure, M2, tosses other less liquid accounts and intangibles into the pot.[62]

The Fed reports that at any given time M1 is divided approximately half-and-half between deposit accounts and hand-to-hand currency.[63] This is misleading, however. Most American hand-to-hand currency is held abroad in countries with poorly functioning local currencies.[64] Within our borders, most "money" consists of checking and similar accounts with financial institutions.

A deposit account is defined in Sec. 9-102(a)(29) as:

> A demand, time, savings, passbook, or similar account maintained with a bank. The term does not include investment property or accounts evidenced by an instrument.

This definition, like that of "money" is surprisingly unhelpful, presupposing that the reader already knows what an "account maintained by a bank" is. To make a "deposit" into a checking account is to make an unsecured demand loan to a bank or other financial institution. The customer has no property interest in any funds owned by the bank. The bank merely agrees to repay the loan upon the customer's order.

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[62] M2, includes savings accounts and certain other time deposits as well. The Federal Reserve Board, *Monetary Policy and the Economy* 22, http://www.federalreserve.gov/pf/pdf/pf_2.pdf. Until 2006, the Fed also published a third even larger aggregate, M3. Federal Reserve Bank of New York, *The Money Supply*, http://www.newyorkfed.org/aboutthefed/fedpoint/fed49.html.

Nevertheless, as already mentioned, the U.C.C. still does not include such accounts in its definition of money, but relegates them to other categories such a "deposit account" and, perhaps, "general intangible." U.C.C. § 9-102(a)(42) (2010). M2 and M3 also includes what the U.C.C. would characterize as "investment property." U.C.C. § 9-102(a)(49) (2010).

[63] Board of Governors of the Federal Reserve System, *Money Stock Measures, Federal Reserve Statistical Release*, (Jan. 14, 2016) http://www.federalreserve.gov/Releases/H6/current/H6.pdf.

[64] Federal Reserve Bank of New York, *How Currency Gets into Circulation*, (July 2013), http://www.newyorkfed.org/aboutthefed/fedpoint/fed01.html.

Consequently, a deposit account is a ledger that records the amount of this unsecured loan.[65]

In any event, what is important for us is that, unlike the Fed, the U.C.C. distinguishes between currency represented by physical tokens and by book-keeping entries, only including the former (i.e. M0) in the definition of "money."

The fact that a "deposit account" is not "money" is evident from the fact that Article 9 repeatedly refers to it as separate category of collateral. For example, Sec. 9-102(b)(9) defines "cash proceeds" as "proceeds that are money, checks, deposit accounts, or the like." Pursuant to Sec. 9-312(b)(3) first-generation security interests in "money" can only be protected by possession understood as physical custody, whereas 9-312(b)(1) provides that first-generation security interests in deposit accounts can only be perfected by "control." Finally, although the super-negotiation rule for funds transferred out of deposit accounts is almost identical to that for "money," the two are set forth in different sections, namely Sec. 332(b) and 332(a), respectively.

Consequently, the novelty of bitcoin is not that it is a digital rather than physical form of money, but that it can be held and transferred directly by an owner by registration on a decentralized blockchain. In contrast, deposit accounts exist only through an intermediary—a bank or

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[65] A dwindling plurality of these orders are given in the traditional form of a physical check. A large majority in dollar amount of deposits, withdrawals and transfers are made electronically, even among consumers. Scott Schuh, *Overview of the Survey of Consumer Payment Choice (SCPC) Program,* FED. RESERVE BANK OF BOS., (May 6, 2010). Consequently, monetary transactions are usually book entries. Of course, even this may be a misleading metaphor in the sense that they no longer involve physical "books," but electronic entries.

The law of deposit accounts is shockingly untheoretized. One thing is clear, however. The term "deposit" is a leftover from the medieval practice whereby merchants would literally deliver gold to bankers for safe-keeping. Today, one rarely makes deposits by delivering hand-to-hand money to a bank. And, regardless of how one delivers money to the bank, the "depositor" loses any property interest she once had in the money upon its "deposit." Indeed, the customer has no property interest in any bank asset whatsoever. Although we are familiar with the image of bank vaults filled with dollar bills, banks hold only that amount of physical currency that they anticipate will be necessary to meet requests for cash withdrawals at ATM's and in over-the-counter transactions. We intuitively know this when we laugh at the cartoon image of Scrooge McDuck playing in piles of physical currency. Pursuant to the Fed's Regulation D (12 C.F.R. § 204) banks and other depositary institutions are required by state and federal law to keep reserves against depositary liabilities currently at ratios ranging from 0% to 10%. These "reserves" may consist either of vault cash or accounts maintained at Federal Reserve Bank. *Reserve Requirements*, BD. OF GOVERNOR'S OF THE FED. RES. SYS., (Dec. 16, 2015), http://www.federalreserve.gov/monetarypolicy/reservereq.htm. In addition, under the Federal Deposit Insurance Act (12 U.S.C. §§ 1811 *et seq.)* ordinary accounts maintained by banks and certain other institutions are insured by the Federal Deposit Insurance Corporation up to $250,000.

similar financial institution.[66] Even bitcoin held *indirectly* through an intermediary would not be deemed to be a deposit account under Article 9. However, the customer and the intermediary could elect to have it treated as "investment property" under Article 8.

III. Possession as Physical Custody.

Another indication that the U.C.C. limits the term "money" to physical currency is that pursuant to Sec. 9-312(b)(3) a non-proceeds "security interest in money may be perfected only by the secured party's taking possession." This means that characterizing bitcoin as money under the U.C.C. would actually make it less able to function as a currency. It could not be used as collateral because it would be impossible to create a perfected first-generation security interest in it.

The U.C.C. never defines the term "possession" but, as I have introduced, it is quite clear that it uses the term to mean the fact of physical custody. Obviously, only tangible things can be physically possessed. This can be seen in the enumeration of *other* types of collateral in which a security interest can be perfected by possession "negotiable documents, goods, instruments . . . or tangible chattel paper"[67]—all tangible things. Although Official Comment 3 to Sec. 9-313 says that the section "does not define 'possession'," this is *not* an indication that it can be interpreted as something other than physical custody. Rather this comment refers to common law agency and other rules about when possession by a third party is deemed to be possession by a secured party.

One category of tangible personalty is excluded from the list of collateral perfectible by possession: security interests in *certificated* securities can be perfected by "taking delivery."[68] This is not an exception to the general rule, however. Sec. 8-301(a) states that "delivery" of a certificated security only occurs when a person (either directly or through a third party) "acquires possession of the certificated security." Official Comment 2 to this provision clarifies that the section is referring to "*physical* possession of certificates (emphasis added)." In other words, physical custody is a necessary, but not sufficient, condition of delivery.

The U.C.C. uses the word "possession" over 100 times. In only two or three places is this modified by the word "physical." Reading the U.C.C. as a whole, and understanding the customs and practices it

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66 A term that includes a "person engaged in the business of a banking and include as savings bank, savings and loan association, credit union, and trust company." U.C.C. § 1-201(a)(4) (2001).

67 U.C.C. § 9-313(a) (2010).

68 *Id.*

enshrines, the term "possession" is meant as physical custody of a tangible thing. To give a few examples:

a. Holders in due course. The clearest (but still poorly drafted) place this can be seen, is in Article 3's rules with respect to holders of negotiable instruments which are all based on physical possession of pieces of paper. Much of Article 3 revolves around the ability of "holders in due course" to take free of defenses (Sec. 3-305) and adverse claims (Sec. 3-306). To be a holder in due course one must, of course, first and foremost, be a "holder." Sec. 1-201(b)(21) defines "holder" as a person in "possession of a negotiable instrument that is payable either to bearer or to an identified person that if the person in possession," certain persons in "possession" of a negotiable tangible document of title" and a "person in control of a negotiable electronic document of title." Sec. 3-201 defines "negotiation" as "transfer of possession, whether voluntary or involuntary, of an instrument by a person other than the issuer to a person who thereby becomes its holder." Sec. 3-109(a)(1) defines a bearer instrument as one that is payable to "the person in possession." Sec. 3-301, defining a "person entitled to enforce" an instrument distinguishes between holder, nonholders in possession, persons not in possession and persons in wrongful possession of and instrument. These provisions read, with an awareness of the common law of instruments indicates that the term "possession" means the fact of physical custody.

b. Collateral in possession of persons other than the debtor. Sec. 9-313(c), which governs when a secured party is deemed to possess collateral in the possession of a person other than the debtor, also implicitly uses the term "possession" to mean physical custody. This provision requires that the person in possession acknowledge that "it holds possession of the collateral for the secured party's benefit." This is reinforced by Official Comments 3 and 4, which clarify that this reflects the basic principle that a principal can possess property that its agent "holds."

c. Attachment. Attachment is Article 9's term for the creation of a security interest.[69] Sec. 9-203(b)(2) provides that one of the conditions of attachment for collateral that is not a certificated security can be satisfied by "possession of the secured party under Section 9-313 pursuant to the debtor's security agreement." Official Comment 2 clarifies that the four attachment formalities of Sec. 9-203(b) constitute "evidentiary requirements."[70] That is, as I shall discuss,[71] under the doctrine of

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[69] "A security interest attaches to collateral when it becomes enforceable against the debtor with respect to the collateral" U.C.C. § 9-203(a) (2010).

[70] Official Comment 5 to the 1972 revision of Sec. 9-203 referred to this as being "in the nature of a Statute of Frauds." As I have discussed elsewhere, Sec. 9-203 is written as though there are three elements of attachment with the third element capable of being met

"ostensible ownership" physical possession is considered a relatively unambiguous way to publicize a claim of a property interest sufficient to evidence the existence of a contract, similar to having the debtor sign (or, in modern parlance, "authenticate") a security agreement containing a description of the collateral."

The 1994 and 1999 revisions added a new alternative evidentiary formality: "control"—which is the effective power to exclude others. But control is limited to "deposit accounts, investment property, or letter-of-credit rights."[72] I discuss control later in this Article,[73] but would point out here that the contrast between the word "possession," which is only used in connection with tangible things, and "control," which is also used in connection with certain intangibles, is strong indication that the term "money" only refers to hand-to-hand money.

d. Purchase Money Super-Priority. The super-priority rules for purchase money security interests under Section 9-324 (which only apply to goods and software) are dependent on the timing of when the debtor receives possession of the collateral. In the case of goods that are not inventory or livestock, under Sec. 9-324(a) for a purchase money financer to obtain super-priority over an earlier-in-time perfected secured party, it is sufficient if the purchase money financer perfects its security interest "when the debtor receives possession of the collateral or within 20 days thereafter."[74]

Official Comment 3 to this section claims that "[n]ormally, there will be no question when 'the debtor receives possession of the collateral'" before going on to discuss ambiguous cases. These examples indicate that possession must mean physical custody. The first example discussed is when a debtor takes possession of goods in stages, and then assembly and testing are completed (by the seller or debtor-buyer) *at the debtor's location.* Under those circumstances, the buyer "takes possession" within the meaning of subsection (a) when, after an inspection of the portion of

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in four different ways. However, conceptually, I think that it is analytically clearer to think of there being four elements—1) the debtor must have rights in the collateral, 2) the secured party must give value, 3) the security interest must be granted pursuant to a security agreement and 4) the security agreement must be evidenced by one of four formalities. Jeanne L. Schroeder & David Gray Carlson, *Security Interests Under Article 8 of the Uniform Commercial Code* 557, 577 (1990) [hereinafter Schroeder & Carlson, *Security Interests*].

71 *See infra* text at notes 81-84.

72 U.C.C. § 9-203(b)(2)(D) (2010).

73 *See infra* text at notes 152-53.

74 In the case of inventory, the rules of Sec. 9-324(b) are more complex because the purchase money financier's security interest must be perfected "when the debtor receives possession of the inventory" and must give notice to certain earlier-in-time perfected secured parties "within five years before the debtor receives possession . . . " U.C.C. § 9-324(b) (2010).

the goods in the debtor's possession, it would be apparent to a potential lender to the debtor that the debtor has acquired an interest in the goods taken as a whole. (Emphasis added.)

The second example is familiar to all commercial law professors. Although "true leases" and security interests in the form of leases are notoriously difficult to tell apart, the distinction is crucial for tax and accounting, as well as commercial and debtor-creditor law. One difference is, of course, that, to be enforceable against certain other claimants, a secured party must perfect its security interest but a lessor does not have to perfect its rights.

This raises the hypothetical with which we love to bedevil our students. As described in Official Comment 3: "[A] person may take possession of goods as a lessee under a lease contract and then exercise an option to purchase the goods from the lessor on secured credit." In this situation, how could the secured party meet the condition for purchase-money super-priority that it perfect its security interest within 20 days of the debtor "receiv[ing] possession of the collateral" when the lessee has had physical custody of the leased property since the beginning of the lease? The comment suggests that the 20-day period only starts running when the secured interest attaches because only then are the goods deemed to be "collateral" defined in 9-102(a)(12) as "the property subject to a security interest . . . "

In both of these cases, the drafters of the comments are treating it as obvious that possession always requires physical custody, but there might be circumstances in which physical custody might be a necessary, but not sufficient, condition of possession for the timing purposes of Sec. 9-324. In other words, for the purposes of this section, the receipt of collateral can never occur before the debtor (or its agent) takes *physical* custody, but might occur later.[75]

e. Repossession. One of the most basic rights of a secured party upon default is to "repossess" tangible collateral. Once again, although Sec. 9-609 does not define what it means for the secured party to take possession, in context it is obvious that it is referring to physical possession. For example, the secured party is also given the right to proceed "without judicial process, if it proceeds without breach of the peace." These provisions indicate that the drafters envision repossession as removal of physical custody. Probably more obviously, as an alternate to "taking possession" a secured party may "*without removal*, . . . render

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[75] As further indirect evidence that Sec. 9-204's reverences to the debtor receiving possession refers to physical custody, Sec. 2-103(1)(c) provides that, for the purposes of Article 2, "'receipt' of goods means taking physical possession of them." Official Comment 2 clarifies that this is to make clear the distinction between receipt and delivery. U.C.C. § 9-204 (2010); U.C.C. § 2-103(1)(c) (2002).

equipment unusable and dispose of collateral on a debtor's premises." (Emphasis added.) As Official Comment 6 explains, "[i]n the case of some collateral, such as heavy equipment, *the physical removal from the debtor's plant* . . . may be impractical or unduly expensive (emphasis added)." It further describes rendering equipment unusable is "in lieu of removal." That is, "taking possession" means taking physical custody.

f. Buyers in the Ordinary Course. Buyers in the ordinary course of business ("BIOC") can take the goods free of free of the rights of a person who entrusts "possession of goods to a merchant who deals in goods of that kind" under Sec. 2-403(2) and free of security interests created by the buyer's seller under 9-320. Sec. 1-201(a)(9) which defines BIOC's clarifies that:

> Only a buyer that *takes possession of the goods* or has a right to recover the goods from the seller under Article 2 may be a buyer in ordinary course of business. (Emphasis added.)

To make this point even clearer, Sec. 9-320(e) provides that the BIOC rule of 9-320(a) "do[es] not affect a security interest in goods in the possession of the secured party under Section 9-313." As Official Comment 8 states, these provisions were added in large part to overrule the notorious *Tanbro* case in which a buyer was found to be a BIOC who took free and clear of a prior-in-time security interest perfected by filing despite the fact that, not only did the buyer *not itself* take physical custody of the collateral, the secured party remained in physical custody of it![76]

Once again, in context, "possession" implicitly means physical custody. This is also seen in Section 9-403(3)'s definition of "entrustment" as "any delivery, and any acquiescence in retention of possession."

To summarize, although the U.C.C. never expressly defines the word "possession" read in context, with a knowledge of commercial custom and practice, the term means the fact of physical custody not the legal right to exclude others.

IV. Ostensible Ownership and "Control."

One could justifiably complain that conflation of possession with physical custody of tangible things, if ever justified in the past, is hopelessly unsophisticated and increasingly unworkable in the 21st century. Indeed, as I keep indicating, it conflates the *fact* of possession

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[76] Tanbro Fabrics Corp. v. Deering Mills, Inc., 350 N.E.2d. 590 (N.Y. 1976).

with the *legal right* of possession—the supposedly naive law person's view of property that we try to wean our students from in the first year of law school. The right of possession should be thought of as the right of a claimant to exclude others from the object of property claimed. Taking custody of tangible objects is only one way of doing this. As the Supreme Court has recognized in *Carpenter v. U.S.*,[77] when the object is intellectual property, possession should be thought of as the right of exclusive use.[78] Similarly, the word "possession" as used in New York State's Civil Practice Laws and Rules has been interpreted as meaning the right of exclusion, so that intangible property is capable of being possessed.[79] Consequently, couldn't we re-interpret the language of the U.C.C. better to serve our modern—or perhaps post-modern—economy?

