REGULATING THE USE OF CRYPTO-ASSETS AS COLLATERAL IN SECURED TRANSACTIONS: U.S AND CANADIAN PERSPECTIVES

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ABSTRACT

The thesis is focused on regulating the use of crypto-assets as collateral in secured transactions. The ability of a debtor to receive a loan from a lender in exchange for its collateral is a vital part of global commercial activity. Crypto-assets are a relatively new asset class introduced with the term "cryptocurrency" in the Bitcoin Whitepaper released by Satoshi Nakamoto in 2008. Since the invention of crypto-assets, many regulatory efforts have been made to govern the use of crypto-assets by different countries including Canada. These regulatory efforts have led to policies on crypto-assets in several contexts such as taxation and their use in financial crimes. That crypto-assets use in secured transactions has yet to be expressly regulated in Canada has led to speculation on how the current personal property security law in Canada applies to crypto-assets. An examination of the current personal property security law in Canada reveals that, under existing law, it is difficult to acquire a reliable and effective security interest in crypto-assets. This thesis, therefore, identifies the current issues hampering the appropriate regulation of crypto-assets under Canadian secured transaction law, evaluates the consistency of the relevant laws with guiding secured transaction values such as facility and certainty, and recommends possible solutions to the current issues. The issues include the failure to expressly categorize crypto-assets as a form of personal property, the lack of suitable modes of perfecting security interests in crypto-assets, and the non-negotiability of crypto-assets. The analysis and recommendations made in this thesis are intended to bring the issues with crypto-related secured transactions to light so that they may be considered and addressed by lawmakers in Canada. The recommendations in this thesis will also be of interest to jurisdictions with similar secured transaction regulatory frameworks, which are considering the incorporation of crypto-assets into their secured transactions legislation as a unique form of personal property.

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GLOSSARY

Personal property security law is filled with technical language. Specifically, discourse on the use of crypto-assets in the secured transaction's context requires an array of specialized language to appropriately illuminate the various laws and concepts. For ease of reference to readers, this glossary serves as a repository of the relevant technical terms.

DEFINED TERMS

"Article 12" means Article 12 of the Uniform Commercial Code.

"Article 9" means Article 9 of the Uniform Commercial Code.

"Bitcoin" means a digital currency created for use in peer-to-peer online transactions.

"Blockchain" means a digital database containing information (such as records of financial transactions) that can be simultaneously used and shared within a large decentralized, publicly accessible network.

"Collateral" means personal property that is subject to a security interest.

"Controllable electronic record" means a record stored in an electronic medium that can be subjected to control under Section 12-105 of the Uniform Commercial Code. The term does not include a controllable account, a controllable payment intangible, a deposit account, an electronic copy of a record evidencing chattel paper, an electronic document of title, electronic money, investment property, or a transferable record.

"Crypto-asset" means digital assets that use public ledgers over the internet to prove ownership. They use cryptography, peer-to-peer networks, and a distributed ledger technology (DLT) – such as blockchain – to create, verify, and secure transactions.

"Cryptocurrency" means a digital or virtual currency secured by cryptography and built on a blockchain, a decentralized peer-to-peer network, or ledger.

"Cryptography" means the study and practice of sending secure, encrypted messages between two or more parties.

"CSA" means Canadian Securities Administrators.

"CTP" means Crypto-asset Trading Platform.

“Distributed Ledger Technology” a digital system that allows users to record, share, and synchronize data and transactions across a distributed network consisting of numerous participants.

“Intangibles” means personal property that is not goods, chattel paper, a document of title, an instrument, money or an investment property, and includes a licence.

“Margin Call” means a situation where a broker requests that an investor deposit more cash or securities to cover potential losses.

“Mining” means the process by which networks of specialized computers generate and release new Bitcoin and verify new transactions.

“Negotiability” means the ability of personal property to be transferred thereby entitling its owner to some benefit, so that legal ownership of the benefit passes by delivery or endorsement of the personal property.

“Over-Collaterization” is a situation where the value of the asset used as collateral on a loan exceeds the loan value.

“PPR” means the Personal Property Registry or an equivalent public registry for registering notice of security interests in personal property.

“PPSA” means, and is a generic reference to, the Canadian PPSA. The applicable PPSA citation for this thesis is as follows: Personal Property Security Act, S.S. 1993, c. P-6.2 (Saskatchewan, SPPSA). Unless otherwise specified in this thesis, the SPPSA serves as a proxy for the PPSA. In other words, unless otherwise specified, all statutory references to the PPSA are to the provisions of the SPPSA.

“PPSL Values” means the values of personal property security law, as described in Chapter 1, comprised of the prime value of ‘facility’, and the supporting values of ‘transparency’, ‘flexibility’, ‘simplicity’, ‘efficiency’, ‘predictability’, ‘certainty’, ‘clarity’, ‘equality’, ‘balance’, ‘comprehensiveness’, ‘uniformity’ and ‘coherency’.

“Private Key” is like a password- a string of letters and numbers that allows you to access and manage your crypto funds.

“Smart Contract” means a contract where the terms agreed between the parties are written within lines of code that self-execute once the conditions of the agreement are met.

"STA" means the *Securities Transfer Act*, SS 2007, c S-42.3.

"Stablecoin" means a crypto-asset whose market value is pegged to that of another asset such as a fiat currency, commodity or financial instrument.

"UCC" means the Uniform Commercial Code of the United States of America.

"UNCITRAL" means the United Nations Commission on International Trade Law.

"Virtual Currency" means a digital asset that can be used to buy and sell goods or services.

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CHAPTER ONE: GENERAL INTRODUCTION

1.1 Introduction

The main questions sought to be answered in this thesis are – Should modern secured transactions legislation be amended to make crypto-assets a more viable form of personal property collateral? If so, how can the legislation be improved? These questions are particularly relevant today because crypto-assets are moving closer towards mainstream adoption. Crypto-assets are currently being used as collateral in secured transactions, and their use as collateral is likely to increase as they become more widely adopted.

This thesis examines the current regulatory regime applicable to crypto-assets in Canada. Crypto-assets are automatically within the scope of regulation under Canadian personal property security law by virtue of being personal property. However, crypto-assets are not expressly provided for under the law and as a result, they are treated as a residual form of personal property. The laws currently applicable to crypto-assets were drafted without consideration of crypto-assets and their unique nature. This thesis, therefore, examines the existing personal property security legislation in Canada to identify the key issues which need to be resolved in order to sufficiently regulate the use of crypto-assets as collateral. Secured transaction legislation in the United States (US) is also analyzed to draw comparisons because the existing secured transactions framework in the US and Canada are broadly similar. As a result of the similarities between US and Canadian secured transactions law, both countries have experienced the same issues with the regulation of crypto-related secured transactions. These issues include the categorization of crypto-assets, how security interests in crypto-assets may be perfected to ensure proper enforcement, and the negotiability of crypto-assets in a manner that protects third parties. The US has made several efforts to resolve these issues, and the different approaches taken by the US to regulate crypto-related secured transactions would be examined. This thesis identifies certain foundational principles that lawmakers should consider in regulating the use of crypto-assets as collateral in secured transactions and evaluates the efficacy of the regulatory approaches taken by the US with reference to these principles.

Upon identification of the issues currently hampering effective regulation of crypto-related secured transactions in Canada, this thesis makes recommendations to resolve the issues. The recommendations include the specific categorization of “crypto-assets” as a form of personal property under Canadian personal property security law and, the implementation of perfection by control to resolve the enforcement issues currently affecting parties with security interests

in crypto-assets. The thesis also proposes provisions for the protection of third parties dealing with crypto-assets that are subject to a security interest, to strengthen third-party rights in crypto-related secured transactions.

The first chapter of this thesis defines crypto-assets and describes how they have evolved since their invention. It also provides an overview of personal property security law in the US & Canada and explains the foundational premise for this research, referring to the theoretical basis for secured transactions and the guiding principles of secured transactions law. This chapter also outlines the methodology that would be employed in the thesis.

1.2 What are Crypto-Assets?

Crypto-assets are without a doubt one of the most disruptive technological innovations of the 21st century. The world was introduced to the term "cryptocurrency" with the release of the Bitcoin whitepaper by Satoshi Nakamoto in 2008.[1] Cryptocurrency is a type of virtual asset that is secured using cryptography. Cryptocurrency uses distributed ledger technology[2] such as blockchain to record and verify transactions.[3] Bitcoin was developed following the global financial crisis to resolve the problem of currency volatility and data protection.[4] It was invented to give people more control over their money and improve the efficiency of financial transactions, by removing centralized entities such as banks and governments, which could create bottlenecks in the financial system.[5]

Bitcoin is the first decentralized digital currency, and it can be used to pay for products and services. The utilization of blockchain technology for the creation of bitcoin and other crypto-assets eliminates the risk of duplication of digital currencies which could lead to double-spending.[6] In order to verify a bitcoin transaction, each user of the blockchain network needs to validate the transaction. Validation ensures that each bitcoin is unique and cannot be

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[1] Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System" (2008), online: Bitcoin < https://bitcoin.org/bitcoin.pdf >.

[2] CFI Team, "Distributed Ledger Technology" (October 9, 2022), Online: CFI < https://corporatefinanceinstitute.com/resources/cryptocurrency/distributed-ledger-technology/ >: Distributed Ledger Technology ("DLT") may be defined as a digital system that allows users to record, share, and synchronize data and transactions across a distributed network consisting of numerous participants.

[3] Canada Revenue Agency "What is Cryptocurrency?" (January 26, 2022), online: Canada.ca < https://www.canada.ca/en/revenue-agency/news/newsroom/tax-tips/tax-tips-2022/what-cryptocurrency.html >.

[4] "Why was Cryptocurrency Created, Was there a Reason?" (September 30, 2021), online: CryptoSetGo < https://cryptosetgo.com/why-was-cryptocurrency-created-was-there-a-reason/#:~:text=The%20main%20reason%20why%20Bitcoin%20was%20created%20back,on%20time%20Crypto%20is%20the%20new%20international%20currency. >.

[5] *Ibid.*

[6] Andrew Norry, "The Complete History of Cryptocurrency for Beginners" (February 14, 2018), online: Parameter < https://parameter.io/history-of-cryptocurrency/ >.

replicated. Bitcoin's decentralized nature also makes it less prone to network failure or hacking, as there is no centralized point of vulnerability that can be compromised.[7] It also means that every holder of bitcoin is responsible for storing and securing their funds and has no one to hold accountable in cases of mishaps such as theft or missing private keys (with the exception of users of centralized cryptocurrency exchanges).[8]

1.3 The Evolution of Crypto-Assets

In order to make a case for the regulation of the use of crypto-assets in secured transactions, I will attempt to give an overview of the evolution of crypto-assets. This overview will show how crypto-assets progressed from a relatively unknown invention to an asset that has disrupted the traditional financial system and become an asset held in the investment portfolios of some of the biggest corporations in the world, thus making its use as collateral worthy of regulation.

In the early years of cryptocurrency invention, the term cryptocurrency was synonymous with bitcoin. Some of the earliest bitcoin transactions occurred on the Bitcointalk forum, which had one of the first communities of bitcoin enthusiasts.[9] One of the earliest recorded transactions for value was the purchase of two pizzas for 10,000 BTC in 2010.[10] By 2011, alternative cryptocurrencies were created (often known as alt-coins) and one of these was Litecoin, which used the same technology as bitcoin, but was also intended to improve certain aspects of the bitcoin design such as speed and pseudonymity.[11] One bitcoin was valued at $0.30 by January 2011.[12] The development of other cryptocurrencies and the increased popularity of bitcoin led to the creation of cryptocurrency exchanges where bitcoin could be publicly traded. These developments influenced the valuation of bitcoin and led to a price of about $30 in June 2011 before it crashed to about $5 by the end of the year.[13] About the time of the price peak, an article was released about the Silk Road, an online black market where illegal items were sold.[14] This illegal marketplace utilized bitcoin due to the pseudonymity of its transactions and this article was one of the earliest relatively mainstream articles on bitcoin. The release of this

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[7] *Ibid.*
[8] *Ibid.*
[9] Francisco Memoria "The First Bitcoin Transactions: From a Test to the Famous Pizza Purchase" (October 7, 2021), online: CryptoCompare < https://www.cryptocompare.com/coins/guides/the-first-bitcoin-transactions-from-a-test-to-the-famous-pizza-purchase-1/ >.
[10] *Ibid.*
[11] See Norry, *supra* note 6.
[12] *Ibid.*
[13] *Ibid.*
[14] Adrian Chen, "The Underground Website Where You Can Buy Any Drug Imaginable" (June 1, 2011), online: Gawker < https://www.gawker.com/the-underground-website-where-you-can-buy-any-drug-imag-30818160 >.

article began the mainstream association of bitcoin with illegal activity. Notwithstanding the bad press that cryptocurrency started to receive, legitimate merchants such as WordPress began accepting bitcoin as payment.[15] Others soon followed, and the end of 2012 saw an appreciation of the price of Bitcoin to about $13.[16] More cryptocurrencies were also created including Ripple, which utilized faster innovative modes of creation other than mining[17] and had faster transaction processing times.

2013 was a significant year for bitcoin, with the main payment processor for bitcoin recording over $1 million worth of transactions in a single month and the bitcoin marketplace surpassing $1 billion in the course of the year.[18] This substantial growth was partly attributed to the increase in the number of merchants willing to accept cryptocurrencies for payments and the consequential exposure that was created for cryptocurrencies.[19] This growth was also partly credited to market manipulation caused by artificial trading between bots.[20]

In early 2014, Mt Gox, the largest cryptocurrency exchange at the time, was hacked and about 6% of the total bitcoin in circulation was stolen.[21] This resulted in doubt about the security of cryptocurrency transactions and led to a price decline from about $950 in January 2014 to about $200 in August 2015.[22] Though this hack was not of the blockchain itself but of the centralized cryptocurrency exchange, this event was a major stumbling block in cryptocurrency adoption. Despite this event, 2014 remains a significant year for cryptocurrency evolution as it marked the creation of NEO,[23] one of the first platforms to enable smart contracts[24] on the blockchain, and the launch of the first bitcoin bank in the world.[25] Ethereum, the second-largest

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[15] Jon Matonis, "What's Your Bitcoin Strategy? WordPress Now Accepts Bitcoin Across The Planet" (November 16, 2012), online: Forbes < https://www.forbes.com/sites/jonmatonis/2012/11/16/whats-your-bitcoin-strategy-wordpress-now-accepts-bitcoin-across-the-planet/?sh=2b9e80325f62 >.

[16] See Norry, *supra* note 6.

[17] "What is Mining?" (13 February 2023), online: Coinbase < https://www.coinbase.com/learn/crypto-basics/what-is-mining >: Mining is the process by which networks of specialized computers generate and release new Bitcoin and verify new transactions.

[18] Collins Valentin, "Crypto Timeline: The Evolution of Bitcoin, Blockchain, and Cryptocurrency Technologies" (March 30, 2020), online: BlockPublisher < https://blockpublisher.com/crypto-timeline-the-evolution-of-bitcoin-blockchain-and-cryptocurrency-technologies/ >.

[19] See Norry, *supra* note 6.

[20] *Ibid.*

[21] Andrew Norry, "The History of the Mt Gox Hack: Bitcoin's Biggest Heist", (March 31, 2020) online: Blockonomi < https://blockonomi.com/mt-gox-hack/ >.

[22] See Norry, *supra* note 6.

[23] *Ibid.*

[24] TechnologyHQ, "Blockchain Smart Contracts: Challenges and Opportunities" (January 29, 2019) Online: TechnologyHQ < https://www.technologyhq.org/smart-contracts-challenges-and-opportunities/ >: A smart contract is a contract where the terms agreed between the parties are written within lines of code that self-execute once the conditions of the agreement are met.

[25] "Bitcoin Year in Review: 2014 – A Year to Remember" (March 4, 2021) online: CCN < https://www.ccn.com/bitcoin-year-in-review-2014/ >.

cryptocurrency by market cap, was launched shortly after (in 2015) and Coinbase became the first regulated cryptocurrency exchange.[26]

2017 is arguably the most significant year yet as it relates to mainstream cryptocurrency adoption. 2017 recorded phenomenal valuations of cryptocurrencies with Bitcoin rising to almost $20,000 by December 2017, Ethereum rising by over 9,000%, and Ripple rising by about 36,000%.[27] Though a price crash soon followed which led to some commentators describing cryptocurrency as the largest 'bubble' in history,[28] it is a fact that cryptocurrency adoption has continued to grow immensely, and it is now considered one of the largest asset classes in history. The term "Cryptocurrency" has now become a subset of the larger body of assets commonly known as crypto-assets because it has developed far beyond currencies and comprises other types of assets including platform tokens like Ethereum and Cardano, utility tokens, stablecoins, and lots more.[29] Major corporations such as Paypal, Microsoft, and Tesla enable crypto-asset-related transactions[30] and many big corporations now hold crypto-assets as part of their investment portfolio.[31] Recently, the tech giant Facebook changed its name to "Meta" in the wake of the Metaverse boom, which saw the introduction of several blockchain-enabled virtual reality projects which are projected to become a more significant technological innovation in the future.[32] Bitcoin has also been declared as legal tender in El-Salvador[33] and

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[26] See Norry, *supra* note 6.
[27] *Ibid.*
[28] Angela Monaghan, "Bitcoin biggest bubble in history, says economist who predicted 2008 crash" (February 2, 2018), online: The Guardian < https://www.theguardian.com/technology/2018/feb/02/bitcoin-biggest-bubble-in-history-says-economist-who-predicted-2008-crash >.
[29] Kieran Smith, "6 Types of Crypto Assets You Need to Know About" (June 8, 2020), online: Crypto Currency News < https://cryptocurrencynews.com/6-types-crypto-assets/#:~:text=6%20Types%20of%20Crypto%20Assets%20You%20Need%20to,4%20Utility%20Tokens.%205%20Tokenized%20Assets.%20More%20items >.
[30] Krutika Adani, "15 Major Companies That Accept Crypto Payments" (July 21, 2021), online: CoinsCapture < https://coinscapture.com/blog/15-major-companies-that-accept-crypto-payments >.
[31] Stephen Graves & Daniel Philips, "The 10 Public Companies With the Biggest Bitcoin Portfolios" (July 25, 2022), online: Decrypt < https://decrypt.co/47061/public-companies-biggest-bitcoin-portfolios >.
[32] Andrew Griffin, "Why is Facebook changing its name to Meta? The official reason – and why it might really be happening" (October 29, 2021), online: Yahoo finance < https://finance.yahoo.com/news/why-facebook-changing-name-meta-082701191.html >.
[33] Mark Kolakowski "El Salvador Becomes Bitcoin Laboratory as First Nation to Adopt it as Legal Tender" (September 07, 2021), online: Investopedia < https://www.investopedia.com/el-salvador-accepts-bitcoin-as-legal-tender-5200470#:~:text=Bitcoin%20officially%20became%20legal%20tender%20in%20El%20Salvador,increasingly%20popular%20among%20many%20investors%20and%20speculators%20globally. >.

the Central African Republic,[34] and a similar move is being considered in some other countries as well.[35]

These developments all indicate that crypto-assets and distributed ledger technology, though still relatively early in development, are here to stay. Several countries including Canada and the US have recognized their permanence and established crypto regulations as it relates to certain aspects of the economy such as financial crime prevention and taxation.[36] Since rules have been put in place to combat crimes and economies are now benefitting from crypto-assets via taxation, it is not far-fetched to consider regulation of the use of crypto-assets in secured transactions. I have established that crypto-assets are assets that have to a large extent gained mainstream adoption. Beyond that, crypto-assets are already utilized as collateral in secured transactions and as long as this remains a legal way to utilize crypto-assets, the law should help create certainty and facilitate these transactions.

1.4 Personal Property Security Legislation in Canada and The United States

The Personal Property Security Act ("PPSA") is the main legislation governing secured transactions in personal property in all common law provinces in Canada. The PPSA regulates security interests in goods, instruments, documents of title, chattel paper, investment property, money, and intangibles.[37] The scope of the PPSA is very broad and does not only involve debt payment obligations such as loans but also encompasses other transactions giving rise to a security interest such as leases, conditional sales, trusts, pledges, and assignments.[38] However, there are exceptions to its application such as liens, interests in land, including leases, interests in annuities and insurance policies, and interests in any kind of compensation for labour or personal services (other than fees for professional services), rights to damages in tort, etc.[39] The PPSA regulates crypto-related secured transactions through the "intangibles" category.

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[34] Ryan Browne, "Central African Republic becomes second country to adopt bitcoin as legal tender" (April 28, 2022), online: CNBC < https://www.cnbc.com/2022/04/28/central-african-republic-adopts-bitcoin-as-legal-tender.html >.

[35] Rahul Nambiampurath, "These Countries Are Considering Making Bitcoin A Legal Tender" (June 30, 2022), online: IBT < https://www.ibtimes.com/these-countries-are-considering-making-bitcoin-legal-tender-3557424 >.

[36] Vanya Gautam, "Countries Where Cryptocurrency Is Taxed" (February 12, 2022), online: India Times < https://www.indiatimes.com/worth/investment/countries-where-crypto-is-taxed-561760.html >; See also Alix d'Anglejan-Chatillon, Ramandeep Grewal, Eric Levesque "Blockchain & Cryptocurrency Laws and Regulations 2023 | Canada" online: GLI < https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/canada#chaptercontent10 >: These crypto regulations include Canada's *Proceeds of Crime (Money Laundering) and Terrorist Financing Act*, the *Income Tax Act* and the *Excise Tax Act*.

[37] *Personal Property Security Act 1993*, SS 1993, c P-6.2 [SPPSA], s 2(ff).

[38] *Ibid*, s 3.

[39] *Ibid*, s 4.

The Uniform Commercial Code is a set of laws that regulate all commercial transactions in the US. It was designed to encourage uniformity in the treatment of commercial transactions in all jurisdictions across the US.[40] Article 9 of the Uniform Commercial Code ("UCC") deals with secured transactions. The original UCC Article 9 predates the PPSA and is similar in many respects in terms of its application. US lawmakers have recently introduced crypto-specific amendments to the UCC, and these amendments are primarily contained in Articles 9 & 12.

1.5 Research Question

The main questions sought to be answered in this thesis are:

> Should modern secured transactions legislation be amended to make crypto-assets a more viable form of personal property collateral? If so, how can the legislation be improved?

As crypto-asset adoption becomes more mainstream, more people will be interested in using their crypto-assets as collateral. There are many reasons why a debtor may choose to use their crypto-assets as collateral. For instance, a debtor holding a crypto-asset like bitcoin may be holding the asset because they deem it valuable and likely to appreciate. Instead of disposing of their assets and using the profits to finance a business endeavour, they may decide that it is better to grant a security interest in the crypto-asset to a lender in exchange for a loan, to take advantage of the potential appreciation of the asset.[41] Also, a debtor holding a crypto-asset like a stablecoin[42] may do so because they do not feel comfortable keeping their funds in traditional banks. These debtors should also not need to have to convert their stablecoins into cash and store in a bank to be able to access a loan.

Crypto-assets are a novel asset class that is not completely understood by many and the technology behind them continues to evolve daily. Any form of regulation of crypto-assets must therefore take into consideration the unique nature of the asset class and address all potential concerns that may arise. The proposed legislation must be one that facilitates crypto-related secured transactions and is consistent with the foundational secured transaction

[40] Jean Murray, "What is the Uniform Commercial Code: Definitions & Examples of the UCC" (11 September 2020), online: the balance small business < https://www.thebalancesmb.com/what-is-the-uniform-commercial-code-398505 >.
[41] Syed Shoeb, "Why Borrow Cryptocurrencies against Your Collateral?" (3 October 2019), online: Medium < https://medium.com/nuo-news/why-borrow-cryptocurrencies-against-your-collateral-nuo-network-2082875cec76#:~:text=Well%2C%20they%20can%20pledge%20them%20as%20collateral%20to,obtain%20funds%20to%20use%20without%20selling%20their%20holdings. >.
[42] Adam Hayes, "Stablecoins: Definition, How They Work, and Types" (4 October 2022), online: Investopedia < https://www.investopedia.com/terms/s/stablecoin.asp >.

principles outlined below. The proposed legislation must also be presented in a clear and simple manner to enable parties that choose to engage in this form of secured transactions to do so with ease. To properly regulate the use of crypto-assets in secured transactions, this thesis will focus on the major aspects of secured transactions law that must be addressed in the regulation of any form of personal property. These include identifying the appropriate kind of personal property to which crypto-assets belong, the creation, attachment, and perfection of a security interest in crypto-assets, and the priority and enforcement concerns associated with using crypto-assets as collateral. This thesis concentrates mainly on Canadian secured transaction law, but also offers insight into the American approach to regulation.

1.6 Foundational Premise for this Research

As discussed above, crypto-assets are a relatively new concept, and a high degree of scepticism still surrounds the discourse on their use. For this reason, some might argue that any regulation of the use of crypto-assets in secured transactions is premature. But I am of the view that this issue is worthy of immediate legislative consideration because the use of crypto-assets in secured transactions is growing and parties to these transactions should be certain about the position of the law on the issues they may encounter.

Canadian secured transactions law exhibits fewer uncertainties than many other comparable systems due to the incremental reform that has been made over the years in the pursuit of uniformity across the provinces and territories.[43] Regulating the use of crypto-assets in secured transactions will further promote certainty in the law. Other than certainty, there are many other principles that secured transactions legislation should uphold, and these will be examined in-depth below. But before delving into these principles, I will examine the nature and theoretical basis for secured transactions to determine whether secured transactions are indeed beneficial and worthy of facilitation. I will also address the usefulness of regulating crypto-related secured transactions specifically, by determining whether crypto-assets are "quality collateral" deserving of regulation.

1.6.1 The Nature and Theoretical Basis for Secured Transactions

A secured transaction is one in which a debtor grants an interest in its property to a secured party to ensure payment or performance of an obligation.[44] Secured transactions are an

[43] Ronald C.C. Cuming, Catherine Walsh and Roderick J. Wood, "Secured Transactions Law In Canada – Significant Achievements, Unfinished Business And Ongoing Challenges" (2011), C.B.L.J 50 at 156.
[44] Clayton Bangsund, *Bangsund on the Personal Property Security Act: The CCPPSL Model* (Thomson Reuters, 2021) at 1.

important part of commercial relationships and the economy. By permitting secured parties to take a security interest in the collateral of a debtor, secured transactions provide a guarantee of legal relief to the secured party if the debtor is unable to fulfill its obligation.

Secured transactions law is premised on the notion that "the total net wealth of an economy will increase if more secured credit is available as a complement to unsecured credit."[45] Businesses do not typically have all the cash required to satisfy their financial obligations, and to meet these obligations credit needs to be available to them.[46] The availability of credit is thereby vital to the success of businesses and the growth of the economy. Credit providers are better enabled to offer the necessary financial support to businesses when the risk of non-repayment is reduced as much as possible. The grant of a security interest in the property of a debtor reduces the risk of non-repayment by allowing the secured creditor to dispose of the encumbered assets in the event of default, to recover the credit advanced. Due to this reduction in risk, credit providers are more likely to advance funds to businesses at a lower interest rate than where they have no security.[47] Furthermore, borrowers are typically allowed to retain possession and use of their collateral, so secured credit is generally viewed as a win-win situation for borrowers and secured creditors.[48]

However, several arguments have been advanced disputing the usefulness and benefits of secured credit. Firstly, some critics are of the view that secured credit is harmful to the debtor's non-adjusting unsecured creditors as the grant of security to one creditor may significantly reduce the asset pool available to satisfy the claims of the existing non-adjusting unsecured creditors.[49] These critics view secured credit as a means of wealth redistribution where the powerful (secured creditors) prey on the weak (non-adjusting unsecured creditors).[50] As a

[45] United Nations Commission on International Trade Law (UNCITRAL), UNCITRAL Legislative Guide on Secured Transactions (New York: United Nations, 2010) at Intro para. 46.
[46] *Ibid.*
[47] "Secured Transactions in the United States", Online: Primidi.com < https://www.primidi.com/secured_transactions_in_the_united_states >.
[48] Clayton Bangsund, "Control v. Registration: Contemplating A Potential Paradigm Shift in The PPSA's Governance of Security Interests in Deposit Accounts" (JuliusErwin, 2018) at 31.
[49] *Ibid* at 32; Also see Lucian Ayre Bebchuk and Jesse M. Fried, "The Uneasy Case for the Priority of Secured Claims in Bankruptcy: Further Thoughts and a Reply to Critics" (1997) 82 Cornell L. Rev. 1279 ("Further Thoughts") at 1295-1304: non-adjusting creditors are creditors that are unable to adjust their credit terms in light of a new creditor's security interest. These include involuntary creditors, voluntary creditors with small claims, government tax, and regulatory claimants, and prior voluntary creditors.
[50] *Ibid* at 33*;* Lynn M. LoPucki, "The Unsecured Creditor's Bargain" (1994) 80 Va. L. Rev. 1887 at 1947; John Hudson, "The Case Against Secured Lending" (1995) 15 Int'l Rev. L. & Econ. 47.

solution, some critics advocate for an adjustment of the priority rules to allow non-adjusting unsecured creditors to share in the proceeds of the liquidated collateral.[51]

It is also argued that debtors do not really benefit from secured credit because the low-interest rate they receive from the secured creditor is offset by the higher rate of interest that the other creditors will charge, once they discover that the debtor has depleted the existing asset pool by granting security.[52] This increased cost for the debtor along with the high cost of issuing security has led some scholars to conclude that the debtor would be worse off with security than without it.[53] This then begs the question of why secured credit is so common. If secured credit truly creates an undesirable outcome for debtors, why do even the most sophisticated businesses grant security? Some scholars have tried to justify the ubiquity of secured credit and have presented several theories to explain this phenomenon. These include the theories of screening, signalling, monitoring, and controlling.[54]

The screening theory posits that granting a security interest may help reduce the costs associated with a loan transaction because it eradicates the need for a detailed credit investigation.[55] The debtor's ability to grant security is usually a good indicator of its ability to repay the loan, so if the costs of conducting a credit investigation are projected to be more than the cost associated with a grant of security, this may be a compelling reason for the debtor to grant security. For instance, in pawnbroking, the cost associated with the grant of security (perfection costs) are low since perfection usually occurs by transferring possession of the collateral to the secured creditor, and the cost implication of the debtor's restricted use of the collateral is also low because the item transferred is usually not an income-generating asset.[56]

The signalling theory suggests that the grant of collateral by a debtor signals the debtor's ability to repay the loan.[57] Signalling theory posits that a low-risk borrower is more willing to grant

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[51] Bangsund, *supra* note 44 at 33.
[52] *Ibid*; Thomas H. Jackson and Anthony T. Kronman, "Secured Financing and Priorities Among Creditors" (1979) 88 Yale L.J. 1143; Alan Schwartz, "Security Interests and Bankruptcy Priorities: A Review of Current Theories" (1981) 10 J. Legal Stud. 1 ("Current Theories"); F.H. Buckley, "The Bankruptcy Priority Puzzle" (1986) 72 Va. L. Rev. 1393.
[53] Schwartz, Current Theories, *supra* note 52 at 7.
[54] Norman Siebrasse, "A Review of Secured Lending Theory" (The World Bank, 1997) online: ResearchGate < https://www.researchgate.net/publication/237830835_A_Review_of_Secured_Lending_Theory >; Also see Robert Scott, "The Truth About Secured Lending" (1997) 82 Cornell Law Rev. 1436 at 1448-52.
[55] *Ibid* at 13.
[56] *Ibid.*
[57] John Armour, "The Law and Economics Debate About Secured Lending: Lessons for European Lawmaking? (2008) 2 European Company and Financial Law Review 3 at 17.

collateral than a high-risk borrower because the cost of offering collateral would be more for the high-risk borrower and this cost would discourage a high-risk borrower from granting collateral. The low-risk borrower is willing to grant security to take advantage of the lower interest rate since the cost of granting the collateral is low and he knows that he will not default on the loan.[58] This theory however appears to be contrary to reality as empirical evidence suggests that security is granted more frequently by newer and smaller firms, which usually have lower creditworthiness.[59]

The monitoring theory suggests that a debtor might grant a security interest if the cost involved is less than the cost required for the secured creditor to monitor the debtor's conduct after the loan has been advanced.[60] There is almost always a risk borne by a lender when extending a loan. There is also a chance that the debtor might behave in a manner contrary to the terms of the loan after it is advanced, which could increase the lender's risk of non-repayment. To mitigate such risks, a lender may decide to closely monitor the debtor's conduct to reduce the threat of misbehaviour. The cost involved in monitoring is usually borne by the debtor and the riskier the lender deems the loan to be, the more monitoring procedures that would be implemented, leading to higher monitoring costs.[61] A standard loan agreement usually contains a clause requiring the debtor to pay all costs involved in facilitating the transaction. These costs usually include monitoring costs, perfection costs, legal, and any ancillary fees. The grant of security by the debtor reduces the lender's risk of non-repayment, thus reducing the number of monitoring procedures needed. In instances where it would cost less for the debtor to grant a security interest than the monitoring costs which he would have to bear on behalf of the lender, this may be a reason for the debtor to choose to grant a security interest.