I completely agree as a matter of legal theory. Indeed, my first book, *The Vestal and the Fasces: Hegel, Lacan, Property and the Feminine*[80] is an extensive argument as to why this should be the case from the position both of American law and Hegelian jurisprudence. I try to explain the tendency for this conflation through Lacanian psychoanalytic theory. I also argue that, because claims of possession are supposed to be good against "the world," that is, a large class of third parties who do not necessarily have contractual or other relations with the claimant, as a condition of enforceability they must have be publicly manifest in a way to put third parties on notice. Following Hegel, I believe that although taking or retaining physical possession might be one way of doing this, it is not the most adequate way, as it can easily be thwarted by a thief. Accordingly, public recording one's claim might be more reliable. The specific manifestation that will be recognized, however, needs to be specified by positive law.

Nevertheless, in applying commercial law we are not free to reinvent the wheel, but must interpret a given statute that was drafted in a given historical context. To reinterpret the term "possession" as used in the U.C.C. to mean the right of exclusion would affect the over one-hundred places it is used implicitly to mean the fact of physical custody.

To understand the schema of Article 9 we must consider the legacy of the doctrine of "ostensible ownership" and the concept of "control"

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77 484 U.S. 19 (1987).

78 Although in *Carpenter* the Supreme Court seemed to think that the analysis of information as property was unproblematic (484 U.S. at 25-26), in fact, as I have discussed elsewhere, its proper characterization is highly contested. Jeanne L. Schroeder, *Unnatural Rights: Hegel's Theory of Personality and Intellectual Property*, 60 U. MIAMI L. REV. 453 (2006), *reprinted in* CHRISTOPHER, YOO, COPYRIGHT (CRITICAL CONCEPTS IN INTELLECTUAL PROPERTY LAW) (2011).

79 Jeanne L. Schroeder & David Gray Carlson, *Where Corporations Are: Why Casual Visits to New York Are Bad for Business*, 76 ALBANY L. REV. 1141, 1165-66 (2013).

80 *See supra* note 45.

first added to the U.C.C. in the 1994 Revisions to Article 8. The original doctrine of ostensible ownership,[81] reflected in fraudulent conveyance law, was that any separation of claims of possession and physical custody was actually or constructively fraudulent vis a vis creditors of the non-possessory party unless it was "cured."[82] The proposition was that a potential creditor who saw a party in possession of goods could be fooled into thinking that he was the owner free and clear. If this was ever empirically the case in the 16th century when the doctrine was first propounded, it strikes me as absurd in the 21st where the separation of ownership and custody, and the ownership of intangible property that can't be held in custody, are common, if not the norm.[83]

The doctrine of ostensible ownership caused at least two problems for secured lending. Hypothecations—i.e. non-possessory security interests—and security interests in intangibles that cannot be physically possessed were problematic. The drafters of the U.C.C., seeking to make hypothecations and security interests in intangibles simple to create, wanted to solve the "problem" of ostensible ownership. They did this by allowing non-custodial security interests in many categories of collateral to be perfected by filing. Unfortunately, they continued to conflate the fact and the right of possession, and treated filing as an alternative to possession. I would say, in contrast, that all forms of perfection should it should be thought of legally recognized means of publicly manifesting or objectifying one's claim of possession.[84]

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[81] The following is an abbreviated discussion of an argument I make in Jeanne L. Schroeder, *Some Realism About Legal Surrealism*, 37 WM. & MARY L. REV. 455, 461 (1996) [hereinafter Schroeder, *Realism*].

[82] Douglas G. Baird & Thomas H. Jackson, *Possession and Ownership: An Examination of the Scope of Article 9*, 35 STAN. L. REV. 175, 210 (1983). Baird & Jackson, perhaps the most vigorous defenders of ostensible ownership analysis in modern times, would have the law extend the U.C.C.'s perfection by filing requirements to other non-custodial property interests such as leases.

[83] Schroeder, *Realism*, *supra* note 81, at 485–97. Other critics who question its empirical assumptions are Charles Mooney, Jr., *The Mystery and Myth of "Ostensible Ownership" and Article 9 Filing: A Critique of Proposals to Extend Filing Requirements to Leases*, 39 ALA. L. REV. 683 (1988) and David M. Phillips, *Flawed Perfection: From Possession to Filing Under Article 9—Part 1*, 59 B.U. L. REV. 1 (1979).

The doctrine of ostensible ownership is most explicitly acknowledged in Sec. 2-402 which, in recognizing the continuing validity of extra-code law, states:

> A creditor of the seller may treat a sale or an identification of goods to a contract for sale as void if as against him a retention of possession by the seller is fraudulent under any rule of law of the state where the goods are situated [except in certain cases involving merchant sellers].

U.C.C. § 2-402(2) (2002).

[84] Schroeder, *Realism*, *supra* note 81, at 506-08, 521-24, 533-34.

V. General Intangibles and the Law of Proceeds.

If bitcoin is neither money nor a deposit account, it can only fall within the catchall category of "general intangibles," which is defined as personal property that does not fall within any other category.[85] This categorization has the potential of negatively affecting the marketability of bitcoin.

This is because Article 9 has *no* negotiation rule for the *buyers* of general intangibles that are subject to a perfected security interest. That is, once a security interest in a general intangible is perfected, it survives even after multiple transfers to third parties. On the one hand, this may be more significant than it might appear at first blush, because if a cryptocurrency were to become widely used as either a currency or a payment system, it might implicate the proceeds provisions of Article 9. On the other hand, this problem might be mitigated by the practical problems a secured party might have in locating and garnishing bitcoin after transfer.[86]

A. Proceeds.

One of the novel aspects of Article 9 that distinguishes security interests in personal property from mortgages on real property, is the proceeds provisions that are now enumerated in Sec. 9-315. Sec. 9-315(a) states that, except as otherwise provided in Articles 9 and 2:

> (1) a security interest . . . continues in collateral notwithstanding sale, lease, license, exchange or other disposition thereof unless the secured party authorized the disposition free of the security interest . . . ; and
>
> (2) a security interest attaches to any identifiable proceeds of collateral.

Proceeds are defined in relevant part as "whatever is acquired upon the sale, lease, license, exchange, or other disposition of collateral."[87]

Sec. 9-315(c) provides that, if the security interest in the original collateral were perfected then the proceeds security interests will be temporally perfected. This temporary perfection will lapse 21 days later

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85 "General intangible" means any personal property, including things in action, other than accounts, chattel paper, commercial tort claims, deposit accounts, documents, goods, instruments, investment property, letter-of-credit rights, letters of credit, money, and oil, gas, or other minerals before extraction. The term includes payment intangibles and software.
U.C.C. § 9-102(a)(43) (2010).

86 *See infra* text at note 104-07.

87 U.C.C. § 9-102(a)(64)(A) (2010).

unless one of three conditions apply.[88] The condition that is relevant for our discussion is 9-315(d)(1), which itself has three conditions:

> (A) a filed financing statement covers the original collateral;
>
> (B) the proceeds are collateral in which a security interest may be perfected by filing in the office in which the financing statement has been filed; and
>
> (C) the proceeds are not acquired with cash proceeds.

1. Example: Buyers in the Ordinary Course. An example will show how this would work. Because Dell Computer purports to accept bitcoin for on-line purchases of computers, I will use a consumer computer company as my continuing example.[89] Suppose that Debtor has granted a security interest in its inventory to its financer—a common practice.[90] Also assume that Debtor's secured party has perfected its security interest by filing a financing statement[91] with the Secretary of State of Delaware, Debtor's jurisdiction of incorporation,[92] that satisfies the

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[88] U.C.C. § 9-315(c) (2010). In addition to the conditions of Sec. 9-315(d)(1) that I discuss in this section, these conditions are

> (2) the proceeds are identifiable cash proceeds; or
>
> (3) the security interest in the proceeds is perfected other than under subsection (c) when the security interest attaches to the proceeds or within 20 days thereafter.

U.C.C. § 9-315(d) (2010).

[89] Dell's bitcoin transactions are handled by Coinbase, a leading bitcoin wallet. Dell seems to have entered into what Coinbase calls an "instant conversion service." That is, when a merchant's customer wishes to pay in bitcoin, Coinbase will calculate the purchase price of the goods at the then prevailing conversion rate, and will transfer the customer's bitcoin into the merchant's account. Coinbase will then immediately buy the bitcoin from the merchant at the original sales price in dollars. The settlement of this dollar transfer can take two or three days. By doing so, Coinbase is protecting the merchant from any fluctuations in the conversion price. *Merchant Transaction and Settlements*, COINBASE USER AGREEMENT, (May 27, 2016), https://www.coinbase.com/legal/user_agreement#2.-merchant-transactions-and-settlement. *See* also *infra* text at notes 94-97.

[90] Other analysts have raised this issue when a debtor has granted a blanket security interest in all of its property including general intangibles. *See, e.g.*, Lawless, *supra* note 29. In such a situation, I think it is more likely that a debtor might realize that the security interest includes cryptocurrency.

[91] Filing is the appropriate perfection formality for non-possessory security interests in goods. U.C.C. § 9-310 (2010). We are also assuming that all the elements of attachment in the inventory have been met.

[92] Although the "where-to-file" rules are extremely difficult to read, basically the law of the debtor's location governs filing (U.C.C. § 9-301(1) (2010)) and a corporation is deemed located in its state of incorporation (U.C.C. § 9-307(e) (2010)). Delaware's

requirements of Sec. 9-502(a) by indicating the collateral covered. A typical indication in a financing statement would be "all inventory, whether now existing or hereafter acquired."

When Debtor sells a computer and receives bitcoin in exchange, the security interest will in most cases not continue in the computer because, as an empirical matter, the consumer will usually qualify as a BIOC who takes the computer free of the secured party's security interest under Sec. 9-320(a).

However, under the proceeds rules, the secured party will have a temporarily perfected security interest in the bitcoin received as proceeds. Moreover this security interests will continue to be perfected after 21 days because a security interest in general intangibles may be perfected by filing a financing statement with the Secretary of State of Delaware, Debtor's state of incorporation. Note that this is the case even though the financing statement does not refer to general intangibles, let alone bitcoin. That is, 9-315(d) is an anomaly to the general rule that perfection by filing puts lenders and other potential claimants on notice by indicating the collateral covered by a secured party's security interest.[93]

U.C.C. provides that financing statements with respect to non-real-property-related are to be filed with the Secretary of State. Del. Code. Ann. tit. 6, § 9-501(a)(2).

[93] This is not as big a loophole to the notice-filing regime as it might seem, because it is mitigated by U.C.C. § 9-315(d)(1)(c), which provides that this section does not apply if there are intervening cash proceeds. That is, if a debtor sells collateral and receives cash proceeds—that is "money, checks, deposit accounts, or the like" (U.C.C. § 9-102(a)(9) (2010))—and uses the cash proceeds to buy something else—say equipment—the secured party will obtain an automatically attached and temporarily perfected security interest in the equipment as proceeds of proceeds. However, this time, the automatic perfection lapses after 20 days unless the financing statement correctly indicates the collateral. To maintain continuous perfection, the secured party must perfect the proceeds of proceeds by another means. For example, if the financing statement says "inventory," the secured party would either have to take possession of the equipment or file a new financing statement indicating the new collateral.

Because of this, the anomaly can be expected to cause relatively little confusion as an empirical matter. When one sells inventory, for example, the usual proceeds that would be generated would be cash proceeds or various categories of rights to payments, such as accounts or chattel paper. U.C.C. Sec. 9-315(d), in effect, gives rival claimants notice that the indication of collateral in a financing statement automatically includes cash proceeds and rights to payment. The most common exception to this would be when the debtor makes a like-kind exchange, such as when a debtor, which is a car dealership, accepts a trade-in as part of the purchase price of a new car. As the trade-in will, in most cases, be placed in the dealership's inventory, a financing statement that says "inventory" would satisfy the notoriety concern of perfection. The odd hypotheticals that haunt our casebooks, such where a car dealer swaps a car in inventory for a computer that is used as equipment (*see, e.g.*, STEVEN L. HARRIS & CHARLES W. MOONEY, JR., SECURITY INTERESTS IN PERSONAL PROPERTY; CASES, PROBLEMS AND MATERIALS 211 (5th ed.

2. Transfer of Bitcoin as Proceeds. So far, this is not problematic. Indeed, this is how Sec. 9-315 is supposed to work. It is the next likely transaction that raises issues. Debtor now takes its bitcoin proceeds and uses them to acquire something else. As a matter of fact, to date most sellers, like Dell, actually use bitcoin more as a gimmicky payments system and as a way of lowering transaction fees, rather than as a currency. By this I mean that Dell does not designate the price of computers in bitcoin, but in dollars. Nor does it hold significant amount of bitcoin at any time. If a consumer wishes to pay the price in bitcoin, the price in bitcoin will be calculated on checkout at the then prevailing market rate.[94]

Dell processes its bitcoin sales through Coinbase, a bitcoin wallet and exchange.[95] Coinbase will transfer bitcoin from a customer's account into an account Dell maintains at Coinbase. Coinbase then immediately buys back the bitcoin from Dell by transferring to Dell an amount equal to the original purchase price of the goods (minus a fee) payable in dollars.[96] The original security interest will automatically attach and perfect first to the bitcoin as proceeds and, upon Coinbase's purchase of the bitcoin, to the dollars credited to Dell as "proceeds of proceeds." The status of the proceeds of proceeds are beyond the scope of this Article.[97]

2011)) is presumably deemed so unusual that the drafters decided that it could be tolerated as *de minimis*.

[94] According to Dell's website, the price in bitcoin is only held open for 10 minutes. *Bitcoin Terms and Conditions, Paying with Bitcoin*, DELL http://www.dell.com/learn/us/en/uscorp1/campaigns/bitcoin-terms-and-conditions (last visited Jan. 16, 2016).

[95] *Id.*

[96] *Money* reporter John Davidson suggests that it might be the case that Dell never actually takes title to the bitcoin, but that Coinbase buys the bitcoin from Dell's customer and then pays Dell the dollar value. Jacob Davidson, *No, Big Companies Aren't Really Accepting Bitcoin*, MONEY (Jan. 9, 2015), http://time.com/money/3658361/dell-microsoft-expedia-bitcoin/.

This seems to be incorrect. Coinbase's user agreement states that it transfers customer's a customer's bitcoins into the merchant's account. *See supra* note 89. What does seem to be correct, is that because Dell apparently uses Coinbase's instant conversion service, Dell does not hold any significant amount of bitcoin and is not using it as either a unit of account or a store of value.

In contrast, Overstock indicates that it does hold 80% of the bitcoin it receives in payment. Davidson, *supra*.

[97] It is not clear how to characterize this so long as these "dollars" are held in an account at Coinbase. This would only be a deposit account if Coinbase were a "bank" defined in Sec. 1-201(a)(4) as "a person engaged in the business of banking an includes a savings bank, savings and loan association, credit union and trust company." It is doubtful if Coinbase so qualifies, in which case Dell's claim against Coinbase would broadly fall would be a general intangible. A possible alternative, discussed below (*see infra* text at note 149) that if Coinbase could qualify as a "securities intermediary," then Dell and Coinbase could elect to have the funds in the account treated as a "financial asset."

Our concerns are the rights of the bitcoin wallet that purchased Debtor's bitcoins. Under Sec 9-315(a), the security interest continues in the bitcoins unless the secured party consents to the transfer or an exception applies. The problem is that *there is no negotiation exception for buyers of general intangibles.* Moreover, the security interest will continue in the bitcoins when the bitcoin wallet sells them to another party, and when that party transfers them *ad infinitum*.

3. Negotiation Rules for General Intangibles. Article 9 does have one negotiation rule for perfected security interests in general intangibles. Unfortunately, it would not apply to buyers (or donees) of bitcoin. Sec. 9-321(b) provides that"

> A licensee in ordinary course of business takes its rights under a nonexclusive license free of a security interest in the intangible created by the licensor, even if the security interest is perfected and the licensee knows of its existence.

Obviously, as noted in Official Comment 2, this is based on the long-standing rule of 9-320(a), discussed above, protecting buyers of goods in the ordinary course of business.[98]

The obvious problem here is that the person acquiring the bitcoin from Debtor in my hypo—or for that matter, in any other transaction in which bitcoin is being used as a cryptocurrency or payment system—is not a "licensee." What this section seems to contemplate are transactions in software or other intellectual property which are also included in the catchall category of "general intangibles." Except when the owner of such intellectual property is selling or otherwise transferring 100% of its interest, a transferee will be a licensee of the property. For example, although I might speak colloquially of "buying" and downloading the newest version of WordPerfect for my computer, or an app for my phone, I am actually acquiring a non-exclusive license in the software or app. Sec. 9-321(b) assures me that if Corel were to grant a security interest to a secured party in its rights to WordPerfect, and then defaults on the secured transaction, I do not need to worry that the secured party

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[98] "licensee in ordinary course of business" means a person that becomes a licensee of a general intangible in good faith, without knowledge that the license violates the rights of another person in the general intangible, and in the ordinary course from a person in the business of licensing general intangibles of that kind. A person becomes a licensee in ordinary course if the license to the person comports with the usual or customary practices in the kind of business in which the licensor is engaged or with the licensor's own usual or customary practices.

U.C.C. §. 9-321(a) (2010).

would have the right to remove my copy of WordPerfect on my computer.

4. Adequacy of Filing after Transfer. Those who are not intimately familiar with Article 9's transfer regime, might assume that the financing statement that perfected the security interest granted by the original debtor should not be adequate to perfect a security interest once the collateral is owned by a subsequent transferee with a different name and located in a different jurisdiction. After all, if a creditor of the transferee were to search the public record in the transferee's name in the transferee's jurisdiction it would not be able to learn of the existence of the continuing security interest. This assumption is incorrect. To understand why we need to take a detour through the perfection formalities of Article 9.

Sec. 9-502 sets forth the "big three" requirements for information that must be set forth in a financing statement: the name of the debtor; the name of the secured party or its representative; and an indication of the collateral. We have already discussed the anomaly that in some circumstances a financing statement is adequate to perfect a security interest in proceeds despite the fact that the description is no longer accurate. More important for our discussion is the fact that a financing statement may remain adequate to perfect a security interest after disposition despite the fact that the name of the debtor is incorrect.

Sec. 9-507(a) provides:

> A filed financing statement remains effective with respect to collateral that is sold, exchanged, leased, licensed, or otherwise disposed of and in which a security interest . . . continues, even if the secured party knows of or consents to the disposition.

Sec. 9-508(c) further clarifies that the provisions of Article 9 relating to when the name of a debtor becomes seriously misleading so that a financing statement needs to be amended to *not* "apply to collateral as to which a filed financing statement remains effective against the new debtor under 9-507(a)." Rather Sec. 9-508 anticipates circumstances in which the original debtor changes its name or undergoes a change in business structure, such as a merger.

This would seem to be an even greater deviation from the principle that perfection is supposed to put potential creditors, purchasers and other persons on notice of the existence of a security interest. Here, checking the public file under the transferee's name will not reveal the existence of any security interest. As Official Comment 3 to Sec. 9-507(a) states:

> any person seeking to determine whether a debtor owns collateral free of security interests must inquire as to the debtor's source of title and, if circumstances seem to require it, search in the name of a former owner.

This rule, apparently, is designed to mediate between the necessarily inconsistent policies of notice to the world and protection of secured parties. The concern is that it would be too easy for a dishonest debtor to defeat the rights of its secured lender if it could unilaterally destroy perfection by transferring collateral to another person. Historically, this rule probably did not overly burden potential creditors or purchasers because, empirically, the most likely transaction involving collateral that can both be perfected by filing and also not be protected by a negotiation exception (so that the security interest would continue despite disposition) would be the resale of used equipment. If so, Sec. 9-507(a) would only require a relatively small class of potential buyers and creditors to include an investigation of provenance, in addition to a search of the files, as part of their due diligence in deciding whether to buy, or make a loan secured by, used equipment. This seems even more the case when one considers that large swaths of equipment that would expected to retain sufficient value after transfer to justify tracing—for example, motor vehicles, airplanes and boats—are subject to *extra-U.C.C.* registration systems under which title can be traced.

5. Example: Continuous Perfection Despite Transfer. Let's return to our example once more. Debtor has granted a security interest in its inventory to secured party, "Bank." Bank files a financing statement with the Secretary of State of Delaware indicating the collateral as "inventory" and identifying the debtor as "Debtor Inc.," its corporate name as specified in its charter. Assuming that the other elements of attachment and perfection have been met, Bank would have a perfected security interest in Debtor's current inventory.

Debtor then sells computers and related equipment to a small business that pays in bitcoins having a then market value of $20,000 dollars. As discussed in the last section, the buyer will almost certainly be a BIOC that will take free of Bank's security interest. Bank, however, will now have a perfected security interest in the $20,000 of bitcoin (the "encumbered bitcoin").

Debtor immediately turns around and sells the encumbered bitcoin to Dealer for $20,000 (minus an exchange fee). Because there is no negotiation exception for general intangibles, Bank still has a perfected security interest in the encumbered bitcoin in Dealer's "hands."[99]

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[99] Bank now also has a security interest in the funds in the deposit account as cash proceeds of the encumbered bitcoin, but that is beyond the scope of this article.

Dealer now takes the encumbered bitcoin and sells it to Transferee. Transferee also takes the encumbered bitcoin subject to Bank's perfected security interest. This will continue *ad infinitum* until Bank's original financing statement lapses in the ordinary course *despite the fact that the financing statement continues to list Debtor Inc. as the debtor, indicates that the collateral is inventory, and is filed in Delaware regardless of where the owner of the encumbered bitcoin is located at least for a substantial period of time.* As discussed in paragraph 7, the somewhat good news is that perfection will eventually lapse if the location of the new debtor is different from that of the original Debtor.

6. Future Advances. This rule is particularly harsh when one considers Article 9's future advance rules. For example, in my recurring hypothetical, imagine that on day 1 when it files its financing statement, Bank has only lent $5,000 to Debtor. Presume, also, that the security agreement between Debtor and Bank provides that the collateral shall secure all indebtedness whether existing now or incurred in the future. After Dealer sells the encumbered bitcoin to Transferee, Bank lends Debtor an additional $1 million dollars. The encumbered bitcoin secures *the entire amount of this second loan*. Moreover, in the event of a default, Bank has no duty to marshal assets and foreclose first on other collateral still held by Debtor, but may proceed against Transferee to foreclose on *its* encumbered bitcoin.

Sec. 9-323, which mitigates the harshness of the future advance priority rules, will give little solace to the potential bitcoin market. It contains exceptions for rival secured parties when the security interest is perfected by automatic or temporary perfection, for lien creditors, for buyers of receivables, chattel paper, payment intangibles or promissory notes, for consignees, and for buyers and lessees of goods. One class of transferees who are notably absent from this list of protected transferees are buyers of general intangibles that are perfected by filing! That is, in my hypo, poor Transferee would find that its encumbered bitcoin is security not just for the $5,000 of secured loans outstanding on the day it acquired the encumbered bitcoin, but the entire $1,005,000 that Debtor owns Bank.

7. *Lapse Upon Change of Jurisdiction.* Some relief for purchasers of general intangibles is offered by Article 9's baleful choice-of-law rules for filing if the purchaser is deemed to be located in a different jurisdiction from the original debtor. This is because perfection by filing in the original jurisdiction will eventually lapse if not reperfected in the new jurisdiction. The relief this might offer may, unfortunately, be limited by the odd phenomenon of what I call "rolling continuous perfection" that I discuss in the next subsection.

The labyrinth that is Article 9's filing rules results from the fact that filing is made at the state, and not the national level. Although vastly simplified in the 1999 revisions, these rules remain fairly mysterious to the neophyte since they are located in Article 9's confusingly drafted choice-of-law rules. Despite the opacity of the statutory language, however, the basic rule for general intangibles is fairly clear. Pursuant to Sec. 9-301(1), "while a debtor is located in a jurisdiction, the local law of that jurisdiction governs perfection, . . . " For example, if a debtor is located in Delaware, then Delaware law governs perfection of a security interest in a general intangible. If one were to consult Delaware's version of the U.C.C. one would find that in order to perfect a security interest in a general intangible, one would have to file a financing statement with the Secretary of State of Delaware.[100] We will discuss what it means for a debtor to be located within a jurisdiction shortly.

The rules as to when perfection of collateral transferred to a new debtor lapse fall within Sec. 9-316, which governs changes in governing law. Specifically Sec. 316(a) provides:

> (a) A security interest perfected pursuant to the law of the jurisdiction designated in Section 9-301(1) . . . remains perfected until the earliest of:
>
> > (1) the time perfection would have ceased under the law of that jurisdiction;
> >
> > (2) the expiration of four months after a change of the debtor's location to another jurisdiction: or
> >
> > (3) the expiration of one year after a transfer of collateral to a person that thereby becomes a debtor and is located in another jurisdiction.

Secs. 9-316(h)(2) and (i)(2) tells us that if the security interest is not reperfected before such times, then "it becomes unperfected and is deemed never to have been perfected as against a purchaser of the collateral for value."

Understand what this means in our example. Day 1, Debtor sells encumbered bitcoin to Buyer. Buyer takes the bitcoin subject to the security interest granted by Debtor, and remains so subject even after perfection lapses. Consequently, if Debtor defaults in its secured obligation, Secured Party can foreclose on the encumbered bitcoin if it were still owned by Buyer. If perfection lapses under these provisions, however, then secured parties, buyers and other persons who might

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[100] Del. Code. Ann. tit. 6, § 9-501(a)(2).

purchase the encumbered bitcoin will take free of the security interest. Donees and lien creditors who acquire the encumbered bitcoin before the lapse of this period would take subject to the security interest, however.

Let us look at the provisions of 9-316(a) seriatim. Subsection 9-316(a)(1) is simple. The basic rule of Sec. 9-515(a) is that a financing statement has a five-year duration, unless it is extended by filing a continuation statement. 9-316(a) merely clarifies that the effectiveness of a financing statement is not extended upon transfer of the collateral. For example, if a financing statement were filed against Debtor, with respect to collateral on July 1, 2011, it will expire on June 30, 2016 unless a continuation statement is filed before the termination date. If Debtor transferred the encumbered bitcoin to buyer on June 29th, then the financing statement will expire on the next day, and will not be entitled to the grace periods of the other two subsections of 9-316(a).

Sec. 9-316(c) also seems fairly straightforward (although I will add a complication in the next subsection). Suppose that the encumbered bitcoin is perfected by the filing of a financing statement against Debtor in the state of Delaware (its location) on July 1, 2016. On July 2, 2016, Debtor sells the encumbered bitcoin to Buyer, who is located in New York. Unless the security interest is reperfected in New York by July 1, 2017, the security interest will not merely become unperfected after that date, it will retroactively lapse, but only with respect to purchasers who acquire the encumbered bitcoin for value.

Sec. 9-316(a)(2) might, at first blush, not seem to be relevant to our hypothetical since it refers to changes in the *debtor's* location, not transfer of the collateral. This is not quite correct, but to understand why, one must look to Article 9's definition provisions. Sec. 9-102(a)(28)(A) defines "Debtor" as "a person having an interest, other than a security interest or other lien, in the collateral, whether or not the person is an obligor." In other words, the term "debtor" is not limited to the original person who entered into the security agreement, but also includes any person who subsequently acquires encumbered collateral from the original debtor.

To go back to our example, on July 2, Debtor sells the encumbered bitcoin to Buyer who, this time, is located in Delaware at the time of the purchase. The one-year limitation of 9-316(a)(3) would not apply, the financing statement would remain in effect, and the security interest would remain perfected for the balance of the financing statement's five-year duration. If, however, Buyer were to change its jurisdiction by moving to New York on September 1, 2016, then Sec. 9-316(a)(2)'s four-month period would begin to run and the financing statement would expire on December 31, 2016 (unless the security interest is reperfected during this period).

But for the strange possibility of continuous "rolling continuous perfection" to which I will turn shortly, Sec. 9-316 would seem to have the possibility of freeing up encumbered bitcoin in a significant percentage of cases. This is because the transferee will often be located in a different location from the original debtor against whom a financing statement is filed.

The rules for determining the location of a debtor are set forth in Sec. 9-307 and are fairly clear, at least with respect to U.S. persons. Businesses that are formed by filing with a state—such as corporations, limited partnerships and limited liability companies[101]—are located in their state of organization.[102] Consequently, in my continuing example, Debtor, a Delaware corporation, is located in Delaware, and Delaware's U.C.C. provides that financing statements must be filed with the Secretary of State of Delaware. Sec. 9-307(b)(1) provides that individuals are located at their principal residence, and other businesses are located at their chief executive offices. The rules for foreign businesses are somewhat more complicated but do not concern us now. The point is, that if encumbered bitcoin were to be used to pay for goods and services, it is highly likely that the recipient of the bitcoin would, under these rules, often be located in another jurisdiction,[103] in which case it would seem like perfection should lapse in one year.

8. Rolling Continuous Perfection. Unfortunately, what the U.C.C. gods giveth, they often taketh away. If bitcoin would ever truly become a payment system, the lapsing perfection rule of Sec. 9-316 that I just described could be undone by what I will call the "rolling continuous perfection" aspects of Sec. 9-316's grace periods.

This is an oddity that, until I started analyzing bitcoin, I had thought only posed problems under the pre-1999 versions of Article 9, which generally provided that the filing location for the perfection of security interests in goods was the state where the goods were physically located. I used to push my students in their understanding of the filing regime by

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101 U.C.C. § 9-102(a)(71) (2010).

102 U.C.C. § 9-307(e) (2010).

103 One might be tempted to worry that, insofar as businesses are often the counterparty in financial and other business transactions that therefore, transferees of bitcoin will likely be located in Delaware, the premier state of incorporation. This is probably incorrect as an empirical matter. According to *The Wall Street Journal*, 54% of public companies are incorporated in Delaware, although the percentage has been rising over the last decade. Liz Hoffman, *Dole and Other Companies Sour on Delaware as Corporate Haven*, WALL ST. J. (Aug. 2, 2015), http://www.wsj.com/articles/dole-and-other-companies-sour-on-delaware-as-corporate-haven-1438569507. But this means that a large number of publicly traded corporations are elsewhere. Moreover, in my experience, the vast majority of private corporations, L.P., and L.L.C.'s are organized in the states where their primary place of business is located, i.e. not Delaware.

proposing hypotheticals, based on some early cases, where collateral was repeatedly relocated between different jurisdictions. My hypotheticals were designed as exceptions to prove the rule—that is, bizarre anomalies that illustrated how the rule nevertheless worked smoothly in the vast majority of case. Unfortunately, the so-called exception could, in fact, be common in the case of bitcoins if it were ever actually to become a payment system.

Let us go back to my hypothetical. Debtor grants a security interest in its inventory pursuant to an authenticated security agreement containing an appropriate description of the collateral. On January 2, 2016, Secured Party perfects by filing a financing statement in Delaware (Debtor's state of incorporation) naming Debtor as debtor and indicating the collateral as "inventory." Debtor sells inventory in exchange for bitcoin. The security interest automatically attaches and perfects in the bitcoin as proceeds. On July 1, 2016, Debtor uses the encumbered bitcoin to purchase goods and services from Buyer. Buyer takes the encumbered bitcoin subject to Secured Party's perfected security interest. However, because Buyer is located in New York, perfection of the security interest is scheduled to lapse on June 30, 2017, pursuant to Sec. 9-316(a)(3). However, on June 29, 2017, Buyer transfers the encumbered bitcoin to Transferee, a purchaser for value, which is located in New Jersey. One might suppose that perfection of the encumbered bitcoin, now owned by Transferee, will lapse on June 30, 2017. This is incorrect. The copula of Sec. 9-316(a) refers to the continuance of a security interest that is originally perfected, and the three rules of the subsections refer to when the perfection lapses. Consequently, on June 29, 2017, when Buyer transfers the encumbered bitcoin to Transferee, the security interest remains perfected because the grace period of Sec. 9-316(a)(3) had not yet expired. Consequently, pursuant to the express language of Sec. 9-316(a)(3), upon the transfer to Transferee, *a new one-year grace period would begin running*. The same thing would happen every time a new transfer occurs until the fire-year life of the original filing finally elapses.