The controlling theory posits that secured credit may be beneficial to a debtor because it could lower the aggregate cost of the loan transaction.[62] Secured credit gives the lender the ability to enforce payment of the loan amount in the event of default by forcibly collecting the loan if the borrower does not voluntarily repay, thereby achieving some control over the transaction. The grant of secured credit may enhance the lender's ability to enforce payment in the

[58] Siebrasse, *supra* note 54.
[59] *Ibid*; Also see AN Berger and GF Udell, 'Collateral, Loan Quality, and Bank Risk' (1990) 25 Journal of Monetary Economics 21; SS Chen, GHH Yeo, and KW Ho, 'Further Evidence on the Determinants of Secured Versus Unsecured Loans' (1998) 25 Journal of Business Finance and Accounting 371; MA Lasfer, 'Debt Structure, Agency Costs and Firm's Size: An Empirical Investigation', working paper, Cass Business School (2000).
[60] See Jackson & Kronman, *supra* note 52 at 1149.
[61] *Ibid.*
[62] Ronald J. Mann, "Explaining the Pattern of Secured Credit" (1997) 110 Harv L. Rev. 625 at 639.

following ways: by encumbering collateral, by granting priority to a lender, or by enhancing the lender's remedy so it can coerce payment quicker than if the debt were unsecured.[63] Apart from the control which the lender has over recovering the loan via enforcement, the grant of collateral can also increase the lender's ability to limit further borrowings, increase the debtor's motivation to repay the loan voluntarily, and facilitate restraints on the debtor's incentive to take unnecessary risks.[64] These are all reasons that could make the lender agree to more favourable loan terms with a debtor.

It might be true that secured credit is not always a win-win situation for the debtor and secured creditor. Valid concerns have been raised about its role in wealth redistribution, which affects the more vulnerable creditors. The theories which have been presented to explain the benefits of secured credit mostly justify secured credit as a cost-saving strategy that a debtor might employ to reduce costs associated with obtaining a loan. However, these theories only highlight the usefulness of secured credit in specific situations and do not wholly justify the benefits of secured credit.[65] It is my view that the ubiquity of secured credit is evidence of its usefulness. It is possible that its ubiquity is due to the absence of credit advancement on more favourable terms, but even if this happens to be the case, secured credit is generally of more benefit to the wider society than it is harmful because it facilitates the free flow of capital, which is vital to economic growth. In the words of Armour, the empirical findings "tend to suggest that the legal institution of secured credit is, on the whole, socially beneficial and that such benefits are likely to outweigh the social costs of any transactions motivated by redistribution."[66]

I will therefore be proceeding on the assumption that secured credit is a worthwhile legal institution, and that secured transactions involving the personal property of debtors ought to be facilitated. It is however important to also examine the usefulness of facilitating secured transactions in the context of crypto-assets specifically. A major concern often raised against the need to regulate the use of crypto-assets under Canadian secured transactions law is that crypto-assets are not a good form of collateral and so, the law should not be updated to facilitate their effective use as such. I disagree with this contention and will hereby be examining what "quality collateral" means in the context of the digital age.

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[63] *Ibid.*
[64] *Ibid* at 641.
[65] *Ibid* at 682.
[66] Armour, *supra* note 57 at 2.

1.6.2 Do Crypto-assets have what it takes to be considered quality collateral?

There are many kinds of personal property that can be used as collateral for loans. But some forms of collateral are better than others.[67] The PPSA categorizes forms of personal property in a way that almost any asset can be considered collateral. To cover all bases, the PPSA even has a residual class of personal property known as "intangibles", which includes all other forms of personal property not specifically mentioned in the PPSA.[68]

Over the course of history, what is considered "quality collateral" has evolved. In 1339, King Edward III pledged his crown as security to a lender in Luxembourg, to finance the Hundred Years' War.[69] Though this collateral could be easily traced to its owner and was likely a desirable asset, taking possession of the collateral would have involved the logistical challenges of crossing jurisdictional lines by land and sea. That, in addition to the challenges involved in finding a buyer for the collateral, would have made it difficult to liquidate. Collateral that requires high costs to attain possession and collateral which does not have a ready market for liquidation purposes, may not be considered "quality collateral" today.[70]

In the modern day, quality collateral is usually cost-effective to hold, operationally easy to use, and easy to take possession of, and liquidate.[71] The quality of a form of personal property as collateral is diminished if it fails to meet any of the above criteria. The Corporate Finance Institute has also eloquently outlined the qualities of good collateral as the MAST framework.[72] MAST stands for Marketable, Ascertainable, Stable, and Transferrable.[73] For an asset to be marketable, it must be desirable to other parties. There must be an active secondary market for the collateral.[74] For instance, stocks are marketable forms of collateral because there are various stock exchanges with active participants trading assets daily. The market capitalization of stocks and other equities is also a good indicator of the marketability of a particular equity.[75] In the crypto-asset context, there are several cryptocurrency exchanges where assets are traded

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[67] Greg Muecke, "What Makes for a Good Collateral Asset?" (January 6, 2021), online: Nasdaq < https://www.nasdaq.com/articles/what-makes-for-a-good-collateral-asset-2021-01-06 >.
[68] SPPSA, *supra* note 37.
[69] Muecke, *supra* note 67.
[70] *Ibid.*
[71] *Ibid.*
[72] Kyle Peterdy, "Collateral Quality" (July 7, 2022) online: CFI < https://corporatefinanceinstitute.com/resources/knowledge/credit/quality-of-collateral/ >.
[73] *Ibid.*
[74] *Ibid.*
[75] Chris Davis, "Market Capitalization: What It Is and Why It's Important" (May 2, 2022), online: nerdwallet < https://www.nerdwallet.com/article/investing/what-is-market-cap >. A company's market cap is the total value of its shares of stock. It serves as a good indicator to investors of how valuable the public perceives a company to be.

daily. Like stocks, some crypto-assets are more desirable than others and this is evidenced by their high market capitalizations. Bitcoin and Ethereum are examples of crypto-assets with large market capitalizations;[76] they also have high trading volumes so can be easily liquidated in the secondary market.[77] These may therefore be better quality collateral than less traded crypto-assets.

Quality collateral must be ascertainable.[78] This means it should be easy to understand the market value of the asset. An asset that has an easily verifiable market value such as stocks and bonds is more ascertainable than assets that have a more subjective value such as fine art or jewellery.[79] Similar to stocks, crypto-assets are ascertainable because their market values can be easily verified at any time by accessing an exchange where they are traded.

Stability is another important factor in determining whether collateral is of high quality. Stability is the argument usually emphasized by people that do not deem crypto-assets as good collateral. Before accepting an asset as collateral, a lender must consider how stable the collateral is, and whether it is likely to retain its value over the duration of the loan. High-quality collateral should either retain its value well or at least depreciate to a predictable degree. For instance, manufacturing equipment usually depreciates at a predictable rate, so secured creditors can structure the loan in a way that their credit exposure declines in line with the diminishing collateral value.[80] Stocks on the other hand are more volatile and depreciate at a less predictable rate. However, secured creditors usually work around this by employing strategies such as over-collateralization[81] and margin calls[82] to ensure that the available collateral is sufficient to cover their credit exposure. Secured creditors who choose to accept crypto as collateral could also use similar strategies to ensure that in the event of default, the collateral is of sufficient value to recover the loan amount. These secured creditors could also

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[76] Nathan Reiff, "Top 5 Cryptocurrencies by Market Cap" (June 25, 2019), online: Investopedia < https://www.investopedia.com/news/top-5-cryptocurrencies-market-cap/ >.
[77] "Top Cryptos by Volume (all currencies, 24hr)" (August 9, 2022), online: Yahoo finance < https://finance.yahoo.com/u/yahoo-finance/watchlists/crypto-top-volume-24hr/ >.
[78] Peterdy, *supra* note 72.
[79] *Ibid*.
[80] *Ibid.*
[81] Overcollateralization is a situation where the value of the asset used as collateral on a loan exceeds the loan value; See CFI Team, "Overcollateralization" (February 2, 2021), online: CFI < https://corporatefinanceinstitute.com/resources/knowledge/credit/overcollateralization/#:~:text=Overcollateralization%20is%20a%20credit%20enhancement%20technique%20and%20limits,the%20collateral%20to%20redeem%20any%20potential%20loan%20losses. >.
[82] A margin call occurs when a broker requests that an investor deposit more cash or securities to cover potential losses. See James Chen "Margin Call" (January 4, 2022), online: Investopedia < https://www.investopedia.com/terms/m/margincall.asp >.

accept less speculative crypto-assets like stablecoins which have values that are pegged to traditional fiat currencies,[83] or crypto-assets with larger market caps as these tend to be less volatile than most.[84] Where this is the case, the arguments against using crypto-assets as collateral become less meaningful.

Title to high-quality collateral should be easily transferrable.[85] Where the asset is situated in a remote location, there will be significant cost and logistical concerns involved in transferring the title. Whereas title to crypto-assets is easily transferrable via the trading platform, and the blockchain instantly records the transaction and the address to which the assets are transferred.

In summary, though the concerns around the stability of the market value of crypto-assets as collateral are valid, this is an insufficient reason not to establish legal provisions for parties who choose to engage in these transactions. Blockchain technology is becoming more useful today, and there are a lot of prospects for the use of the technology in the secured transaction context. For instance, emerging technologies such as the blockchain have addressed many of the concerns that existed with the use of gold as collateral through digital ownership of physical gold.[86] There is great potential for the use of blockchain technology and assets that are built on it to become even more useful in secured transactions. This is because of its secure and efficient record-keeping infrastructure which makes it useful for documenting and accessing information on asset ownership, transfer of title, and the grant of security.[87] Assets built on the blockchain have the qualities of being easily traceable and transferrable which gives them an edge over many forms of traditional collateral. It is thus useful for the secured transactions legislation to become more inclusive of the blockchain and blockchain-related assets such as cryptocurrencies. It is likely that the maturity of crypto as an asset class would lead to less

[83] Although stablecoins are less speculative, there is still a risk of volatility associated with stablecoins. For instance, there were concerns that the USDT could lose its peg because its reserves were suspected to be less than the number of stablecoins issued. Secured parties accepting stablecoins, therefore, need to engage in proper due diligence before accepting these currencies, to decide if they are willing to accept this risk. Due diligence may include a confirmation that the reserves backing the stablecoins are insured. See Mike Antolin, Toby Bochan, "Fiat-Backed Stablecoins: What You Need to Know About Tether, USD Coin and others" (March 22, 2023) online: CoinDesk < https://www.coindesk.com/learn/fiat-backed-stablecoins-what-you-need-to-know-about-tether-usd-coin-and-others/ >.

[84] Davis, *supra* note 75.

[85] Peterdy, *supra* note 72.

[86] Wes Kaplan, "Digitized Gold: Why Going Digital is The Smartest Way to Own Gold" (January 29, 2021) online: Nasdaq < https://www.nasdaq.com/articles/digitized-gold%3A-why-going-digital-is-the-smartest-way-to-own-gold-2021-01-29 >.

[87] Sean William, "20 Real-World Uses for Blockchain Technology" (April 11, 2018) online: TheMotleyFool < https://www.fool.com/investing/2018/04/11/20-real-world-uses-for-blockchain-technology.aspx#:~:text=20%20Real-World%20Uses%20for%20Blockchain%20Technology%201%20Payment,...%205%20Data%20sharing.%20...%20More%20items...%20 >.

volatility in its market value which would make it a better source of collateral in the future. In my view, the volatile nature of crypto-assets is the main factor limiting their potential to be very high-quality collateral. However, I still consider crypto-assets as good collateral and believe that the strategies currently used by lenders that accept equities as collateral, could be more commonly employed to reduce the volatility concern associated with crypto-assets.

1.6.3 The PPSL Principles

A review of the literature reveals the difficulty in articulating the unifying tenets of personal property security law.[88] However, there are certain principles that are often repeated in the literature as ideals that lawmakers should consider when designing optimal commercial legislation. It is clear from these principles that lawmakers are expected to make clear and simple laws to facilitate the free flow of secured credit to foster economic activity. Some of the common themes that can be observed from existing secured transaction literature on these principles include the facilitation of secured transactions,[89] the treatment of diverse forms of secured credit equally,[90] and the enhancement of certainty and transparency.[91]

There are several accounts of the principles of personal property security law, but I will be adopting the principles that have been laid out by Bangsund. Based on an examination of several accounts on the objectives of personal property and security law, Bangsund has thoughtfully derived 13 central principles of personal property security law in an attempt to create unifying principles of personal property security law.[92] He has termed these principles "the PPSL Values" and I shall be analyzing each of these principles and relying on them as the foundational principles which should be considered in the formulation of secured transaction legislation. These principles are not intended to be exhaustive but, in my view, comprehensively embody the intentions behind the PPSA. The PPSL values are as follows:

i. Facility

The PPSA is facilitative. It is designed to facilitate and not impede secured transactions. It encourages debtors to leverage their assets to the full extent, to obtain credit.[93] This upholds the liberal philosophy that the law should not interfere with people's rights to use their property

[88] Bangsund, *supra* note 44 at 38.
[89] UNCITRAL, *supra* note 45, Intro para. 47.
[90] Ronald C.C. Cuming, Catherine Walsh & Roderick J. Wood, *Personal Property Security Law*, 2nd ed. (Toronto: Irwin Law, 2012) at 6-12.
[91] UNCITRAL, *supra* note 45, Intro para. 47.
[92] Bangsund, *supra* note 44 at 42.
[93] UNCITRAL, *supra* note 45 at Intro para. 50.

as they desire.[94] The PPSA's facilitative nature also extends to how it assesses the risk for all the debtor's existing and potential future creditors in a simple and inexpensive manner.[95] Facility is also reflected by how the PPSA focuses on dispute avoidance and resolution. The clarity and simplicity of the PPSA's priority rules make it less likely that a dispute would arise and even when it does, the courts can easily apply the clear rules to resolve the dispute.[96]

ii. Transparency

In facilitating secured transactions, the PPSA encourages transparency. Parties to secured transactions are able to assess the risk involved before proceeding with a transaction. The Personal Property Registry ("PPR") is the main tool that promotes the PPSA's transparency. A search of the PPR reveals to the creditor all the encumbered assets of the debtor and how many other creditors have a security interest in those assets. The UNCITRAL describes the significance of a public notice registry as follows:

> "In order for a secured transactions regime to function efficiently, it is important that all parties be able to determine with a reasonable degree of certainty the extent of the rights of a grantor and third parties in assets to be encumbered. The cornerstone for achieving this certainty, while at the same time respecting and addressing confidentiality concerns, is to establish a general security rights registry for recording notices about the possible existence of a security right".[97]

The Canadian PPR is easily accessible. Searches and registrations can be conducted online, and all creditors can gain access to it and obtain the information necessary to conduct a risk assessment.

iii. Flexibility

The PPSA is flexible. It regulates secured transactions while allowing parties to retain autonomy in how they tailor their financing arrangements.[98] The PPSA's flexibility is reflected in the following provisions i) the advance registration rule, which gives the secured party the flexibility to register his security interest in the debtor's personal property before or after a security agreement is signed, or a security interest attaches;[99] ii) the omni-registration rule, which permits the secured party to rely on one registration to perfect security interests granted

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[94] See Bangsund, *supra* note 44 at 44; Also see Steven L. Harris and Charles W. Mooney, Jr., "A Property-Based Theory of Security Interests: Taking Debtors' Choices Seriously" (1994) 80 Va. L. Rev. 2021 ("Property Based Theory") at 2022: "The law should not impair the ability of debtors to secure as much or as little of their debts with as much or as little of their existing and future property as they deem appropriate."
[95] Bangsund, *ibid.*
[96] *Ibid.*
[97] UNCITRAL, *supra* note 45 at Intro para. 54.
[98] Cuming, Walsh & Wood, *supra* note 90 at 6.
[99] PPSA, s. 43(4); Cuming, Walsh & Wood, *ibid*. at 327.

under multiple agreements and transactions, thereby guaranteeing the secured party's priority;[100] and iii) the registration error forgiveness rule, which forgives the secured party's registration errors and treats the registration as valid, so long as the error is not seriously misleading.[101]

The flexibility of the PPSA is borne of out the desire to facilitate secured transactions. The PPSA has been designed to support freedom of contract and provide an affordable and straightforward perfection and risk assessment process to secured parties, through the PPR.

iv. Simplicity

Simplicity is a very important legal value because, without it, the law would be uncertain and unpredictable.[102] The PPSA promotes simplicity by devising an easy process for the creation and perfection of security interests.[103] This is described by UNCITRAL as follows:

> The Guide also takes the position that creation of a security right should be as simple as possible and that only minimal additional steps should be required to make the security right effective against third parties.[104]

UNCITRAL identifies the processes of creating and perfecting security interests as the main considerations to be had in ensuring simplicity in the PPSA. It also states that only minimal additional steps should be required to establish the effectiveness of the security right against third parties, as it recognizes that lengthy additional steps would only result in a complicated process which will only lead to a less facilitative PPSA.

v. Efficiency

The term 'efficient' is defined as "doing something in a good, careful, and complete way with no waste of time, money or energy."[105] The PPSA's efficiency is demonstrated in the process of creating and perfecting security interests,[106] ease of accessibility to information necessary for the secured party to conduct due diligence, and the procedure for enforcement of security interests in the event of default.[107]

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[100] PPSA, s.43(5); Cuming, Walsh & Wood, *ibid*. at 329.
[101] PPSA, s.43 (6); Cuming, Walsh & Wood, *ibid.* at 363-371.
[102] Stephanie Ben-Ishai & David Percy, Contracts: Cases and Commentaries, 9th ed. (Toronto: Carswell, 2014) at 10: "The law and lawyers are supposed to be providing a service for consumers. If the law is too complex and unpredictable, as well as being destructive rather than supportive of continuing relationships, then it is surely not living up to the reasonable expectations of those consumers."; Also see Peter Schuck, "Legal Complexity: Some Causes, Consequences, and Cures" (1992) 42 Duke L.J. 1 at 3.
[103] UNCITRAL, *supra* note 45 at Intro para. 51.
[104] UNCITRAL, *ibid* at Intro para. 65.
[105] Oxford Learners Dictionary < https://www.oxfordlearnersdictionaries.com/definition/english/efficient >.
[106] Bangsund, *supra* note 44 at 50; see also Cuming, Walsh & Wood, *supra* note 90 at 7 and 9.
[107] Bangsund, *ibid.*; Cuming, Walsh & Wood, *supra* note 90 at 7.

vi. Predictability

Bangsund acknowledges the similarity between 'predictability', 'certainty', and 'clarity' as they all connote definiteness and confidence. He thereby classifies the three terms as a family of "PPSL definiteness values".[108] It is sometimes argued that these definiteness values could be addressed as one PPSL value, but the literature suggests that there are certain distinguishing characteristics of each of those values that make them worthy of individual consideration.[109] Predictability is a very important value of personal property security law because it adds to the simplicity of the secured credit process. When the law is predictable, disputes are less likely to occur because each party is able to conduct accurate risk assessments before deciding to enter into the transaction. Duggan & Ziegel explain the importance of predictability as follows:

> The ability to predict accurately the relative priority position a credit grantor will occupy in the event it is required to rely on a security interest is often an important consideration in the initial decision to grant credit. The lack of a single, integrated system of priority rules that characterized prior law meant that a decision whether or not to grant credit often had to be made in the context of considerable legal uncertainty about the outcome of a priority dispute involving other claims to the collateral. The much more complete priority system of the PPSA not only ensures greater consistency in court decisions dealing with priority disputes but also facilitates more accurate assessment of the legal risks involved in granting credit.[110]

vii. Certainty

Certainty is an essential feature of commercial law. The benefits of certainty in relation to the PPSA are explained by Cuming, Walsh & Wood as follows:

> By establishing a single comprehensive registration system, the PPSA greatly enhanced certainty and predictability for secured parties. Under the Act, priority among security interests that have been perfected by registration generally is determined by the order of registration without regard to actual knowledge, and the holder of a registered or otherwise perfected security interest generally has priority against subsequent claimants.[111]

The PPR is the main tool used to promote the certainty that the PPSA gives to secured parties. Cuming, Walsh & Wood use the terms 'certainty' and 'predictability' in conjunction.[112] Though similar, the use of both terms in conjunction indicates that there may be a distinction between them. Bangsund points out that 'certainty' appears to have a broader meaning than

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[108] Bangsund, *ibid.*
[109] Bangsund, *ibid*; see also Cuming, Walsh & Wood, *supra* note 90 at 10.
[110] Anthony J. Duggan & Jacob S. Ziegel, Secured Transactions in Personal Property: Cases, Text, and Materials, 6th ed. (Toronto: Emond Montgomery Publications Limited, 2013) at 22.
[111] Cuming, Walsh & Wood, *supra* note 90 at 11(emphasis added); Also see UNCITRAL, *supra* note 45 at Intro para. 54.
[112] For another example, see Roy Goode, "The Codification of Commercial Law" (1988) Monash U.L. Rev. 135.

'predictability'.[113] While 'predictability' is only used when referring to future events (i.e., I predict that I will have priority over D's other creditors when I lend him money), 'certainty' can be used either before or after an event (i.e. before the event – I am certain I will have priority over D's other creditors when I lend him money) and after the event (i.e. Now that I have lent D the money, I am certain that I have priority over his other creditors).

viii. Clarity

Clarity can be defined as "the quality of being expressed clearly."[114] UNCITRAL emphasizes that clear rules are vital in a modern secured transactions regime to allow prospective creditors to determine the priority of their security rights before entering into a transaction.[115]

ix. Equality

Equality as a PPSL value relates to the free market economic principle of effective competition.[116] All participants in the secured credit marketplace should have equal opportunity and treatment, regardless of social standing or character.

UNCITRAL emphasizes the importance of equality in the secured credit marketplace as follows:

> Open competition among all potential credit providers is an effective way of reducing the cost of credit. For this reason, an efficient secured transactions regime will be designed to apply equally to a wide range of credit providers: financial institutions and other lenders, manufacturers, and suppliers, and both domestic and non-domestic credit providers.[117]

This is also highlighted by Cuming in relation to the highly contentious discourse on federal Bank Act security as follows:

> A basic assumption is that the best system is one that facilitates the greatest amount of competition and efficiency in the market. When one applies a competitive market test, it is difficult to make a case for the type and degree of federal involvement suggested in the Paper. Why should two types of participants in the same market (eg. banks and credit unions) be subject to different legal regimes? Why should a debtor have different rights depending on whether he or she borrows from a bank or a credit union? How can credit users do any "comparison

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[113] Bangsund, *supra* note 44 at 52.
[114] Oxford Learner's Dictionary < https://www.oxfordlearnersdictionaries.com/definition/english/clarity?q=clarity >.
[115] UNCITRAL, *supra* note 45 at Intro para. 55.
[116] UNCITRAL, *ibid.* at Intro paras. 43 and 45. Also see Friedrich A. Hayek, *The Road to Serfdom* [London: The Institute of Economic Affairs, 2005] at 45: "The liberal argument does not advocate leaving things just as they are; it favours making the best possible use of the forces of competition as a means of coordinating human efforts. It is based on the conviction that, where effective competition can be created, it is a better way of guiding individual efforts than any other."
[117] UNCITRAL, *supra* note 45 at Intro para 52.

> shopping" for a product (financing) when there is artificial product differentiation resulting from differences in the legal regimes applicable to the various sources of financing?[118]

Equality in the secured transaction's context helps reduce the cost of credit because financial institutions are less likely to abuse their position where there is free competition. The PPSA embraces this value because it generally aims to place all parties to secured transactions on equal footing.[119]

x. Balance

The use of the term 'balance' as a PPSL value is synonymous with fairness. UNCITRAL describes the meaning of balance in the PPSL context as follows:

> Security agreements are not just contractual undertakings between secured creditors and grantors. Their property effects also affect the rights of third parties such as other secured creditors, privileged and unsecured creditors, purchasers and other transferees of the encumbered assets, the insolvency representative, and the State. An efficient and effective secured transactions regime must take into account the legitimate interests of all parties and aim to achieve each of the substantive objectives mentioned above, in a way that is balanced and consistent with relevant laws, including insolvency laws.[120]

Under the PPSA, the value of balance is exhibited in the provisions on proceeds.[121] For instance, where a debtor purchases automobiles using a purchase money loan and then sells the automobiles for cash during the ordinary course of business, the purchase money secured creditor is entitled to proceeds from the sale of the automobiles (i.e., the cash) as collateral for the loan. It is fair and just that the secured creditor does not lose its collateral just because it has been sold, but instead gains replacement collateral. The PPSL value of balance also extends to the priority rules that apply in relation to the replacement collateral. As a general rule, the priority of a purchase money security interest also extends to proceeds. However, in situations involving priority between an accounts financier who holds the debtor's deposit account as original collateral, and a purchase money secured creditor who holds a security interest in the debtor's account as proceeds, different provinces have adopted varied interpretations of what balance means. Cuming, Walsh & Wood outline a scenario and explain the approaches adopted by different provinces as follows:

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[118] Ronald C.C. Cuming, "The Position Paper on Revised Bank Act Security: Rehabilitation of Canadian Personal Property Security Law or Curing the Illness by Killing the Patient" (1992) 20 Can. Bus. L.J. 336 at 346.
[119] Bangsund, *supra* note 44 at 56.
[120] UNCITRAL, *supra* note 45 at Intro para. 58.
[121] Cuming, Walsh & Wood, *supra* note 90 at 7.

> An accounts financier is given a security interest on all the debtor's accounts and it registers first-in-time. Later, an inventory financier is given a purchase money security interest on all inventory that it supplies to D. The inventory financier takes the necessary procedural steps to ensure that it obtains the purchase money security interest superpriority. Some of the inventory is then sold to customers giving rise to proceeds in the form of accounts owing to the debtor.[122]
>
> There are two distinct approaches that have been adopted in the various PPSA jurisdictions. In Ontario and the Atlantic provinces, the inventory financer is given priority only if it gives advance notice to the accounts financer of its intention to take a purchase money security interest in the inventory.[123] In the Western provinces and the Territories,[124] the accounts financer is given priority over the inventory financer provided that the accounts financer claims the accounts as original collateral rather than as proceeds and has given new value for them.[125]

The above account reflects the balancing value as employed by lawmakers in different provinces. It shows how there is no one formula for achieving balance under the PPSA. The general takeaway from this is that the PPSA exhibits balance and fairness by weighing the legitimate interests of all relevant parties to the transaction.

xi. Comprehensiveness

As mentioned earlier, comprehensiveness is synonymous with completeness. UNCITRAL describes 'comprehensiveness' as a PPSL value below:

> The Guide is based on the premise that secured credit is promoted when restrictions concerning who may be a grantor or a secured creditor, what types of assets may be encumbered, and what kinds of obligation may be secured are minimized. Thus, States should aim at enacting legislation that is comprehensive in scope and that, as far as possible, embraces all forms of secured transactions, all categories of grantors and secured creditors, and all types of movable assets and secured obligations.[126]

The PPSA exhibits comprehensiveness by substantially addressing all major secured transaction issues i.e., creation, perfection, priority, and enforcement in all types of personal property. The same cannot be said for secured transaction provisions under the *Bank Act*. The *Bank Act* is restrictive because it does not apply to all borrowers, banks, or all kinds of personal property.[127]

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[122] Cuming, Walsh & Wood, *supra* note 90 at 464.
[123] See, for example, OPPSA, s.33(1).
[124] See, for example, SPPSA, s.34(6).
[125] Cuming, Walsh & Wood, *supra* note 90 at 464.
[126] UNCITRAL, *supra* note 45 at Intro para. 61. See similar statements at Intro paras. 50, 53 and 62.
[127] See Clayton Bangsund, "Another Appeal for Pragmatic Reform: The Future of Section 427 Bank Act Security and Canadian Personal Property Security Law", (2012) Social Science Research Network (posted January 31, 2012), online: SSRN, in which he proposes the suspension and ultimate repeal of the Bank Act security provisions.

xii. Uniformity

Uniformity of secured transaction laws across the different provinces and state lines is encouraged to better serve commercial parties.[128] Canada and the US show their commitment to achieving nationwide inter-jurisdictional uniformity. The Uniform Law Conference of Canada aims to harmonize the laws of all the provinces and territories. In the US, commercial laws are mainly governed by the Uniform Commercial Code, a model code enacted mostly uniformly across all 50 U.S states.

xiii. Coherency

Coherency is "the quality of being logical and consistent."[129] In the PPSL context, coherency means treating similar forms of personal property alike. The PPSA aims to provide a consistent set of legal rules for similar forms of personal property.

1.6.4 Compatibility of the Existing PPSA with the PPSL Principles

The current PPSA does not reflect these values in relation to its treatment of crypto-assets. For instance, the PPSA currently does not facilitate secured transactions involving crypto-assets. Certainty is another value of personal property and security law that is currently lacking in relation to crypto-assets under the PPSA. The categorization of crypto-assets under the PPSA reflects this lack of certainty. Some speculators have argued that crypto-assets be categorized as money under the Act, while others have suggested that crypto-assets are intangibles or even investment property.[130] If there is no certainty as to what kind of personal property crypto-assets are under the PPSA, then there is no way they can be regulated effectively, and this could lead to disputes between parties.