On the one hand, if bitcoin were ever to become generally used as a "currency" or payment system, we would expect to transfers—and, therefore, the recommencement of the Sec. 9-316(a) to become the norm, not the exception, so that proceeds security interests in bitcoins as proceeds would potentially limit their negotiability and, therefore, utility as a payments system. On the other hand, these limitations on negotiability would be expected to negatively affect the utility of bitcoin as a currency or a payment system.

B. Implications.

The bitcoin neophyte might be tempted to think that this is only a theoretical problem. Aren't bitcoins famously anonymous? Won't encumbered bitcoins simply disappear into cyberspace after they are transferred? This implies that the secured party might continue to have a security interest in an encumbered bitcoin, but it will never be able to find it as a practical matter.

This is a serious misconception. As Blythe Masters asserts, one of the advantages of using the blockchain protocol for the settlement of financial transactions is that bitcoin is *more*, not less transparent than conventional payment systems. Hand-to-hand money is rarely traceable—most bills are not "marked" and only Scrooge McDuck memorizes the serial numbers of his dollar bills. Funds deposited into commingled deposit accounts are not even theoretically traceable—so-called tracing "rules" are actually equitable tracing "fictions." Despite our inadequate and outdated vocabulary for traditional monetary transactions, there is no such thing as an identifiable dollar held in a deposit account.

In contrast, bitcoin transactions are infinitely traceable.[104] As discussed above,[105] the defining characteristic of all bitcoin "currencies" is the blockchain, which prevents counterfeiting and double-spending. Each bitcoin transaction is unique and identifiable and all transfers are recorded. Accordingly, ownership in bitcoin is, therefore, not truly anonymous, but can be pseudonymous. Although the secured party may have difficulty identifying many owners of an encumbered bitcoin, it will always be able to identify the encumbered bitcoin itself. Consequently, if the original debtor defaults on the secured transaction, and the unencumbered bitcoin ever comes into the hands of an identifiable transferee, then the secured party would have the right to "repossess" it. Consequently, one of the advantages of using the blockchain for the transfer of value is that does away with the confusing *metaphors* of tracing rules that apply to deposit accounts and replace them with the reality of actual tracing.[106]

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104 Casey, *supra* note 19.

105 *See supra* text at notes 34-42.

106 Some, including prominent bitcoin lawyer and proponent, Patrick Murck, have suggested that bitcoins are not traceable after disposition because of its very technology. https://cyber.law.harvard.edu/events/luncheon/2015/10/Murck. To oversimplify his argument, each bitcoin is unique in the hands of each owner so that although bitcoin transfers are traceable, the bitcoin itself is not because it is not a coin. I agree with George Fogg (*supra* note 29, at 3), that a court would not accept this argument because the value transferred can be readily identified through traditional equitable tracing principles.

Moreover, as discussed above,[107] both FinCEN, under the Bank Secrecy Act, and New York State, under its so-called bit-license rules, impose informational gathering and reporting rules with respect to bitcoins that will increase the practical identifiability of bitcoin owners. For example, Coinbase, the bitcoin wallet that Dell uses, is registered with FinCen as a Money Service Business.[108] Here there may be a chicken-and-egg issue. The more that bitcoin becomes a mainstream payment system, the more likely that the ownership of bitcoin will be identifiable, making Article 9's proceeds rules more problematic. However, the problems of Article 9's proceeds rules may be a factor in keeping bitcoin from becoming a mainstream payment system. Accordingly, for bitcoin to meet its potential, it might be necessary to amend Article 9 to create a super-negotiation rule for cryptocurrency analogous to the super-negotiable regimes of money, deposit accounts and investment property.[109]

VI. Amending Article 9.

A. Security Interests.

Article 9 would have to be amended to add a super-negotiation regime if bitcoin were to be truly successful as a cryptocurrency and a payment system. This would require four primary elements: (i) a definition of a cryptocurrency; (ii) the super-negotiation rule itself; (iii) a definition of "control" with respect to cryptocurrencies; and (iv) priority rules with respect to security interests in cryptocurrencies.[110]

1. Definition. Definition of a cryptocurrency could be a delicate matter.[111] Although the blockchain was originally created to prevent the

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Murck also thinks that courts should find that transferred bitcoin become disencumbered upon transfer by common law analogy to the law of deposit accounts, investment securities (which, I believe he mis-characterizes, applying the rule of Sec. 8-502 applicable to securities entitlement to certificated securities), and the notoriously inconsistent common law of the confusion of goods. As I indicate throughout this article, although I agree with his intuition that it would probably be a good commercial policy for society to adopt a negotiation or super-negotiation rule for cybercurrencies, the problem is that the law of general intangibles is governed by the U.C.C. and not common law principles. This is why I argue that the U.C.C. should be amended.

107 *See supra* text at notes 43-45.

108 *See generally MSB Registrant Search Web* Page, FINCEN, http://www.fincen.gov/financial_institutions/msb/msbstateselector.html (last visited Jan. 17, 2016).

109 *See infra* text at note 110-16.

110 Numerous conforming amendments would also be needed to other provisions in Article 9 to reflect these changes. For example, Sec. 9-203(b)(3)(D) should be amended to add control of a cryptocurrency as a permitted attachment formality.

111 FinCEN, in its "Guidances," uses the term "decentralized virtual currency." *See, e.g.*, DEP'T OF THE TREASURY FIN. CRIMES ENFORCEMENT NETWORK, FIN-2013-G001,

counterfeiting and double-spending of bitcoin, its potential uses are not so limited. As I discuss in Part 3, it can be used for the issuance and transfer of uncertificated securities. Others foresee yet other applications. For example, Ethereum is exploring the development of applications as diverse as self-executing smart contracts and ownership registration systems for assets.[112] Consequently, the drafters would have the difficult task of drafting a definition of cryptocurrency that is flexible enough to include the evolution of future payment systems, but not so broad as to sweep in other uses of the blockchain which will probably require their own rules. For example, just because the ownership of uncertificated securities and perhaps other property could be recorded on a blockchain, this should not bring them under the definition of cryptocurrency, rather than investment securities.

If Article 9 were to be amended, this would be an excellent opportunity to also clarify that the term "money" in Sec. 1-201(a)(24) as intended only to cover tangible money (i.e. notes and coins), and to add a new category of cryptocurrency. Moreover, this new category of money should be added to the definition of "cash collateral."

2. Super-negotiability. Drafting the super-negotiation rule itself would be the easiest part of the task. A subsection (c) could be added to Sec. 9-332 that might read:

> (c) [**Transferee of cryptocurrency**]. A transferee of cryptocurrency takes the cryptocurrency free of a security interest unless the transferee acts in collusion with the debtor in violating the rights of the secured party.

3. *Control.* In most of my discussion of bitcoin under Article 9 I have concentrated on the power of a transferee to take free and clear of a security interest. However, if it is to function like a currency, it is equally important that we need to provide a mechanism by which a secured party can obtain and protect a security interest in bitcoin by preventing the transfer that would create the possibility of a priority dispute in the first place. That is, as the drafters of the 1994 and 1999 revisions of the

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GUIDANCE: APPLICATION OF FINCEN'S REGULATIONS TO PERSONS ADMINISTERING, EXCHANGING, OR USING VIRTUAL CURRENCIES (2013). I have deliberately chosen to use the term "cryptocurrency" in this article because I am not taking a position as to whether FinCEN's definition, which is designed for the purpose of determining the application of the BSA to blockchain payments would make a good starting place for developing a definition for the very different purposes of formulating conveyancing rules under the U.C.C.

[112] ETHEREUM, https://www.ethereum.org, (last visited Jan. 17, 2016).

U.C.C. realized, "control" is the necessary corollary to a super-negotiation regime.

Looking to the control concept of Articles 8 and 9 suggests practical ways that a secured party of a debtor that has a direct interest in bitcoin could protect itself from further transfer as a *practical* matter. That is, control of intangibles (like possession of tangibles) minimizes the possibility that rival second-in-time property interest will ever arise.

First, and most simply, the debtor could transfer the bitcoin to the secured party—just as control of securities entitlements and deposit accounts can be established by transferring the accounts to the secured party.

Alternately, as discussed,[113] the transfer of bitcoin requires the use of two "keys"—a "public" key that everyone in the blockchain can see to verify the ownership of an individual bitcoin, and a "private" key known only by the owner. If the private key were to be transferred to the secured party then the security would have the ability to transfer the bitcoin. This transfer of the private key could also be made an attachment or perfection formality under Article 9 as a technical legal matter.

Finally, the problem with this form of "control" is that, although the secured party can now transfer the encumbered bitcoin, so can the debtor. That is, giving the private key to the secured party does not destroy the debtor's knowledge of the private key. Consequently, perhaps a third form of control would be the creation of a new private key that would not be known by the debtor.

In the meantime, a secured party who does wish to take a security interest in bitcoin, under the current regime, would be well-advised to take similar actions to protect its rights as a practical matter to prevent transfer, even though it would not constitute "control" for the purposes of attachment and perfection purposes. Although I have emphasized that each individual bitcoin is infinitely traceable on the blockchain, and that transferees are merely pseudonymous, as a practical matter, a secured party may have difficulty finding a transferee and garnishing an encumbered bitcoin as a practical matter. However, the secured party would still have to obtain an authenticated security agreement and file a financing statement for its security interest to attach and perfect so long as bitcoin continues to be characterized as a general intangible.

4. *Priority.* Another innovation of Article 8's indirect holding regime that was extended to other forms of intangibles, under Article 9, was a deviation of the traditional first-to-file-or-perfect priority rule with a hierarchical priority regime. As I shall discuss, the rule of Sec. 9-328 with respect to investment property replaces the traditional first-to-file-

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[113] *See supra* text at note 41.

or-perfect priority rule with a more complex hierarchical one.[114] That is, some forms of perfection are more powerful than others. Sec. 9-327 contains a similar priority rule with respect to deposit accounts, namely, a security interest in a deposit account held by the bank at which the deposit account is maintained, is prior to all other secured parties unless the rival has obtained control by having the account transferred into its name under Sec. 9-104(a)(3). Secured parties who have control are prior to security interests perfected by some other means.[115] The first-to-file-or perfect only applies between secured parties who perfect by the same means.

An analogous rule could be added for priorities in cryptocurrencies. Adding "control" as an attachment and perfection formality with respect to cryptocurrencies does not mean that we should eliminate the option of perfection by filing. To do so would prevent a proceeds-security interest from lapsing in 21 days under 9-315(d). This rule would no longer be pernicious if there were a super-negotiation rule and if a security interest perfected by filing were subordinate to one perfected by control. It would probably not be necessary to add a rule for security interests taking by intermediaries because[116] indirectly held bitcoin would more appropriately be characterized as financial assets under Article 8.

B. Filing.

One last thought before concluding. Ethereum among others, contemplate that the blockchain can be used for many other applications in addition to currency and payments. One of these is as a decentralized title recording system.[117] Accordingly, it could be used to create one of the goals of secured lending—namely a single, national, searchable, filing system for all debtors that could replace the present state-by-state system. That is, financing statements could be filed on a blockchain.

Once an appropriate protocol is developed, a state or group of states could begin using a blockchain filing system without amendment to

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114 *See infra* text at note 151-57.

115 Because first-generation security interests in deposit accounts can only be perfected by control (U.C.C. § 9-312(b)(1)), as a practical matter this only applies to rival second-generation security interests in proceeds deposited in a deposit account perfected under U.C.C. § 9-315(d)(2) (2010).

116 *See supra* notes 114-15, in this section, for more detail.

117 Judith Alison Lee et. al., *Blockchain Technology and Legal Implications of 'Crypto 2.0*', BNA'S BANKING REPORT (March 31, 2015), http://www.gibsondunn.com/publications/Documents/Lee-Long-Blockchain-Technology-BNA-Banking-03.31.2015.pdf.
Indeed, the country of Hondoras, is exploring using blockchain technology to replace its dysfunctional land registry. *The Great Chain of Being Sure About Things*, THE ECONOMIST (Oct. 31, 2015), http://www.economist.com/news/briefing/21677228-technology-behind-bitcoin-lets-people-who-do-not-know-or-trust-each-other-build-dependable.

Article 9. Although Part 5 of Article 9 refers in several places to a filing office (see e.g. 9-501(a)), there is no reason under the language of the U.C.C. that a state's filing office, usually the Secretary of State, could not establish a blockchain recording system to that recording on the blockchain would constitute filing with that office under Part 5.[118] Similarly, there is no reason why Sec. 9-519's requirements for numbering, maintaining and indexing records and communicating information provided in records could not be met through an electronic ledger system, including one maintained by a third party contractor. If anything, such a system could probably be made more efficient and accurate than systems currently in place.

Moreover, states need not fear that single system would eliminate the filing fees that they currently collect—a concern that could be an impediment to having states adopt the amendments. We could continue the practice whereby a filing fee must be paid to the state of the debtor's location. A "smart" blockchain ledger could be programmed to allow secured parties to automatically transfer filing fees to the Secretary of State of the jurisdiction of the debtor's location by transferring funds on the blockchain itself.

PART 2: INDIRECT OWNERSHIP OF BITCOIN UNDER ARTICLE 8

If bitcoin constitutes a general intangible under Article 9, then it will never shed a perfected proceeds security interest no matter how many times it is transferred. Luckily, this does not mean that an encumbered bitcoin could *never* be freed from a security interest. *If* an owner of bitcoin is willing to hold it *indirectly* through a third party, *then* she could take advantage of the super-negotiation rules of Article 8.[119] This is because, if the third party qualifies as a "securities intermediary," then the holder and the securities intermediary can elect to treat bitcoin held in an account as a "financial asset."

Although, this might be a work around of Article 9 for some bitcoin owners, it would defeat one of the primary advantages of

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[118] This would likely necessitate amendments to a state's non-U.C.C. administrative laws and regulations, but that is beyond the scope of this Article.

[119] George K. Fogg of the law firm of Perkins Coie has come to a similar conclusion. Fogg, *supra* note 29, at 4-5. Professor Lawless has rejected the use of Article 8 as a means of curing the problems of the non-negotiability on the grounds that bitcoins are not securities within the meaning of Article 8. Bob Lawless, *Is UCC Article 8 Bitcoin's Savior (for Commercial Law)?*, CREDIT SLIPS (March 28, 2014), http://www.creditslips.org/creditslips/2014/03/is-ucc-article-8-bitcoins-savior-for-commercial-law.html. Although I agree with this aspect of his analysis, it does not recognize that, while not securities, bitcoin can, under the conditions I discuss, be treated as investment property.

cryptocurrencies over conventional payment systems such as checking accounts, credit or debit cards, automatic clearing house transactions, wire transfers or money transmissions. This is *precisely* the ability to engage in person-to-person transfers of value the need to use a mediating bank, broker or other institution.

However, Article 8 does potentially offer a pre-existing legal regime that might help the development of uses of the blockchain other than of conveying.

I. Article 8's History.

A. The Paper Crunch.

Article 8's indirect holding regime is as anti-intuitive as it is successful. To understand it, it is useful to consider its historical development.[120] The common law had a very difficult time conceptualizing the conveyancing of intangibles. Consequently, when stock markets started developing in the 19th century, legislative action was necessary to enable the free alienability of common stock. These early statutes analogized common stock to negotiable instruments. A stockholder's claim in the corporation would be evidenced by a unique piece of paper—the stock certificate—which could only be transferred by physical delivery accompanied by any necessary indorsements.

Actually, the system was somewhat more complex than the law of instruments. Corporate codes *also* provided that a corporation need only recognize the claims to receive dividends and to vote their securities of stockholders who are registered as owners on the corporate stock transfer ledger. For a transferee to become the record owner of the stock, it would need to deliver the stock certificate and any necessary indorsements to the corporation which would then cancel the old certificate, issue a new certificate in the name of the transferee, register the transfer on its books and deliver the new stock certificate to the transferee.[121]

Although cumbersome, this system of direct ownership seems intuitive because we have replaced an intangible—which is hard to think about—with a tangible piece of property. This makes the trading of stock feel like a simple sale of goods. It works perfectly well for privately held corporations and is therefore retained in the statute.

It also worked reasonably well until the 1960's when the average number of daily trades ballooned to 10 million, a number that seemed as

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[120] For a more detailed treatment of Article 8, *see* Schroeder, *Article 8*, *supra* note 47, and Schroeder & Carlson, *Security Interests*, *supra* note 70.

[121] For a description of traditional stock registration, *see Pierpoint v. Hoyt*, 260 N.Y. 26 (N.Y 1932).

unimaginably large then as it seems ridiculously small, today.[122] This caused the "paper crunch." The New York Stock Exchange had to close on Wednesdays so that small armies of messengers literally ran around Wall Street delivering stacks of transferred stock certificates.[123]

B. The Failed Uncertificated Security.

A committee was formed to amend Article 8 to solve the paper crunch. The drafters' solution seems almost charmingly naive from a 21st century perspective.[124] They thought that they could lessen the paper crunch by eliminating a piece of physical paper. And, *voila,* they invented the "uncertificated security" which was just that—a security that was not represented by a physical stock certificate, but only on the stock transfer books of the corporation.

The uncertificated security had a number of flaws. First, the "paper work"—understood as the procedures required to convey an uncertificated security—was more, not less, burdensome than that for traditional certificated securities.[125] Second, it lacked the intuitive appeal of certificated securities. And, third, the problem it was created to solve no longer existed by the time the 1979 amendments were promulgated.

As a result, the uncertificated security regime adopted in the 1977 revision never caught on. Even today, it is used primarily by mutual funds which shares, of course, do not trade.[126] It is true that federal debt securities, such as treasury bonds, were, and still are, issued only in book-entry form, but the Federal Reserve Bank so distrusted Article 8's regime it adopted a regulation saying that federal uncertificated securities would be *deemed* to be certificated for the purpose of Article 8![127]

As I shall discuss, in Part 3, Article 8's failed uncertificated security regime, which was reformed in 1994, may be given a new life because it permit the issuance and trading of blockchain cryptosecurities in the direct ownership regime. It is ironic that the drafters who could not understand their own present, may have ended up predicting the future.

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122 Schroeder & Carlson, *Security Interests*, *supra* note 70, at 562 n. 13.

123 *Id.*

124 Schroeder, *Article 8*, *supra* note 46, at 312 n. 42.

125 Gillette and Maher, *Revised Article 8: Issuers Beware!,* 15 U.C.C. L. J. 146, 147-48 (1982).

126 If one wants to invest in a mutual fund—the colloquial term for an open-ended investment company—one does not go into the market and buy a share from another investor. Rather one buys a share directly from the fund itself. Similarly, when one wants to divest one's interest, one does not seek to sell shares in the market, one redeems one's interest. Accordingly, the amount of assets under investment by a mutual fund grows and shrinks. This is to be contrasted a closed-ended investment company, sometimes called an exchange traded fund, in which shares are traded.

127 Schroeder & Carlson, *Security Interests*, *supra* note 70, at 560.

C. Immobilization.

To return to the 1960's, the financial industry could not wait for a drafting committee to invent a law to solve the paper crush. Rather, it developed a practical solution: immobilization. That is, it did not get rid of *paper*, it reduced paper *work*.

One benefit of this solution is that it reconciled a number of competing goals. Wall Street wants transfers to be frequent and fast. Today, the average daily trading volume on the New York Stock Exchange alone regularly exceeds 1 billion shares.[128] In contrast, corporations that have to maintain stock transfer books and send out dividend checks and proxy statements, etc. to registered owners, want transfers to be infrequent and slow. Immobilization and the use of intermediaries meets both of these needs by creating two parallel modes of owning and transferring stock: the traditional slow, direct, record ownership regime and a new, fast, indirect, beneficial ownership one layered on top of it.

Many investors have long opted to hold their shares through a brokerage account. Immobilization took this to the next level. The securities industry formed a new entity, the Depository Trust Corporation (now called the Depositary Trust & Clearing Corporation or DTCC) owned by the brokerage firms and banks that maintain securities accounts at DTCC and use its services. One of DTCC's functions was and is to physically hold stock certificates issued by corporations. Trading of pro-rata interests in this stock takes place on DTCC's computers.

Let us consider a simple example as to how this works. *X* Corp. has an initial public offering of 50 million shares of common stock. As is typical, a substantial percentage of these shares will go into the DTCC system. Accordingly, *X* will issue one or more jumbo certificates representing, let's say, 40 million shares to DTCC (actually, the name on the certificate and on the company's books will be CEDE & Co., DTCC's nominee). DTCC will keep this jumbo certificate in its vaults.[129]

DTCC will have no beneficial interest in the shares represented by the jumbo certificate. Rather the jumbo represents the aggregate shares

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[128] *Daily NYSE Group Volume in NYSE Listed, 2016*, NYX DATA, http://www.nyxdata.com/nysedata/asp/factbook/viewer_edition.asp?mode=table&key=3141&category=3 (last visited June 5, 2016). Moreover, a majority of trades in the U.S. no longer occur on the New York Stock Exchange.

[129] DTCC's vault at 55 Water Street in downtown Manhattan was flooded by the storm surge caused by Superstorm Sandy in October 2012, causing substantial damage to 1.7 million securities certificates. *Superstorm Sandy Recovery,* DTCC 2013 ANNUAL REPORT, http://www.dtcc.com/annuals/2013/superstorm-sandy-recovery/index.php (last visited June 5, 2016).

beneficially purchased by its members in the IPO. Accordingly, DTCC's records might show that 10 million shares have been credited to Goldman Sachs's securities account, 5 million to Citibank's, 1 million to Morgan Stanley's, etc.

Say I want to "buy" 100 shares of *X*. I will call up Victor, my registered representative at Morgan Stanley with which I have a securities account. He will arrange for a book entry to be made on Morgan Stanley's books crediting my account with 100 of the shares that are shown on its account at DTCC and debiting my account with the purchase price of the shares.

Notice that my purchase of shares may or may not have resulted in bookkeeping entries at DTCC's level, and certainly did not result in a transfer at the corporate level. It might be that Morgan Stanley was holding a certain number of shares of *X* stock in inventory, and transferred some of those to me. Or, it could be that another customer of Morgan Stanley wanted to sell 100 shares of *X* stock on the same day, in which case a debit would have been made in her account along with the credit to my account. DTCC would only get involved if, for example, Morgan Stanley needed to acquire 100 additional shares of X to satisfy my purchase, in which case it would have to would "purchase" 100 of the shares that another broker had "in its account" at DTCC.

In fact it is more complex in practice. Brokerages and banks do not settle their trades in real time. Rather, they and DTCC keep a running tab of all trades by its members and net them after the close of markets. Consequently, even though Morgan Stanley and its customers might in a single day sell 50,000 shares of X to Goldman Sachs and its customers, and on the same date, Goldman Sachs and its customers may sell 60,000 shares of X to Morgan Stanley and its customers, DTCC's records will only show a debit of 10,000 X shares out of Goldman Sachs's account and a credit of 10,000 X shares into Morgan Stanley's account. Now, add to this example the fact that trades are not being made between only two brokerage houses but among hundreds or thousands of brokerages and banks, and the netting becomes increasingly complex. Under current SEC regulation known as T + 3, transactions in securities must clear (i.e. all the netting must be accomplished) three business days following the date of the transaction. The Fed performs a similar function with respect to federal debt securities.

Even this abbreviated description of the indirect holding system should make a few things clear. Although I say colloquially that I own 100 shares of X stock this terminology is not technically correct. Under the federal securities laws I am only the *beneficial* owner of 100 shares of X stock. In fact, I have no direct interest, let alone record ownership, in any specific share of stock. In the parlance of the U.C.C. I have

"securities entitlement"[130] against Morgan Stanley for something, and Morgan Stanley has a securities entitlement against DTCC. Only DTCC has a claim as a stockholder of record against X under corporate law, and only DTCC is an owner of a security under commercial law. Moreover, when I buy and sell "stock," it is not merely impracticable, it is usually impossible to trace my purchase or sale to a corresponding sale or purchase by another investor or institution. Moreover, I have no relationship with DTCC—for the purposes of commercial law we are complete strangers.[131]

D. The Fall of the 1977 Revision.

The drafters of the 1977 revision to Article 8 who were concentrating on their new invention of uncertificated securities were not unaware of this development and did draft provisions purporting to govern the transfer (including the creation and perfection of security interests) in securities held in what they infelicitously called a "fungible bulk." The problem was that the drafters did not understand the implications of the points made in the previous paragraph. They analogized securities being held indirectly through brokers and DTCC to goods held by a bailee and conceptualized the relationship of me, at the bottom of this pyramid, as a principal and DTCC, as my agent even though, in fact, DTCC literally does not know that I exist. As described above in my discussion of "possession" under the U.C.C., the traditional way a secured party perfected a security interest by possession when goods are held by a bailee was by giving notice to the bailee.

Despite its woefully inadequate treatment of indirectly held securities, the indirect holding system functioned on its own for over a decade. This is because the property law of indirect securities only becomes important if a broker-dealer or other intermediary becomes insolvent and does not have sufficient securities or other assets to satisfy the claims of its customers. For example, suppose that a broker-dealer has told its customers that it is holding an aggregate of 1 million shares of *X* Corp. on behalf of all of its customers. The broker-dealer becomes insolvent and its receiver discovers that, in fact, it only holds 800,000 shares. In such a case, one would need to figure out which customers (or their secured parties) owned the shares, and which only now had an unsecured claim in the broker-dealer's insolvency proceeding.

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130 U.C.C. § 8-102(a)(17) (1994).

131 Nor do I have any relationship with *X* for commercial or corporate law purposes. The securities laws do, however, in some circumstances, require or permit *X* to recognize me as beneficial owner. This is beyond the scope of this Article.

This rarely happened because of strict regulation by the SEC, the Fed and the Securities Protection Insurance Company ("SIPC") established in 1970 under the Securities Protection Insurance Act ("SIPA").[132] To oversimplify, the regulators closely monitor the solvency of broker-dealers having retail clients. In most cases when a broker approaches insolvency, SIPC seizes the broker and sells its customer accounts to a solvent broker-dealer. As a result, the customer experiences the transaction not as an insolvency proceeding, but as corporate reorganization. In the rare cases in which the accounts cannot be transferred and there is a shortfall, SIPC will liquidate the broker-dealer, distribute investment assets pro rata to customers, and insure the existence of missing securities up to $500,000.[133]

The flaws of Article 8 were only revealed when a hole in the regulatory system was revealed. Broker-dealers who dealt solely with government securities were exempt from this regulation. When a number of these government securities broker-dealers failed in 1980's, for the first time the courts had to apply the conveyancing and priority rules of Article 8. The general consensus was that the results were unsatisfactory.[134]

II. The Current Regime.

Because of this, and a number of other events, including the so-called market "break" of 1987, and the bankruptcy of Drexel Burnham Lambert, the SEC convinced Congress to direct it to write a federal regulation of securities clearing unless state law were amended better to reflect modern practice.[135] NCCUSL appointed a committee in order to update Articles 8 and 9.[136] When the first committee proved insufficiently ambitious, a second committee was appointed to rethink the Article 8 regime entirely.

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[132] Securities Investor Protection Act of 1970, 15 U.S.C. §§ 78aaa *et seq* (amended 2010).

[133] Securities Investor Protection Act of 1970, 15 U.S.C. §§ 78fff-3(a) (amended 2010). They also guarantee cash claims up to $250,000 (subject to a cost of living adjustment). 15 U.S.C. §§ 78fff-3(d), (e). Although, brokers can file for bankruptcy under the Bankruptcy Act, under which SIPC would act as trustee, typically SIPC will exercise its power to convert the proceeding to a SIPA liquidation. Under both regimes, customers who held their securities indirectly in street name share pro rata in the securities that the broker actually holds. The difference is that, in bankruptcy, the trustee will sell the broker's holdings and distribute cash to the customer's. Under SIPA, SIPC will, to the extent practical, make distributions in kind. Schroeder, *Article 8*, *supra* note 47, at 461-60.

[134] I discuss the caselaw in Schroeder, *Article 8*, *supra* note 47, at 334-49.

[135] Schroeder, *Article 8*, *supra* note 47, at 349.

[136] *Id.*

A. Securities Entitlements.

The result was that Article 8 now has two very different sets of rules. The first, which only covers securities held directly, largely retains and clarifies the traditional rules of securities trading. I will discuss how these work with respect to uncertificated securities later in this Article.

The second, governing securities held indirectly, was written from scratch. Essentially, the new committee, unlike its predecessor, did not speculate how indirect securities holding and trading *might* work and try to develop a law by analogy. Rather, it studied what DTCC, the Fed, broker-dealers and banks actually did, and wrote a statute describing this practice.

Current Article 8 rejects the assumption of old Article 8 that investors owned securities held indirectly, by analogy to bailments. The investor holding indirectly is now not conceptualized as the security holder at all. She is now an "entitlement holder"[137] who has a "securities entitlement" against a "securities intermediary"[138] with maintains a "securities account."[139] A securities entitlement cannot easily be shoe-horned into pre-existing legal categories; it is sui generis. It is therefore defined in Sec. 8-109(a)(17) as "the rights and property interests of an entitlement holder with respect to a financial asset specified in Part 5 of Article 8.[140]

Without getting into the weeds of Part 5, which is beyond the scope of this Article, the point is to give the entitlement holder *economic* rights that are nearly equivalent to those of someone who holds a security directly by requiring the securities intermediary to pass along the benefits of all rights it has against the issuer of the security as record owner of the security. For example, only registered holders of common stock are entitled to receive dividends or vote. Under Sec. 8-505, the securities intermediary must, therefore, distribute dividends it receives in its capacity as record owner of stock pro rata to the entitlement holders of securities entitlements with respect to that stock. Under Sec. 8-506 it must vote its stock as directed by the entitlement holders. Under Sec. 8-507, the securities intermediary must obey the instructions (called "entitlement orders"[141]) of the entitlement holder with respect to the financial assets held in the securities account. For example, if I tell Victor to sell my 100 shares of *X*, he must cause Morgan Stanley to make an entry debiting my account of 100 *X* shares and crediting it with the

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137 U.C.C. § 8-102(a)(7) (1994).
138 U.C.C. § 8-102(a)(14) (1994).
139 U.C.C. § 8-501(a) (1994).
140 U.C.C. § 8-102(a)(17) (1994).
141 U.C.C. § 8-102(a)(8) (1994).

sales price of 100 *X* shares (minus a commission). (Note in the last example, although I am an "expert" in Article 8 law and understand its arcane vocabulary, most people, including myself, continue to use the now obsolete language of direct security holding, except when I am writing a law review article or drafting a contract, where exactitude is required).

Under Sec. 8-504, the securities intermediary must at all times own either securities directly, or securities entitlements indirectly, sufficient to cover all of the securities entitlements of all of its entitlement holders. To go back to my example, I have a securities entitlement against Morgan Stanley as a financial intermediary with respect to 100 *X* shares. Imagine that entitlement holder A and B, other Morgan Stanley customers, have securities entitlements with respect to 200 and 300 *X* shares, respectively. Morgan Stanley must at all times either own directly, or have securities entitlements with DTCC or another securities intermediary, with respect to 600 shares of *X* stock.[142]

B. Conveyancing and Super-Negotiation.

What concerns us here are the conveyancing rules of Articles 8 and 9 with respect to "financial assets" held in securities accounts. To reiterate, all conveyancing regimes must balance between the two contradictory policies of protecting first-in-time possessory rights and encouraging market transactions by allowing certain favored transferees to take free of those rights. Traditional regimes for most types of property other than hand-to-hand money, have at least in form favored the former over the latter in the sense that the default rule is that a first-in-time claimant prevails unless the transferee can prove that she is entitled to a negotiation exception. Usually this requires that the transferee show that she gave value, had the requisite level of good faith, and sometimes the satisfaction of other market requirements such as the transaction being in the ordinary course of business or finance.