The PPSA also fails to uphold the value of fairness as it relates to crypto-assets because an application of the current PPSA to crypto-assets tends to suggest that the PPSA is skewed to protect the borrower in crypto-related secured transactions, with less consideration for the lender and third parties. Comprehensiveness is also identified as one of the principles of personal property security law. For the PPSA to be comprehensive, it needs to completely address the different issues that are within the realm of contemplation in the areas it governs. The current PPSA is not comprehensive as it relates to crypto-assets, because it does not

[128] Roderick J. Wood, "Acquisition Financing of Inventory: Explaining the Diversity" (2014) 13(1) O.U.C.L.J. 49 ("Acquisition Financing") at 51, n.14.
[129] Oxford English Dictionary, online: Lexico < https://www.lexico.com/definition/coherence >.
[130] Xavier Foccroulle Menard and Cecilia Barrette-Leduc, "Sound Regulations for Security Interests in Cryptocurrency" (December 1, 2021), 37:1 B.F.L.R 97 at 113.

provide for the specific nature of crypto-assets. Any application of the PPSA to crypto-assets at this point can only be general and may lead to more questions than answers, as crypto-assets were not contemplated in the drafting of the PPSA. For the PPSA, to continue to uphold these values, crypto-assets need to be regulated. Equality is also identified as a value that should be upheld in making personal property security law, in order to promote diverse sources of credit and diverse forms of secured transactions. Crypto-related secured transactions already exist and are becoming more common. The lack of PPSA provisions regulating crypto-assets does not reflect the promotion of this form of secured transactions.

1.7 Research Methodology & Structure

This thesis employs traditional and statutory interpretive approaches that focus on analysing the specific language contained in the relevant legislative provisions. The thesis mostly relies on a textualist approach to statutory interpretation, given that certainty, clarity, and predictability are key principles considered when drafting commercial legislation. Since the thesis relies on certainty, clarity, and predictability as key values of secured transactions law, I have primarily utilized the textualist approach to statutory interpretation that places primacy on the ordinary meaning of the statutory language. I have also utilized the purposive approach to statutory interpretation to identify the legislative objective of certain statutory provisions. However, I rely on this interpretive approach only when the plain language of the legislation is ambiguous.

The thesis also utilizes a comparative approach between the secured transactions legislation in Canada and the US. This thesis comprises four chapters. The first chapter provides a general introduction to the research. It begins with a beginner-friendly overview of crypto-assets, which explains the concept and purpose of crypto-assets. It then proceeds to give a historical background of crypto-assets and how they have evolved to a point where the regulation of their use as collateral is necessary. This chapter also introduces secured transactions law, by explaining the nature and theoretical basis behind secured credit. It provides an overview of the relevant secured transactions legislation in Canada and the US i.e. the PPSA and UCC Article 9 (2010 version) respectively, presents the research question, and offers an in-depth explanation of the significance of this research.

The second chapter involves an extensive review of existing legislation. It begins by identifying the key areas that need to be addressed in the regulation of the use of crypto-assets as collateral. This involves examining the existing categories of personal property under the extant laws,

identifying the category to which crypto-assets belong under existing legislation, and conducting a review of the suitability of the applicable categorization. Chapter two also covers an extensive review of the PPSA and UCC Article 9 perfection rules. Due to the similarities between the PPSA and UCC Article 9, the PPSA is the primary legislation referred to, while UCC Article 9 is referenced where comparison is necessary. The second chapter also discusses the current enforcement options in the event of default, available to secured parties who accept crypto-assets as collateral under the legislation.

The third chapter examines the progress that has been made in the regulation of the use of crypto-assets as collateral. It covers any laws that have been passed or proposals made in relation to its regulation. This chapter focuses greatly on the progress made in the US, as they have already begun the process of regulation. The different approaches discussed in this section include the Wyoming approach to the regulation of digital assets in secured transactions, the relevant provisions as contained in the Uniform Regulation of Virtual-Currency Businesses Act (URVCBA) which recommends the treatment of crypto-assets as investment property, and the approach taken under the 2022 version of UCC Article 9 & 12, which has been approved for enactment by U.S States. This chapter involves an explanation of these approaches and an assessment of their suitability. This chapter also contains a review of the rules on investment property as provided under the PPSA, the Securities Transfer Act ("STA"), and Article 8 of the UCC. This review is conducted to examine the possibility of treating crypto-assets as investment property or in a similar manner, and the effects of such treatment.

The fourth chapter is the concluding chapter of this thesis. It recommends a detailed framework for the regulation of crypto-assets. It mainly deals with the following aspects of regulation: the creation of an appropriate categorization of personal property for crypto-assets under the Act; suitable perfection provisions that consider the unique nature of crypto-assets – this includes an examination of perfection mechanisms currently utilized by secured parties that accept crypto-assets as collateral; and protection of third parties involved in crypto-related secured transactions. I conclude by recommending an innovative framework that is easy to comprehend and reflects the PPSL values discussed in this chapter.

CHAPTER TWO: REVIEW OF EXISTING SECURED TRANSACTIONS LEGISLATION IN CANADA AND THE UNITED STATES

2.1 Introduction

This chapter focuses on the existing secured transactions legislation in the United States and Canada. It begins with a review of the kinds of personal property under the PPSA and UCC Article 9 ("the applicable laws") and proceeds to examine them in the context of crypto-assets to determine which category crypto-assets belong to under existing law. It then highlights the current issues involved with the treatment of crypto-assets under applicable laws, including the issues relating to perfection, enforcement, and the non-negotiability of crypto-assets. This chapter concludes by broadly examining the modes of perfection under the applicable laws, including those that do not currently relate to crypto-assets, to determine whether any of the existing modes may be more suited to crypto-assets and able to resolve the persisting issues. This chapter does not offer any firm recommendations on which existing laws may be better suited to crypto-assets, but simply identifies the problems and identifies some implications that may lead the reader to form their own conclusions on which rules are more appropriate for the regulation of the use of crypto-assets in secured transactions.

2.2 Categorization of Crypto-assets Under the Applicable Laws

The PPSA defines personal property as "goods, chattel paper, investment property, a document of title, an instrument, money or an intangible."[1] Under UCC Article 9, personal property includes accounts, chattel paper, commercial tort claims, deposit accounts, documents, goods, instruments, investment property, letter of credit rights, letters of credit, money, oil, gas, or other minerals before extraction, and general intangibles.[2] Crypto-assets are not expressly mentioned under these provisions but it is not in doubt that the PPSA and UCC Article 9 cover crypto-assets because they are applicable to all forms of personal property. The inclusion of the intangibles category ensures that even where a type of personal property does not fit into any of the more specific categories, the property will still be governed under the applicable laws. Both the common law and statutes in Canada and the United States have defined "Property" expansively, so the status of crypto-assets as property is clear. For instance, in *Saulnier v Royal Bank of Canada,* the court held that fishing licenses were property for the purposes of the federal *Bankruptcy and Insolvency Act* (BIA) and the Nova Scotia PPSA.[3] In relation to the PPSA, the

[1] *Personal Property Security Act*, SS 1993, c P-6.2 [SPPSA], s 2(ff).
[2] See *Uniform Commercial Code* [UCC], § 9-102(a)(42).
[3] *Saulnier v Royal Bank of Canada*, 2008 SCC 58.

court held that fishing licenses fulfilled the definition of intangible property because "the definition of 'intangible' simply describes something that otherwise constitutes 'personal property' but is not one of the listed types of tangible personal property."[4]

Several scholars have examined the different kinds of personal property to determine the most appropriate category for crypto-assets. Categorization is vital in deciding how crypto-assets should be treated under the applicable laws. It is specifically important for purposes of attachment, perfection, and determining the priority of secured creditors and other transferees of collateral.[5] The literature suggests that the most likely categorization for crypto-assets is either money, investment property, or intangibles. Nevertheless, we will be examining all potential categorizations for crypto-assets under the PPSA and UCC Article 9 below.

2.2.1 Goods: There has been some discussion as to whether crypto-assets are goods.[6] Goods are defined under the PPSA as:

> tangible personal property, fixtures, crops and the unborn young of animals, but does not include chattel paper, a document of title, an instrument, an investment property, money or trees, other than trees that are crops, until they are severed or minerals until they are extracted.[7]

Goods are also defined similarly under UCC Article 9, though the definition is more extensive.[8] It is unlikely that crypto-assets are goods because they are not tangible property.

It has been suggested that treating crypto-assets as commodities may be a good idea because it reflects the economic behavior of crypto users and is also in line with traditional economic notions of exchange.[9] Some courts have also held electricity, an intangible commodity, to be "goods" under the UCC, though usually in the context of UCC Article 2 (which regulates

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[4] *Ibid*.
[5] James Nehf, "Security Interests in Virtual Currencies" (2 March 2020), Online: SSRN < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547540 >.
[6] *Ibid.*
[7] SPPSA, *supra* note 1, s.2(t.4).
[8] U.C.C, *supra* note 2, § 9-102(a)(44): "Goods means all things that are movable when a security interest attaches. The term includes fixtures, standing timber that is to be cut and removed under a conveyance or contract for sale, the unborn young of animals, crops grown, growing, or to be grown, even if the crops are produced on trees, vines, or bushes, and manufactured homes. The term also includes a computer program embedded in goods and any supporting information provided in connection with a transaction relating to the program if (i) the program is associated with the goods in such a manner that it customarily is considered part of the goods, or (ii) by becoming the owner of the goods, a person acquires a right to use the program in connection with the goods."
[9] Mitchell Prentis, Digital Metal: Regulating Bitcoin as A Commodity, 66 Case W. Res. L. Rev. 609, 626 (2015): "It would make sense for regulators to treat Bitcoin as a commodity. Commodities are generally defined as 'goods sold in the market with a quality and value uniform throughout the world.' This categorization would be appropriate because it realistically reflects the economic behavior of Bitcoin users and squares with traditional economic conceptions of exchange."

sales).[10] Virtual currencies have also been categorized by the courts as "goods exchanged in a market for a uniform quality and value", though not in relation to UCC Article 9.[11] The discussion on crypto-assets as goods has also been analyzed from the context of how the crypto-assets are stored. It has been argued that crypto-assets can be classified as goods where they are held or embodied in a tangible form such as a hardware wallet or other form of computer hardware.[12] UCC Article 9 however excludes from the definition of goods, "a computer program embedded in goods that consist solely of the medium in which the program is embedded".[13] Article 9 does not define a computer program so if given a wide interpretation, crypto-assets are likely to be considered as such because of their digital nature. Crypto-assets are also not customarily considered as part of any tangible assets so it is likely that they would be excluded from the definition of goods. It is therefore unlikely that crypto-assets are goods for purposes of UCC Article 9.

On the other hand, it is possible to argue that crypto-assets are goods under the PPSA, if stored in a tangible form because the PPSA does not exclude computer programs embedded in tangible assets from its definition of goods. Such an argument may be speculative at best. Stronger arguments have been made in relation to the categorization of crypto-assets as other kinds of personal property. Moreover, classifying some crypto-assets as goods because of how they are stored may create uncertainty as the same type of crypto e.g., bitcoin would then be treated differently where it is stored intangibly as opposed to when it is stored tangibly.

2.2.2 Money: Another possible categorization for crypto-assets is money. This is because some crypto-assets such as bitcoin were intended to be currencies and they are becoming more commonly used as a mode of payment. The PPSA defines money as:

> a medium of exchange that is authorized by the Parliament of Canada as part of the currency of Canada; or authorized or adopted by a foreign government as part of its currency.[14]

[10] See *re Escalera Res. Co*., 563 B.R. 336 (Bankr. D. Colo. 2017): "The bottom line is that the great majority of state courts consider electrical energy to be 'goods' under the UCC;" the court however acknowledged the lack of consensus on this in bankruptcy courts.
[11] *CFTC v McDonnell*, 287 F. Supp. 3d 213 (E.D.N.Y. 2018).
[12] Ashlyn Robinson, "Crypto-Collateral? Securing Loans with Digital Currency" (21 March 2019) online: Yahoo Finance <finance.yahoo.com/news/crypto-collateral-securing-loans-digital-070045279.html>.
[13] U.C.C, *supra* note 2, § 9-102(a)(44).
[14] SPPSA, *supra* note 1, s 2(bb).

The UCC also 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 intergovernmental organization or by agreement between two or more countries.[15]

The first barrier to the categorization of crypto-assets as money is that money is tangible under the applicable laws. This means that cash and coins are equivalent to money under the PPSA and Article 9. Funds held in a bank account are referred to as deposit accounts under the applicable laws.[16] The way money is treated under the applicable laws also suggests that money means cash. This is evident in the modes of perfecting security interests in money and the special priority rules for money under Section 31(2) of the PPSA.[17]

Crypto-assets are not cash, so it is unlikely that they are money under the PPSA and UCC Article 9. However, the manner in which money is defined under these laws suggests that crypto-assets could be treated as money where it is adopted as part of the currency of one or more countries in the world. The official commentary of UCC Article 1 explains that "the test adopted is that of sanction of government… which recognizes the circulating medium as a part of the official currency of that government. The narrow view that money is limited to legal tender is rejected".[18] This means that crypto-assets need not be the only official currency of a government for it to be considered money. It is sufficient that the crypto is only a part of it.[19] On 7 September 2021, the adoption of Bitcoin by the Government of El Salvador took effect.[20] More recently, the Central African Republic became the second country to adopt Bitcoin as a legal tender.[21] If the literal rule of interpretation is applied, the adoption of Bitcoin as legal tender by these countries makes it money under the applicable laws. Bitcoin would therefore have to be categorized differently

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[15] U.C.C, *supra* note 2, § 1-201(a)(24): Though money is defined in Article one of the U.C.C, its definition applies to Article 9 because Article 1 contains general provisions that are applicable to other articles of the UCC.
[16] *Ibid*, §9-102(a)(29).
[17] SPPSA, *supra* note 1, s 31(2).
[18] U.C.C, *supra* note 2, Official Comment §1-201(24).
[19] See James Surowiecki, Cryptocurrency: *The Bitcoin, A Virtual Medium of Exchange, Could Be a Real Alternative to Government-Issued Money - But Only If It Survives Hoarding by Speculators*, MIT Tech. Rev. (Aug. 23, 2011), available at http://ilp.mit.edu/newsresults.jsp?tot=8774&page=730 (discussing bitcoin as a medium of exchange).
[20] Oscar Lopez & Ephrat Livni, *In Global First, El Salvador Adopts Bitcoin as Currency* (7 September 2021), online: The New York Times <www.nytimes.com/2021/09/07/world/americas/el-salvador-bitcoin.html>.
[21] Ryan Browne, *Central African Republic becomes second country to adopt bitcoin as legal tender*, (28 April 2022), online: CNBC < https://www.cnbc.com/2022/04/28/central-african-republic-adopts-bitcoin-as-legal-tender.html >.

from the other crypto-assets since those have not been declared as legal tender by any jurisdictions.

The adoption of Bitcoin as legal tender by these jurisdictions has led to a contradiction between the definition of money and the treatment of money under the applicable laws. As mentioned previously, the applicable laws presume that money is a tangible asset and treats it as such for perfection purposes. A security interest in money under the PPSA may either be perfected by registration or possession. Registration is the general mode of perfection, and it applies to all forms of collateral under the PPSA. It is also the most vulnerable method of perfection because an innocent transferee that obtains possession of money will take priority over a secured party that registered its security interest in the money at an earlier time.[22] But if that secured party had taken possession of the money, the debtor would have been unable to make an unauthorized transfer to an innocent third party.

The possibility of taking possession of bitcoin treated as money is however theoretical because as a practical matter, perfection by possession cannot apply to security interests in bitcoin under the existing PPSA and UCC Article 9 frameworks. The frameworks presume that only tangible assets can be possessed and require the collateral to be in "actual or apparent possession or control" of the secured party.[23] There may be an exception to the presumption that perfection by possession cannot apply to bitcoin, where the bitcoin is stored in a tangible wallet and given to the secured party.[24] In this situation, the secured party would possess the tangible wallet as goods and could argue that it is also in possession of the bitcoin within it. An argument may also be made that the criterion for possession may be met when the debtor transfers its bitcoin to the secured party's tangible wallet.[25] However, there is no guarantee that the courts would view these circumstances as constituting perfection by possession under the applicable laws. The debtor may also not be willing to hand over their bitcoin in these ways to the secured party, especially given the high risk of theft of items in tangible form. A facilitative secured transactions framework should not provide a method of perfection that appears to impose the storage of bitcoin in a tangible rather than an intangible form. If parties who store their bitcoin via electronic means can only perfect their security interests by registration, this may pose serious issues for the secured creditor as there is a great risk that they would lose their priority ranking and experience challenges in enforcing their security interests. The re-categorization of

[22] SPPSA, *supra* note 1, s 31(2).
[23] SPPSA, *supra* note 1, s 24(2).
[24] Robinson, *supra* note 12.
[25] *Ibid.*

bitcoin as money is therefore undesirable because both modes of perfecting security interests in money are unsuitable to perfect security interests in bitcoin and this may lead to a situation where parties with security interests in bitcoin do not get optimally protected by law.

The re-categorization of bitcoin as money under the applicable laws also affects the rules on the protection of transferees of negotiable collateral under section 31(2) of the PPSA and UCC Article 9-332(a). These provisions were intended to protect transferees of tangible assets such as money and not intangible assets such as bitcoin. Section 31 (2) of the PPSA states that

> a transferee of money takes free from a perfected or unperfected security interest in the money if the transferee took possession and acquired the money without knowledge that it was subject to the security interest; or gave value, whether or not the transferee acquired the money with knowledge that it was subject to the security interest.[26]

As a result of this provision, a transferee of bitcoin may take free from a security interest in the bitcoin, while this would not be possible if it were another crypto-asset being transferred to the transferee under the same circumstances. For example, where bitcoin is used as payment for the purchase of a vehicle, the seller that accepts the bitcoin as payment would not be required to release that bitcoin to a secured party if the bitcoin was used as collateral because he gave value for it. However, if another crypto-asset (e.g., Ethereum) was used as payment in the same scenario, the third party could be pursued by a secured party for the Ethereum. Third parties in this situation are therefore being protected in the case of bitcoin but not other crypto-assets, not because bitcoin is so different from the others but simply because of its adoption as legal tender in a few countries. This could lead to disputes in a situation where a party asserts that bitcoin is not money by virtue of a purposive interpretation of the applicable laws and claims that the secured party should be able to pursue the transferee to recover the bitcoin. The treatment of bitcoin as money may also lead to disputes in relation to whether secured parties with interests in bitcoin should benefit from the automatic and continuous perfection of proceeds that is offered to parties with interests in liquid collateral (money, cheques, or deposit accounts) under the PPSA[27] since bitcoin was not the kind of collateral intended as liquid. These are just a few issues that may arise with the classification of bitcoin as money.

Interestingly, Wyoming has adopted the position that some digital assets can be treated as money. It categorizes this subset of digital assets as virtual currencies and provides for the perfection of

[26] SPPSA, *supra* note 1, s 31(2).
[27] SPPSA, *supra* note 1, s 28(2)(c).

security interests in these assets by possession.[28] Crypto-assets have also been characterized as money in non-secured transaction contexts. For instance, some courts have categorized crypto-assets as money, particularly in relation to the interpretation of money laundering and money-transmitting statutes. In the *United States v. Faiella*, the defendants who dealt in bitcoin were charged with running an unlicensed "money transmitting business" in contravention of 18 U.S.C ss. 1960.[29] The defendants moved to dismiss the case on the basis that bitcoin could not be considered as money under the statute but the court disagreed, noting that money is "something generally accepted as a medium of exchange, a measure of value, or a means of payment."[30] The court considered the meaning of money as contained in the Merriam-Webster Online dictionary which consists of "officially coined or stamped metal currency," "paper money," and "money of account" (defined as "a denominator of value or basis of exchange which is used in keeping accounts and for which there may or may not be an equivalent coin or denomination of paper money"). The court held that bitcoin met the requirements for "money" under these definitions because "it can be easily purchased in exchange for ordinary currency, acts as a denominator of value, and is used to conduct financial transactions."[31]

Also, in *SEC v. Shavers*,[32] the Security Exchange Commission instituted an action for fraud against Shavers, alleging a bitcoin Ponzi scheme. The defendant argued that bitcoin was not considered a form of money by the United States government and so the activity was outside the domain of the securities laws. They stated that an investment could only fall within SEC jurisdiction when involving an "investment of money." The court held that the activity fulfilled this requirement because bitcoin "can be used as money. . . to purchase goods and services." The court determined that bitcoin "is a currency or form of money" and so the SEC had jurisdiction. The U.S Department of Treasury's Financial Crimes Enforcement Network (FinCEN") has also mentioned that traders of digital currencies are to register as Money Service Businesses.[33] Though the courts have not categorized bitcoin as money for UCC Article 9 purposes, the above cases prove that it is not far-fetched to do so. It is however important to note that the

[28] Section 34-29-103 of the Wyoming Statute states as follows: (a) Notwithstanding the financing statement requirement specified by [Section 9-310(a)] as otherwise applied to general intangibles or any other provision of law, perfection of a security interest in virtual currency may be achieved through possession . . .."
[29] *United States v. Faiella*, 39 F. Supp. 3d 544, 545 (S.D.N.Y. 2014).
[30] *Ibid.*
[31] *Ibid*; see also *State v. Espinoza*, 264 So. 3d 1055 (Fla. Dist. Ct. App. 2019).
[32] *SEC v. Shavers*, 2013 U.S Dist. LEXIS 110018, at 4 (E.D Tex. Aug. 6, 2013).
[33] See Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies, FIN-2013-G001, Department of the Treasury, Financial Crimes Enforcement Network, March 18, 2013; United States v. 50.44 Bitcoins, 2016 U.S. Dist. LEXIS 70404, at 3 (D. Md. May 31, 2016).

categorization of crypto-assets as money in the above cases was in line with the legislative purposes of those laws, unlike secured transactions law where assets may need to be categorized more strictly in order to receive suitable treatment.

A summary of the downsides to the classification of bitcoin as money for purposes of this thesis is that possession is generally an impractical method for the perfection of security interests in bitcoin. This leaves registration as the only viable means of its perfection. So, the uncertainty that arises out of its classification as money under the PPSA outweighs the benefits it receives by virtue of such categorization. Amending the definition of money to exclude digital assets may therefore be necessary to appropriately regulate crypto-assets under the applicable laws. If legislators decide not to exclude digital assets from the definition of money, then the definition of money would need to be expanded to include all virtual currencies, whether or not they have been declared as part of the currency of any government. Legislators would also need to expand the scope of money to include intangible currencies. However, expanding the definition of money might make it difficult to justify the need for a separate treatment of deposit accounts.[34] Due to the issues already highlighted about the uncertainties that the categorization of bitcoin or crypto-assets, in general, may create, I am of the view that crypto-assets should not be considered as money under secured transactions law.

2.2.3 Investment Property: It has been argued that crypto-assets can also be categorized as investment property in certain situations. The PPSA defines investment property as "a security, whether certificated or uncertificated, security entitlement, securities account, futures contract, or futures account."[35] Article 9 of the UCC contains a similar definition of investment property but also provides for different kinds of commodity contracts and commodity accounts.[36] A discussion on the treatment of crypto-assets as investment property cannot be conducted without an analysis of the *Securities Transfer Act* ("STA") and UCC Article 8. The STA and UCC Article 8 provide rules on each of the assets that have been classed as "investment property" under the applicable laws. The two possibilities for categorizing crypto-assets as investment property are as "security" or "financial assets".

[34] A deposit account is what is commonly referred to as a "bank account". Deposit accounts are used to deposit and withdraw funds, make and receive payments, and store funds. Like crypto-assets they are intangible in nature and can be used to make payments, but they are not categorized as money under the PPSA, so neither should crypto-assets. Please see Clayton Bangsund, "Control v. Registration: Contemplating A Potential Paradigm Shift in The PPSA's Governance of Security Interests in Deposit Accounts" (JuliusErwin, 2018) at 3.
[35] SPPSA, *supra* note 1, s 2(x.1).
[36] U.C.C, *supra* note 2, § 9-102(a)(49).

A security is defined under the STA as follows:

> except as otherwise provided in sections 10 to 16, an obligation of an issuer or a share, participation, or other interest in an issuer or in property or an enterprise of an issuer:
>
> (i) that is represented by a security certificate in bearer form or registered form, or the transfer of which may be registered on books maintained for that purpose by or on behalf of the issuer;
> (ii) that 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) that: (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 for the purposes of this Act[37]

UCC Article 8 also provides a similar definition. This definition highlights four prerequisites that must be met for an asset to be considered a security. First, it must be connected to an issuer, either by way of an obligation of the issuer, a share, participation, or other interest in an issuer, or an issuer's property or enterprise. Secondly, it must be evidenced in the records of an issuer either by a security certificate or on the books by or on behalf of an issuer. Third, it must also be part of a class or series of interests or obligations, thus excluding single-creditor obligations such as a car or bank loan,[38] and lastly, it must be traded in securities markets or must be a medium of investment with terms that expressly state that it is covered by the STA. The fourth standard implies that mediums of investment that are not traded on a securities exchange such as crypto-assets may be able to opt-in to the STA if they meet the other criteria for securities.[39]

The main barrier to categorizing crypto-assets as securities is that they cannot be described as "obligations of an issuer, or shares, participation, or other interests in an issuer or in property or an enterprise of an issuer."[40] Unlike shares of corporations, a crypto-asset does not represent an obligation or other interest in an issuer because being a holder of a crypto-asset does not entitle one to the profits of the company that issues the crypto-asset. The profits of a crypto company would be shared amongst the investors/shareholders of the company. The crypto-asset is simply a product of the company, and its holders only benefit from the success of the asset and do not bear any losses or make any gains from the success of the company that issues the asset.

However, we cannot rule out the possibility of some crypto-assets meeting the definition of securities under the STA and UCC Article 8 in the future. It is possible that a company might

[37] *Securities Transfer Act*, SS 2007, c S-42.3 [STA], s 1(2) (ff).
[38] Clayton Bangsund, *Bangsund on the Personal Property Security Act: The CCPPSL Model* (Thomson Reuters, 2021) at 49
[39] Nehf, *supra* note 5.
[40] STA, *supra* note 37.

decide to structure its affairs in a way that its crypto-asset holders also have rights and participatory interests in the company itself, by virtue of holding the asset. We also cannot rule out the possibility of crypto-asset providers beginning to offer their assets as a part of a class or series, having these assets represented as certificates in bearer or registered form, or opting-in to be treated as mediums of investment under the STA or UCC Article 8. But, as of now, crypto-assets do not qualify as securities under the applicable laws.

Wyoming, however, has taken a different approach to the categorization of digital assets in secured transactions and has identified digital securities as a sub-category of digital assets. Digital security is defined under the Wyoming statute in the same manner as the definition of a security under the *US Federal Securities Act 1933* as follows:

> a digital asset which constitutes a security, as defined in W.S. 17-4-102(a)(xxviii), but shall exclude digital consumer assets and virtual currency[41]

The definition of Security under the *Federal Securities Act 1933* is quoted below. The Wyoming digital asset statute relies on this definition for secured transaction purposes and considers digital securities as securities and investment property for UCC Article 8 and 9 purposes.[42] The US *Federal Securities Act 1933* defines a security as:

> any note, stock, treasury stock, security future, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, collateral-trust certificate, preorganization certificate or subscription, transferable share, investment contract, voting-trust certificate, certificate of deposit for a security, fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option, or privilege on any security, certificate of deposit, or group or index of securities (including any interest therein or based on the value thereof), or any put, call straddle, option, or privilege entered into on a national securities exchange relating to foreign currency, or, in general, any interest or instrument commonly known as a "security", or any certificate of interest or participation in, temporary or interim certificate for, receipt for, guarantee of, or warrant or right to subscribe to or purchase, any of the foregoing[43]

This definition is a lot wider than the STA and UCC Article 8 definitions and has been used to argue that crypto-assets are securities in other contexts. For instance, the Securities Exchange Commission (SEC) has alleged that several crypto-assets are securities by virtue of how they are offered to the public. In the ongoing case of *SEC v Ripple*, the SEC argued that digital assets could be classified as securities if they have the characteristics of investment contracts.[44] The

[41] *Wyoming Statute*, § 34-29-101(a)(iii).
[42] *Ibid,* § 34-29-101(a)(iii).
[43] *The Securities Act 1933*, 15 U.S.C., s. 77b(a)(1).
[44] *Securities and Exchange Commission v. Ripple Labs Inc*, 20 Civ. 10832 (AT) (S.D.N.Y. Oct. 4, 2021).

test used to determine whether an asset is an "investment contract" was presented in the 1946 case of *SEC v. W. J. Howey Co*.[45] The Howey test stated that an investment contract would exist where an investment of money is made in a common enterprise with a reasonable expectation of profits to be obtained from the work of others. The SEC alleged that Ripple had breached sections 5(a) and 5(c) of the US *Federal Securities Act 1933* by raising about $1.3 billion through the illicit offer and sale of XRP, which was used to fund the Company's operations and enrich its executives. Speculators have pointed out that some other crypto-assets which have promoted their tokens as investments and conducted "initial coin offerings" (similar to Initial public offerings), may also be pursued by the SEC depending on the outcome of the Ripple case.[46]

Though the Howey test originates in American courts, it has been adopted by the Canadian Supreme Court[47] as one of the tests that may be applied to determine whether an asset is a security under Canadian law. Canadian courts have also applied the "risk capital" framework in the *Hawaii* case[48] to determine whether or not an asset is a security.[49] Furthermore, the courts have stated that even where an asset does not meet the tests outlined in the *Howey* and *Hawaii* cases, the courts can still apply a broader purposive approach to determine that the asset is a security, if it is in line with the relevant legislative policy for that asset to be deemed a security.[50] Canadian securities regulators have interpreted the courts decision to mean that certain crypto-assets such as utility tokens and crypto-assets issued through initial coin offerings securities may be considered securities in Canada.[51] For instance, the Ontario Securities Commission entered into a settlement with CoinLaunch Corp., claiming that they had facilitated the unregistered sale of tokens that constituted securities.[52] However, bitcoin and ether have been declared to not be

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[45] *Securities and Exchange Commission v. W. J. Howey Co*., 328 U.S. 293 (1946).

[46] Antoine Tardif, *An Analysis of the SEC vs Ripple Labs Inc Complaint*, (23 December 2020), Online: Securities.io < https://www.securities.io/an-analysis-of-the-sec-vs-ripple-labs-inc-complaint/ >.

[47] *Pacific Coast Coin Exchange v. OSC*, [1978] 2 SCR 112 at 132. ("I have examined the facts in the sole light of the Howey and Hawaii tests. Like the Divisional Court, however, I would be inclined to take a broader approach. It is clearly legislative policy to replace the harshness of caveat emptor in security-related transactions and courts should seek to attain that goal even if tests carefully formulated in prior cases prove ineffective and must continually be broadened in scope. It is the policy and not the subsequently formulated judicial test that is decisive.")

[48] *State Commissioner of Securities v. Hawaii Market Center,* [1971] 485 P.2d 105. Under this framework (commonly called a "risk-capital" framework) the analysis considers whether initial "value" is furnished to an enterprise (without control over the enterprise), which furnished capital is subject to the risks of the enterprise and induced by promises by promoters that there will be a benefit above the initial value.