The drafters decided that there was a national interest that the securities markets be as liquid as possible—investors who buy securities in the stock exchange should not have to worry about title. Consequently, they came close to reversing the default rule; purchasers prevail over first-in-time parties unless they acted with an affirmative *bad* faith. Five years later, the 1999 revisions to Article 9 went a step further in applying this principal to money and deposit accounts, also reversing the

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[142] These rights are supplemented by the rights granted to customers against registered broker-dealers under federal and state securities and banking regulation, as well as rules of self-regulatory organizations. These are beyond the scope of this Article.

traditional default rule so now the first-in-time party now loses unless *it* can show that the transferee met the bad faith test.[143]

The harshness, from the first-in-time claimant is mitigated in two ways. First, the scope of the super-negotiation rule is limited. It does not cover securities held directly by the investor, which remain subject to a slightly modified traditional rule that I will discuss later.[144] Second, it does not apply to the entire securities entitlement, but to specific financial assets held in a securities account with respect to which the entitlement holder claims a securities entitlement. Third, the statute creates a new mode of perfection of security interests that will have the same practical effect of the physical possession of tangible collateral—control. Indeed, control can be thought of as a corollary to super-negotiability.

C. Control.

The super-negotiation rule of Article 8 is set forth in Section 8-503(e) which provides:

> An action based on the entitlement holder's property interest with respect to a particular financial asset under subsection (a), whether framed in conversion, replevin, constructive trust, equitable lien, or other theory, may not be asserted against any purchaser of a financial asset or interest therein who gives value, obtains control, and does not act in collusion with the securities intermediary in violating the securities intermediary's obligations [to the entitlement holder under Part 5].

This is supplemented by Sec. 9-331(b), which states that Article 9 "does not limit the rights of or impose liability on a person to the extent that the person is protected against the assertion of a claim under Article 8." Note, that Article 8's rule is somewhat narrower than Article 9's for deposit accounts in that it is limited to "purchasers for value" whereas Article 9 protects "transferees." This should not make too much of a difference because, the U.C.C., following traditional property rules, does not adopt the lay definition that would limit a purchaser to a buyer, but instead includes anybody who takes in a voluntary transaction creating a property interest.[145] That is, the only transferees who are not protected would be donees, lien creditors and thieves—commercial law's disfavored step-children.

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143 *See supra* text at note 47.
144 *See infra text* at note 182.
145 U.C.C. § 1-204 (2001).

Consequently, to go back to our recurring example, Debtor grants a security interest in its inventory to Bank, who perfects by filing. If Debtor sells a computer and receives bitcoin as payment, the Bank has a perfected security interest in the bitcoin (the "encumbered bitcoin") as proceeds. The problem is that, because bitcoin would constitute a "general intangible" under Article 9, this security interest will continue even after disposition by Debtor, i.e. if Debtor uses the encumbered bitcoin to pay for goods or services, the transferee will take it subject to Bank's interest. This is because there is no negotiation rule for general intangibles that cuts off the adverse claims of perfected security interests. Because the blockchain makes each specific bitcoin traceable forever, this rule threatens the utility of bitcoin and its progeny as an alternative currency or payment system.

If, however, Debtor, rather than holding the encumbered bitcoin directly in its own name, holds it indirectly through a securities intermediary, then it, and its transferees, could avail themselves of the super-negotiation rule of 8-504(3). It would then be an entitlement holder who has a securities entitlement with respect to the bitcoin as financial asset held in a securities account maintained by a securities intermediary. If it wishes to transfer the encumbered bitcoin, it would give its securities intermediary an entitlement order to transfer the encumbered bitcoin to the transferee. In the vast majority of cases, the transferee would take the bitcoin free and clear of the Bank's adverse claim.

D. Financial Assets.

This rule, however, only applies to "financial assets" held by a securities intermediary. Consequently, the first stage in our analysis is to determine whether or not a bitcoin is a financial asset. The good news is that, although it is not *necessarily* a financial asset, it can be made into one. Perhaps more exciting is that this analysis suggests that *any* asset recorded on a blockchain could be made into a financial asset entitled to Article 8's super-negotiability regime!

1. Categorization. Let me make a few points about the characterization of assets for Article 8 purposes. The question as to whether an asset is or is not a security for the purposes of commercial law is completely distinct from the question as to whether it is a security for the purposes of federal or state securities laws. Articles 8 and 9 are primarily conveyancing regimes. They are concerned with the rights that rival property claimants have with respect to an asset. The securities laws, in contrast, are investor protection statutes. They are concerned, therefore, with the substantive rights the investor has vis a vis the issuer of the security. Consequently, although there is substantial overlap between the definitions of the two regimes with respect to some

traditional investments, some investments that are securities for one regime may or may not be investments for the other. For example, most common stock in a corporation would in the vast majority of cases be considered securities under both regimes.[146] In contrast, limited partnership interests are presumed to be securities under the federal securities laws, but traditionally they would not have been securities for Article 8 purposes.[147] Although not free from doubt, limited partnership interests would probably not have been securities under the 1977 version of Article 8 because they were probably not "of a type commonly dealt in on securities exchanges or markets." Under revised Article 8, the securities status of limited partnership interests is elective. That is, the organizer of a limited partnership could choose whether or not to have its interests governed by Article 8.

Once the drafting committee of what would eventually become the 1994 revisions to Article 8 came up with the concept of the securities entitlement, then it soon became obvious that there was no reason to limit the definition of financial assets to traditional securities. Indeed, to do so would likely have had a negative effect because investors already held a wide variety of investments in their securities accounts.[148] I

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[146] Common stock of a corporation meets all three elements of the definition of security in Sec. 8-102(a)(15) discussed *infra* in text at note 175. Both Sec. 2(a)(1) of the Securities Act of 1933 (15 U.S.C. § 77b(a)(1)) and Sec. 3(a)(10) of the Securities Exchange Act of 1934 (15 U.S.C. §78c(a)(10)) include "stock" as the first category of investments constituting a security for the purposes of those acts. The Supreme Court, in *United Housing Foundation, Inc. v. Forman* (421 U.S. 837 (1975)), held that sometimes investments that are designated as shares of stock will nevertheless not constitute "stock" for the purposes of the federal securities laws if they lack the most common features of stock. However, in *Landreth Timber Company v. Landreth* (471 U.S. 681 (1995)), the Court clarified that ordinarily the stock of a business corporation do have the common features of stock and are, therefore, presumed to be securities.

[147] Partnership interests do not fall within any of the type of investments constituting securities enumerated in the two securities acts. They, however, would be securities if they fell within the "catchall" category of "investment contracts" as determined by the *Howey* test discussed *supra* in note 49. Although partnership interests are investments of money in a common enterprise, with the expectations of profits, there is a question as to whether these profits will be predominantly from the efforts of others. Ordinarily it is assumed that, since, by law, limited partners may not manage the partnership and general partners have the power to manage the partnership, the former would meet the *Howey* test and constitute a security, whereas the latter would not (although courts will occasionally find exceptions to these general rules). JAMES D. COX ET AL , SECURITIES REGULATION; CASES AND MATERIALS 48-49 (6th ed. 2009).

[148] They also realized that, once Article 8 set up a clear conveyancing regime, the issuers of investments, that did not traditionally fall within Article 8, might want to opt into this new regime. For example, Sec. 8-103(c) repeats the traditional rule that interests in privately held limited partnerships and limited liability company interests are not necessarily financial assets, but these interests could be if such companies' organizational documents "expressly provide that it is a security governed by [Article 8 of the UCC]."

suggest that the invention of the blockchain might enable investors to elect to submit almost any form of property to Article 8's regime.

2. Definition. Consequently, 8-102(a)(9) includes three categories of investments in the definition of financial assets. I will analyze the first two categories in Part 3 when I discuss cryptosecurities. It is the third category that interests us here. The term financial asset includes:

> (iii) any property that is held by a securities intermediary for another person in a securities account if the securities intermediary has expressly agreed with the other person that the property is to be treated as a financial asset under this Article.

The section continues:

> As context requires, the term [i.e. financial asset] means either the interest itself or the means by which a person's claim to it is evidenced, including a certificated or uncertificated security, a security certificate, or a security entitlement.

This third definition of financial asset requires that it be held by a securities intermediary, which is defined as:

> (i) a clearing corporation; or
>
> (ii) a person, including a bank or broker, that in the ordinary course of its business maintains securities accounts for others and is acting in that capacity.

Since the definition of clearing corporation is limited to federal reserve banks and certain entities licensed by the SEC, it does not seem relevant to our discussion at this time. Conventional broker-dealers and banks that currently act as securities intermediaries obviously fall within this provision and could agree to hold bitcoin as financial assets, although I have no knowledge that any are yet doing so at the time I am writing this Article. However, there are numerous bitcoin exchanges, wallets and service companies—such as Coinbase—that might be able organize themselves in such a way as to meet this definition by characterizing their relationships with their clients as securities accounts. According to Sec. 8-501:

That is, these organizations can elect whether or not they want Article 8 to govern the transfer of their interests. U.C.C. § 8-103(c) (1994).

> "Securities account" means an account to which a financial asset is or may be credited in accordance with an agreement under which the person maintaining the account undertakes to treat the person for whom the account is maintained as entitled to exercise the rights that comprise the financial asset.

3. First-Generation Security Interests. Another advantage of holding bitcoin indirectly and characterizing it as financial asset is that it permits the creation of first-generation security interests (as opposed to proceeds security interests). To date, to my knowledge, debtors do not enter into security agreements granting security interests in bitcoin. However, if bitcoin were to become a significant payment device—or if the blockchain were to become a significant means of recording the ownership and transfer of property—then one would expect that lenders would wish to take it as collateral. One might also conversely argue, that bitcoin will not reach its potential as a commercial device unless it *can* serve as collateral. So-called "cash collateral" in which a secured party has a securities interest in a deposit account is used in any number of financial transactions. There should be a way of using bitcoin accounts for these purposes. This would be particularly the case of blockchain securities, since conventional securities are used as collateral for margin loans in the ordinary course.

The problem with holding bitcoin directly is, as we saw, is that it currently would be considered a general intangible. We have concentrated so far on the disadvantages of this for the debtor and its transferees, namely that it can never be disencumbered from a perfected proceeds security interest without the approval of the secured party.

But the status as a general intangible is also problematic for the secured party. Although the secured party retains a security interest in a transferred general intangible, it has no practical means of preventing the transfer in the first place. Although the blockchain is completely traceable, as a practical matter it may be difficult to find the owner of a transferred bitcoin. Even if the secured party does locate the owner, it may not be clear how it could garnish bitcoin under present debtor-creditor procedure.

Sec. 9-314(1) states that "[a] security interest in investment property . . . may be perfected by control of the collateral under Section . . . 9-106." The definition of "investment property" includes a "security entitlement [and] securities account."[149] Sec. 9-106(a) in turn

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[149] U.C.C. § 9-102(a)(49) (2010).

provides that "[a] person has control of a . . . security entitlement as provided in Section 8-106."

4. Example: Bitcoin as Financial Asset. Before we consider the definition of control, let us review how this works through an example. We start out with Debtor being the direct owner of bitcoin worth $1 million. It wants to grant a security interest in the bitcoin to Secured Party. It opens up a securities account with Securities Intermediary and transfers the bitcoin to Securities Intermediary. Debtor and Securities Intermediary agree that the bitcoin shall constitute a financial asset for the purpose of Article 8. Note, because Debtor is no longer the direct owner of the bitcoin, it now technically holds a securities entitlement with respect to the financial asset (i.e. the bitcoin) held in the securities account, as defined in Article 8, Part 5.[150]

Under Sec. 8-503, Debtor, as entitlement holder, does have some indirect property rights with respect to the underlying financial asset, but they are *sui generis* and beyond the scope of this discussion. What we care about is that one of Securities Intermediary's duties to Debtor as entitlement holder is to comply with all entitlement orders with respect to the transfers of a financial asset. Finally, as already discussed, *if* a financial asset is transferred out of a securities account, as an empirical matter, the purchaser will in the overwhelming majority of cases take it free of adverse claims.[151]

5. Establishing Control. Consequently, although Article 9 does permit a secured party to perfect a security interest in a securities entitlement by filing, and in some circumstances security interest may be automatically perfected upon attachment, obviously, these modes of perfection give very little practical protection against subsequent purchasers of financial assets because the debtor can give an entitlement order to the securities intermediary to transfer the financial asset out of the account free and clear of any adverse claims including perfected security interests. They also give little protection against second-in-time secured parties under the priority rules of Sec. 9-328, which subordinate

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[150] This is why Article 9 refers to security interests in securities entitlements and securities accounts, rather than to the underlying financial assets held in the securities account. U.C.C. §§ 9-101 *et seq.* (2010).

[151] Article 8 anticipates the transfer of securities entitlements, and Sec. 8-502 provides "a person who acquires a security entitlement . . . for value and without notice of [an] adverse claim" takes free of that claim. U.C.C. § 8-502 (1994). As an empirical matter it can be expected that such transfers will be limited to security interests as entitlement holders will rarely transfer ownership of a securities entitlement or securities account. A person who wants to sell a financial asset from the entitlement holder will, instead, require that the entitlement holder give an entitlement order to the securities intermediary instructing it to transfer that financial asset either directly to the buyer or to the buyer's securities intermediary.

security interests perfected by filing to security interests perfected by control. Consequently, automatic perfection and perfection by filing should probably be thought of as being primarily for the purpose of protecting the secured party's claim against second-in-time lien creditors and, therefore, in the debtor's bankruptcy.

Whereas perfection by filing gives secured parties little practical ability to protect themselves against transfers of collateral, the super-negotiation regimes of Articles 8 and 9 give secured parties the ability to ratchet up protection through "control." When inventing the new concept of control, the drafters of the 1994 revisions rejected the old paradigm that analogized indirect holding to possession of goods through bailees. Rather they asked, first, what the practical effects of physical custody of tangible things might be that justified the privileged status granted by the U.C.C., and, second, whether they could devise a schema that would have a similar practical effect with respect to indirectly held securities. The Article 8 regime they created was so successful that a similar one has been added to Article 9 for deposit accounts, electronic chattel paper and letter of credit rights.

Physical custody by the secured party, of course, better enables the secured party to enforce its basic remedy upon default of selling the collateral. That is, one does not need to *re*possess what one already physically *possesses*. But, more importantly, it greatly decreases the ability of the debtor to transfer the collateral to a third party.[152] Consequently, the idea of "control" is to try to minimize the chance that priority disputes ever arise in the first place so that the super-negotiation rules do not come into play.

Sec. 8-106 provides that:

> (d) a purchaser [a term that includes secured parties] has "control" of a security entitlement if:
>
> (1) the purchaser becomes the entitlement holder;
>
> (2) the securities intermediary has agreed that it will comply with entitlement orders originated by the purchaser without further consent by the entitlement holder; or
>
> (3) another person has control of the security entitlement on behalf of the purchaser or, having previously acquired control of the security

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[152] This is why so many commentators criticized the *Tanbro* case that found that a transferee could become a buyer in the ordinary course of business despite the fact that the goods were in the physical possession of the secured party. *See supra* text at notes 76.

> entitlement, acknowledges that it has control on behalf of the purchaser.
>
> (e) If an interest in a security entitlement is granted by the entitlement holder to the entitlement holder's own securities intermediary, the securities intermediary has control.

Let's look at these seriatim, starting from the first (i.e. Sec. 8-106(d)(1)) and the last (i.e. Sec. 8-106(e)), which are the forms of legal control that offer the most empirical control.

The first mode of control is the most secure. The entitlement holder transfers its account into the name of the purchaser—in this case the debtor tells the securities intermediary to change the name on its account to the secured party. Obviously, as the securities intermediary may only transfer financial assets out of a securities account upon receiving an entitlement order from the entitlement holder, the secured party, being the entitlement holder, does not bear the risk that the debtor will transfer away its collateral.

Under the last mode of control the securities intermediary is also the party making the secured loan to the Debtor. The advantage of this mode of control is that Sec. 9-328(3) provides that (unless the securities intermediary otherwise agrees) a security interest in a securities entitlement held by a securities intermediary has priority over security interests held by any other secured party.[153]

The two intermediate modes of control involve and depend on the cooperation of a third party, who is neither the debtor nor the secured party. As such, the practical utility of these modes of control depends on careful contract drafting. For example, under Sec. 8-106(d)(2), a secured party would have control if the securities intermediary agrees to obey the secured party's entitlement orders. However, note, that the debtor may still also have the right to give entitlement orders to the securities intermediary. Consequently, as a practical matter the parties need a three-party agreement under which the parties agree under what circumstances the debtor and secured party may give orders and what the securities intermediary should do if it receives conflicting orders. For example, in

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[153] Consequently, if a broker, bank or other institution that maintains security accounts wishes to make a loan secured by financial assets, it should consider demanding that the debtor open a securities account with the lender. Of course, the securities intermediary still does not have perfect protection because it has to obey the entitlement orders of the debtor as entitlement holder prior to default under the secured transaction. This means that the lender-securities intermediary should specify in its security agreement and contract establishing the securities account precisely under what circumstances the debtor-entitlement holder has the right to give entitlement orders.

order for debtor to be able to manage its portfolio, it might be contracted between the debtor and the secured party that, although both the debtor and secured party have the power to give entitlement orders, the secured party may not give an entitlement order until the occurrence of an event of default under the secured transactions. Moreover, the securities intermediary would agree (with the express written agreement of the debtor-entitlement holder) that it will not obey entitlement orders given by the entitlement holder after receiving of a notice from the secured party that an event of default has occurred under the secured transaction.[154]

Similar contractual issues arise under Sec. 8-106(d)(3) where a third party having control need only acknowledge that it has control on behalf of the purchaser.

Once a hierarchy of perfection means was established, it became clear that there was no reason to retain the traditional rule that security interests in securities (and in subsequent Amendments to Article 9, instruments) should not be perfectible by filing like most other forms of collateral. One result of this is that, given that a second-in-time secured party could trump a first-in-time secured party by taking control, perfection by filing in effect only protects a filing secured party from subsequent lien creditors of the debtor and ensures that it survives the strong-arm power should the debtor become bankrupt.[155]

The adoption of a weak perfection-by-filing regime led to another initially surprising innovation—automatic perfection of "a security interest in investment property created by a broker or other securities intermediary."[156] Although this might at first blush seem to violate the notoriety function of perfection formalities, at further consideration it is clear that it just reflects both finance practice and common knowledge in the securities industry. For example, when securities intermediaries sell investments (either on their own account or for the account of an entitlement holder), the seller regularly retains a security interest in the sold property pending the settlement of payment, which, under current SEC rules, can take place up to three trading days later. Consequently, if we were to require perfection by filing, in effect, every securities intermediary in the country would have to file a financing statement against every other securities intermediary listing the collateral as "investment property." The filing fees this would have generated would have no doubt been a windfall to state budgets. Given common

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[154] As a practical matter, a well-written three-party control agreement should contain some dispute-resolutions mechanism in the event that the debtor-entitlement holder disputes the secured party's claim that an event of default has occurred.

[155] 11 U.S.C. § 544(a)(1) (2005).

[156] U.C.C. § 9-309(10) (2010).

knowledge of the practice, such a filing requirement would be unnecessary as it would have served no conceivable informational function and be wasteful.[159]

E. Other Property as Financial Assets.

We are now in a position to see how the blockchain protocol opens up the possibility of electing to submit virtually any form of property to Article 8. Although the popular press has been captivated by Nakamoto's vision of bitcoin as an alternative currency, the possible uses of the blockchain are not so limited. As mentioned,[160] some see the blockchain as a potential payment system for the transfer of any form of value, whether designated in conventional fiat currencies or alternative cryptocurrencies. Others contemplate whether it can be used to create self-executing "smart" contracts.

Because the blockchain is a decentralized ledger, it could be used to record any form of property or other legal claims (although in practice, some existing legal rules, such as real estate recoding acts, might limit the legal efficacy of blockchain registration).[161] Once a blockchain ledger were established, the owner of a registered claim could transfer her registered claim into a securities account she maintains with a securities intermediary. The owner, now an entitlement holder with respect to such claim, and the securities intermediary could now elect to have the claim treated as a financial asset for the purposes of Articles 8 and 9.

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[159] Sales of payment intangibles (U.C.C. § 9-309(3)) and promissory notes (U.C.C. § 9-309(4)) are automatically perfected upon attachment for similar reasons.

This is why, as noted in Official Comment 6 to Sec. 9-309, we have traditionally granted 21-day automatic perfection for certain security interests granted by what we now call securities intermediaries. The current regime merely eliminated the necessity for secured parties who wished to have an indefinite security interest to roll the loans over every 21 days. Moreover, as an automatically perfected security interest is subordinate to a later-in-time security interest perfected by control, it should be thought of, once again, as a protection against lien creditors and bankruptcy.

[160] *See supra* text at notes 12-21.

[161] It has been reported that at least one couple has recorded their marriage on a blockchain. William Suberg, *First Blockchain marriage will take place at Disney World Bitcoin Conference*, THE COINTELEGRAPH (Sept. 23, 2014), http://cointelegraph.com/news/first-blockchain-marriage-will-take-place-at-disney-world-bitcoin-conference. It is hard to see what the point of this gimmick might be other than publicity. The blockchain registration is unlikely to meet the requirements of Florida marriage law, and would seem to serve no other purpose since marital rights cannot be conveyed. But see *c.f.* THOMAS HARDY, THE MAYOR OF CASTERBRIDGE: THE LIFE AND DEATH OF A MAN OF CHARACTER (1886) (A husband auctions off his wife in a drunken pique. She lives with her purchaser—who luckily is a kind man and a good mate—for over 18 years in the mis-impression that he has acquired her husband's legal status).

If they were to do so, the entitlement holder and her transferees would be entitled to a fully developed law of conveyancing to govern their financial transaction without the worries of the vagaries of the common law.

PART 3: CRYPTOSECURITIES AND ARTICLE 8.

I. Introduction.

The blockchain was invented for the purpose of allowing for the transfer and preventing the double-spending of cryptocurrencies. However, there is no reason why it needs to be limited.

In May 2015, NASDAQ announced that it was launching a pilot program for using the blockchain technology to trade securities.[162] Also, as introduced, Overstock.com has been experimenting with the issuance of debt securities on a blockchain[163] and several large banks and the DTCC have completed a text run replicating trading of CDS's over a distributive ledger.[164]

Byrnes believes that moving equity securities to a blockchain would have at least two advantages. First, it could greatly reduce the time for settlement of securities transactions from the current T + 3 to almost immediately—or at least to within an hour. Second, because of the transparency of the blockchain, it would eliminate naked short-selling, a practice that Byrne's believes used for malicious price manipulation.[165]

The reason why the blockchain is supposed to prevent naked short-selling is because, according to "Robby Dermody, of Counterparty [w]ith the blockchain, ownership of stock is reduced to pure mathematics . . . .' It would be impossible to naked short a stock,'" although he acknowledges the possibility of bugs in the software.[166] This strikes me as wishful thinking. If a party wished to engage in short selling in violation of SEC regulations, it would certainly also be ready, willing and able, to hide her identity through the use of third parties or otherwise.

Byrne's claims that the adoption of cryptosecurities could greatly decrease the timing of settlements are more realistic, if somewhat exaggerated. T + 3 trading is merely the maximum clearing time that

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[162] *NASDAQ Launches Enterprise-Wide Blockchain Technology Initiative*, NASDAQ (May 11, 2015), http://ir.nasdaq.com/releasedetail.cfm?releaseid=912196.

[163] *See supra* text at note17.

[164] *See supra* text at note 129-131.

[165] *See supra* text at note 18.

[166] Metz, *supra* note 18.

SEC regulations allow, rather than a necessary technological limit.[167] Although U.S. equities do tend to settle three days after the transaction date, debt instruments can settle quicker and U.S. Treasury securities can settle on the transaction date. The European Union has recently imposed a T + 2 rule[168] and DTCC has recommended that U.S. markets follow suit, and then consider whether it should reduce settlements further to T + 1.[169] Consequently, settlement through the traditional system could be made faster than it is now, although probably not as fast as a transfer on a blockchain.

More importantly, "settlement" does not merely include transfer of a security from the seller to the buyer. It also includes the transfer of the purchase price from the buyer to the seller. Consequently, even if the cryptosecurity itself were to be transferred on the blockchain, settlement could not be completed immediately unless payment was also made over the blockchain. It seems doubtful to me that most investors would be interested in buying and selling equity securities using such a volatile asset as the original bitcoin. However, they may not have to as technology progresses. For example, Ripple Labs claims that its blockchain protocol can be used to settle transfers of value using conventional currencies in addition to XRP, its proprietary cryptocurrency.[170]

For my mundane purposes, however, these developments are interesting from a commercial law perspective because they may finally breathe life in to the uncertificated securities provisions added to Article 8 in the 1977 revision, and subsequently modified in the 1994 revision.

II. Uncertificated Securities.

A. Back to the Future.

Blockchain securities trading, like blockchain payments, has the possibility of being a truly post-modern phenomenon. As Slavoj Žižek asserts, post-modernism precedes, rather than succeeds, modernism.[171] By this he means that post-modern institutions recover certain aspects of

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[167] 27 C.F.R. § 240.15c6-1 (1995).

[168] Central Securities Depositories (CSDs), EUROPEAN COMMISSION (May 21, 2016), http://ec.europa.eu/finance/financial-markets/central_securities_depositories/index_en.htm.

[169] *DTCC Recommends Shortening the U.S. Trade Settlement Cycle*, DTCC WHITE PAPER (April 2014), http://www.dtcc.com/~/media/Files/Downloads/WhitePapers/T2-Shortened-Cycle-WP.pdf.

[170] *Ripple Introduction*, RIPPLE WIKI (Oct. 25, 2015, 10:10PM) https://wiki.ripple.com/Ripple_Introduction.

[171] SLAVOJ ŽIŽEK, LOOKING AWRY: AN INTRODUCTION TO JACQUES LACAN THROUGH POPULAR CULTURE 145 (1992).

pre-modern ones that had seemingly been superseded by modernism. Perhaps more accurately, from a Hegelian perspective one might say that post-modernism is a sublation of modernism and pre-modernism.[172] It both preserves and negates elements of both, to create a new, if uneasy, resolution of their tensions.

What pre-modern payments and securities trading had in common is that they could be two-party face-to-face transactions. A buyer can deliver hand-to-hand money to the seller in exchange for goods and services. Similarly, in pre-modern securities trading, a seller of securities could hand a physical certificate to the buyer in exchange for money. As a result, both sides of the transaction could occur simultaneously—a sale was an *event*.[173]

As early as the 1930's, Karl Llewellyn argued that the problem with the common law of sales was that it treated pre-modern practices—which he called "farmers transactions"—as the norm.[174] In fact, they had been largely superseded in the sense that the modern norm had become what he called a "merchants transaction."[175] Rather than being an event, a merchants transaction was now a *process* that took place over time and often involved third party intermediaries such as carriers, and banks.[176] Famously, his analysis eventually won out, leading to the promulgation of Article 2 on sales and the rest of the U.C.C.

One thing that modern payment systems and securities trading have in common is the necessity of third-party intermediaries—banks, credit card companies, Western Union, PayPal, etc. in the case of payments, and securities intermediaries in the case of securities. Although pre-modern direct systems still exist, they are limited to a relatively small class of activities as a practical matter—such as making small purchases at the grocery store, or holding shares in closely-held corporations which are rarely transferred. Although in recent years, there has been a number of developments that have been marketed as new peer-to-peer payment systems—such as Venmo—in fact, to date none of these are truly peer-to-peer, but are merely been alternate ways of accessing the pre-existing credit/debit card, checking account or other intermediary systems. That is, Venmo and its ilk are not really P2P at all. They add an additional level of intermediation to the system.

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[172] JEANNE LORRAINE SCHROEDER, THE TRIUMPH OF VENUS: THE EROTICS OF THE MARKET 298 (2004).

[173] Schroeder, *Death and Transfiguration, supra* note 57, at 1306-09.

[174] Llewellyn, *Horseback*, *supra* note 57, at 727, LLEWELLYN, SALES, *supra* note 57, at 53; and Llewellyn, *First Struggle*, *supra* note 57, at 879.

[175] Llewellyn, *First Struggle*, *supra* note 57, at 876.

[176] Schroeder, *Death and Transfiguration*, *supra* note 57, at 1309-11.

What the blockchain offers is the possibility of reinstating a pre-modern, direct, unmediated way of transferring value or securities, but using modern electronic communications. Will people use these new systems? Only time will tell. I use the credit card system for most payments in order to get "miles" and other perks, and in order to obtain the "charge-back" protection. I will probably continue to hold my securities indirectly through my broker for convenience and the services it renders. However, it is likely that intermediaries will begin to use new technologies in order to speed up transactions. Moreover, the willingness of customer and merchants to continue to use intermediaries might change if the difference in speed and cost are great enough.

B. Characterization Under Article 8.

Bitcoin stock would be also be post-modern because it could revive the failed experiment of uncertificated securities. Consequently, trading securities over a blockchain, would not require amendments to Article 8.

Sec. 8-102(a)(18) simply defines an uncertificated security as "a security that is not represented by a certificate." Section 8-102(a)(15) reads:

> "Security," . . . means an obligation of an issuer or a share, participation, or other interest in an issuer, or a share, participation, or other interest in an issue or in property or an enterprise of an issuer:
>
> > (i) which is represented by a security in bearer or registered form, or the transfer of which may be registered upon books maintained for that purpose by or on behalf of the issuer;
> >
> > (ii) which is one of a class or series or by its terms is divisible into a class or series of shares, participations, interests, or obligations; and
> >
> > (iii) which:
> >
> > > (A) is, or is of a type, dealt in or traded on securities exchanges or securities markets: or
> > >
> > > (B) is a medium for investment and by its terms expressly provides that it is a security governed by this Article.

Probably the most classic type of security is common stock—the residual equity interest in a corporation. Common stock issued on a

blockchain would, therefore, be an uncertificated security, with the blockchain constituting the "books" maintained for registering the transfer of the stock on behalf of the issuing corporations. As discussed, a blockchain is nothing but a registration of a chain of ownership. Despite the reference to "books," there is no reason to think that it is intended to refer to physical, as opposed to electronic record keeping. Note there is no requirement that the company itself maintain these "books," merely that they be maintained "on behalf of" the issuer—small publicly-traded corporations often use the services of independent stock transfer agents to do so. Consequently, there is no reason why the miners or other parties who maintain the blockchain cannot be conceptualized as performing this function.[177]

C. Authorization Under Corporate Law.

Article 8 merely presents the conveyancing rules for uncertificated securities that have been issued. It does not give corporations or other issuers the authority to do so. For this, one must look to see whether the corporate codes of the various states do so. Fortunately, in anticipation of the uncertificated securities revolution that never occurred, they do. For

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[177] The one and only case that has considered the meaning of Sec. 8-102(a)(15) has taken a very expansive reading. The 2d. Circuit certified the question to the New York Court of Appeals as to whether a series of promissory notes were securities governed by Article 8 despite the fact that they were neither in bearer or registered form nor did the issuer maintain note transfer books. The New York Court of Appeals agreed with the Second Circuit that, in interpreting the phrase "the transfer of [the obligation] *may* be registered upon books maintained for that purpose by or on behalf of the issuer [and] that the proper inquiry is whether the notes *could have been* registered on transfer books maintained by [the issuer] not whether they were registered on transfer books at the time of the litigation." Highland Capital Mgmt., LP v. Schneider, 460 F.3d 308, 313-14 (2d Cir. 2006) (emphasis in original).

This is a classic example of hard facts making bad law. The Second Circuit and the New York Court Appeals wanted to enforce an oral contract despite the generally applicable statute of frauds contained in the pre-2001 version Sec. 1-206(a), which was in effect at that time Sec. 8-113 clarified that there is no statute of frauds for contracts for the sale or purchase of securities. In their zeal to achieve what they felt was the just result they ignored the fact that Article 8 is largely a conveyancing regime that issuers are able to opt in or out of. Under the Courts reasoning, Sec. 8-102(a)(15)(i) would become superfluous because there is always a theoretical possibility that an issuer could have established transfer books even if had decided not to do so.

One might be concerned by the "of a type" requirement of subsection (iii)(A), on the grounds that, although common stock generally is certainly of a type traded on securities exchanges and markets, blockchain stock specifically is not yet so traded. Although I believe that this definition is not intended to limit the form that an issuer's securities trading registry takes, the ultra-cautious attorney can make use of the "opt-in" provision of subsection (iii)(B). That is, issuer's board of directors can expressly specify in their resolutions authorizing the issuance of the stock that its stock constitutes uncertificated securities for the purposes of Article 8.

example, Delaware General Corporation Law ("DGCL") Sec. 158 provides that:

> The shares of a corporation shall be represented by certificates provided that the board of directors of the corporation may provide by resolution or resolutions that some or all of any or all classes or series of its stock shall be uncertificated shares.