[49] *Pacific Coast Coin, supra* note 47.

[50] *Ibid.*

[51] Canadian Securities Administrators, "CSA Staff Notice 46-307 Cryptocurrency Offerings" (2017), online (pdf): Alberta Securities Commission ; Canadian Securities Administrators, "CSA Staff Notice 46-308, Securities Law Implications for Offerings of Tokens" (2018), online (pdf): Alberta Securities Commission

[52] Ontario Securities Commission, *In the Matter of CoinLaunch Corp.- Settlement Agreement* (18 July 2019), Online: Ontario Securities Commission < https://www.osc.ca/sites/default/files/pdfs/proceedings/set_20190719_coinlaunch.pdf >.

securities in Canada but have instead been classified as Decentralized Commodity Crypto-assets (DCAs).[53]

The Canadian Securities Administrators (CSA) have asserted that though DCAs are not securities on their own, a crypto-asset trading platform (CTP) user's "contractual right" to delayed delivery of DCAs creates either a security or a derivative.[54] The CSA's decision to assert jurisdiction over CTPs helps reduce the risk usually associated with third-party intermediaries, and custodial services involved in crypto-asset transactions. CTPs have historically faced several challenges, hence the Canadian securities regulator's interest in additional investment protections. These challenges include high-profile exchange hacks, price, and trading volume manipulation,[55] platform-level failure, and loss of investor crypto-asset private keys.[56] By virtue of Staff Notice 21-327 and the resultant framework in Staff Notice 21-329, firms which provide custodial services through a CTP internal wallet are now subject to supervision by the Investment Industry Regulatory Organization of Canada (IIROC), and other investment dealer rules.[57]

Though crypto-assets are classified into several smaller categories and treated differently by Canadian securities regulators, these sub-categorizations are not germane for secured transactions purposes because the definition of securities under secured transactions law differs from what the courts have said in *Pacific Coast Coin*,[58] and the interpretation of the securities regulators is of limited relevance for the purpose of asset categorization under the PPSA.

The Wyoming approach and the fact that crypto-assets are being considered securities in other contexts by US and Canadian regulators, suggest the possibility of some crypto-assets being considered securities by courts in the context of secured transactions in the future. It may therefore be worthwhile for legislators to have this in mind and specifically take a position on whether crypto-assets are securities when regulating the use of crypto-assets in secured

[53] Ryan Clements, "Emerging Canadian Crypto-Asset Jurisdictional Uncertainties and Regulatory Gaps" (2021) 37.1 B.F.L.R 25.
[54] Joint Canadian Securities Administrators / Investment Industry Regulatory Organization of Canada, *CSA Staff Notice 21-327, Guidance on the Application of Securities Legislation to Entities Facilitating the Trading of Crypto Assets,* (16 January 2020) at 1.)
[55] Michael Sheetz, "A single anonymous market manipulator caused bitcoin to top $20,000 two years ago, study shows" (4 November 2019), online: CNBC; Anne Gaviola, "Coinsquare execs step down after accusations of market manipulation" (22 July 2020), online: BNN Bloomberg; Ontario Securities Commission, "OSC Panel approves settlement with Coinsquare, Cole Diamond, Virgile Rostand and Felix Mazer" (21 July 2020), online: Ontario Securities Commission.
[56] Ontario Securities Commission, "QuadrigaCX, A Review of Staff of the Ontario Securities Commission" (14 April 2020), online: Ontario Securities Commission.
[57] CSA Staff Notice 21-327, *supra* note 54.
[58] *Pacific Coast Coin, supra* note 47.

transactions. For instance, UCC Article 8-103(c -g) and sections 12-16 of the STA specify some assets as securities and others as not. A similar provision may be inserted in the STA and UCC Article 8 to clarify the law's position on digital assets.

The other possible way in which crypto-assets may be classified as investment property is if they satisfy the requirements of a financial asset. The definition of financial asset under the STA and UCC Article 8, which was adopted by the PPSA and UCC Article 9 shows that in certain instances crypto-assets can be categorized as investment property. A financial asset is defined under the STA as:

> "financial asset" means, except as otherwise provided in sections 10 to 16:
>
> (i) a security;
> (ii) an obligation of a person that:
> (A) is, or is of a type, dealt in or traded on financial markets; or
> (B) is recognized in any other market or area in which it is issued or dealt in as a medium for investment;
>
> (iii) a share, participation, or other interest in a person, or in property or an enterprise of a person that:
>
> (A) is, or is of a type, dealt in or traded on financial markets; or
>
> (B) is recognized in any other market or area in which it is issued or dealt in as a medium for investment;
>
> (iv) 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 Act; or
>
> (v) a credit balance in a securities account, unless the securities intermediary has expressly agreed with the person for whom the account is maintained that the credit balance is not to be treated as a financial asset under this Act.[59]

An asset may be regarded as a financial asset even if it satisfies only one of the criteria provided above. Crypto-assets may fit into the definition in (iv), which simply defines a financial asset as property held by a securities intermediary for its owner in a securities account.

There are three essential components to part (iv) of the definition of a financial asset. First, the asset must be held by a securities intermediary. A securities intermediary is defined under the STA as "a clearing agency; or a person, including a broker, bank or trust company, that in the ordinary course of its business maintains securities accounts for others and is acting in that

[59] STA, *supra* note 37, s 1(2)(o).

capacity."[60] The second prerequisite is that the asset is held in a securities account. This is defined under the STA as "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 constitute the financial asset."[61] Lastly, the securities intermediary and the owner of the asset must expressly agree to treat the property as a financial asset under the STA. A crypto-asset cannot automatically be characterized as a financial asset even if a holder transfers the asset to a securities intermediary to hold on their behalf in a securities account. An express agreement to treat the asset as a financial asset under the STA and UCC Article 8 is necessary for a crypto-asset to be recognized as a financial asset. Where a crypto-asset satisfies the definition of a financial asset in Section 1(2)(o) iv, it may be held as a security entitlement[62] in a securities account.

The process just outlined is currently the only way a crypto-asset can be classified as investment property under the applicable laws. Many scholars have argued that crypto-assets may be categorized as investment property[63] and this sentiment is shared by certain jurisdictions. For instance, the United States' *Uniform Regulation of Virtual-Currency Businesses Act* ("URVCBA"), has adopted the treatment of security interests in investment property to virtual currencies.[64] It is logical that the possibility of treating crypto-assets as investment property has been considered since crypto-assets can be traded in a similar manner to securities and other investment properties.

The existing regulatory framework for investment property may also be beneficial to crypto-assets because it presents feasible options for secured parties in relation to the perfection and enforcement of their security interests in a crypto-asset in the event of default. Though the categorization of crypto-assets as investment property is possible, the current laws limit the possibility of such classification to parties that hold their crypto-assets indirectly through a securities intermediary. Direct holders of crypto-assets cannot take advantage of this provision, meaning that treating crypto-assets as investment property would only have limited applicability, and would lead to a difference in treatment of security interests in crypto-assets simply by virtue

[60] *Ibid,* s 1(2)(ee).
[61] *Ibid.*
[62] STA, *supra* note 37, s 1(2)(hh): Security entitlements are the rights and property interests of an entitlement holder with respect to a financial asset.
[63]Nehf, *supra* note 5 at 16-17; Sarah Jane Hughes, ''Property, Agency, and the Blockchain: New Technology and Longstanding Legal Paradigms" (2019) 65 Wayne L. Rev. 57, 65.
[64] The Uniform Regulation of Virtual Currency Businesses Act 2017 with Prefatory note and comments.

of the manner in which they are held (i.e. directly vs indirectly). This may lead to uncertainty as to how crypto-assets will be treated in other situations where the investment property rules are inapplicable. Because of this, the investment property categorization is unworkable for crypto-assets in general under the current versions of the applicable laws.

2.2.4 Intangibles: The final possible categorization for crypto-assets under the applicable laws is as an "intangible" under the PPSA and a "general intangible" under Article 9 of the UCC.

Historically, the kinds of personal property comprised under this term were part of the categorization referred to as "chose in action" under the Canadian common law taxonomy.[65] This categorization was however too broad and difficult to define. The kinds of personal property under the category of "choses in action" were also not given equal treatment under the law.[66] Some of these included deposit accounts, bills of exchange, and securities.[67] Because the term lacked precision, the PPSA retired this term and adopted a more specific approach to categorizing personal property. The intangible category was introduced to cover all kinds of personal property that did not fit into the individual categories.

An intangible is defined under the PPSA as

> personal property that is not goods, chattel paper, a document of title, an instrument, money or an investment property, and includes a licence.[68]

While a general intangible is defined as

> 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.[69]

The terms "intangible" and "general intangible" are used to classify any personal property that is not specifically covered under the applicable laws. As can be seen from our analysis of the potential personal property categorizations for crypto-assets, crypto-assets cannot neatly be classified as any of the kinds of personal property mentioned. As a result, it is generally accepted that crypto-assets were not contemplated in the drafting of the applicable laws and should

[65] Clayton Bangsund, "The Deposit Account & Chose in Action at Common Law & Under the PPSA: A Historical Review" (November 2014) 30 B.F.L.R 1.
[66] *Ibid.*
[67] *Ibid.*
[68] SPPSA, *supra* note 1, s 2(1)(w).
[69] U.C.C, *supra* note 2, § 9-102(a)(42).

therefore be categorized as intangibles and general intangibles under the PPSA and UCC Article 9 respectively.

2.3 The Issues with the Current Categorization of Crypto-Assets under the PPSA and UCC Article 9

The current categorization of crypto-assets as an intangible and a general intangible under the PPSA and Article 9 UCC presents several challenges because these categorizations do not consider the unique nature of crypto-assets. The main issues that these categorizations pose are clearly reflected in the current perfection, enforcement, and negotiability rules relating to crypto-assets.

2.3.1 Perfection: Under the PPSA and UCC Article 9, intangibles can only be perfected by registration. Registration is the universal perfection method applicable for the perfection of security interests in all kinds of personal property.[70] It is also the most vulnerable method of perfection under the applicable laws because, in certain situations involving some types of personal property (e.g. money, instruments, investment property), alternate perfection methods have dominant priority status.[71] Though the registration of security interests would give notice of the encumbered asset to potential secured parties, a secured party that has registered its security interests in crypto-assets is not entitled to hold/control the asset. This means that the debtor continues to hold the asset and there is a risk that they might transfer or otherwise dispose of the asset without the secured party's knowledge. A secured party who decides to rely on perfection by registration could request the debtor's private key so it can have access to the crypto-assets in the case of default. However, there is nothing preventing the debtor from releasing a fake private key to the debtor and even if the debtor releases the correct private key, this does not give the secured party the power to practically prohibit the debtor from disposing of the crypto-assets. It also does not preclude the debtor from releasing the same private key to its other secured creditors.

2.3.2 Enforcement: The PPSA and UCC Article 9 gives the secured party the right to take possession of the collateral in the event of default.[72] Theoretically, this applies to crypto-assets but in practice, enforcement of security interests in crypto-assets may not always be possible. Because the debtor is not obligated to release its private key by virtue of perfection by

[70] Bangsund, *supra* note 38.
[71] SPPSA, *supra* note 1, s 31(2); s.31.1(2).
[72] SPPSA, *supra* note 1, s 58(2)(a); U.C.C, *supra* note 2, § 9-609(a)(1).

registration, the secured party may be unable to gain access to the debtor's crypto-assets in the case of default and there is no way to force the debtor to release the assets either. The lack of centralized authority in the crypto-asset ecosystem means that the secured party cannot circumvent the debtor to seize its crypto-assets. Since the secured party may be unable to take advantage of the self-help provisions, its only viable option may be to seek the assistance of the courts for enforcement of its rights. The secured party may do this by asking the court to order the debtor to release the crypto-assets to them and requesting an injunction to prevent the debtor from disposing of the crypto-assets, while the enforcement proceedings are ongoing.

The fact that litigation is the only relatively viable enforcement option for secured parties that accept crypto-assets as collateral, goes against the facilitative nature of the PPSA. Moreover, litigation may not even be a solution to the recovery of the secured party's investment in the case of default. Where the debtor refuses to abide by an enforcement order of the court, there is very little the courts can do to assist the secured party because there is no centralized entity that the courts can order to release the crypto-assets to the secured party if the debtor refuses. Unlike enforcement of a judgment in relation to deposit accounts, there is no equivalent garnishment order in relation to crypto-assets. Section 41(2) of the *Enforcement of Money Judgments Act* ("EMJA") provides for the seizure of an intangible asset by serving a notice on the judgment debtor or the person whose obligation consists of the property.[73]

As mentioned above, it may be impossible for the secured party to gain access to the crypto-assets since the debtor may be the only person that has information about his private key. Even where the debtor provides the secured party with its private key, there is still a risk that the debtor may transfer or otherwise dispose of the crypto-assets, and given the anonymity of cryptocurrency transactions, it may be very expensive or almost impossible to trace the crypto-assets to the appropriate transferee. For example, a secured party lends $100,000 to a debtor and registers a security interest in the debtor's Ethereum worth $150,000 at the time of registration. The debtor still in control of the Ethereum then sells it for $80,000, which is the market value of the Ethereum at the time it is sold. The rules on proceeds under the PPSA, only entitle the secured party to claim the market value of the collateral on the day it was sold.[74] The secured party is successful in pursuing the $80,000 proceeds of the sale but intends to recover the outstanding $20,000 by pursuing the third party who purchased the Ethereum from the debtor. The secured

[73] *The Enforcement of Money Judgments Act,* SS 2010, c E-9.22 [EMJA], s 41(2).
[74] SPPSA, *supra* note 1, s 28(1).

party is permitted to do this under the PPSA because the purchaser of an intangible does not take the collateral free of the security interest where the purchase was authorized by the secured party (except for Bitcoin if treated as money under the PPSA).[75] However, due to the anonymity of cryptocurrency transactions, neither the debtor nor the secured party knows the purchaser of the Ethereum. Though the transaction may be traced on the blockchain to an address, the name of the purchaser is not contained on the blockchain and cannot be retrieved by any other means. This scenario shows that the current enforcement mechanisms are not practical for crypto-assets and this issue stems down to the categorization of crypto-assets. If crypto-assets are categorized in a manner that allows more perfection methods such as perfection by control, the secured party would have no difficulty enforcing its security interest in the event of default because he already has control over the crypto-assets.

2.3.3 The Non-Negotiability of Intangibles: Another issue arising from the classification of crypto-assets as intangibles are that crypto-assets are affected by the non-negotiability of intangibles. This has led to some commentators referring to secured transactions as the "Achilles Heel" of mainstream cryptocurrency adoption.[76] S.28(1) of the PPSA states that "Subject to this Act, where collateral is dealt with or otherwise gives rise to proceeds, the security interest (a) continues in the collateral unless the secured party expressly or impliedly authorizes the dealing; and (b) extends to the proceeds."[77]

A similar provision under UCC Article 9 states that:

> Except as otherwise provided in this article and in Section 2-403(2): a security interest or agricultural lien continues in collateral notwithstanding sale, lease, license, exchange, or other disposition thereof free of the security interest or agricultural lien; and a security interest attaches to any identifiable proceeds of collateral.[78]

This is usually referred to as a "blanket lien".[79] It means that a secured party does not lose its security interest in collateral by virtue of an unauthorized disposition or any other unauthorized dealing of the collateral by the debtor. The security interest continues to any third party that the

[75] *Ibid,* s 31(1).
[76] Timothy Jones & Dillon Collett, "Cryptocurrency Assets Under Insolvency and Personal Property Security Law" (15 February 2018), online: Aird & Berlis, <www.airdberlis.com/insights/publications/publication/cryptocurrency-assets-under-insolvency-and-personal-property-security-law>.
[77] SPPSA, *supra* note 1, s 28.
[78] U.C.C, *supra* note 2, § 9-315.
[79] Xavier Foccroulle Menard, *Cryptocurrency: Collateral for Secured Transactions?* (28 April 2020) 34:3 Banking & Finance Law Review 347.

collateral is transferred to, even where the collateral has changed form and has become a different kind of property. There is an exception to this rule under S. 31 of the PPSA and § 9-332 of the UCC which provides that transferees of negotiable collateral take free from security interests where the transferee acquired the collateral without knowledge that it was encumbered or gave value, whether or not the transferee had knowledge that the collateral was encumbered.[80] Negotiable collateral includes money, an account, an instrument, and a financial asset (under Section 104(1) STA & UCC Article 8-502). It does not include intangibles such as crypto-assets. This means that a transferee of crypto-assets takes it subject to pre-existing security interests when they are transferred without authorization from the secured party, regardless of whether the transfer occurred in the ordinary course of business.[81] For example, a debtor grants a secured party a security interest in all its present and after-acquired personal property. The debtor then purchases equipment in the ordinary course of business from a third party with Ethereum. If the debtor does not receive authorization from the secured party to transfer the Ethereum to the third party, the Ethereum will remain subject to the secured party's security interest. If the debtor defaults, the secured party is entitled to seize Ethereum from the third party as collateral.[82] The risk of having crypto-assets seized could discourage third parties from accepting it as payment, thus hampering its growth as a payment method.[83]

2.4 Existing Perfection rules under the PPSA and UCC Article 9

Since we have established that having registration as the only perfection method for security interests in crypto-assets does not provide secured parties with adequate protection, we will now be examining the existing perfection provisions under the applicable laws.

> A security interest is perfected when it has attached and all steps required for perfection pursuant to this Act have been completed, regardless of the order of occurrence.[84]

This means that a security interest can only be described as 'perfected' once attachment has taken place and a perfection step has been carried out. Attachment marks the creation of a security interest in personal property.[85]

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[80] SPPSA, *supra* note 1, s 31; U.C.C, *supra* note 2, § 9-332.
[81] SPPSA, *supra* note 1, s 28.
[82] Adam Driedger *Bitcoin and Bankruptcy: Implications for Canadian Insolvency Law* (15 June 2018), online: Insolvency Institute of Canada, <www.insolvency.ca/en/iicresources/resources/Bitcoin-and-Bankruptcy_Adam-Driedger.pdf>.
[83] Jones & Collett, *supra* note 78.
[84] SPPSA, *supra* note 1, s 19.
[85] Bangsund, *supra* note 38 at 87.

> A security interest attaches when (a) value is given; (b) the debtor has rights in the collateral or power to transfer rights in the collateral to a secured party; and (c) except for the purpose of enforcing rights between the parties to the security agreement, the security interest becomes enforceable within the meaning of section 10; unless the secured parties have specifically agreed to postpone the time of attachment in which case it attaches at the time specified in the agreement.[86]

For the secured party to have established a complete interest in personal property, the three requirements for attachment must have been met i.e. the secured party must have given value, the debtor must have rights in the collateral or power to transfer rights to the secured party, and the security interest must be enforceable. Meeting these requirements gives the secured party a statutory charge that may be asserted against third parties.[87]

For the security interest to be enforceable, there must be an oral or written security agreement between the parties. An oral agreement may suffice for enforceability between the debtor and the secured party but will not suffice on its own for enforceability against third parties. For it to be enforceable against third parties, there must be either a signed security agreement or the secured party has to have taken possession,[88] delivery,[89] or control[90] over the personal property. In the case of intangibles, the law does not recognize possession, delivery, or control for enforceability and so it is important to have a signed security agreement that describes the collateral by item or kind or by reference to the "intangibles" category, to establish a secured party's interest.[91] This means that a crypto-asset can be described as "intangibles" or even more specifically as "crypto-assets", "virtual currencies", "bitcoin" etc., as long as the term used describes the collateral held by the debtor. A statement in the Security Agreement, that a security interest is taken in all of the debtor's present and after-acquired personal property will also suffice for the secured party to enforce his security interest in crypto-assets against third parties.[92] Upon creating a security interest in personal property, there are four perfection steps under the PPSA which are applicable depending on the type of collateral involved. This includes registration – applicable to all types of collateral, possession – applicable to all forms of tangible

[86] SPPSA, *supra* note 1, s 12(1).
[87] With the exception of Yukon and Saskatchewan, every CCPPSL model jurisdiction expressly equates a broadly-based PPSA security interest to a floating charge at the beginning of the general statutory provision on attachment.
[88] SPPSA, *supra* note 1, s 10 (1)(a).
[89] *Ibid*, s 10(1)(b).
[90] *Ibid*, s 10(1)(c).
[91] *Ibid*, s 10(1)(d)(i)(H).
[92] *Ibid*, s 10(1)(d)(iii).

collateral except certificated security, delivery – for certificated securities, and control – applicable to investment property and electronic chattel paper.

2.4.1 Registration: Perfection by registration is achieved by registering a financing statement in the Personal Property Registry ("PPR"). A financing statement is a public notice of intended or existing interest in the collateral.[93] Registered users of the PPR can register their security interests and conduct searches on possible encumbrances on personal property. Registration of a financing statement is effective from the time assigned to it at the registry and it is expected that secured parties register their interests at the earliest possible time.[94] The applicable laws encourage secured parties to register their security interests early and permit registration even before the execution of a security agreement with the debtor or the attachment of the security interest.[95] Registration may also be an efficient perfection step because the PPR facilitates the perfection of security interests taken under several security agreements, via single registration.[96] For example, a lender that accepts crypto-assets as collateral may only need to register "all crypto-assets" of the debtor, to cover various secured loan agreements between itself and that debtor, involving different types of crypto-assets. This decreases the perfection cost that would be incurred by the secured party.[97] A similar outcome is also achieved where the secured party registers a security interest in "all present and after-acquired personal property" of the debtor.

The Personal Property Security Regulations (the "Regulations") permit the registration of a financing statement for an infinite period, or for a term between one and twenty-five years, which may be renewed upon expiration.[98] The following information is required to file a financing statement:

a) subject to section 28, the name and address of:
   i. the registrant;
   ii. the secured party; and
   iii. the debtor;
b) the registration type;
c) the registration life of the interest;
d) the Court of Queen's Bench number of a judgment or court order, if any;
e) subject to sections 12.1 and 16, a description of any serial numbered goods, if no general property information is provided;

[93] Bangsund, *supra* note 38.
[94] *Ibid.*
[95] SPPSA, *supra* note 1, s 43(4).
[96] *Ibid*, s 43(5).
[97] Bangsund, *supra* note 38.
[98] *Personal Property and Security Regulations*, RRS c P-6.2 Reg 1 [SPPSR], ss 3-4.

f) subject to sections 12.1 and 16, general property information, if no serial numbered goods have been identified;
g) any other information required by the registrar".[99]

It is important to provide accurate information in the financing statement to assist third parties who conduct searches at the PPR. It is also crucial to provide an adequate description of the collateral, as failure to do this could render the security interest unperfected and vulnerable in the event of conflicting interests. The Regulations provide for distinct collateral description requirements for serial numbered and non-serial numbered collateral. For purposes of this thesis, we will examine the requirements for non-serial numbered collateral only. This type of collateral can be described in one or more of the following ways:

> (a) by item or kind or as "goods", "chattel paper", "investment property", "document of title", "instrument", "money" or "intangible";
>
> (b) by a statement indicating that the security interest has been taken in all of the debtor's present and after-acquired personal property;
>
> (c) by a statement indicating that the security interest has been taken in all of the debtor's present and after-acquired personal property, except specified items or kinds of personal property, or except property described as "goods", "chattel paper", "investment property", "document of title", "instrument", "money" or "intangible";
>
> (d) as "inventory", but that description is valid for the purposes of this section only while the collateral is held by the debtor as inventory.[100]

It is insufficient to simply describe the collateral as "consumer goods" or "equipment" without providing more specific information on the kind of goods. Where this description is used, it would be considered inadequate and would render the security interest unperfected.[101] Crypto-assets currently fall into the non-serial numbered collateral classification and could be classified as intangibles (except for Bitcoin which may be described as money). Where a security interest is to be taken in all present and after-acquired personal property, the crypto-assets would be covered in this description along with all other personal property of the debtor. Where a security interest is taken in just the crypto-assets, it is advisable to describe them as precisely as possible. For instance, where a debtor gives the secured party a security interest in his Ethereum, it may be wise to describe the security interest as an "interest in the Ethereum belonging to debtor name and stored at the following crypto address and any other address such Ethereum may be transferred to in the future." Crypto-assets may also be covered by a statement indicating that

[99] *Ibid*, s 5(3).
[100] SPPSR, *supra* note 89, s 14(2).
[101] *Ibid*, s 14(3).

the security interest has been taken in all present and after-acquired personal property of the debtor. It is also good to cover proceeds in the collateral description in order to claim cryptocurrency proceeds that may arise from the sale of collateral.[102] A party may perform a search at the PPR for a security interest in crypto-assets via debtor name.

2.4.2 Possession: This method may be used to perfect different kinds of tangible collateral, apart from securities. This includes tangible chattel paper, goods, instruments, negotiable documents of title, or money.[103] The secured party must be in actual or apparent possession of the collateral[104] and must have obtained the collateral voluntarily (i.e., not by seizure or repossession)[105] for it to be considered a valid perfection step under the PPSA. Generally, crypto-assets cannot be perfected by possession because they are intangibles. However, if Bitcoin is treated as money under the PPSA and UCC Article 9, then possession of Bitcoin may be possible. This may only occur where the Bitcoin is stored in tangible form, for instance, in a hardware wallet. There is however no guarantee that the courts would equate possession of a tangible wallet with possession of the Bitcoin contained within. A party arguing against the possibility of possessing Bitcoin may say that the secured party has simply perfected his interest in the tangible wallet as goods and not the Bitcoin within it. This can be compared to the fact that taking possession of a computer may not result in possession of the software licenses contained in it. The arguments of a party asserting the unlikelihood of possessing Bitcoin may also be strengthened by the fact that other crypto-assets will not be possessed under the PPSA and UCC Article 9, even when stored in tangible wallets, because they cannot be categorized as money.

2.4.3 Delivery: Delivery may be used to perfect security interests in certificated securities under the PPSA and UCC Article 9.[106] The rules governing delivery are contained under the STA and UCC Article 8. Perfection by delivery occurs when:

> (a) the purchaser acquires possession of the security certificate;
> (b) another person, other than a securities intermediary, either:
>
> > (i) acquires possession of the security certificate on behalf of the purchaser; or
> > (ii) having previously acquired possession of the security certificate, acknowledges that the person holds the security certificate for the purchaser; or
>
> (c) a securities intermediary acting on behalf of the purchaser acquires possession of the security certificate, the security certificate is in registered form and the security certificate is:

[102] SPPSR, *supra* note 100, s 15 (b).
[103] SPPSA, *supra* note 1, s 24(1).
[104] *Ibid*, s 24(2).
[105] *Ibid*, s 24(1).
[106] *Ibid*, s 24 (3); U.C.C, *supra* note 2, § 9-313.

(i) registered in the name of the purchaser; payable to the order of the purchaser; or
(ii) payable to the order of the purchaser; or
(iii) specially endorsed to the purchaser by an effective endorsement and has not been endorsed to the securities intermediary or in blank".[107]

Though it is possible to perfect security interests in certificated securities by delivery, it is not the best way to perfect a certificated security. A secured party is better protected where it receives an accompanying endorsement, giving the secured party control over the collateral. Security interests in crypto-assets cannot be perfected by delivery due to their limited classification as securities, and even if some crypto-assets become classified as securities for secured transaction purposes in the future, they will likely be uncertificated securities. Uncertificated securities can be perfected by control,[108] which is the strongest method of perfection, so there is no need to advocate perfection by delivery as an alternative method for perfecting security interests in crypto-assets.

2.4.4 Control: Control may be used to perfect security interests in investment property[109] and electronic chattel paper.[110] The requirements for control of securities and security entitlements are covered by the STA and UCC Article 8, while futures contracts, securities accounts, futures accounts, and electronic chattel paper are covered under the PPSA and UCC Article 9.[111] As it pertains to control of investment property, this thesis will focus on control of securities, security entitlements, and securities accounts, as these are most relevant in the crypto-asset discussion. This section also refers to provisions in the STA and the PPSA to explain the mechanics of control under the applicable laws. The STA uses the term "purchaser" to refer to a secured party because a security interest is considered a purchase under the act. Control of a certificated security is achieved under the STA as follows:

STA s.23(1) A purchaser has control of a certificated security that is in bearer form if the certificated security is delivered to the purchaser[112].
(2) A purchaser has control of a certificated security that is in registered form if the certificated security is delivered to the purchaser and:

(a) the security certificate is endorsed to the purchaser or in blank by an effective endorsement; or

[107] STA, *supra* note 37, s 68(1); U.C.C, *supra* note 2, § 8-301.
[108] SPPSA, *supra* note 1, s 24.1(1); U.C.C, *supra* note 2, § 9-106.
[109] SPPSA, *supra* note 1, s 24(1); U.C.C § 9-106.
[110] SPPSA, *supra* note 1, s 24.2; U.C.C, *supra* note 2, § 9-105.
[111] *Ibid,* s 2(1.1); U.C.C. *supra* note 2, § 9-106.
[112] STA, *supra* note 37*,* s 23(1).

(b) the security certificate is registered in the name of the purchaser at the time of the original issue or registration of transfer by the issuer.[113]

Delivery is equal to control for a certificated security in bearer form under the STA. But for a certificated security in registered form, an endorsement or registration in the name of the purchaser in addition to the delivery of the certificated security is required to constitute control.

The STA lists the following requirements for control of uncertificated securities:

STA s. 24(1) A purchaser has control of an uncertificated security if:

(a) the uncertificated security is delivered to the purchaser; or

(b) the issuer has agreed that the issuer will comply with instructions that are originated by the purchaser without the further consent of the registered owner.[114]

STA s. 24(2) A purchaser to whom subsection (1) applies in relation to an uncertificated security has control of the uncertificated security even if the registered owner retains the right:

(a) to make substitutions for the uncertificated security;

(b) to originate instructions to the issuer; or

(c) to otherwise deal with the uncertificated security.[115]

Flowing from s.24(1)(a), STA s. 68(2) states that "Delivery of an uncertificated security to a purchaser occurs when:

(a) the issuer registers the purchaser as the registered owner, on the original issue or the registration of transfer; or

(b) another person, other than a securities intermediary, either:

(i) becomes the registered owner of the uncertificated security on behalf of the purchaser; or

(ii) having previously become the registered owner, acknowledges that the person holds the uncertificated security for the purchaser."[116]

Delivery is also synonymous with control of an uncertificated security under the STA. Unlike a certificated security in registered form which requires accompanying endorsements to achieve control, the delivery referred to here is not a mere delivery of a document that represents a security interest. Because of the intangible nature of an uncertificated security, delivery indicates power (control) over the collateral. This power is practically achieved either by registering the purchaser as a registered owner by the issuer, registering another party other than the securities

[113] *Ibid*, s 23(2).
[114] *Ibid*, s 24(1).
[115] *Ibid, s* 24(2).
[116] *Ibid*, s 68(2).

intermediary as the registered owner on behalf of the purchaser or by the acknowledgment of a previously registered owner, that he holds the security on behalf of the purchaser.