Consequently, Overstock, which is a Delaware corporation, could start issuing uncertificated common stock by board resolution, without amending its charter.

The Model Business Corporation Act ("MBCA") Sec. 6.26 permits the board of directors to authorize uncertificated securities "unless the articles of incorporation or bylaws provide otherwise."[178] Because issuing uncertificated securities have to date been so unusual for companies other than mutual funds, I would expect that the charter and by-laws of most MBCA corporations are probably silent on the issue but, obviously, counsel would have to double-check before advising a corporate client.

DGCL Sec. 159 expressly provides that transfer of stock of Delaware corporations is governed by Article 8, to which we now turn. One thing one should keep in mind as I keep emphasizing, bitcoin (or anything else recorded on a blockchain) is not truly anonymous, it is pseudonymous. The blockchain is a ledger of title, so each owner in the chain must be identified, at least by number, albeit, as is currently the case with conventionally evidenced securities, an owner could attempt to hide behind an alias or hold its securities indirectly through an intermediary). Identification of ownership is perhaps even more important for blockchain stock because the rights to receive notices, to vote, to receive dividends, exercise appraisal rights, etc. are limited to registered owners, so there must be someway of identifying security owners. This is bolstered by Sec. 8-207(a) which states that:

> Before due presentment . . . of an instruction requesting registration of transfer of an uncertificated security, the issuer . . . may treat the registered owner as the person exclusively entitled to vote, receive notifications, and otherwise exercise all the rights and powers of an owner.

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[178] New York's Business Corporation Law contains a similar provision. N.Y. B.S.C. § 508 (2015).

Moreover, under the federal securities laws, proxy statements must be sent to registered owners, and under both the securities laws and Part 5 of Article 8, intermediaries that are record owners acting for others, must pass these rights down to the persons who are beneficial owners under securities laws and entitlement holders under Article 8.[179] This ability to identify the holder of the uncertificated security seems to be the allure of blockchain securities for Byrne of Overstock, who wants to thwart anonymous naked short sellers. This ignores, of course, the fact that uncertificated securities can be held indirectly through securities intermediaries just like certificated securities.[180]

D. Transfer and Delivery.

Under Secs. 8-104(a) and 8-301, an uncertificated security is transferred by "delivery" under Sec. 301(b):

> Delivery of an uncertificated security to a purchaser occurs when:
>
> > (1) the issuer registers the purchase as the registered owner, upon original issue or registration of transfer; or
> >
> > (2) another person, other than a securities intermediary, either becomes the registered owner of the uncertificated security on behalf of the purchaser, or, having previously become the registered owner, acknowledges that it holds for the purchaser.

Note here, that *unlike* the U.C.C.'s use of the term "possession," its definition of "delivery" is not implicitly limited to a transfer of *physical* custody, but is a term of art for the act(s) that is necessary to complete the transfer of the security. Delivery includes physical custody *only* when the security to be delivered is certificated.

Although not a model of clear exposition, the way an owner of an uncertificated security effectuates a transfer is by giving an "instruction" to the issuer (or to whomever maintains the issuer's books for the purpose of transfer). Sec. 8-102(1)(12) defines an instruction as:

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[179] *See supra* text at note 141.

[180] The relationship of securities intermediaries and their clients are also governed by Securities Exchange Act of 1934 and the regulations promulgated under it, as well as by rules of self-regulatory organizations including FINRA and the various stock exchanges. The treatment of cryptosecurities under these provisions is beyond the scope of this Article.

> A notification communicated to the issuer of an uncertificated security which directs that the transfer of the security be registered or that the security be redeemed.

An instruction must be given by an "appropriate person" defined in Sec. 8-107(a)(2) as "with respect to an instruction, the registered owner of an uncertificated security." Sec. 8-107(b) further clarifies that an instruction is effective only if made "by the appropriate person" or agent.[181] With respect to a cryptosecurity, presumably the holder would be able to give the instruction through the blockchain using her double-key procedure.

The issuer's duty to register transfers of uncertificated securities is parallel to the familiar rules with respect to certificated ones. Sec. 8-401 states in relevant part:

> (a) If . . . an instruction is presented to an issuer with a request to transfer of an uncertificated security, the issuer shall register the transfer as requested if:
>
> > (1) under the terms of the security the person seeking registration of transfer is eligible to have the security registered in it name;
> >
> > (2) the . . . instruction is made by the appropriate person or by an agent who has actual authority to act on behalf of the appropriate person;
> >
> > (3) reasonable insurance is given that the . . . instruction is genuine and authorized . . . .
> >
> > (6) a demand that the register not register transfer has not become effective . . . ;
> >
> > (7) the transfer is in fact rightful or is to a protected purchaser.
>
> (b) If an issuer is under a duty to register a transfer of a security, the issuer is liable to a person presenting an instruction for registration or to the person's principal for loss resulting from unreasonable delay in registration or failure or refusal to register the transfer.

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[181] Sec. 8-307 also gives specific rules for deceased owners, agents and other representatives that are beyond the scope of this Article. U.C.C. § 8-307 (1994).

One might ask whether the reference in Sec. 8-401 to the *issuer* registering a transfer proscribe the use of a blockchain for this purpose. I don't think so. Article 8 and corporate codes merely require an issuer to keep a transfer ledger, but neither prescribes the method for doing so. Smaller issuers have long used agents to maintain their ledgers. I can see no reason why an issuer cannot adopt a blockchain as its ledger. Indeed, one can make a strong argument that its double-key transfer system, coupled with a miner or consensus verification process would be a safer mode of determining whether an instruction is genuine and authorized than the traditional certificated security regime that relies on examination of indorsements.

E. Stop Transfer Orders.

One potential complication of using blockchain technology is the right of an owner of a security under Sec. 8-403 to demand that the issuer not transfer it. Pursuant to 8-403(b), if the issuer receives an instruction to transfer an uncertificated security after receiving such a demand, the issuer must communicate to both the person who made the demand and the person who initiated the transfer request and withhold registration for a period not exceeding 30 days. Sec. 8-403(d) provides that the issuer will then be immune from liability to the person making the demand unless, within that period, the demanding party either brings an appropriate legal procedure enjoining the transfer or posts an indemnity bond protecting the issuer.

Would this provision hinder one of the primary advantages of a blockchain recording system—that is, automatic and almost instantaneous settlement?

First, I would note, as described in Official Comment 2, the impetus of this section was to protect "registered owners of certificated securities who lose or misplace their certificates." Ordinarily, if the owner of directly owned certificated securities intended to transfer them, it would need to obtain a substitute certificate from the issuer under Sec. 8-405. This can be a time-consuming and expensive process because the owner would have to bring legal process or post a bond to protect the issuer in case a protected purchaser subsequently presents the "lost" certificate for transfer. Official Comment 2 suggests that the procedures of Sec. 8-403 give the true owner 30 days to complete this process. It would seem that the drafters of Sec. 8-403 merely extended this provision to uncertificated securities out of mindless parallelism without much thought as to what it would mean to "lose" a conventional uncertificated security.

However, as the Mt. Gox fiasco has shown, an intermediary "holding" cryptocurrencies can be hacked and bitcoins "stolen" out of an

account.[182] Consequently, owners of cryptosecurities may, indeed, want a way to at least temporarily stop the transfer of "stolen" securities.

Indeed, it should be easier, not more difficult, to deal with stop-transfer under the blockchain than with a conventional registry. This is because the blockchain verification system that prevents spending the same "coin" twice, could also be used to prevent transfers of a specific cryptosecurity. It would seem to be "only" a matter of programming to create a system—a smart contract—in which a registered owner could, through the use of her public and private key, automatically put a 30 day block on trading of her "lost" securities.[183] Moreover, a blockchain could also be programmed to automatically send out the notices required by Sec. 8-403 when it receives an attempt to transfer during this period.

Unfortunately, any stop transfer rule would probably give little protection for the poor owner of a stolen cryptosecurity as an empirical matter. Sec. 8-403(a) provides:

> A person who is an appropriate person to . . . originate an instruction may demand that the issuer not register transfer of a security by communicating to the issuer a notification that identifies the registered owner and the issue of which he security is a part and provides an address for communications directed to the person making the demand. *The demand is effective only if it is received by the issuer at a time and in a manner affording the issuer reasonable opportunity to act on it*. (Emphasis added.)

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[182] *See supra* note 5. After we served on a panel about bitcoin together at my law school, I had coffee with the now notorious Charlie Shrem (*see supra* note 40). To show me how bitcoin worked, he opened up a digital wallet on my iPad with Instawallet, a rival bitcoin exchange, and transferred 5 satoshis (i.e. bitcoin cents) to me. This was worth somewhere between $4 and $5 at that time—about the amount he owed me for his latte. I forgot about this until the price of a single bitcoin was trading over $1,000, raising Shrem's coffee reimbursement to more than $50. I was not able to open my eWallet. It turned out that less than a month after opening my eWallet, Instawallet became one of the first bitcoin exchanges to be looted by thieves and closed down. Joe Weisenthal, *BITCOIN SERVICE INSTAWALLET: We've Been Hacked And Are Suspending Service Indefinitely*, BUSINESS INSIDER, (April 3, 2013, 2:36PM), http://www.businessinsider.com/instawallet-suspended-2013-4.

[183] Sec. 8-407 provides that:

> A person acting as authenticating trustee, transfer agent, registrar, or other agent for an issuer in the registration of a transfer of its securities, in the issuer of new . . . uncertificated securities . . . has the same obligation to the . . . Owner of a . . . uncertificated security with regard to the particular functions performed as the issuer has in regard to those functions.

U.C.C. § 8-407 (1994).

Presumably, most thieves who steal securities do so with the intent to sell them quickly before the theft is discovered. With a conventional certificated security, this might take several days so that the registered owner might have the practical ability to give an effective stop transfer order. However, one of the greatest advantages—and in this case the disadvantage—of a blockchain is its speed. By the time the registered owner discovered that a cryptosecurity was missing, the thief's sale would probably already have been settled so that it would be too late to give notice.

F. Negotiability.

One disadvantage of owning cryptosecurities directly, rather than indirectly through a securities intermediary, is that transferees will not be entitled to the protections of the super-negotiation rule discussed above, but only a traditional negotiation one. That is, Article 8 establishes a derivation rule as the default rule—a transferee takes subject to first-in-time claims unless it can show that it qualifies for an exception. Only time will tell whether this distinction will be largely formal or whether it will have an empirical effect on the marketability of cryptosecurities.

Specifically, Sec. 3-302 sets forth the default derivation rule that (with two exceptions that are beyond the scope of this Article) "a purchaser of a[n] . . . uncertificated security acquires all rights in the security that the transferor had or had power to transfer." That is, if the security owned by the transferor were subject to an adverse claim, such as a security interest, then the transferee would take it subject to the security interest. This is mitigated, however, by Sec. 8-303(b), which sets forth the traditional negotiation exception that "[i]n addition to acquiring the rights of a purchaser, a protected purchaser also acquires its interests in the security free of any adverse claim."

A "protected purchaser"—a term added in the 1994 Amendments to replace the traditional term, "bonafide purchaser for value"—is a purchaser who:

> (1) gives value;
>
> (2) does not have notice of any adverse claim to the security; and
>
> (3) obtains control of the . . . certificated security.

Once again, in the U.C.C., the term purchaser is not limited to a buyer, but includes anyone who takes in a voluntary transaction [184] —i.e. almost anyone other than a thief of a lien creditor.

"Value" is defined under Sec 1-204 as "any consideration sufficient to support a simple contract." Consequently, donees, in addition to thieves and lien creditors, could not become protected purchasers, because traditional negotiation rules are designed to protect favored market transactions.[185]

What is or is not notice of an adverse claim is not governed by the usual rule of Article 1, but by Sec. 8-105. Although Sec. 8-105(a) does provide that willful blindness can constitute notice, this is somewhat mitigated by the definition of "adverse claim" in Sec. 8-102(a)(1), that encompasses not merely a "property interest in a financial asset" but a claim "that it is a violation of the rights of the claimant for another person to hold, transfer, or deal with the financial asset." Moreover, Sec. 8-105(e) clarifies that a filed "financing statement under Article 9 is not notice of an adverse claim to a financial asset." Connecting the dots, it would seem unlikely that there would be many circumstances in which 8-105 would apply unless the purchases was acting in affirmatively bad faith. Consequently, this may not, in practice, be that different from the "collusion" standard under super-negotiation rules in which case the vast majority of buyers of cryptosecurities will, as an empirical matter, take free and clear of security interests and other adverse claims.

This does not mean that cryptosecurities can never be the subject of Article 8's super-negotiation regime. An investor can choose to hold its cryptosecurities, as an uncertificated security, indirectly through a financial intermediary.

One might object that to do so would destroy one of the advantages of issuing securities in bitcoin form—namely the ability to trade directly without the use of intermediaries. That is true. This means that some classes of investors, including large institutional investors and active day traders, will not choose to do so.

However, holding cryptosecurities through intermediaries retains the advantage of faster, and perhaps more secure, settlement of trades than through the DTCC system. Consequently, if bitcoin stock trading were to become more common so that publicly traded companies issued their common stock in this form, many individual investors who use

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[184] U.C.C. §§ 1-201(a)(29), (30) (2001).

[185] This does mean that donees never take free from adverse claims. The basic derivation principle of Sec. 8-302 is also a shelter rule. A donee who receives a gift from a donor, who is himself a protected purchaser, is not a protected purchaser, but she nevertheless inherits all the donor's rights as such. U.C.C. § 8-302 (1994).

investment advisors may prefer the convenience of continuing to hold securities indirectly.

CONCLUSION.

Unless it is amended, the U.C.C. may keep bitcoin as a cryptocurrency or payment system from reaching its full potential. Cryptocurrency do not, nor can they be made to, fit within Article 9's definition of "money." Consequently, it falls within the catch-all category of "general intangible," which is Article 9's term for any form of personal property that does not fit into another defined category. The problem is that there is no negotiation, let alone super-negotiation, rule applicable to general intangibles. This means that once a security interest attaches to bitcoin, it will continue to be encumbered despite transfer. This is in sharp contrast to the "money," which can, in most circumstances, be transferred free and clear of adverse claims including security interests.

For example, if a debtor accepts bitcoin as payment upon the sale of inventory subject to a perfected security interest, the secured party will have a perfected security interest in the bitcoin as proceeds regardless of how many times it subsequently changes hands. Because any individual bitcoin can be traced on the blockchain, this could substantially decrease the utility of bitcoin as a currency and payment system.

If, however, an owner of bitcoin were willing to hold it *indirectly* in a securities account maintained by a broker, bank or other party who qualifies as a "securities intermediary," then the parties could elect to have bitcoin treated as a "financial asset" in which case super-negotiation" rules of Article 8 apply. Consequently, any subsequent transferee of the bitcoin out of the account would take free of all adverse claims, unless he colluded with the original owner in violating the rights of another party. Unfortunately, to do so would defeat one of the greatest attractions of bitcoin—the ability to transfer value directly between parties without the use, and expense, of third-party intermediaries.

Nevertheless, Article 8's indirect ownership regime might have utility for used of the blockchain beyond cryptocurrencies. As the blockchain is a transfer ledger there is no reason why it couldn't be used as a transfer protocol for any form of property. Once title to property was recorded on a blockchain, it could be transferred into an account maintained by a financial intermediary in which case it would be entitled to treatment as a financial asset. Moreover, there is no reason why, under current Article 9, the states couldn't use a blockchain to establish a single, national, searchable, filing system for all debtors that could replace our current cumbersome state-by-state system.

For bitcoin to act more like a true currency, however, Article 9 would need to be amended to add a new definition of cryptocurrency, to add a super-negotiation rule analogous to those that currently apply to money and deposit accounts under Sec. 9-332, and to add a provision whereby a secured party could perfect its security interest by taking "control" of bitcoin, understood in terms of the practical ability of a secured party to prevent the debtor from transferring the collateral.

In contrast, surprisingly, the U.C.C. as currently drafted can easily accommodate the development of cryptosecurities that would be issued and traded on a blockchain. This is because cryptosecurities would fall within Article 8's definition of "uncertificated securities." Ironically, therefore, cryptosecurities could invigorate a rarely used statutory schema that was created to solve a completely different problem.