Where the uncertificated security is held by the issuer, control may also be realized by the purchaser if the issuer is prepared to act on the instructions of the purchaser in relation to the security, without the consent of the registered owner. This means that control is achieved where the purchaser can request the issuer to dispose of the collateral by any means, without seeking the registered owner's permission to do so. It is noteworthy that control of uncertificated security cannot be obtained without the consent of the registered owner.[117] This means that the registered owner must first authorize the issuer to either deliver or act on the instructions of the purchaser in relation to the security before the purchaser can achieve any form of control over the collateral. Where the purchaser meets the requirements for control under s.24(1) of the STA without obtaining consent from the registered owner, he would be seen to have acted in bad faith and against the spirit of the PPSA,[118] thus nullifying his control over the collateral. Another thing to note is that the issuer may choose not to abide by the registered owner's request that it should comply with instructions originating from the purchaser.[119] An agreement under S.24(1)(b) is usually made using a tripartite control agreement entered by the debtor, issuer, and purchaser.[120]

Where delivery of an uncertificated security is made or a tripartite control agreement is formed, a purchaser has control of the security even if the registered owner maintains control of the uncertificated security.[121] This means that it is possible to have dual control over an uncertificated security. This is not problematic due to the presence of the issuer, who is an independent party acting based on the agreement governing the relationship between the parties. This means that the issuer will not honour the instructions of any party if such instructions undermine the arrangement between the parties under the tripartite control agreement.

The control provisions on security entitlements under the STA are very similar to the control provisions on securities. To have a security entitlement simply means being entitled to the rights and property interest in a financial asset specified under Part VI of the STA.[122] An entitlement holder "means a person identified in the records of a securities intermediary as the person having

[117] STA, *supra* note 37, s 27(1).
[118] SPPSA, *supra* note 1, s 65(4).
[119] *Ibid,* s 27(3).
[120] *Bangsund*, *supra* note 38.
[121] STA, *supra* note 37, s 24(2).
[122] *Ibid*, s 1(hh).

a security entitlement against the securities intermediary and includes a person who acquires a security entitlement by virtue of clause 95(1)(b) or (c)."[123]

> 95(1) Except as otherwise provided in subsections (3) and (4), a person acquires a security entitlement if a securities intermediary:
> (a) indicates by book entry that a financial asset has been credited to the person's securities account;
> (b) receives a financial asset from the person or acquires a financial asset for the person and, in either case, accepts it for credit to the person's securities account; or
> (c) becomes obligated under another statute, law, regulation or rule to credit a financial asset to the person's securities account.[124]
> (2) If a condition of subsection (1) has been met, a person has a security entitlement even if the securities intermediary does not itself hold the financial asset.[125]
>
> (3) A person is to be treated as holding a financial asset directly rather than as having a security entitlement with respect to the financial asset if a securities intermediary holds the financial asset for that person and the financial asset:
> (a) is registered in the name of, payable to the order of or specially endorsed to that person; and
> (b) has not been endorsed to the securities intermediary or in blank.[126]
>
> (4) Issuance of a security is not establishment of a security entitlement.[127]

Security entitlements are obtained when a securities intermediary credits a party's securities account with a financial asset. A party whose securities account is credited with a financial asset by a securities intermediary is usually referred to as an entitlement holder. The STA differentiates between being a direct holder of a financial asset and being an entitlement holder. A person holds a financial asset directly where a securities intermediary holds a financial asset for the person, but the financial asset is either registered in the name of, payable to the order of or specially endorsed to that person and the financial asset has not been endorsed to the securities intermediary or in blank. The control provisions governing security entitlements are virtually the same as those regulating uncertificated securities. The control provisions on securities accounts simply state that a secured party that has control of all securities entitlements contained in a securities account has control over the securities account.[128] As discussed above, crypto-assets may be categorized as financial assets in certain situations. A crypto-asset may only qualify as a financial asset when the assets are held by a securities intermediary, giving the owner of the

[123] *Ibid,* s 1(m).
[124] *Ibid,* s 95 (1).
[125] *Ibid,* s 95(2).
[126] *Ibid*, s 95(3).
[127] *Ibid,* s 95(4).
[128] SPPSA, *supra* note 1, s 2 (1.1) (e).

crypto-assets a security entitlement to the assets. Where a crypto-asset qualifies as a security entitlement, it can be perfected by control, thus eliminating the enforcement concerns associated with crypto-assets. Instead of the crypto-assets remaining in the debtor's control as is the case where crypto-assets are perfected by registration, the securities intermediary would be in actual control of the crypto-assets. This means the securities intermediary would act as an independent third party and abide by the terms of the control agreement between the parties to release the crypto-assets to the secured party in the event of default. Though some crypto lending firms and small investment firms already offer these services to secured parties, this is yet to become mainstream.[129] Many major firms are still weary of acting as securities intermediaries when it comes to crypto-assets due to the risks of volatility that are associated with managing crypto-assets.[130]

As discussed above, the CSA has mentioned that a user's contractual right to delayed delivery of DCAs, when custodied by a CTP, creates either a derivative or a security. Though crypto-assets are not securities for secured transaction purposes, the treatment of CTPs by the CSA reveals that CTPs are bound by securities law when acting as intermediaries on behalf of its users. Because CTPs provide custodial services, it may be possible for the CTPs to obtain control over crypto-assets and hold these assets on behalf of secured parties. In this situation, the relationship between the CTP and the secured parties would be similar to that of traditional securities intermediary and parties with a security entitlement to crypto-assets. This is because the CTPs delayed delivery of the crypto-assets means that the parties only have entitlement rights to the asset, but do not hold the assets directly. Because of certain risks such as the risk of CTP insolvency, the CSA has determined that CTPs be subject to securities legislation such as *National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations,* which requires CTPs to register in Canada, and provides rules that these CTPs must abide by during the registration process.[131] Part of these requirements include the use of a qualified custodian by the CTP to take control of the crypto-assets, given an extra layer of protection to investors in the event of CTP failure.[132] The use of a qualified custodian ensures that the crypto-assets belonging to users of the platform are protected in cases of exchange hacks

[129] Paul de Havilland "Report Suggests Financial Advisors Moving into Crypto" (February 10, 2020), Online: CryptoBriefing < https://cryptobriefing.com/report-suggests-financial-advisors-moving-crypto/#:~:text=Only%206%25%20of%20financial%20advisors%20currently%20have%20crypto,also%20designed%20to%20measure%20intentions%20rather%20than%20actions >.
[130] *Ibid.*
[131] *National Instrument 31-103, Registration Requirements, Exemptions, and Ongoing Registrant Obligations* (1 March 2021).
[132] *Ibid* at Part 14.5.2.

or CTP insolvency. Specifically, the use of a qualified custodian to hold the user's assets ensures that the user's crypto-assets are not co-mingled with the platform's assets and will not be part of the pool of assets available to creditors in the event of insolvency.[133] This means that unlike the use of a traditional securities intermediary, which involves the execution of a tripartite control agreement, there are actually four relevant parties in the case of perfection by control when a CTP is the intermediary. These parties are the secured party, the debtor, the CTP acting as intermediary, and the qualified custodian. The parties may still opt for a tripartite control agreement with the CTP since they have entrusted the CTP with their assets. However, this may expose the parties to the risk of being unable to recover the crypto-assets in the event of CTP failure. An alternative may be to enter into a four-party agreement between the secured lender, the debtor, securities intermediary, and the qualified custodian, which states that the qualified custodian will abide by the control agreement and perform the duty of the intermediary in the event that the intermediary is unable to do so.

However, the reality is that many CTPs continue to operate illegally in Canada, and do not use qualified custodians to protect their users' assets. Therefore, those who choose to entrust their crypto-assets to unregistered CTPs for secured transactions purposes must accept the risk of being unable to recover their assets in the event of CTP failure. Moreover, CTPs may be unwilling to enter these customised control agreements with debtors and secured parties, whether or not they operate legally in Canada, and in the case of legal operations, a qualified custodian may also be weary about entering into a 4-way control agreement, in order to avoid liability. And so, currently the traditional securities intermediary regime for security entitlements (the "opt in" option) remains the safest way to hold crypto-assets through an intermediary for secured transactions purposes.

Control can also be used to perfect security interests in electronic chattel paper in some Canadian provinces. The proposals made at the 2017 CCPPSL annual meeting involved the introduction of control as a perfection step for electronic chattel paper, and this has been adopted in the Saskatchewan PPSA.[134] It became necessary to implement a control rule for electronic paper to provide an equivalent of perfection by possession which is applicable to tangible chattel paper. The implementation of the control rule was also vital to clarify priority rules where there are

[133] *Ibid*; see also Canadian Securities Administrators Staff Notice 21-332, *Crypto Asset Trading Platforms: Pre-Registration Undertakings, Changes to Enhance Canadian Investor Protection,* (February 22, 2023).
[134] SPPSA, *supra* note 1, s 24.2(1).

competing security interests in the electronic chattel paper and to also provide the secured party with more protection in the event of enforcement. The standards for control of electronic chattel paper have intentionally been made broad to accommodate technological advancements such as blockchain, that may assist commercial parties in creating appropriate control mechanisms. A party may gain control of electronic chattel paper under the PPSA as follows:

> S.2(1.2) A secured party has control of electronic chattel paper if the record comprising the chattel paper is created, stored and transferred in a manner such that:
>
> (a) a single authoritative record of the electronic chattel paper exists that is unique, identifiable and, except as otherwise provided in clauses (d), (e), and (f), unalterable;
> (b) the authoritative record identifies the secured party as the transferee of the record;
> (c) the authoritative record is communicated to and securely maintained by the secured party or its designated custodian;
> (d) copies of or amendments to the authoritative record that add or change an identified transferee of the authoritative record can be made only with the consent of the secured party;
> (e) each copy of the authoritative record and any copy of a copy is readily identifiable as a copy that is not the authoritative record; and
> (f) any amendment of the authoritative record is readily identifiable as authorized or unauthorized.[135]

This is very similar to the older provision on obtaining control of electronic chattel paper under UCC Article 9-105. The PPSA provides six standards that must be met for an electronic chattel paper to be perfected by control. First, the electronic chattel paper must be a single authoritative record that is unique, identifiable, and unalterable (with a few exceptions). It must identify the secured party as the transferee of the record, the record must be communicated to and securely maintained by the secured party or its custodian. If copies of or amendments to the records are made to change an identified transferee of the record, the secured party must consent to those changes. Each copy of the authoritative record must be readily identifiable as a copy, and any amendment of the authoritative record must be readily identified as authorized or unauthorized.

Due to the novelty of electronic chattel paper under the PPSA, practical mechanisms for control of electronic chattel paper are yet to be developed in Canada. However, some mechanisms exist in the U.S since electronic chattel paper was recognized as a form of personal property under UCC Article 9 over two decades ago. These control mechanisms have been described by Cory Kapeller as follows:

[135] SPPSA, *supra* note 1, s 2 (1.2).

> E-Vault Model: A 'single document management system' model in which all parties, from the originator to the final investor, have access to the authoritative copy on a single system. Ownership and control are related to access rights and change dynamically as ownership of the electronic record is transferred.
>
> Single Registry Model: The authoritative copy itself may be transmitted from system to system and from one physical location to another, but a central registry referenced in the electronic record itself keeps track of the current owner and the location of the authoritative copy.[136]

While these mechanisms are consistent with the control standards under the PPSA, Canadian commercial parties may want to consider more modern mechanisms to achieve control of electronic paper such as the use of smart contracts and multi-signature arrangements in relation to non-fungible tokenized chattel paper. Similarities may be drawn between the use of electronic chattel paper and crypto-assets in secured transactions because they are both collaterals of a digital nature. However, they are very different kinds of assets so the control standards that have been set for electronic chattel paper would be incompatible with crypto-assets. For instance, unlike with electronic chattel paper where it may be relatively easy to identify the authoritative e-chattel paper, crypto-assets are for the most part fungible in nature. With the exception of non-fungible tokens (NFT) which would qualify as "single authoritative records, that are unique and identifiable and unalterable". Crypto-assets in general also differ from electronic chattel paper because electronic chattel paper contains the name of the secured party as transferee of the record but there is no way for a third party to know whether a crypto-asset is encumbered or identify the secured party that has an interest in it (except in the registration context). The broad approach that has been taken in the establishment of control standards for electronic chattel paper, may however be useful in the creation of a well-suited perfection framework for crypto-assets. Any amendment to the perfection framework for crypto-assets should not include rigid rules to allow for creativity and innovation from a technological perspective, to achieve the goal of the legislation.

2.5 Conclusion

This chapter demonstrates that the existing secured transaction laws are not designed to accommodate crypto-assets. This is evidenced by the amount of speculation involved about the appropriate category that crypto-assets fall into, which has been further complicated by the declaration of Bitcoin as legal tender in El Salvador and the Central African Republic. The

[136] Cory Kapeller, "Keeping Up with the Joneses: A Review, Critique and Analysis of Electronic Chattel Paper Approaches and Proposals" (23 January 2019), online: JuliusErwin <www.juliuserwin.com/commercial-law1>.

categorization issue is a vital one because it determines how crypto-assets are treated under the applicable laws and also determines the level of difficulty that a secured party may face to recover its investment in the event of default. Even where we assume that crypto-assets fall into the residual class of personal property i.e. intangibles, this does not eliminate the issues that parties involved in crypto-related secured transactions may face. In fact, it leads to further complexities as the mode of perfection applicable to intangibles is not suitable for crypto-assets. The current perfection mechanism could lead to loss of investment of secured creditors as there is no practical way to enforce the security interests in crypto-assets that have been perfected by registration. The fact that crypto-assets are also less negotiable collateral by virtue of their current classification as intangibles is also problematic as it impacts innocent third parties that have given value for the assets and hinders mainstream adoption of crypto-assets as a payment method. Since perfecting crypto-assets by registration does not protect secured parties, it may be time to look to the other modes of perfection under the applicable laws for a solution. The most viable option of the four existing modes of perfection appears to be control because of the success that has been had in perfecting security interests in other intangible forms of personal property by control. It is however unlikely that any of the existing control mechanisms under the applicable laws would neatly regulate crypto-assets due to its unique nature. Regardless of whether or not the control rule is the best way to perfect security interests in crypto-assets, what is clear is that the current mode of perfection is not working and any mode that is adopted subsequently should be one that resolves the current enforcement issues and demonstrates more fairness in the protection of parties involved in secured transactions.

CHAPTER THREE: CURRENT DEVELOPMENTS IN THE REGULATION OF THE USE OF CRYPTO ASSETS AS COLLATERAL

3.1 Introduction

This chapter examines the developments that have been made in regulating the use of crypto assets as collateral in secured transactions. The United States has made several strides in crypto-related secured transactions legislation both at the state and federal levels. The aim of this chapter is to examine these laws to determine whether they contain provisions that are viable for a practical regulation of crypto-assets. The viability of each piece of legislation will be assessed by how well it addresses the four main issues identified in the second chapter of this thesis. These comprise the categorization of crypto assets, perfection, enforcement, and the non-negotiability of crypto assets under the current laws. Identifying the workable sections of the relevant legislation and critiquing the inadequate provisions will assist in making recommendations for a more practical and party-centric regulatory framework. We will also assess the compatibility of these provisions with the foundational principles of personal property security law addressed in chapter one of this thesis, to ensure that the recommendations uphold the foundational principles of the PPSA and secured transactions law in general.

3.2 Current Approaches to the Treatment of Crypto-Assets in Secured Transactions

3.2.1 Crypto-assets as Financial Assets under the Uniform Regulation of Virtual-Currency Businesses Act ("URVCBA") and the Uniform Supplemental Commercial Law for the URVCBA

In 2017, the National Conference of Commissioners on Uniform State Laws (also known as the Uniform Law Commission, "ULC"), introduced the Uniform Regulation of Virtual-Currency Businesses Act ("URVCBA"), for the regulation of virtual currency business activity of persons offering services or products to residents of enacting states.[1] One of the business activities regulated by the URVCBA is "certain custodial or fiduciary services in which the property or assets under the custodian's control or under management include property or assets recognized as virtual currency".[2] By regulating virtual currency businesses that offer custodial or fiduciary services, the URVCBA essentially regulates the activities of intermediaries that

[1] *Uniform Regulation of Virtual Currency Businesses Act 2017*[URVCBA], Prefatory note at 1.
[2] *Ibid*.

obtain control of virtual currency being used as collateral on behalf of parties to a secured transaction. Virtual currency is defined under the URVCBA as

> a digital representation of value that:
>
> > (i) is used as a medium of exchange, unit of account, or store of value; and (ii) is not legal tender, whether or not denominated in legal tender.[3]

The URVCBA defines legal tender as "a medium of exchange or unit of value, including the coin or paper money of the United States, issued by the United States or by another government."[4] The exclusion of legal tender from the definition of virtual currency implies that bitcoin will not be considered virtual currency under the URVCBA if the law were to be applied today, by virtue of the adoption of bitcoin as a medium of exchange by El-Salvador and the Central African Republic. The adoption of bitcoin in these jurisdictions has therefore rendered the definition of virtual currency under the URVCBA insufficient. For clarity, the URVCBA specifically excludes certain digital products and services from the definition of virtual currency as follows:

> (i) a transaction in which a merchant grants, as part of an affinity or rewards program, value that cannot be taken from or exchanged with the merchant for legal tender, bank credit, or virtual currency; or (ii) a digital representation of value issued by or on behalf of a publisher and used solely within an online game, game platform, or family of games sold by the same publisher or offered on the same game platform.[5]

The above provision clarifies that the term "virtual currency" does not include digital tokens solely used in online games. A valuable item such as a digital gift card will also not be categorized as virtual currency under the URVCBA if it cannot be exchanged for money or virtual currency with the merchant who grants it.

The URVCBA also defines what it means for a custodian to have "control" of a customer's virtual currency. "Control" here is defined as the power to execute unilaterally or prevent indefinitely a virtual-currency transaction.[6] One way the URVCBA regulates virtual currency businesses is by requiring virtual currency providers in all states that enact the law to be licensed in the state by the relevant department, or registered with the responsible department.[7]

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[3] URVCBA, *supra* note 1, s 102(23)(A).
[4] *Ibid*, s.102(8).
[5] *Ibid,* s. 102(23)(B).
[6] *Ibid,* s 102(3).
[7] URVCBA, *supra* note 1, s 201(1).

The main aim of the URVCBA is to create predictable legislation tailored to virtual currency businesses to comfort users of virtual currency products and services that virtual currency businesses will be regulated fairly and in a similar manner to providers of other financial products and services.[8] As such, the URVCBA is very similar to the Uniform Money Services Act which regulates money transmitters, check cashers, and similar businesses.[9] Some distinct features are however included in the URVCBA to address contemporary regulatory issues such as property interests and entitlements under section 502.

Section 502 of the URVCBA protects the owner of a virtual currency that is entrusted to a licensee or registrant, in the same way that certain protections are available for owners of investment securities indirectly held by securities intermediaries under UCC Article 8. The URVCBA does not limit the responsibility of acting as an intermediary to clearing agencies, brokers, and trust companies. Any entity that is able to satisfy the requirements for registration/licensing as a virtual currency business within the URVCBA can undertake duties as an intermediary. Section 502 restricts the virtual currency business' ability to deal with a customer's virtual currency as its own property, by removing the virtual currency under the control of a licensee or registrant from the virtual currency business' balance sheet.[10] In the event that the virtual currency business becomes insolvent, creditors of the business would have no claim to the virtual currency belonging to the business' customers. This section further requires virtual currency businesses with control over virtual currency belonging to customers to maintain an amount adequate to satisfy the aggregate entitlements of the customers to each type of virtual currency that they have entrusted to the business. In the event that the virtual currency business does not maintain sufficient amounts of the virtual currencies, the entitlement holders (i.e. the secured parties) will be entitled to the available virtual currencies pro-rata their original entitlements, regardless of the time the entitlement originated, or the time control of the virtual currency was obtained by the licensee or registrant.[11] Section 502 protects secured parties that entrust their crypto-collateral in the hands of intermediaries by ensuring that intermediaries maintain a sufficient amount of crypto-assets to satisfy their customers' entitlements, and do not co-mingle their customer's assets with the assets of the virtual currency business. Though section 502 of the URVCBA regulates virtual currency businesses in a way that prioritizes the protection of secured parties utilizing the services of intermediaries, it does

[8] *Ibid*, prefatory note at 1.
[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid,* s 502(b).

not provide sufficient information on the rights of the secured parties and the intermediaries themselves.[12] It is for this reason that the Uniform Law Commission developed a law as a substitute for Section 502, which instead adopts the more comprehensive approach of UCC Article 8.

This law is known as the Uniform Supplemental Commercial Law for the URVCBA ("USCL" or "the Supplemental Law"). It was established to provide a more extensive set of rules to govern property interests and entitlements to virtual currency. In addition to user protection, it also provides commercial law rules that promote certainty and finality in transactions involving crypto-assets.[13] The rights that the Supplemental Law grants to customers of virtual currency businesses are comparable to the rights of customers of securities intermediaries under Part 5 of UCC Article 8.[14] The ULC has recommended that the Supplemental Law be enacted in conjunction with the URVCBA, but section 502 of the URVCBA be replaced with the relevant provisions of the Supplemental Law in states that enact both laws.[15] The ULC has also clarified that the aims of the Supplemental Law include better enabling crypto-asset owners to use their crypto-assets as collateral under UCC Article 9 by providing for secured parties obtaining crypto-assets as collateral to proceed in a similar manner to traditional securities held in securities accounts subject to UCC Article 8 and enhancing the negotiability of virtual currency.[16]

Section 4 of the Supplemental Law incorporates UCC Article 8 by providing that the licensee or registrant and the owner of the crypto-assets must execute an agreement evidencing their relationship.[17] The agreement must specify which jurisdiction's laws govern the agreement. Where such jurisdiction has not enacted the UCC, a UCC jurisdiction must be specified as the securities intermediary's jurisdiction for the purpose of Article 8,[18] and the agreement must state that the law in force in the specified UCC jurisdiction is applicable to all issues identified in Article 2(1) of the Hague Securities Convention.[19] The agreement must also specify that the licensee or registrant is a securities intermediary and that its control of the crypto-assets creates

[12] URVCBA, *supra* note 1, Comment 2 at 74.
[13] *Uniform Supplemental Commercial Law for the Uniform Regulation of Virtual-Currency Businesses Act 2018* [USCL], Prefatory Note at 1.
[14] *Ibid.*
[15] *Ibid.*
[16] *Ibid.*
[17] *Ibid,* s 4(a)1.
[18] *Ibid,* s 4 (a)(2) a.
[19] USCL, *supra* note 13*,* s 4(a)(2) b; The Convention on the law applicable to certain rights in respect of securities held with an intermediary, also known as the Hague Securities Convention is an international multilateral treaty that intends to create global legal certainty in relation to cross-border securities transactions.

a securities account of which the owner of the asset is an entitlement holder. The agreement must also specify that the parties have agreed to treat the crypto-assets as financial assets credited to the owner's securities account and that the licensee is prohibited from granting a security interest in the user's crypto-assets to anyone.[20] The Supplemental Law prohibits parties from agreeing to terms that provide less protection to the owner of the crypto-assets than the safeguards contained under Article 8, and also prohibits a variation of section 4 by agreement.

In essence, the URVCBA and the Supplemental Law formally adopt the treatment of investment property under UCC Article 8 to crypto-assets. The law requires the user and the licensee or registrant to "opt-in" to the provisions of Part 5 of UCC Article 8 so that its virtual currency may be treated as a financial asset by the licensee or registrant. This clarifies the path that users seeking to grant and secured parties seeking to enforce security interests in virtual currencies can take. Virtual currency belonging to owners that sign a control agreement with a securities intermediary in accordance with this Act would be categorized as "investment property" and not "general intangibles" under UCC Article 9.[21]

The previous chapter of this thesis highlighted the reasons why it is logical for legislators to want to treat crypto-assets in a similar manner to traditional investment property. We will now be discussing the implications of this treatment and whether the adoption of UCC Article 8 provisions is in fact suitable for crypto-assets. UCC Article 8 and the Securities Transfer Act ("STA") which was referenced in the previous chapter are almost identical, so in discussing the implications of the incorporation of UCC Article 8 provisions under the URVCBA and the Supplemental Law, we will also use the opportunity to discuss the implications of treating crypto-assets as investment property more generally. This discussion would also cover the possibility of treating crypto-assets as investment property in Canada. Before we begin this discussion, it should be noted that the Uniform Law Commission has recommended that States do not adopt the URVCBA and the Supplemental Law until more studies have taken place. A committee known as the Committee on the Uniform Commercial Code and Emerging Technologies was formed to undertake these studies and as of July 2022, they have approved

[20] *Ibid,* s 4(a)(3) c.
[21] *Ibid*, s 4, Comment 1.

amendments to the UCC to deal with these issues more extensively.[22] These amendments are yet to be passed in any US state.[23]

(i) Implications of the Treatment of Crypto-assets as Investment Property

The main implication of adopting a UCC Article 8 treatment to crypto-assets is that it re-categorizes crypto-assets from "general intangibles" to "investment property". In chapter two, we established that the only viable way for crypto-assets to be categorized as investment property is if the securities intermediary decides to treat the crypto-assets as financial assets and give the owner of the crypto-assets a security entitlement in the assets. The classification of crypto-assets as investment property changes the dynamics of the perfection, enforcement, and non-negotiability rules applicable to crypto-assets. Security interests in crypto-assets are usually perfected by registering a financing statement at the Personal Property Registry.[24] The implication of treating crypto-assets as investment property is that perfection by control will then apply to security interests in crypto-assets. In the previous chapter, we identified that the perfection of security interests in crypto-assets by registration could lead to some priority and enforcement issues. Perfection by control would resolve those issues because control is the ultimate method of perfecting security interests in investment property.[25]

As the ultimate step for perfecting security interests in crypto-assets, the use of control will give parties involved in crypto-asset transactions more confidence in their dealings. Enforcement of the security interest will be seamless because the securities intermediary will act based on the initial agreement of the parties in the event of default. Under the STA and UCC Article 8, control is achieved in different ways, depending on the kind of investment

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[22] The ULC issued the following statement in March 2019: "To meet the growing need for law on this topic, the ULC and ALI have created a study committee to determine how the Code [the UCC] might be amended on a uniform basis to deal with emerging technologies. States are urged to refrain from enacting legislation pending the result of the committee's work. The study committee's process will take into account diverse views and perspectives and practical applications, and it will draw from a wide range of skills and expertise. The process is especially relevant where some technologies are at early stages or otherwise have not fully matured and creative approaches need to be devised in anticipation of, and not to stifle future transactions and developments. The committee welcomes participants from states that wish to be involved in its work and from individuals and groups with a stake in the development of appropriate laws to govern digital-asset transactions." See Caitlin Long, "Seismic News About State Virtual Currency Laws: ULC Urges States To Withdraw Model Act", (March 25, 2019) Online: Forbes <https://www.forbes.com/sites/caitlinlong/2019/03/25/seismic-news-about-state-virtual-currency-laws-ulc-urges-states-to-withdraw-model-act/?sh=23610d8c5fda >.

[23] The 2022 amendments to the UCC have neither been introduced or enacted in any US State as of 11 October 2022; UCC, 2022 Amendments to, (October 11, 2022) Online: ULC < https://www.uniformlaws.org/committees/community-home?communitykey=1457c422-ddb7-40b0-8c76-39a1991651ac >.

[24] *Personal Property Security Act*, SS 1993, c P-6.2, [SPPSA] s.2(1)(r); The *Personal Property and Security Regulations*, RRS c P-6.2 [SPPSR] Reg 1.

[25] *Ibid*, s 31.1(2).

property. Since crypto-assets can only be recognized as security entitlements under the STA and UCC Article 8, the control rules in relation to security entitlements will apply. Control of a security entitlement may be gained by a purchaser through different methods. A purchaser is any person that undertakes a voluntary transaction that creates an interest in property.[26] This includes a person that takes a security interest in property. A purchaser has control of a security entitlement if:

> (a) the purchaser becomes the entitlement holder;
>
> (b) the securities intermediary has agreed that it will comply with entitlement orders that are originated by the purchaser without the further consent of the entitlement holder; or
>
> (c) another person has control of the security entitlement on behalf of the purchaser or, having previously obtained control of the security entitlement, acknowledges that the person has control on behalf of the purchaser.[27]

There are three methods by which a purchaser may gain control of a crypto-asset under the STA and UCC Article 8. The first is by becoming the entitlement holder to the asset. The second is usually achieved by a tripartite agreement between the securities intermediary, the purchaser, and the entitlement holder, whereby the securities intermediary agrees to act on the instructions of the purchaser without further consent of the entitlement holder. The last method involves achieving control through a nominee; the person with control maintains the crypto-asset on the purchaser's behalf and acts on the purchaser's instructions. Where one of the methods of control stated above is met, a purchaser will still have control of the security entitlement even if the entitlement holder maintains the right to make substitutions for the security entitlement, originate entitlement orders to the securities intermediary, or otherwise deal with the security entitlement.[28] A securities intermediary will gain automatic control when an entitlement holder grants its own securities intermediary an interest in its property.[29] Also, a party that has control of all security entitlements contained in a securities account will also have control over the securities account in accordance with the PPSA and UCC Article 9.[30]

Another consequence of treating crypto-assets as investment property is that the entitlement holder may be able to enjoy protection from an adverse claim. The STA ensures that a person who acquires a security entitlement for value and, without notice of an adverse claim is protected from having any legal proceedings in connection to the adverse claim brought against

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[26] *Securities Transfer Act*, SS 2007, c S-42.3 [STA], s 1(2)(z).
[27] *Ibid*, s 25(1); *Uniform Commercial Code* [U.C.C], § 8-106(d).
[28] *Ibid,* s 25(2); U.C.C, § 8-106(f).
[29] *Ibid,* s 26; U.C.C, § 8-106(e).
[30] SPPSA, *supra* note 24, s 2 (1.1) (e).

it.[31] An adverse claim is defined as "a claim that: (i) the claimant has a property interest in a financial asset; and (ii) it is a violation of the rights of the claimant for another person to hold, transfer or deal with the financial asset."[32] A person who purchases a security entitlement, or interest in it, from an entitlement holder, where the purchaser gives value, obtains control, and has no notice of the adverse claim, would also benefit from this protection.[33] Additionally, a purchaser is protected from legal proceedings based on an adverse claim so long as that legal proceeding could not have been brought against the entitlement holder from whom it purchased the security entitlement.[34] This means that the owner of a crypto-asset treated as financial assets cannot be pursued by any other person who claims to have any pre-existing interest in those crypto-assets, so long as the owner gave value for the assets and had no notice of the other party's interest in the crypto-assets. This protection also applies to any subsequent person that purchases the crypto-assets or any interest in them (e.g., a secured party) from the entitlement holder. The STA clarifies what it means to have notice of an adverse claim as follows:

> A person has notice of an adverse claim if:
>
> (a) the person knows of the adverse claim;
>
> (b) the person is aware of facts sufficient to indicate that there is a significant probability that the adverse claim exists and deliberately avoids information that would establish the existence of the adverse claim; or
>
> (c) the person has a duty, imposed by statute or regulation, to investigate whether an adverse claim exists and the investigation, if carried out, would establish the existence of the adverse claim.[35]

Notice of an adverse claim can either mean having actual knowledge of the adverse claim, being willfully ignorant of the claim, or having a statutory duty to investigate the existence of an adverse claim. However, the mere knowledge that a financial asset or an interest in it is being or has been transferred by a representative is not an adverse claim and does not impose any duty on the entitlement holder or a purchaser to investigate the nature and rightfulness of the transaction.[36] However, it will constitute notice of an adverse claim if the entitlement holder or a purchaser of the security entitlement is aware that a representative has transferred the

[31] STA, *supra* note 26, s 96.
[32] *Ibid*, s 1(2) a.
[33] *Ibid,* s 104(1).
[34] *Ibid,* s 104(2).
[35] *Ibid,* s 18.
[36] STA, *supra* note 26*,* s 19(1).

financial asset or an interest in it, and the proceeds are being used for the benefit of the representative or in any manner that constitutes a breach of the representative's duties.[37]

This protection from adverse claims is vital in the development of the use of crypto-assets as collateral in secured transactions and its adoption as a payment method because it makes crypto-assets more negotiable. This is one of the main problems with the treatment of crypto-assets under the PPSA and the version of UCC Article 9 currently enacted in the different US states. A secured party who has perfected its security interest and is in actual control of the crypto-assets, can still have legal proceedings based on an adverse claim brought against him, and a person with a pre-existing security interest who for instance had been defrauded by the debtor of those crypto-assets may be able to lawfully retrieve those assets from the innocent secured party. It could also mean that a secured party may be able to retrieve crypto-assets from a third party who gave value to the debtor for those assets in the ordinary course of business and, without any knowledge of the adverse claim. This situation is very risky to secured parties who agree to take crypto-assets as collateral and also to third parties who accept crypto-assets as payment for goods and services. It is therefore important that innocent parties involved in crypto-asset secured transactions enjoy protection from adverse claims and be at ease that the crypto-assets for which they have given value, will not be retrieved from them in the future.

One method that could be used to achieve control of a crypto-asset treated as a financial asset is by having a tripartite control agreement between the securities intermediary, the entitlement holder, and the purchaser, which provides that the entitlement holder hand over control of its crypto-assets to the securities intermediary, through a wallet in which only the securities intermediary possesses the private key and it will simply act on the instructions of the parties in line with the control agreement. The securities intermediary could also automate this process by applying a smart contract, which locks the crypto-asset until the conditions specified by the parties are fulfilled. A smart contract is a contract where the terms agreed between the parties are written within lines of code that self-execute once the conditions of the agreement are met.[38] The code and the agreement within it exist on a distributed ledger network such as the blockchain. Once the terms of the smart contract have been laid down in the code, they become non-negotiable, and the contract automatically breaks on the side of the defaulting party leaving them without an opportunity to cure the default. The use of smart contracts in crypto-related

[37] *Ibid,* s 19(2).
[38] TechnologyHQ, "Blockchain Smart Contracts: Challenges and Opportunities" (January 29, 2019) Online: TechnologyHQ < https://www.technologyhq.org/smart-contracts-challenges-and-opportunities/ >.

secured transactions protects the crypto-assets from the securities intermediary by preventing the possibility of the securities intermediary utilizing the crypto-assets in the settlement of another obligation. The use of smart contracts will also assure the entitlement holder that its securities account has indeed been credited with the crypto-assets since they are locked up and not accessible by the securities intermediary. The problem with smart contracts at the moment is their lack of flexibility, which makes it difficult for parties to amend the terms upon execution of the smart contract.[39] On the technology side, efforts should be made towards ensuring the flexibility of smart contracts to take into consideration the fact that it is sometimes necessary for parties to an agreement to vary the terms of their agreement. Where the terms of a control agreement are varied but the smart contract is rigid, this may lead to an absurd result for the parties.

(ii) Concerns with the Treatment of Crypto-Assets as Investment Property

Though there are many advantages to the treatment of crypto-assets as investment property, this treatment is not without its concerns. The URVCBA and the Supplemental Law aim to provide a clear framework for crypto-asset users that employ the services of intermediaries. In other words, they provide protection for crypto-asset owners that choose to utilize UCC Article 8's indirect holding system. The URVCBA and the Supplemental Law are however silent on protection for users who choose to hold their crypto-assets directly. This may lead to a situation where secured parties either require debtors to hand over their crypto-assets to intermediaries as a pre-condition for lending, or debtors feel obligated to do this in order to obtain better terms in their transactions. This begs the question of whether commercial laws should provide better protection to secured parties dealing with the same kind of collateral solely because they choose to utilize the indirect holding system. Is there any reason why the use of the indirect holding system should be preferred for crypto-assets as against a system without intermediaries?

It may be argued that the use of intermediaries in secured transactions gives comfort to the secured party that they will recover their investment in the case of debtor default. Since the intermediary is an independent party, it will act on the agreement of the parties and release the debtor's crypto-assets to the secured party in the event of default. However, the use of intermediaries may involve higher transaction costs than the direct holding system and not all parties may be able to afford these additional costs. Also, crypto-assets are by nature

[39] CFI Team "Smart Contracts" (January 29 2021) Online: CFI < https://corporatefinanceinstitute.com/resources/knowledge/deals/smart-contracts/ >.

decentralized. They were intentionally created to be out of the control of centralized institutions such as banks and other financial institutions. A law that affords better protection to crypto-asset holders and secured parties who utilize centralized institutions may be seen as being against the spirit of crypto-assets. It is however not surprising for jurisdictions to provide clarity in the case of indirect holding of crypto-assets, as this gives them more control. Moreover, for crypto-assets to become respectable mainstream assets, some degree of governmental control may be necessary to prevent abuse. But it has been argued that the indirect holding system is not the answer due to its evident flaws.[40]

Under the indirect holding system, the entitlement holder does not have rights in the financial asset itself. Instead, it holds security entitlements that confer limited rights. As a general matter, an entitlement holder only has rights against its securities intermediary and no other party in the chain of indirect holdings, including the issuer.[41] Also, the securities intermediary may sometimes credit the account of an entitlement holder with a financial asset upon receiving an order to transact, without in fact acquiring the desired financial asset.[42] In this situation, the entitlement holder still acquires a security entitlement and the right to claim against the securities intermediary.[43] However, in the event that the securities intermediary becomes insolvent, the entitlement holder may be unable to recoup its entire entitlement. Though an entitlement holder only possesses rights against its intermediary, the entitlement holder may enforce its property interest against other parties in the chain of indirect holdings in the event of the intermediary's insolvency.[44] However, it becomes more unlikely that the entitlement holder will recover its entire investment from the other parties in the chain of indirect holdings as the entitlement holder would not have priority over that party's creditors. The STA and UCC Article 8 do not prohibit the securities intermediaries from crediting the accounts of entitlement holders with securities that they do not own. This may create a danger of overissuing financial assets that do not exist.[45] Meaning that there would be more holders of the financial assets than the quantity that actually exists. In this instance, there is an artificial inflation of supply, which could negatively impact the price of the asset[46].

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[40] Andrea Tinianow, "A Split Emerges In Blockchain Law: Wyoming's Approach Versus The Supplemental Act"(7 March 2019), Online: Forbes < https://www.forbes.com/sites/andreatinianow/2019/03/07/a-split-emerges-in-blockchain-law-wyomings-approach-versus-the-supplemental-act/?sh=595be37a719a >.
[41] STA, *supra* note 26, s 97(3).
[42] *Ibid*, s 95(1)(a).
[43] STA, *supra* note 26, s 95(2).
[44] *Ibid*, s 97(4)(a).
[45] Tinianow, *supra* note 40.
[46] *Ibid.*

In a situation where it becomes common practice to treat crypto-assets like traditional investment property, the issues that have plagued the traditional securities world may affect crypto-assets. Due to the unique nature of crypto-assets, there is no guarantee that they would be able to withstand such issues to the extent that traditional financial assets have.[47] This is because, unlike with securities where it takes some time for books to be settled, crypto-asset transactions are settled almost instantaneously on the blockchain. This may lead to an almost immediate suppression of price, which is based on the actions of securities intermediaries.[48] For some context into the consequence of an overissue by the intermediaries, in *re Dole Food Company* – a class action lawsuit, investors alleged that shares were undervalued at the time of a management buyout, and that this was a result of an overissue. The brokers had credited a total of 49.2 million shares to investors while there were only 36.7 million shares available. Though the extent to which the overissue suppressed the price cannot be quantified, it was clear that it had contributed to the undervaluation of the shares at the time of the buyout.[49]

In the event that crypto-assets become a more widely adopted source of collateral and are being controlled by securities intermediaries, there is a risk that the actions of these intermediaries might have a direct impact on the price of the asset, which may not be beneficial to holders of the asset. This also means that an intermediary that is unable to satisfy the claims of all its holders risks failing once its entitlement holders become aware of the situation and decide to withdraw their holdings from the intermediary.[50] The indirect holding system in the United States has been criticized by many including Vice Chancellor Travis Laster of the Delaware Court of Chancery, who stated that the current system works poorly and harms shareholders, and described blockchain as a "plunger" that could unclog the capital markets.[51] He suggested a regime in which shareholders own their shares directly via blockchain, as a replacement for the indirect holding system. He further criticized the URVCBA and the Supplemental Law as stripping blockchain of its power to resolve the issues in the capital markets.[52]

[47] *Ibid.*
[48] *Ibid.*
[49] *In re Dole Food Co., Inc. Stockholder Litig.*, 110 A.3d 1257 (Del. Ch. 2015).
[50] Tinianow *supra* note 40.
[51] *Ibid.*
[52] *Ibid.*

3.2.2 The Wyoming Approach

The Wyoming Digital Asset Statute ("the Wyoming Statute") was passed in 2019 to amend Article 9 of the Wyoming Uniform Commercial Code (WY-UCC). The statute was then amended in 2021. The Wyoming Statute provides a unique approach to the regulation of crypto-related secured transactions. The statute defines digital assets, clarifies the perfection and priority frameworks applicable to digital assets, establishes specific perfection and priority rules for digital assets, and introduces provisions for how banks can act as custodians with respect to digital assets.[53] Some commentators have commended the Wyoming approach to digital asset regulation and have described the state as a "cryptocurrency and digital asset paradise".[54]

The Wyoming Statute defines a digital asset as "a representation of economic, proprietary or access rights that is stored in a computer-readable format, and is either a digital consumer asset, digital security, or virtual currency."[55] The statute identifies three sub-categories of digital assets namely – digital consumer assets, digital securities, and virtual currency - and it classifies these under distinct existing collateral categories in UCC Article 9. The Wyoming Statute defines a digital consumer asset as follows:

> "Digital consumer asset" means a digital asset that is used or bought primarily for consumptive, personal, or household purposes and includes:
>
> (A) An open blockchain token constituting intangible personal property as otherwise provided by law;
>
> (B) Any other digital asset which does not fall within paragraphs (iii) and (iv) of this subsection.[56]

Digital security is defined under the statute in the same manner as the definition of a security under the Securities Act 1933 as follows:

> a digital asset which constitutes a security, as defined in W.S. 17-4-102(a)(xxviii), but shall exclude digital consumer assets and virtual currency[57]

Virtual currency means a digital asset that is:

> Used as a medium of exchange, unit of account, or store of value; and not recognized as legal tender by the United States government.[58]

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[53] *Wyoming Statute* [WS], § 34-29-101 (2021).
[54] Owen D. Kurtin, "Wyoming's Digital Assets Law and How to Use It" (18 January 2022), Online: Lexology < https://www.lexology.com/library/detail.aspx?g=72a5d03a-98c2-45d5-8bdd-ff98ac7b9730 >.
[55] WS, *supra* note 53, § 34-29-101(a)(i).
[56] WS, *supra* note 53, § 34-29-101(a)(ii).
[57] *Ibid*, § 34-29-101(a)(iii).
[58] *Ibid*, § 34-29-101(a)(iv).

The Wyoming Statute provides that the above terms are mutually exclusive.[59] The statute considers digital consumer assets as general intangibles (for UCC Article 9 purposes only),[60] digital securities as securities and investment property (for UCC Article 8 and 9 purposes),[61] and virtual currency as money (for the purposes of UCC Article 9 only).[62]

An open blockchain token constituting intangible personal property as provided in § 34-29-101(a)(ii)(A) of the definition of "Digital consumer asset", is defined as follows:

> An open blockchain token with the following characteristics constitutes intangible personal property:
>
> (i) The predominant purpose of the token is consumptive, as defined in paragraph (g)(ii) of this section;
>
> (ii) The developer or seller did not market the token to the initial buyer as a financial investment, as defined in paragraph (g)(v) of this section; and
>
> (iii) At least one (1) of the following subparagraphs is satisfied:
>
> (A) The developer or seller reasonably believed that it sold the token to the initial buyer for a consumptive purpose;
>
> (B) The token has a consumptive purpose that is available at or near the time of sale and can be used at or near the time of sale for a consumptive purpose;
>
> (C) The initial buyer of the token is prohibited by the developer or seller of the token from reselling the token until the token is available to be used for a consumptive purpose;
>
> (D) The developer or seller takes other reasonable precautions to prevent an initial buyer from purchasing the token as a financial investment.[63]

"Digital consumer asset" is the term describing an open blockchain token constituting intangible personal property and other forms of digital assets not expressly provided for in the Wyoming Statute. An open blockchain token is a form of digital asset utilizing blockchain technology, which was not marketed to the initial buyer as a financial investment and is predominantly used for consumptive purposes. The Wyoming Statute defines what it means for the purpose of a token to be consumptive as follows:

> "Consumptive" means a circumstance when a token is exchangeable for, or provided for the receipt of, services, software, content or real or tangible personal property, including rights of access to services, content or real or tangible personal property;[64]

A token used for consumptive purposes is one that can be exchanged for services, software, content, or real or tangible property. This means that a holder of a crypto-asset such as Ether,

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[59] *Ibid*, § 34-29-101(b).
[60] *Ibid,* § 34-29-101(a)(ii).
[61] *Ibid,* § 34-29-101(a)(iii).
[62] *Ibid,* § 34-29-101(a)(iv).
[63] WS, *supra* note 53, § 34-29-106(b).
[64] *Ibid*, § 34-29-106(g)(ii).

who trades their crypto-assets for other types of crypto-assets or money, and a holder of Ether that uses their Ether to pay for goods and services may be said to utilize the crypto-asset in a consumptive manner according to the Wyoming Statute. In addition to an open blockchain token being consumptive, for it to constitute intangible personal property it must also be one that was not marketed to the initial buyer as a financial investment.

> "Financial investment" means a contract, transaction or arrangement where a person invests money in a common enterprise and is led to expect profits solely from the efforts of a promoter or a third party;[65]

For now, it is unclear whether there are any crypto-assets that have been marketed as financial investments. Though the SEC has argued in the case of ***SEC v Ripple*** that the XRP token was marketed as a security, the Courts are yet to decide on what it means for a crypto-asset to be marketed as a financial investment.[66] Therefore, most crypto-assets have not been held to be marketed as financial investments and if they can also be described as "consumptive", they will be classified as digital consumer assets. This definition of digital consumer assets is very broad and may include the majority of crypto-assets held by retail buyers except for those crypto-assets that are classified as digital securities and virtual currencies. In my view, the expansive definition of digital consumer assets makes it difficult to ascertain what assets would fall into the category. It is very important that there is a clear distinction between the three sub-categories of crypto-assets under the Wyoming Statute because the modes of perfection for each sub-category are different. Specifically, digital consumer assets can only be perfected by registration. If most crypto-assets fit into this category, it would mean that the Wyoming Statute has failed to enhance the regulation of a majority of crypto-assets that may be used in secured transactions. My view that most crypto-assets existing today would fall under the digital consumer asset classification is given further credence by the fact that the Wyoming Statute states that virtual currency and digital securities are money and investment property respectively for UCC Article 9 purposes. The definition of virtual currency under the statute seems wide enough to cover most crypto-assets. However, the comparison that has been drawn between virtual currency and money under UCC Article 9 indicates that a more restrictive definition of virtual currency was intended by the legislators in drafting the Wyoming Statute. It appears that virtual currency under the statute may therefore be restricted to the kind of crypto-assets known as cryptocurrencies, which are used as mediums of exchange and will not include other kinds of crypto-assets such as utility tokens such as Augur and platform tokens

[65] *Ibid*, § 34-29-106(g)(v).
[66] *Securities and Exchange Commission v. Ripple Labs Inc*, 20 Civ. 10832 (AT) (S.D.N.Y. Oct. 4, 2021).

such as Ether[67], the second largest crypto-asset in the world.[68] If my conclusion is incorrect and I have restricted the definition of virtual currency under the Wyoming Statute beyond the intention of the legislators, then it would be difficult to reconcile the difference between the definitions of virtual currency and an open blockchain token constituting intangible personal property as contained in § 34-29-101(a)(ii)(A) of the Wyoming Statute as part of the definition of digital consumer assets. The similarities between the definition of an open blockchain token constituting intangible personal property and the definition of virtual currency bring about serious uncertainties in relation to whether security interests in crypto-assets that fall within these subcategories are to be perfected by registration or possession. If the definition of digital consumer assets was simply the definition in § 34-29-101(a)(ii)(B) which is residual, this conflict may not have arisen as § 34-29-101(a)(ii)(B) of the Wyoming Statute appears to cover other digital assets that may not be classified as crypto-assets, such as social media content, video game tokens, blogs, podcasts, etc. if they are used in secured transactions. It is however uncertain whether the legislators intended for the statute to cover non-crypto digital assets because an examination of the totality of the statute suggests that it is only intended to govern crypto-assets.

The Wyoming Statute defines "digital security" in a manner consistent with the W.S 17-4-102 (a) (xxviii) (i.e., the Wyoming adaptation of the Securities Act 1933) but states that the UCC Article 8 definition of securities would be utilized for UCC Article 8 and 9 purposes. This begs the question of how those digital securities that fall within the W.S 17-4-102 definition but fall out of the UCC Article 8 definition would be categorized for UCC Articles 8 and 9 purposes.

The Wyoming Statute also covers the provision that allows digital asset owners to opt-in for their digital assets to be treated as financial assets under UCC Article 8 if there is a written agreement between the securities intermediary and the owner of the digital asset. It further states that digital assets treated as financial assets will remain intangible personal property.[69] Where the owner of a digital asset takes advantage of the opt-in provision, their digital assets will cease to be categorized under one of the three sub-categories of this statute but will instead be categorized as "financial assets". This provision is simply a restatement of the provision in

[67] Emily "Cryptoassets: the different types of cryptoassets" (26 May 2018) Online: Coin Weez < https://coinweez.com/different-types-cryptoassets/ >.
[68] "Today's Cryptocurrency Prices by Market Cap" (10 January 2023) Online: CoinMarketCap < https://coinmarketcap.com/ >.
[69] WS, *supra* note 53, § 34-29-102(b).

Part 5 of Wyoming UCC Article 8 and perhaps was only included to confirm its applicability to digital assets. The Wyoming Statute provides that in addition to clearing agencies, trust companies, and brokers which are specified under UCC Article 8 as acceptable securities intermediaries, a bank providing custodial services will meet the definition of a securities intermediary in Wyoming.[70]

The manner in which security interests in a digital asset are perfected depends on the subcategory of digital assets. The Wyoming Statute provides that notwithstanding any other provision of law, a security interest in virtual currency may be perfected by possession, while security interests in digital securities may be perfected by control.[71] A secured party in possession or control of those digital assets has priority over a secured party not perfected by possession or control.[72] The term "control" when used in the Wyoming version of UCC Article 9 and this Statute includes the following:

> (A) A secured party, or an agent, custodian, fiduciary or trustee of the party, has complied with W.S. 34.1-8-106, including by means of a private key or the use of a multi-signature arrangement exclusive to the secured party or any substantially similar analogue;
>
> (B) Use of a smart contract created by a secured party to comply with W.S. 34.1-8-106. As used in this subparagraph, "smart contract" means an automated transaction, as defined in W.S. 40-21-102(a)(ii), or any substantially similar analogue, which is comprised of code, script or programming language that executes the terms of an agreement, and which may include taking custody of and transferring an asset, or issuing executable instructions for these actions, based on the occurrence or nonoccurrence of specified conditions.[73]

The Wyoming Statute provides very clear rules for achieving control. The most important element for control here is the exclusive legal authority to conduct a transaction relating to a digital asset. Control can either be achieved by the secured party or through its agent, custodian, fiduciary, trustee, or even a smart contract created by the secured party. The recognition of smart contracts by the law is notable because it recognizes and accommodates the innovative nature of digital assets, especially as it relates to decentralized lending.

On the other hand, "possession", when used in Wyoming's UCC Article 9 and this Statute "means the ability to exclude others from the use of property, and includes use of a private key, a multi-signature arrangement exclusive to the secured party or a smart contract, as defined in

[70] *Ibid,* § 34-29-102(c).
[71] *Ibid,* § 34-29-103(a).
[72] *Ibid.*
[73] *Ibid*, § 34-29-103 (e)(i).

this subsection, or any substantially similar analogue. "Possession" shall also include delivery of certificated digital securities, consistent with W.S. 34.1-8-301(a)."[74] The use of the term "possession" as it relates to the perfection of security interests in virtual currency is in my view unnecessary and may lead to uncertainties where disputes occur between parties that have perfected their security interests in Wyoming and parties that perfected their interests in other U.S states. Possession is generally associated with perfection of security interests in tangible assets under U.S secured transactions law and there does not seem to be any substantial difference between the definitions of possession and control under this statute to warrant such distinction.

In addition, this statute considers the possibility of having certificated digital securities and provides that perfection by possession would also apply to these assets. The Wyoming Statute also states that possession shall also include delivery of certificated digital securities. This is a very interesting introduction to the statute because it may be possible for such assets to exist in the future. The statute further mentions that perfection by possession creates a possessory security interest in the virtual currency or certificated digital securities, based on the possessory nature of a private key or any substantially similar analogue which may be tangible or electronic.[75] This means that it will be insufficient for the debtor to simply deliver a certificated digital security to a secured party without giving him the ability to control the asset. Even in relation to certificated digital securities, the use of the term possession does not seem necessary because possession of the certificate is insufficient to achieve perfection. For the sake of uniformity, it is my view that the term "control" is better suited in relation to these assets. The definition of control in relation to these assets may then include delivery of the certificated digital security, in addition to having actual control powers including the power to transfer the asset and prevent others from doing so.

The Wyoming Statute stipulates the entry into a security agreement by the debtor and the secured party as a prerequisite for taking possession or control of the digital assets and provides that the agreement may include terms under which the secured party can pledge its security interest in the digital asset as collateral for another transaction.[76] It also allows for perfection by registration for security interests in digital consumer assets, digital securities, and their

[74] WS, *supra* note 53, § 34-29-103(e)(iv).
[75] *Ibid,* § 34-29-103 (f).
[76] WS, *supra* note 53*,* § 34-29-103 (b).

proceeds.[77] It however does not provide for the perfection of security interests in virtual currency by registration. This is likely because it treats virtual currency as money for UCC Article 9 purposes, and money can only be perfected by possession under UCC Article 9. The subcategory referred to as digital consumer assets can only be perfected by registration. This means that a party enforcing security interests in crypto-assets that cannot be categorized as virtual currencies and digital securities may have difficulties perfecting and enforcing their security interests. I assume that the rationale for this is that in addition to some crypto-assets, the digital consumer assets category also covers an unlimited scope of digital assets and the legislators are trying to limit the applicability of control and possession to a restricted group of assets with security interests that need to be perfected this way.

The issue however is that parties with security interests in a large range of crypto-assets that are not digital securities or virtual currencies may be left unprotected. It is my view that these crypto-assets all have similar characteristics and should be treated the same way in the secured transactions context. The subcategories of digital assets under this law seem to only make the law more complex as the manner prescribed for the treatment of virtual currencies and digital securities under the statute are not so different despite the terminologies of possession and control used to distinguish them. A better sub-categorization for digital assets would have been "crypto-assets" and "non-crypto-assets", with security interests in crypto-assets being perfected by control and gaining the benefit of super-priority, while non-crypto-assets remain treated like traditional general intangibles with their security interests perfected by registration.

With regards to perfection by registration, the Wyoming Statute provides that a transferee will take a digital asset free of any security interest if the digital asset was taken for value, and there is no notice of an adverse claim within two years of taking the digital asset.[78] This provision is as follows:

> Notwithstanding any other provision of law, including article 9 of the Uniform Commercial Code, title 34.1, Wyoming statutes, a transferee takes a digital asset free of any security interest two (2) years after the transferee takes the asset for value and does not have actual notice of an adverse claim at any time during the two (2) year period. This subsection only applies to a security interest perfected by filing.[79]

[77] *Ibid*, § 34-29-103(c).
[78] WS, *supra* note 53*,* § 34-29-103(d).
[79] *Ibid.*

This is consistent with the statute of limitations for fraudulent conveyance under U.S. federal bankruptcy law and provides clarity to parties dealing with crypto-asset transactions, as even when perfection by control is not achieved, third parties to secured transactions are still able to take free of security interests after two years. Traditionally, a major benefit of perfection by registration is that it can be relied on by secured parties to put third parties on notice of their security interests without having to keep track of subsequent transfers of a debtor's assets. However, the two-year rule requires the secured party with an adverse claim to give actual notice to the transferee and not just constructive notice attained by registering a financing statement, to avoid the two-year filing priority lapse.[80] This means that a secured party that has perfected its security interest by registration could lose its priority if it is unaware that the digital asset subject to its security interest has been subsequently transferred. This provision increases the negotiability of crypto-assets to innocent third parties. Prior to this law, an innocent transferee could be pursued by secured parties with conflicting claims without any time limit under Wyoming's UCC Article 9. Now, transferees will be free from conflicting security interests after two years as long as those security interests were perfected by registration.

Though this rule tries to balance the rights of the innocent transferee and the secured party that perfects its security interest by registration, some critics have viewed this rule to be harsh because it reduces the rights that a secured party has to recover its collateral that has been transferred and incentivizes secured parties to perfect their security interests by control to protect against unlawful transfers.[81] In my view, the two-year rule diminishes the effectiveness of perfection by registration but it is not a harsh rule because it also offers more protection to innocent third parties. Rather than a secured party pursuing the innocent third party after two years has lapsed, the secured party can either choose to avoid this outcome completely by perfecting its interest by control in the first instance or it can attempt to pursue the person responsible for the fraudulent asset transfer instead of the innocent third party. The issue with this provision is that it only applies to security interests perfected by registration so, in a situation where a secured party in control of its collateral was hacked and the assets were stolen and subsequently transferred to an innocent transferee, there would be no restriction as to the time frame where the secured party can pursue the transferee for the collateral.

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[80] Robert T. Isham III "Wyoming's Digital Assets Amendments: Marked Out or Missed Out? A Review of Recent Amendments to Article 9 of the Wyoming UCC" (1 October 2019) Online: ABA < https://www.americanbar.org/groups/business_law/publications/blt/2019/10/digital-assets/ >.
[81] *Ibid*.

The fact that the two-year rule is only in relation to security interests perfected by registration and not control indicates that this statute prioritizes the protection of secured parties perfected by control over innocent transferees. This statute does not offer enough assurance to transferees (such as a party that accepts crypto-assets as payment) to make them more willing to accept crypto-assets as a means of payment. Since the transferee has no way of knowing at the time it accepts the crypto-assets whether any security interests in them had been subjected to registration or control, it is unable to properly assess the risk it takes when accepting these crypto-assets as payment.

The Wyoming Statute is very innovative for its provisions authorizing a bank to provide custodial services of digital assets. The statute authorizes a bank to provide these custodial services to a customer upon giving 60 days' written notice to the commissioner.[82] This power is equivalent to the power of a qualified custodian granted to a bank under the United States Securities and Exchange Commission in 17 C.F.R S. 275.204(4)-2. In performing custodial services, a bank has a duty to:

> (i) Implement all accounting, account statement, internal control, notice and other standards specified by applicable state or federal law and rules for custodial services;
>
> (ii) Maintain information technology best practices relating to digital assets held in custody. The commissioner may specify required best practices by rule;
>
> (iii) Fully comply with applicable federal anti-money laundering, customer identification, and beneficial ownership requirements; and
>
> (iv) Take other actions necessary to carry out this section, which may include exercising fiduciary powers similar to those permitted to national banks and ensuring compliance with federal law governing digital assets classified as commodities.[83]

A bank must also enter into an agreement with an independent public accountant to conduct independent verification of the client's funds and digital assets in custody, in accordance with 17 C.F.R. S. 275.206 (4)-2(a)(4).[84] The Wyoming Statute provides that digital assets held in the custody of a bank will not be considered depository liabilities or assets of the bank.[85] This means that these assets will not be considered property of the bank which can be claimed by creditors in the event of insolvency. While a bank serves as custodian over digital assets, it

[82] WS, *supra* note 53, § 34-29-104(a).
[83] *Ibid*, § 34-29-104(b).
[84] *17 C.F.R. Part 275, Rules and Regulations, Investment Advisers Act of 1940*, s 275.206(4)-2(a)(4).
[85] WS, *supra* note 53, § 34-29-104(d).

maintains possession or control, as applicable, over the assets in custody.[86] The Wyoming Statute requires the customer to enter into a written agreement with the bank on the treatment of each digital asset held in its custody. The Customer can choose for its digital assets to be treated as custody under a bailment as a nonfungible or fungible asset. Custody under a bailment means that the customer retains direct ownership of its assets but merely gives up possession or control to the bank. This has been described much like a valet parking situation.[87] The option to treat the asset as a nonfungible or fungible asset simply means that the assets will be strictly separated from other assets held by the bank. The Customer also has the option to choose for its digital assets to be treated as a form of custody under a bailment where the bank may only carry out transactions with the digital asset upon the customer's instructions. Under this provision, the bank must enter into an agreement with the counterparty which specifies the time for the return of the asset, to gain control of the digital asset.[88] The provisions governing the relationship the bank has with digital assets are very important and show a conscious withdrawal from the indirect holding structure utilized by traditional securities custodians.

The Wyoming Statute has also incorporated some governing law provisions to prevent uncertainties in relation to what law should govern disputes involving transactions between parties located within and outside Wyoming. These provisions prescribe that in addition to the digital asset being possessed or controlled by a Wyoming bank or other custodian or the debtor or secured party being physically located or incorporated in Wyoming, three factors would be considered to determine whether collateral that is required to be located in a jurisdiction is located in Wyoming.[89] These factors include whether a security agreement typically used in secured transactions exists, whether the choice of law provision in the security agreement evidences the intent of parties to the transaction, including waivers of litigation in jurisdictions outside Wyoming and the use of Wyoming courts, and the clarity of the laws of other jurisdictions relating to a digital asset and the ability of a court to exercise jurisdiction over a particular digital asset.[90] This provision aims to provide clarity on the choice of law conflicts that may arise between parties, by outlining the factors that will be considered in determining whether a digital asset is located in Wyoming and should be governed by Wyoming law. It is

[86] *Ibid.*
[87] Caitlin Long, "What do Wyoming's 13 New Blockchain Laws Mean?"(4 March 2019), Online: Forbes < https://www.forbes.com/sites/caitlinlong/2019/03/04/what-do-wyomings-new-blockchain-laws-mean/?sh=2e419e8b5fde >.
[88] WS, *supra* note 53, § 34-29-104(e).
[89] WS, *supra* note 53, § 34-29-103(g).
[90] *Ibid*, § 34-29-103(g).

however very difficult to completely eradicate choice of law conflicts because the other jurisdiction in question may contain provisions that directly contradict Wyoming's provisions. Choice of law disputes also involve additional transaction costs that may be avoided with uniformity. It is for these reasons that the ULC encourages uniformity across U.S states in commercial transactions.

In general, Wyoming has adopted an investor-friendly approach that encourages innovation. However, issues may arise since this law is expected to work in conjunction with UCC Article 8 and 9, and there are several inconsistencies between the digital asset laws in Wyoming and the UCC that may lead to uncertainties. These include the deviation from the UCC collateral categorization, the difference in perfection provisions, and the introduction of the two-year rule that diminishes the benefits of perfection by registration. The Wyoming Statute is also riddled with uncertainties and fails to provide adequate protection for a wide range of crypto-assets known as open blockchain tokens constituting intangible personal property under the digital consumer asset sub-category. Wyoming's approach also undermines the pursuit of uniformity in securities transfer laws in North America, and uniformity is particularly desirable in the regulation of a new asset class like crypto-assets.[91]

3.2.3 The 2022 Amendments of the Uniform Commercial Code Relating to the Regulation of Digital Assets in Commercial Transactions

In response to the development of innovative technologies affecting commercial transactions, the Uniform Law Commission formed the Committee on the Uniform Commercial Code and Emerging Technologies ("the Committee") and charged it with the responsibility of examining the UCC to consider whether changes to it are advisable to accommodate emerging technologies, such as artificial intelligence, distributed ledger technology, and virtual currency.[92] The work of the Committee has involved an assessment of the different articles governing commercial transactions, including Article 9 on secured transactions. Based on this assessment, the Committee introduced Article 12 to govern digital assets, specifically those that fall into the category of "controllable electronic records". Article 12 was drafted in

[91] Matt Crockett, "Wyoming's DIY Project Gets Western with the UCC", Wyoming Law Review, Vol. 20, No.1.
[92] Prefatory Note to 2022 ULC Annual Meeting (23 February 2023), online: ULC < https://higherlogicdownload.s3-external-1.amazonaws.com/UNIFORMLAWS/2e456b4d-7e6a-18b7-116c-7971f84a8393_file.pdf?AWSAccessKeyId=AKIAVRDO7IEREB57R7MT&Expires=1677474432&Signature=Zei4iU1K65FYNgldXWEl8Pm2HX4%3D >.

partnership with the American Law Institute and was approved and recommended for enactment in all states in July 2022.[93]

The introduction of Article 12 has inadvertently led to amendments to Article 9, including amendments to the current perfection framework. Article 12 establishes a legal framework that is intended to apply more broadly than just electronic (intangible) assets that are developed using current technologies such as distributed ledger technology, which includes blockchain technology.[94] The intention is for Article 12 to also apply to electronic assets developed using technologies that may be developed in the future. This is a good approach because it reduces the need for frequent legislative amendments as technology continues to evolve. These electronic assets have been collectively referred to as "controllable electronic records".

A controllable electronic record is defined as:

> a record stored in an electronic medium that can be subjected to control under Section 12-105. The term does not include a controllable account, a controllable payment intangible, a deposit account, an electronic copy of a record evidencing chattel paper, an electronic document of title, electronic money, investment property, or a transferable record.[95]

A controllable electronic record is a subset of digital asset, and it does not refer to one specific kind of asset. References to crypto-assets such as bitcoin are made constantly in the official comments and prefatory notes to clarify the application of Article 12 to them. The prefatory note to Article 12 also specified that bitcoin is the prototypical controllable electronic record at present.[96] However, a controllable electronic record has a wider scope than just crypto-assets. A controllable electronic record is defined above as a "record". A record is information that is retrievable in perceivable form.[97] To be considered a controllable electronic record, that record must be stored in an electronic medium and must be capable of being subjected to "control". The wide scope of the term "controllable electronic record" may be problematic because it gives the benefit of perfection by control to certain electronic records which may not need to be treated this way, such as video game tokens that hold no real-world value. Perfection by control is a benefit that should be guarded due to the super-priority rights and other benefits usually given to parties with security interests in assets perfected by control. The use of this term makes the benefit of control applicable to a wide range of assets that may not need to be

[93] *Uniform Commercial Code 2022*(as amended).
[94] *Ibid*, Prefatory note to s 12.
[95] U.C.C, *supra* note 93, § 12-102(a)(1).
[96] *Ibid,* Prefatory note to s 12.
[97] *Ibid*, § 1-201(b)(31).

perfected by control for their security interests to be appropriately enforced. This issue is discussed more deeply in the next chapter of this thesis.

The meaning of control is dependent on the kind of property involved.[98] Article 12-105 explains what control means in the context of a controllable electronic record.

(i) Control of a Controllable Electronic Record

Article 12-105 provides the conditions for achieving control of a controllable electronic record as follows:

> (a) A person has control of a controllable electronic record if the electronic record, a record attached to or logically associated with the electronic record, or a system in which the electronic record is recorded:
>
> (1) gives the person:
>
> (A) power to avail itself of substantially all the benefit from the electronic record; and
>
> (B) exclusive power, subject to subsection (b), to:
>
> (i) prevent others from availing themselves of substantially all the benefit from the electronic record; and
>
> (ii) transfer control of the electronic record to another person or cause another person to obtain control of another controllable electronic record as a result of the transfer of the electronic record; and
>
> (2) enables the person readily to identify itself in any way, including by name, identifying number, cryptographic key, office, or account number, as having the powers specified in paragraph (1).[99]

Control of a controllable electronic record will be achieved if the controllable electronic record, a record attached to or logically associated with the controllable electronic record, or any system in which it is recorded gives the person three powers. The official comments prescribe that this description of the source of the relevant powers be interpreted broadly and functionally. It gives the following example:

> a person would have a power even if the characteristics of the particular purchaser disable the person from exercising the power. This would be the case, for example, when the purchaser holds the private key required to access the benefit of the controllable electronic record but lacks the hardware required to use it.[100]

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[98] For example, see U.C.C § 7-106 (electronic documents of title); 8-106 (four different types of investment property, each with a different definition of "control"); 9-104 (deposit accounts); 9-105 (electronic chattel paper). See also Section 9-105A (control of electronic money).
[99] U.C.C, *supra* note 93, § 12-105(a).
[100] *Ibid*, § 12-105, comment 2 at 248.

Also, "a system in which the electronic record is recorded" as provided in Article 12-105(a) will be a permissible source of power even if it is related but not exactly the same system used to record the controllable electronic record. The official comments also explain that an overly literal or rigid interpretation is not what is intended in interpreting the terminology "attached to" or "logically associated" as contained in Article 12-105(a). The statutory language is to be adapted and applied in a functional manner to technology, systems, and infrastructure that may be developed and employed in the future. This is to ensure that records and systems linked to a particular electronic record are embraced in such a manner that the information held in, or the functions accomplished by those "attached" or "associated" records are properly and reasonably attributable to and identifiable as connected with the electronic record itself.[101]

The first power given to a person is the power to avail himself of substantially all the benefit from the electronic record. A person with control is entitled to all the rights offered by the controllable electronic record and can utilize the electronic record in any way it can be used. For example, the person in control of a crypto-asset can "spend" the asset by transferring it to another person in exchange for goods or services.[102] The second is the exclusive power to prohibit others from availing themselves of substantially all the benefit from the controllable electronic record, and the third is the exclusive power to transfer control of the electronic record to someone else or cause someone else to gain control of another controllable electronic record by virtue of the transfer of the electronic record. The official comments clarify that this power to transfer control includes the power to cause another person to gain control of another derivative and resulting controllable electronic record stemming from the transfer of the controllable electronic record.[103] In addition to having the three powers discussed above, control of a controllable electronic record will be achieved where the electronic record is such that allows the person to identify themself as having those three powers. The person can choose to be anonymous and use any means of identification to show that they have control. This includes their name, an identifying number, a cryptographic key, office, or account number, etc.

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[101] *Ibid*; Also see U.C.C, *supra* note 93, § 7-106, 9-105, 9-105A, 9-306A, 9-605, 9-628, and 12-107.
[102] Uniform Law Commission, "Overview of 2022 Amendments to the Uniform Commercial Code – Emerging Technologies" Online: ULC < https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=a116549b-6067-5f82-83ac-3501c7ad882d&forceDialog=0 >.
[103] U.C.C, *supra* note 93, § 12-105, comment 6; see also U.C.C § 12-104, comment 4.

Control is a key element of Article 12 and serves two major functions. The first is that it is only by gaining control of a controllable electronic record that a person becomes eligible to be a "qualified purchaser". Being a qualified purchaser allows the person to take free of claims of a security interest in the controllable electronic record, or any controllable account or controllable payment intangible evidenced by the controllable electronic record, and to be protected by the "no action" rule under Section's 12-104 (e) and (g) respectively.[104] The second reason control matters is that a security interest perfected by control will have priority over a conflicting security interest that was perfected by another method and gaining control pursuant to the debtor's agreement could be a replacement for a signed security agreement as an element of attachment.[105]

It should be noted that the word "exclusive" was used to describe the second and the third powers of a person that has control but was not used in relation to the first power. This means that it is possible to have the power to avail itself of the benefits of a controllable electronic record without having control. The term "exclusive" is defined in section 12-105(b) as follows:

> "Subject to subsection (c), a power is exclusive under subsection (a)(1)(B)(i) and (ii) even if:
>
> (1) The controllable electronic record, a record attached to or logically associated with the electronic record, or a system in which the electronic record is recorded limits the use of the electronic record or has a protocol programmed to cause a change, including a transfer or loss of control or a modification of benefits afforded by the electronic record; or
> (2) The power is shared with another person."[106]

Exclusivity, as used in this section, can be present even when the controllable electronic record or the system on which it is built, places some restrictions on the use of the electronic record or is programmed in a manner that could lead to a change, including a transfer or loss of control or a modification to some benefits afforded by the record. This considers the fact that even if a person has exclusive control of an electronic record, they are still subject to the protocols of the record and the system on which the electronic record is recorded. Where a change or some form of upgrade is made to the controllable electronic record or the system it is recorded on by its developers, this does not impair the exclusivity of the power of the person in control of the record. Please see the example used in the official comments below:

> **Example 1** Pursuant to the governance apparatus of a system (Propofolium) for a cryptocurrency (propofol), an upgrade to the system was made that modified the consensus mechanism for

[104] *Ibid*, comment 1 at 247; Also see U.C.C § 12-.104 (e) & (g).
[105] *Ibid* at 248; Also see U.C.C § 9-326A; 9-203(b)(3)(D).
[106] *Ibid*, § 12-105(b).

> determining the effectiveness of transfers of propofols within the system. Although this change did not divest any holder of propofols of its control, it prospectively modified the system for all propofols. The adoption of this change and the potential for such a change (or any other change) are functions of the attributes of the system and, consequently, of all propofols. Neither this change nor such potential impaired the exclusivity, for purposes of subsection (a)(1)(B), of the powers of a person in control of propofols.[107]

Subsection (b)(2) allows for the person in control to share its powers with another person without harming the exclusivity of those powers. So, in the case of a multi-signature (multi-sig) arrangement, a person that is readily identifiable under subsection (a)(2) and has the powers contained in subsection (a)(1)(A)(B)(i)(ii) can have control even if the action of another person is a condition for the exercise of the power. The example provided in the official comments is provided as follows:

> **Example 2** Pursuant to a multi-sig arrangement, control of propofols (in the system described in Example 1) is shared by Campbell, Elizabeth, Mia, and Natasha. Under the multi-sig arrangement, the exercise of powers over the propofols requires action by three of the four persons having control. None of the participants acting alone has the power to exercise the relevant powers. Subsection (b)(2) makes clear that all four participants have control over the propofols and exclusivity is not impaired by the shared control under the multi-sig arrangement.[108]

There may be questions in relation to what rights the persons with shared control have among themselves. The official comments clarify that if more than one of the four persons in the above example were secured parties, they would need to settle by agreement issues such as relative priorities and enforcement rights.[109] The official comments also highlight the benefits of a multi-sig arrangement. It states that such an arrangement may enhance security. For instance, if a hacker compromises the power of one of the persons with control, the required actions by the other persons would stop the hacker from exercising unsanctioned power over the record.[110] A multi-sig structure also helps to prevent the abuse of a record, as the actions of other parties are required to exercise power over the record.[111]

Subsection (c) explains when a power would not be shared with another person under subsection (b)(2). It states as follows:

> "A power of a person is not shared with another person under subsection (b)(2) and the person's power is not exclusive if:

[107] U.C.C, *supra* note 93, § 12-105, comment 5, example 1 at 249.
[108] U.C.C, *supra* note 93, Example 2 at 250.
[109] *Ibid*.
[110] *Ibid.*
[111] *Ibid.*

(1) the person can exercise the power only if the power also is exercised by the other person; and
(2) the other person:
(A) can exercise the power without exercise of the power by the person; or
(B) is the transferor to the person of an interest in the controllable electronic record or a controllable account or controllable payment intangible evidenced by the controllable electronic record.[112]

This subsection clarifies that a person does not share an exclusive power with another person if the person can only exercise the power with the other person's cooperation, but the other person can exercise the power without the other person or, where the other person is the transferor to the person of an interest in the controllable electronic record or a controllable account or controllable payment intangible evidenced by the controllable electronic record.

Some examples illustrating the application of subsection (c) are as follows:

> **Example 3** Under a multi-sig arrangement, exercise by any two of Campbell, Elizabeth, and Mia is required to exercise a power with respect to a controllable electronic record (CER). None of the three can exercise a power without the cooperation of another, so all three have control because they share the power. Even if Campbell were the transferor of the CER to Elizabeth, Elizabeth's power is shared, and therefore treated as exclusive, because Campbell cannot block Elizabeth's exercise of the power if Mia acts with Elizabeth. It follows that subsection (c)(1) does not apply, subsection (b)(2) does apply, and Elizabeth shares the power with Campbell. (The same result would apply with respect to Mia's power if Campbell were the transferor of the CER to Mia).[113]
>
> **Example 4** Under a multi-sig arrangement, exercise by both Campbell and Elizabeth are required to exercise a power, so subsection (c)(1) applies with respect to each person. However, neither Campbell nor Elizabeth can exercise the power without cooperation of the other and neither is the transferor to the other, so subsection (c)(2)(A) and (2)(B) does not apply with respect to either person. It follows that Campbell and Elizabeth each share the power.[114]
>
> **Example 7** Under a multi-sig arrangement, Mia can exercise a power only with exercise by Elizabeth or Natasha, but Elizabeth and Natasha each can exercise the power unilaterally without the exercise by the other or by Mia. Elizabeth and Natasha share the power, but Mia does not share the power with Elizabeth or Natasha. Mia's power is not exclusive because subsection (c)(1) and (2)(A) applies.[115]

Article 12 states that a person would be presumed to have exclusive powers under this section if they have the powers specified in subsection (a)(1)(B)(i) and (ii).[116] A person can also have control if another person other than the transferor acknowledges that he has control on behalf

[112] U.C.C, *supra* note 93, § 12-105(c).
[113] *Ibid*, comment 5, example 3 at 251.
[114] *Ibid*, example 4 at 251.
[115] *Ibid*, example 7 at 251.
[116] *Ibid*, § 12-105(d).

of the person or if the other person obtains control after acknowledging that he intends to obtain control on the other person's behalf. This means that there is no limitation on a secured party obtaining control through an agent.

A person can also obtain control and subsequently acknowledge that he has control on behalf of someone else.[117] There is no requirement for a person who has control on behalf of another person to disclose that they have control on behalf of the other person.[118] Article 12 also does not impose any duty on the person that acknowledges that he has or will obtain control on behalf of another person to the other person and is not required to confirm the acknowledgment to any other person.[119] This means that even where a party acknowledges that he has control on behalf of the secured party, Article 12 does not impose any duty on that person to the secured party (unless both parties agree otherwise or another law imposes a duty on an agent to the secured party), and the person that has control on behalf of the other is under no obligation to acknowledge that it has control to any other person.

(ii) Rights in a Controllable Electronic Record

By gaining control of a controllable electronic record, a person acquires several rights. Though some of the rights are covered under sections 12-104, other laws may determine whether a person acquires a right in a controllable electronic record and what rights the person acquires.[120] The purchaser of a controllable electronic record will acquire all rights in the controllable electronic record that the transferor had or had the power to transfer.[121] This is referred to as the "shelter principle".[122] Though the shelter principle provides that the transferor will acquire "all rights" in the controllable electronic record, the rights are subject to Section 1-304 which imposes an obligation of good faith in the performance and enforcement of a contract or duty.[123] For instance, where a qualifying purchaser of a controllable electronic record sells the record to a non-qualifying purchaser who had previously engaged in illegal activity in relation to the controllable electronic record in question or an asset to which it is attributable, his exercise of rights to the controllable electronic record may therefore be in breach of the obligation of good faith.[124]

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[117] U.C.C, *supra* note 93, § 12-105(e).
[118] *Ibid*, § 12-105(f)
[119] *Ibid*, § 12-105(g).
[120] U.C.C, *supra* note 93, § 12-104(c).
[121] *Ibid*, § 12-104(d).
[122] *Ibid*.
[123] *Ibid*, § 12-104, comment 4 at 242; also see U.C.C § 1-304.
[124] U.C.C, *supra* note 93, comment 4 at 242.

However, a person that only purchases a limited interest in the record will only acquire rights to the extent of the interest purchased.[125] Section 12-104(e) states that a qualifying purchaser of a controllable electronic record will acquire its rights in the record free of any claim of a property right in the controllable electronic record.[126] A qualifying purchaser is "a purchaser of a controllable electronic record that obtains control of the controllable electronic record for value, in good faith, and without notice of a claim of a property right in the controllable electronic record."[127] "Notice" as used here is actual notice and not constructive notice. This means that a person that perfects his security interest in a controllable electronic record by registration has not given notice of a claim of a property right in the record by virtue of registering its interest.[128] Section 12-104(e) makes controllable electronic records highly negotiable. A purchaser will still take free of security interests in the controllable electronic record even where the transferor of the record had no rights to transfer or otherwise act in relation to the record.[129] For example, by virtue of section 12-104(c), a person who steals a controllable electronic record acquires no rights in the record. However, where a person purchases the record from the thief in good faith, for value, and without notice of a claim of property right, he becomes a qualifying purchaser and would therefore be entitled to take the controllable electronic record free of property claims. In the case of a qualifying purchaser that is a secured party whose interest secures an obligation, the purchaser is entitled to take free of the property claim only to the extent of the obligation secured by virtue of being a purchaser of limited interest as described in Section 12-104(d).[130] The rationale for applying the "take-free" rule to qualifying purchasers is that most systems for transferring a controllable electronic record are pseudonymous so a transferee may be incapable of verifying the identity of the transferor or the source of the transferor's title.[131] The take-free rule helps to protect innocent transferees because there is no way they would have known of the conflicting claims and it would be unfair to them if these assets that they had given value for can be retrieved by secured parties.

Article 12 also prohibits asserting an action against a qualifying purchaser in relation to both his purchase of a controllable electronic record and a claim of a property right in another

[125] *Ibid*.
[126] *Ibid*, § 12-104(e).
[127] *Ibid*, § 12-102(a)(2).
[128] *Ibid*, § 12-104(h).
[129] *Ibid*, § 12-104, comment 7 at 244.
[130] *Ibid*, § 12-104(d).
[131] *Ibid*, prefatory note to s 12.

controllable electronic record, regardless of whether the action is presented as conversion, replevin, constructive trust, equitable lien or other theory.[132] This is referred to as the "no action rule".[133]

(iii) Governing Law

Article 12 provides that the local law of a controllable electronic record will govern issues concerning this article.[134] Section 12-107(c) of the 2022 UCC provides that the jurisdiction of a controllable electronic record will automatically be the jurisdiction expressly provided by the record, if applicable.[135] Where this information is unavailable, the jurisdiction expressly provided to be the controllable electronic record's jurisdiction by the rules of the system in which the controllable electronic record is recorded will be the controllable electronic record's jurisdiction.[136] Where these are inapplicable, the jurisdiction expressly provided by the controllable electronic record as the governing law will be the controllable electronic record's jurisdiction.[137] If the information above is unavailable, the jurisdiction expressly provided by the system in which the controllable electronic record is recorded as the governing law will be the controllable electronic record's jurisdiction.[138] If all of the above are inapplicable, the District of Columbia will be the controllable electronic record's jurisdiction.[139] If subsection (c)(5) applies but the version of Article 12 adopted in the District of Columbia has been materially modified, the governing law will still be the District of Columbia, but Article 12 would apply as though the District of Columbia did not adopt a materially modified version.[140]

(iv) Some Resulting Amendments to UCC Article 9

The 2022 UCC amendments and the introduction of Article 12 have resulted in several changes to UCC Article 9 and other articles of the UCC. Some of the relevant amendments include the addition of "controllable electronic records" to the definition of general intangibles.[141] The amendments clarify that crypto-assets remain intangible property, but they have now been sub-categorized as controllable electronic records and receive unique treatment as a result. It has

[132] U.C.C, *supra* note 93, § 12-104(g).
[133] *Ibid,* § 12-104, comment 8 at 244.
[134] *Ibid*, § 12-107(a).
[135] *Ibid*, § 12-107(c)(1).
[136] *Ibid,* § 12-107(c)(2).
[137] *Ibid,* § 12-107(c)(3).
[138] *Ibid,* § 12-107(c)(4).
[139] *Ibid,* § 12-107(c)(5).
[140] *Ibid*, § 12-107(e).
[141] U.C.C, *supra* note 93, § 9-102(a)(42).

also been clarified under the official comments to Article 8 that controllable electronic records may be treated as financial assets where the secured party and the securities intermediary agree to such treatment.[142] This, therefore, means that Controllable Electronic Records may be categorized as investment property under Article 9 if such a situation occurs. The official comments have also clarified that a securities intermediary need not be a person who credits "securities" as defined in Article 8. That person may also deal exclusively with a financial asset and may include "a cryptocurrency exchange that holds only cryptocurrencies (and not securities) for customers."[143]

The definition of money in UCC Section 1-201(b)(24) has also been amended and the new definition has been adopted under UCC Article 9 with the exclusion of deposit accounts and electronic money that cannot be subjected to control.[144] The modified Article 1 definition of "money" is as follows:

> Money means a medium of exchange that is currently authorized or adopted by a domestic or foreign government. The term includes a monetary unit of account established by an intergovernmental organization, or pursuant to an agreement between two or more countries. The term does not include an electronic record that is a medium of exchange recorded and transferable in a system that existed and operated for the medium of exchange before the medium of exchange was authorized or adopted by the government.[145]

The amendments to this provision are very important and much welcomed because they address an issue identified in chapter two of the thesis about the re-categorization of bitcoin as money due to its adoption as legal tender in El-Salvador and the Central African Republic. This amendment anticipates the possibility of the adoption of not just bitcoin but other crypto-assets as part of a government's currency in the future. It, however, only provides that the electronic record will not be considered money where they were already in existence before they were authorized by the government and does not exclude electronic medians of exchange in general. This means that where a government creates its own digital currency, it will be categorized as money under this new Article 9.

The new Article 9 also provides for perfection of controllable electronic records by control under Section 9-314 and states that security interests in controllable electronic records will not be perfected by control earlier than the time the secured party obtains control and that a secured

[142] *Ibid*, § 8-102, Comment 9 at 82.
[143] *Ibid*, Comment 14 at 83.
[144] *Ibid*, § 9-102(54A); also see 1-201(b)(24).
[145] *Ibid*, § 1-201(b)(24).

party only remains perfected by control while they retain control.[146] It incorporates the control rules applicable to controllable electronic records under Section 9-107A. Section 9-312 also provides for perfection by filing/registration as an option that could be utilized for the perfection of security interests in controllable electronic records. However, parties that perfect their security interests by control will attain super-priority status and have priority over earlier registered security interests.[147] Provisions on the rights of a secured party that takes free of competing property interests under section 12-104(e)[148] and provision of the "no action" rights applicable to qualifying purchasers under section 12-104(g).[149]

Other relevant amendments to UCC Article 9 include the addition of two new types of collateral namely controllable account (a subcategory of account) and controllable payment intangible (a subcategory of payment intangible, which is a subclass of general intangibles).

3.3 How Compatible are the Existing Crypto-related Secured Transaction Laws with the Personal Property Security Law Values?

i. Facility

For personal property security law to be facilitative, the law must enable parties to utilize their assets to the full extent to obtain credit.[150] Where the law restricts the ability of the debtor to leverage its assets in a particular way, it cannot be said that the law is facilitative. The URVCBA and its Supplemental Law do not reflect the value of facility because in order to enjoy appropriate protection under these laws, secured parties must hand over their assets to intermediaries. The URVCBA and its Supplemental Law do not provide for parties to secured transactions who prefer to hold their crypto-assets directly. There are costs associated with utilizing an intermediary in a secured transaction, and such costs do not exist where the secured creditor takes control of the debtor's crypto-assets directly. Therefore, the indirect imposition of the use of intermediaries by the URVCBA and its Supplemental Law does not uphold the value of facility. The Wyoming Statute also fails to fully reflect the value of facility. Though the statute provides the options of perfection by control and possession for digital securities and virtual currencies respectively, digital consumer assets can only be perfected by registration. Apart from the residual function of

[146] U.C.C, *supra* note 93, § 9-314.
[147] *Ibid*, § 9-326A.
[148] *Ibid*, § 9-317(h).
[149] *Ibid*, § 9-331(b).
[150] United Nations Commission on International Trade Law (UNCITRAL), UNCITRAL Legislative Guide on Secured Transactions (New York: United Nations, 2010) at Intro para. 50.

the definition of digital consumer assets, the sub-group of assets also contains a wide range of crypto-assets that should not be treated as intangible personal property and should therefore be perfected either by control or possession in accordance with the statute and not by registration. The Wyoming Statute therefore fails to facilitate secured transactions in relation to these wide group of assets covered under (A) of the digital consumer assets definition.

On the other hand, the introduction of Article 12 by the 2022 version of the UCC and the resulting amendments to UCC Article 9 reflects a conscious effort to facilitate secured transactions by making provisions for a diverse range of crypto-assets. The value of facility is upheld by Article 12 of the 2022 version of the UCC and the resulting amendments to UCC Article 9 because these laws provide multiple options to parties wanting to perfect their security interests in crypto-assets. The broad categorization of crypto-assets as "controllable electronic records" under UCC Articles 9 and 12 ensures that secured parties with interests in any kind of crypto-assets are protected, and also have the options to either perfect their security interests by registration or control depending on their unique transaction needs.

ii. Transparency

The PPSL value of transparency speaks to the parties ability to assess risk before proceeding with transactions. The URVCBA and its Supplemental Law do not promote transparency because the secured parties are unable to assess the level of risk involved when they place crypto-assets in the hands of intermediaries. Some intermediaries engage in non-transparent practices by not actually maintaining sufficient amounts of crypto-assets to satisfy all their customers' entitlements. This lack of transparency is a problem that has plagued the indirect holding system and though the URVCBA and the Supplemental Law try to safeguard secured parties by requiring the virtual currency businesses to maintain sufficient assets for their customers, the URVCBA and the Supplemental Law do not require the virtual currency business to have publicly accessible information that proves that it is, in reality, maintaining a sufficient amount of crypto-assets to satisfy the aggregate entitlements of its customers. Secured parties that entrust their crypto-assets into the hands of intermediaries are therefore unable to properly assess the risk they take by giving up control of their assets.

In contrast, the Wyoming Statute and the relevant 2022 UCC amendments encourage transparency by providing the option of perfection by registration which requires secured parties to perfect their security interests at the Personal Property Registry ("PPR"). Since the PPR is easily accessible, lenders have the opportunity to conduct searches and be fully aware of the encumbrances on the crypto-assets before they decide to engage in secured transactions with debtors.

iii. Flexibility

The value of flexibility involves regulating secured transactions in a manner that allows parties to retain autonomy in how they structure their transactions.[151] Similar to the discussion on facility, the URVCBA, and its Supplemental Law lack flexibility because parties are indirectly forced to hand over control of their crypto-assets to intermediaries in order to benefit from the available protections under those laws. The Wyoming approach and the 2022 version of UCC Article 9 & UCC Article 12 uphold the value of flexibility by giving secured parties the option to either hold their crypto-assets directly or opt-in for their crypto-assets to be treated as financial assets and controlled by intermediaries.

iv. Simplicity

For personal property security law to reflect the value of simplicity, the process of creating and perfecting security interests in personal property must an easy one. The URVCBA and its Supplemental Law provide a simple method for creating and perfecting security interests, therefore upholding the value of simplicity. The URVCBA and its Supplemental Law uphold this value because they apply the already established UCC Article 8 & 9 rules on investment property to crypto-assets. Perfection of security interests in crypto-assets under the URVCBA and its Supplemental Law will occur through control and the control standards applicable to security entitlements under UCC Article 8 will be applicable to crypto-assets. The control standards for security entitlements are clear, established, and easily applicable to crypto-assets. The 2022 UCC versions of Articles 9 and 12 also uphold the principle of simplicity because the attachment provisions are clear and the control provisions are also easy to follow. The presence of official comments in the 2022 UCC Articles 9 and 12 also provides practical examples of how the control standards can be achieved.

[151] Ronald C.C. Cuming, Catherine Walsh & Roderick J. Wood, *Personal Property Security Law*, 2nd ed. (Toronto: Irwin Law, 2012) at 6.

On the other hand, the Wyoming Statute lacks simplicity. It categorizes crypto-assets that have no substantial differences in the context of secured transactions into distinct subgroups and provides variable methods for perfecting security interests in the crypto-assets by virtue of these subgroups. For example, security interests in crypto-assets that fall into the virtual currency subcategory under the Wyoming Statute can be perfected by possession while those crypto-assets that fall within the category of digital securities can be perfected by control. The term "possession", when used in relation to the perfection of security interests in virtual currencies, deviates from the recognized connotation of possession (i.e. possession usually applies in relation to tangible assets like physical money and not virtual assets) under secured transactions law in other parts of the United States. Moreover, the standards for achieving possession and control under the Wyoming Statute are substantially similar which makes the distinction in terminology lead to unnecessary complexities. Where laws are complicated, it is difficult for parties to comply.

v. Efficiency

Efficiency means "doing something in a good, careful, and complete way with no waste of time, money, or energy."[152] The URVCBA and its Supplemental Law lack efficiency, so it makes sense that the ULC later advised states not to adopt it. The URVCBA and its Supplemental Law only address crypto-related secured transactions where an intermediary is utilized. This means that if the URVCBA and its Supplemental Law were to be enacted by states, another law would have been needed to address the other aspects of crypto-secured transactions law that the URVCBA and its Supplemental Law failed to address. The process of enacting another statute to cover the gaps in the URVCBA and its Supplemental Law would have involved expending more money, time, and energy.

The 2022 UCC versions of Articles 9 and 12 are a great substitute for the URVCBA and its Supplemental Law in relation to the regulation of crypto-assets. The 2022 UCC versions of Articles 9 and 12 contain the financial asset opt-in provision contained in the URVCBA and its Supplemental Law, but also regulate crypto-assets in a more careful and complete manner. In the interest of efficiency, the 2022 versions of Articles 9 and 12 even go beyond the scope of crypto-assets and regulate other kinds of controllable electronic records. This may help prevent frequent amendments to UCC Articles 9 and 12, which would save time, money, and energy. Though I am of the view that the scope of the 2022 UCC Articles 9 and

[152] Oxford Learners Dictionary < https://www.oxfordlearnersdictionaries.com/definition/english/efficient >.

12 is excessive, and may lead to unwanted results, it is clear that the value of efficiency was greatly considered in the decision to regulate controllable electronic records. The Wyoming Statute also demonstrates the value of efficiency because it regulates all the key aspects of crypto-related secured transactions, thus preventing a need for frequent legislative amendments that waste money, time, and energy.

vi. Predictability, Certainty & Clarity

'Predictability', 'certainty', and 'clarity' all connote definiteness and confidence. Bangsund classifies these three terms as a family of "PPSL definiteness values".[153] These values are useful in personal property security law to help parties conduct accurate risk assessments before entering into transactions. The URVCBA and its Supplemental Law provide certainty and predictability by adopting the established secured transactions rules under UCC Article 8 to govern security interests in crypto-assets in the control of an intermediary. The URVCBA and its Supplemental Law also uphold the value of clarity by utilizing clear language and providing explanatory notes that further clarify the provisions of the legislation and the intention behind them. However, the values of predictability, certainty, and clarity cannot be fully achieved without comprehensiveness. The URVCBA and its Supplemental Law do not regulate several vital aspects of crypto-related secured transactions thus failing to provide adequate certainty, clarity, and predictability on crypto-related secured transactions to help parties accurately assess risk. Unlike with the URVCBA and its Supplemental Law, the Wyoming Statute's lack of certainty, predictability, and clarity does not flow from its lack of comprehensiveness. The Wyoming Statute makes provisions for the key crypto-related secured transaction issues. However, some of these provisions lead to unnecessary complexities which create uncertainty and unpredictability. For example, the difference between virtual currency and an open blockchain token constituting intangible personal property (referred to under the definition of digital consumer asset) is unclear. The similarity between these two terminologies may bring about uncertainties in relation to how to perfect a security interest in a crypto-asset that may fall into one of these two categories.

On the other hand, the 2022 amendments to UCC Article 12 uphold the values of predictability, certainty, and clarity because they contain sufficiently clear provisions on

[153] Clayton Bangsund, "Control v. Registration: Contemplating A Potential Paradigm Shift in The PPSA's Governance of Security Interests in Deposit Accounts" (JuliusErwin, 2018) at 50.

key secured transaction issues such as creation of the security interest, perfection, and dispute resolution, which enable secured parties to assess risk before proceeding with transactions.

vii. Equality

Equality as a PPSL value means that all participants in the secured credit marketplace should have equal opportunity and treatment, regardless of social standing or character. Free competition in the secured transaction marketplace helps to reduce the cost of credit. The URVCBA and its Supplemental Law are incompatible with the value of uniformity because they indirectly impose the use of intermediaries on secured parties. The cost of utilizing intermediaries in secured transactions is usually high and this may lead to a situation where certain parties are unable to obtain credit or otherwise participate in secured transactions because of their inability to bear these costs. In contrast, the Wyoming Statute and the 2022 amendments to UCC Articles 9 & 12 are compatible with the value of equality because they treat all kinds of secured parties equally and offer different options in which the secured parties may choose to perfect their security interests in crypto-assets. This gives parties the ability to choose the option that best fits their unique circumstances.

viii. Balance

Balance is synonymous with fairness in the secured transaction context. Similar concerns raised in relation to the value of equality exist with respect to the value of balance. The URVCBA and its Supplemental Law may be unfair to weaker parties engaged in secured transactions because not all parties can afford to utilize intermediaries in their secured transactions. The Wyoming Statute also fails to reflect the value of balance because it prioritizes the treatment of certain crypto-assets above others for no justifiable reason. Digital securities and virtual currencies receive ultimate perfection protection through control and possession respectively, while the digital consumer assets in (A) of the definition do not receive this protection. Most crypto-assets are used for consumptive purposes and were not marketed as financial investments, meaning that they may fall into the digital consumer asset category and holders of these kind of crypto-assets would not receive ultimate protection from perfecting their security interests in those assets.

This concern does not arise under the 2022 amendments to UCC Articles 9 and 12. Under the 2010 version of UCC Article 9, the debtor had an unfair advantage over the secured

party which created enforcement difficulties for secured parties. The 2022 amendments have eradicated the unfair advantage that debtors had over the secured party by introducing perfection of security interests in crypto-assets by control. The applicability of perfection by control to crypto-assets under the 2022 amendments to UCC Articles 9 and 12 is therefore compatible with the PPSL value of balance.

However, the value of balance is partially compromised under the 2022 amendments to UCC Articles 9 and 12 by the regulation of all assets that fall under the category of "controllable electronic records". In addition to crypto-assets, the term "controllable electronic record" also governs some other assets that may emerge in the future. The nature and characteristics of these assets are unknown and yet they benefit from a variety of rights available to crypto-assets such as perfection by control and the take-free rule. It is likely that the expansive rights bestowed on secured parties to controllable electronic records may be unnecessary in relation to some future controllable electronic records and lead to unfair outcomes.

ix. Comprehensiveness

The PPSL value of comprehensiveness is synonymous with completeness. Lawmakers should aim to enact legislation that is comprehensive in scope and addresses all forms of secured transactions, the different parties involved, and all kinds of assets and secured obligations.[154] The URVCBA and its Supplemental Law lack the value of comprehensiveness because the laws do not address the manner in which individuals can engage in crypto-related secured transactions without the need for an intermediary. Though the URVCBA and the Supplemental Law are clear that their purpose is to regulate virtual currency businesses and not the entire virtual currency regime, enacting the law without addressing the other important elements of the virtual currency ecosystem would not provide complete certainty on the subject.

In contrast, the Wyoming Statute and the 2022 UCC versions of Articles 9 and 12 comprehensively regulate crypto-assets. Both laws make provision for the categorization of crypto-assets, contain processes for the perfection and enforcement of security interests in crypto-assets, include comprehensive governing law provisions, and provide for the

[154] UNCITRAL, *supra* note 150 at Intro para. 61. See similar statements at Intro paras. 50, 53 and 62.

protection of third-party rights. The comprehensiveness of these laws helps promote certainty and avoid disputes.

x. Uniformity

The value of uniformity encourages the application of similar secured transaction laws across state lines.[155] The URVCBA and its Supplemental Law were approved by the ULC and recommended for enactment in all states, in the pursuit of uniform commercial legislation in the United States. Similarly, the amendments to the UCC were also made by the ULC, to ensure uniformity of commercial laws in US states.

The Wyoming Statute, on the other hand, was passed by the Wyoming legislature for Wyoming alone. Though the statute was intended to help Wyoming become a first mover in crypto-related secured transactions legislation, choice of law concerns may arise by virtue of Wyoming's departure from uniformity. It is therefore possible for a court in a different state to hold that the security interests of a party that has perfected its security interest in Wyoming, are not perfected according to the UCC of that jurisdiction. This may be problematic for Wyoming parties and restrict their ability to transact with parties from other jurisdictions.

xi. Coherency

Coherency is "the quality of being logical and consistent."[156] Personal property security law should aim to provide a consistent set of legal rules for similar forms of personal property. The URVCBA and its Supplemental Law, though problematic in certain aspects, promote the value of coherency. These laws promote coherency by providing for the treatment of crypto-assets in a like manner to investment property, which already has an established system for regulating financial assets that share certain similarities with crypto-assets. Though a different logic is applied in the regulation of crypto-assets under the amended UCC Articles 9 and 12, the value of coherency is also evident here. UCC Articles 9 and 12 recognize the unique nature of crypto-assets and have created a new set of rules for crypto-asset regulation. Though the rules for crypto-asset regulation are different, the established secured transactions concepts such as perfection by control and protection of third-party rights have been preserved and adapted to crypto-assets.

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[155] Roderick J. Wood, "Acquisition Financing of Inventory: Explaining the Diversity" (2014) 13(1) O.U.C.L.J. 49 ("Acquisition Financing") at 51, n.14.
[156] Oxford English Dictionary, online: Lexico < https://www.lexico.com/definition/coherence >.

The Wyoming Statute however lacks the value of coherency in certain respects. For instance, the use of perfection by "possession" in relation to virtual currencies is not consistent with established secured transaction concepts. Possession historically refers to tangible assets such as money and this is the case in other jurisdictions utilizing the UCC. Coherency demands that like property be treated alike and yet the Wyoming Statute divides crypto-assets into separate categories which are not relevant for secured transaction purposes and provides different rules for each sub-category of crypto-assets. The distinction between virtual currencies and digital securities is inconsequential in the secured transaction context and so there is no reason for their respective perfection rules to differ.

3.4 Conclusion

The US laws discussed in this chapter all adopt different approaches to the regulation of crypto-assets in secured transactions. The URVCBA and its Supplemental Law address the issues with categorization, perfection, enforcement, and non-negotiability of crypto-assets by virtue of its incorporation of the UCC Article 8 Part 5 rules on Security Entitlements. However, Article 8 was not drafted with virtual currencies in mind and so it cannot comprehensively and appropriately regulate virtual currencies without some major adjustments. For instance, Part 5 of UCC Article 8 focuses on "security entitlements" which a crypto-asset could be treated as in certain circumstances, but adoption of this law for the regulation of crypto-related secured transactions provides no certainty for crypto-asset holders who choose to directly hold their assets and indirectly pressures secured parties to release their assets to security intermediaries for maximum protection and higher certainty in their transactions. The incorporation of Part 5 of UCC Article 8 also extends the unresolved issues with the indirect holding system to crypto-assets, which may not be designed to handle such issues. For these reasons, it was a wise decision that the ULC advised US states to suspend enactment of this law and I would not recommend Canada to employ this approach to the regulation of crypto-related secured transactions.

Wyoming adopted a more thoughtful approach to the regulation of crypto-assets and the provisions reflect that the law was drafted with consideration to the unique nature of crypto-assets. However, being the first movers in relation to a novel issue may present some challenges. If Wyoming decides to reject the relevant UCC 2022 amendments in favor of retaining its own law or makes material modifications to the amendments, these may pose several choice of law issues for parties who perfected their security interests in Wyoming but

are involved in secured transactions disputes in other states. Also, Wyoming's approach to incorporating its significantly different law into its existing UCC Article 8 and 9 provisions may lead to several uncertainties for parties relying on the Wyoming legislation. The Wyoming Statute also fails to regulate all crypto-assets by control or possession thus offering only a partial solution to the enforcement issues that exist with regards to crypto-assets. It also fails to properly deal with the non-negotiability of crypto-assets, therefore putting innocent third parties at risk. These issues make the statute insufficient for regulating crypto-asset-related secured transactions.

The 2022 UCC amendments to Articles 9 and 12 approach the regulation of crypto-assets from a completely novel perspective. The introduction of the broad term "controllable electronic record" contemplates the likelihood of digital assets built on technologies that do not yet exist and pre-empts the need for frequent amendments with its broad application. Though the use of this term may help reduce the need for constant amendments given the fast-moving nature of the technology industry, the crypto and emerging digital asset landscape are still relatively young so some of these laws may not produce the intended results when applied to future digital assets. Proactive regulation such as this may also hamper innovation. The conditions for achieving control are however commendable. They are clear and logical and the emphasis on exclusivity prevents a situation where multiple unrelated parties claim to have control by virtue of possessing a private key to the wallet. Additional security measures may need to be taken by a secured party to ensure that it actually has the exclusive powers necessary to attain control. The official comments to Article 12 make constant references to multi-signature arrangements. This will ensure that a debtor is unable to release the same private key to multiple unrelated secured parties and trick them into believing they have control over the controllable electronic record. Alternative mechanisms may also need to be introduced on the technology side to ensure that the exclusive powers mentioned under Article 12 are realistically achievable by secured parties. UCC Articles 9 and 12 also provide the necessary protection to innocent transferees involved in crypto-related transactions, thus making the asset more negotiable. These amendments are therefore mostly laudable and provide significantly more certainty to crypto-related secured transactions than previous laws that have tackled the issue. It may be wise for Canadian lawmakers to conduct a review of these amendments to decide whether they may be useful in the creation of a regulatory framework for the Canadian crypto-related secured transactions landscape.

CHAPTER FOUR: CONCLUSION

4.1 Introduction

This chapter begins with a summary of the issues that have been discussed in previous chapters. In line with the first chapter, it restates the importance of this research and why it is the right time for lawmakers to consider regulating the use of crypto-assets as collateral in secured transactions. This chapter restates the foundational principles of secured transactions and briefly sums up the major issues in need of regulation. It then provides a succinct review of other approaches taken to regulate crypto-related secured transactions and offers recommendations based on the totality of research that has been undertaken in this thesis. These recommendations will address in detail the three key areas of reform needed to create an improved legal framework i.e., categorization, perfection, and negotiability of crypto-assets. I will provide reasons for these recommendations, describe mechanisms for the implementation of these recommendations, and make suggestions on how some of these provisions may be drafted to reflect these recommendations.

4.2 Summary of Findings

This thesis is premised on the notion that secured transactions are necessary and beneficial commercial relationships that should be encouraged or at least facilitated. This notion led us to the research questions:

> Should modern secured transactions legislation be amended to make crypto-assets a more viable form of personal property collateral? If so, how can the legislation be improved?

Providing an answer to these questions is becoming more pressing as time goes by because, in spite of the volatility that comes with this asset class, more people are beginning to use their crypto-assets as collateral. The year 2022 was a tough year for crypto-assets and assets in general.[1] Many nations continue to be on the brink of a recession,[2] and both individuals and businesses may be forced to either take loans to maintain their operations or file for bankruptcy/insolvency. The need for secured credit is therefore crucial at this time and the current decline of the crypto-asset market makes it difficult for investors who still believe in the long-term potential of this asset class to decide to liquidate their holdings. It is therefore

[1] George Michael Belardinelli "U.S stocks plummet, cryptocurrency and real estate follow" (August 29, 2022), Online: the Cryptonomist < https://en.cryptonomist.ch/2022/08/29/us-down-real-estate-stocks-crypto/ >.
[2] Bill Conerly "Global Economy Headed Into Recession" (September 23, 2022), Online: Forbes < https://www.forbes.com/sites/billconerly/2022/09/23/global-economy-headed-into-recession/?sh=4b1477daabfa >.

logical for these investors, more than ever before, to want to leverage their crypto-asset holdings to take advantage of credit opportunities.

Crypto-assets are still a relatively novel concept so there is a lot of uncertainty as to what they are and how they should be regulated. Parties to secured transactions may have difficulties identifying the issues necessary for their protection and formulating contractual terms that appropriately shield them from the risks involved in crypto-related secured transactions. A statutory regime is, therefore, necessary to provide certainty to secured parties, lawyers, financial institutions, and any other parties that may be involved in these transactions. The analysis conducted and the recommendations made in this thesis take into account the fact that the crypto-asset and the wider digital asset landscape are still evolving. It, therefore, adopts a balanced approach to regulate the issues that exist now without trying to regulate potential issues that may occur with emerging technologies in the future. The purpose of adopting this balanced approach is to avoid the creation of laws that stifle innovation or eventually lead to absurd outcomes. The findings in this thesis are also made in consideration of the PPSL values discussed in chapter one, to ensure that my recommendations are compatible with core secured transaction principles.

Under the Personal Property Security Act ("PPSA") and the version of Article 9 of the Uniform Commercial Code ("UCC") currently adopted in most US states ("the applicable laws"), I have identified several issues that affect the ability of parties to effectively undertake crypto-related secured transactions. The first issue is the categorization of crypto-assets under the applicable laws. The PPSA defines personal property as "goods, chattel paper, investment property, a document of title, an instrument, money or an intangible."[3] UCC Article 9 also defines the term in a similar manner.[4] The analysis conducted in chapter two of this thesis showed that crypto-assets could not neatly be classified under any of these categories of personal property, apart from the "intangible" category which covers all other types of personal property that have not been specifically listed under the applicable laws. The categorization of crypto-assets as intangibles has resulted in problems of perfection, enforcement, and lack of protection for innocent third parties involved in crypto-related secured transactions.

[3] *Personal Property Security Act*, SS 1993, c P-6.2[SPPSA], s 2(ff).

[4] Under U.C.C Article 9, personal property includes accounts, chattel paper, commercial tort claims, deposit accounts, documents, goods, instruments, investment property, letter of credit rights, letters of credit, money, oil, gas, or other minerals before extraction, and general intangibles; see *Uniform Commercial Code*, § 9-102(a)(42).

As it pertains to perfection, the intangibles category mandates that security interests in crypto-assets be perfected solely by registration.[5] Perfection by registration may not be the most effective method for the perfection of security interests in crypto-assets because there is no requirement to hand over the crypto-assets to the secured party where this method is utilized. This means that a debtor will continue to maintain possession and control of the collateral and so in the event of default, the secured party cannot easily liquidate the collateral to recover its investment. For other kinds of collateral that can be perfected by registration, the secured party can seize the collateral to recover its investment.[6] But when crypto-assets are involved, the secured party is at the mercy of the debtor for the release of its collateral. This is because, though the law technically allows for the seizure of collateral as a means of enforcement for intangible property, the decentralized nature of crypto-assets ensures that the secured party cannot take possession of the crypto-assets if he does not possess the debtor's private keys. Even in situations where the secured party obtains the private key, there are no mechanisms provided by law to protect the secured party from a transfer of the crypto-assets by a debtor to another crypto wallet. The pseudonymity of crypto transactions, the irreversible nature of these transactions, and the difficulty involved in tracing transfers of the assets place the secured party in a vulnerable position when the debtor does not willingly release the crypto-assets upon default.

In addition to these issues, the applicable laws also provide that a security interest will continue in the collateral unless the secured party authorizes the dealing.[7] The exception to this rule is Section 31 of the PPSA and Section 104(1) of the STA which allow transferees of security interests in negotiable collateral (i.e. money, deposit account, instrument, and investment property)[8] to take free from security interests in the negotiable collateral if the transferee took possession and either acquired the collateral without knowledge that it was subject to a security interest or gave value whether or not he had knowledge of the security interest.[9] This exception does not apply to intangibles, which means that a transferee of crypto-assets will take the collateral subject to pre-existing security interests when they are transferred without authorization from the secured party.[10] And so, an innocent transferee of crypto-assets would be caught by this provision notwithstanding the fact that the transferee may be unable to verify

[5] SPPSA, *supra* note 3, s 25.
[6] The *Enforcement of Money Judgments Act,* SS 2010, c E-9.22, s 41(2).
[7] SPPSA, *supra* note 3, s 28.
[8] *Ibid*, s 31(1); U.C.C § 9-332; For investment property, see s 104(1) & U.C.C § 8-502.
[9] *Ibid*, s 31(2)-(4).
[10] SPPSA, *supra* note 3, s 28.

the identity of the transferor or the source of the transferor's title due to the pseudonymous nature of crypto-assets. An innocent transferee that accepts crypto-assets as payment for products or services rendered could also be pursued by a secured party for those crypto-assets. This risk of having crypto-assets seized could discourage third parties from accepting them, thus hampering their commercial utility.[11]

The above issues with the regulation of crypto-related secured transactions under the applicable laws have resulted in some legislative reforms in the United States (US) but these issues are yet to formally be considered in Canada. *The Uniform Regulation of Virtual Currency Businesses Act* ("URVCBA") of 2017 was the first legislation in the US to attempt to address these issues. Section 502 of the URVCBA was designed to protect the owner of virtual currencies entrusted to a licensee or registrant in a similar manner to how owners of investment securities indirectly held through securities intermediaries are protected under UCC Article 8.[12] The provision restricted the virtual currency business' ability to deal with a customer's virtual currency as its own property, by removing from its balance sheet the virtual currency under the control of a licensee or registrant.[13] This was done to protect the virtual currency owned by customers of the business from creditors of the virtual currency business in the event of insolvency. Section 502 also placed a duty on the virtual currency business to maintain an amount adequate to satisfy the aggregate entitlements of the customers to each type of virtual currency that they have handed control over to the licensee or registrant.

Because Section 502 did not comprehensively address issues relating to the rights of the secured party and the business acting as an intermediary, the Uniform Law Commission ("ULC") developed the Uniform Supplemental Commercial Law for the URVCBA ("USCL" or "the Supplemental law") as a substitute to that section of the URVCBA. This law formally adopts the treatment of investment property under UCC Article 8 to crypto-assets and requires the customer and the licensee or registrant to "opt-in" to the provisions of Part 5 of UCC Article 8 so that its virtual currency may be treated as a financial asset by the licensee or registrant. This treatment as financial assets which the Supplemental law affords to crypto-assets allows the perfection of security interests in crypto-assets by control. Perfecting crypto-assets treated as financial assets by control, makes the process of enforcing the security interest seamless for the secured party in the event of default. Treating crypto-assets as financial assets also enhances

[11] U.C.C, *supra* note 4, Prefatory note to s 12.
[12] *Ibid*, s 502, Comment 1 at 74.
[13] *Ibid.*

the negotiability of crypto-assets, thus offering a more balanced approach to the protection of all parties involved in crypto-related secured transactions.

The similarities between how crypto-assets and traditional investment property are utilized and the benefits of treating both assets in like manner, make it logical to consider why this approach to regulation was contemplated. However, this approach is problematic because it does not take into consideration the unique issues in crypto-related secured transactions regulation, such as ensuring exclusive control. It also does not provide solutions for parties that choose to hold the crypto-assets without the use of intermediaries. The existing issues with the use of the indirect holding system in relation to traditional investment property also make it difficult to champion the use of this approach for crypto-related secured transactions. The ULC has since recommended that States do not adopt the URVCBA and the Supplemental law and established the Committee on the Uniform Commercial Code and Emerging Technologies to conduct a deeper examination into the issue to produce more comprehensive legislation.[14] As of July 2022, the committee has approved the relevant amendments to the UCC and has recommended that states adopt them.[15]

The State of Wyoming also implemented its own approach to the regulation of crypto-related secured transactions. It categorizes digital assets into three sub-categories namely: digital consumer assets, digital securities, and virtual currencies. In the alternative, a crypto-asset owner can "opt-in" for its crypto-assets to be treated as financial assets, in line with UCC Article 8. The Wyoming statute also makes provisions for banks providing custodial services to meet the definition of a securities intermediary. It provides that security interests in digital consumer assets and digital securities may be perfected by registration.[16] It also provides for the perfection of security interests in virtual currencies by possession, the perfection of security interests in digital securities by control, and priority to those that perfect their security interests by control or possession.[17] The Wyoming statute also protects transferees by allowing them to take digital assets free of security interests if the digital asset was taken for value, and there is

[14] Caitlin Long, "Seismic News About State Virtual Currency Laws: ULC Urges States To Withdraw Model Act", (March 25, 2019) Online: Forbes <https://www.forbes.com/sites/caitlinlong/2019/03/25/seismic-news-about-state-virtual-currency-laws-ulc-urges-states-to-withdraw-model-act/?sh=23610d8c5fda >.
[15] The 2022 amendments to the UCC have neither been introduced or enacted in any US State as of 11 October 2022; UCC, 2022 Amendments to, (October 11, 2022) Online: ULC < https://www.uniformlaws.org/committees/community-home?communitykey=1457c422-ddb7-40b0-8c76-39a1991651ac >.
[16] Wyoming Statute, s 34-29-103(c)(2021).
[17] *Ibid*, s 34-29-103(a).

no notice of an adverse claim within two years of taking the digital asset.[18] This protection only applies to a security interest perfected by registration and makes the registered crypto-assets more negotiable. However, this provision also implies that where assets belonging to a party with control are transferred without authorization (e.g., hacking), the secured party can pursue the innocent transferee indefinitely for the crypto-assets. As a result, this provision does not offer sufficient protection to innocent third parties and does not adequately address the concern of the lack of negotiability of crypto-assets.

The Wyoming statute also appears to regulate the entire digital assets landscape and it may be argued that the definition of "Digital Assets" in the statute implies the application of the statute to digital assets such as videos, documents, e-books, photos, etc., if they can qualify as "a representation of economic, proprietary, or access rights."[19] However, it is unclear whether such a broad application was intended. This broad application is however not harmful because the Statute limits the applicability of perfection by control and possession and the rights that come with them, to a narrower scope of assets. The scope of assets that enjoy these benefits is in my opinion too narrow as a wide range of crypto-assets in the digital consumer asset category have been lumped in with residual digital assets and so not much has changed in relation to the regulation of those crypto-assets. The Wyoming statute is also expected to work in conjunction with UCC Articles 8 and 9 but the inconsistencies between this statute and the UCC may create uncertainties. Choice of law issues may also arise where a court in a different US jurisdiction utilizing the UCC fails to recognize a secured party's perfection status by virtue of its perfection under the distinct Wyoming rules.

The ULC has now made another attempt to regulate crypto-related secured transactions in the United States with the establishment of the Committee on the Uniform Commercial Code and Emerging Technologies ("the Committee"). The work of the Committee has amended not just UCC Article 9, but the entire UCC. The 2022 amendments have also introduced Article 12 of the UCC, which deals specifically with the regulation of a subset of digital assets known as "controllable electronic records", and their use in commercial transactions.[20] The term controllable electronic record has been defined broadly to include not only crypto-assets but also controllable digital assets that may be invented in the future. A controllable electronic record can be perfected either by control or registration, but a party that perfects by control will

[18] *Ibid*, s 34 -29 – 103(d).
[19] *Ibid,* s 34-29-101(a)(i).
[20] *Uniform Commercial Code 2022*(as amended).

have priority over those that perfect their security interests by registration.[21] The requirements for control of a controllable electronic record can be summarized as having the power to derive all benefits from the electronic record, the exclusive power to prevent others from deriving all the benefits, the exclusive power to transfer control of the record and the ability to readily identify as the person with control.[22] The control provision in this section is vital because it permits a qualified purchaser (equivalent to an innocent transferee) to take free of claims of a security interest in the controllable electronic record, protects these qualified purchasers from any action in connection with the purchased asset,[23] and prioritizes the security interests of a party with control over conflicting security interests.[24]

The categorization of crypto-assets as controllable electronic records sufficiently deals with the current issues that have plagued the regulation of crypto-related secured transactions. However, the use of such a broad term might not always bring about the intended result in relation to future kinds of controllable digital assets. The introduction of electronic money by the amendments is commendable and the exclusion of crypto-assets adopted as legal tender from the definition of money corrects the absurdity that existed with the re-categorization of bitcoin as money by virtue of its adoption as legal tender in El-Salvador and the Central African Republic. While the 2022 UCC amendments are well thought-out, I believe a more streamlined approach to the regulation of crypto-assets is what is needed at this time.

4.3 Creating a Legal Framework for the Regulation of Crypto-Related Secured Transactions – Recommendations

For crypto-assets to be regulated appropriately, detailed categorization, perfection, and negotiability rules need to be provided. My recommendations will include suggestions for how the PPSA can regulate these issues and offers an in-depth explanation as to the reason for each recommendation. It is hoped that these recommendations will also be useful to other jurisdictions when they decide to make amendments to their secured transactions legislation to accommodate digital assets.

[21] U.C.C, *supra* note 20, § 9-326A.
[22] *Ibid*, § 12-105(a).
[23] *Ibid*, § 12-105, comment 1 at 247; Also see U.C.C § 12-.104 (e) & (g).
[24] *Ibid* at 248; Also see U.C.C § 9-326A; 9-203(b)(3)(D).

4.3.1 Categorization of Crypto-Assets in Personal Property Security Law

The first step in regulating crypto-assets in the secured transaction's context is to create a separate type of personal property to classify these assets. The 2022 UCC amendments do not create this separate category of personal property. Instead, they continue to categorize the relevant digital assets as "general intangibles" but have created a subset of general intangibles known as controllable electronic records.[25] I find the retention of the general intangible category for these assets unnecessary because they are given different treatment from traditional general intangibles under the law. Under the PPSA, it would be useful to categorize crypto-assets as a separate kind of personal property because they are a unique kind of asset that requires a different treatment from most intangibles. In addition, personal property of an intangible nature such as investment property has been categorized separately under the PPSA. It is important that the term selected to categorize these kinds of digital assets is broad enough to encompass all variations of the asset, but not too broad that inappropriate kinds of digital assets would be able to fit into the category. Where a digital asset does not fit into the terminology and definition under these recommendations, that digital asset should continue to be treated as an intangible until its treatment is explicitly addressed by lawmakers if necessary. I have considered several terminologies for the categorization of crypto-assets under the PPSA, and these terms are provided as follows:

i. **Crypto-Assets:** These are digital assets that utilize cryptography, peer-to-peer networks, and distributed ledger technology such as blockchain to create, verify, and secure transactions.[26] These assets can be used in a variety of ways including as a store of value and as a medium of exchange. I recommend adopting this term and definition for the categorization of the kind of digital assets that should be regulated under the PPSA because it balances the need to protect parties to crypto-related secured transactions with the concern of overregulating emerging technologies. It is also an established class of assets and though some crypto-assets have unique uses, they share enough similarities for secured transaction purposes to warrant identical treatment. Unlike the term "controllable electronic records", which has an infinite scope, we have established that crypto-assets are not only capable of being controlled but are the kind of assets for which

[25] U.C.C, *supra* note 20, § 9-102(a)(42).
[26] Canadian Securities Administrators "Crypto Assets", Online: CSA: <https://www.securities-administrators.ca/investor-tools/crypto-assets/>.

we should encourage perfection by control because it is very difficult to ensure enforcement of the security interest by any other mode of perfection.

Crypto-assets generally utilize distributed ledger technology to store data across different locations simultaneously and use cryptography to secure and verify transactions. These technologies are what make crypto-assets unique and so any definition of crypto-assets should include these terms. These terms (i.e. distributed ledger technology and cryptography) should also be defined under the PPSA, and the definitions used in this thesis are recommended for adoption. There is a common misconception that distributed ledger technology is synonymous with blockchain, and that all crypto-assets utilize blockchain. While it is true that all crypto-assets utilize some kind of distributed ledger technology, they do not all use blockchain.[27]

Distributed Ledger Technology ("DLT") may be defined as a digital system that allows users to record, share, and synchronize data and transactions across a distributed network consisting of numerous participants.[28] The technology is decentralized in nature because there is no central location where the data it records is stored. Instead, the database exists among numerous participants or across various geographical locations.[29] DLT can either be classified as public or private, depending on how accessible the ledger is. It can also be classed as either permissioned or permissionless depending on whether users require permission from any entity to edit the ledgers.[30] Blockchain is an example of a distributed ledger technology. Other examples of DLT include Hashgraph, Holochain, and Tempo,[31] and, common crypto-assets that do not use blockchain include IOTA and Ripple.[32] The use of the term "Crypto-Assets" would therefore cover cryptographic assets based on all forms of distributed ledger technologies and not just blockchain assets. The official comments do not restrict the application of Article 12 or the amendments to Article 9 to only assets utilizing blockchain technology. It also explicitly refers to the applicability of these articles to other DLT's but states that it will also be applicable to assets utilizing

[27] Karim, "Do All Cryptocurrencies Use Blockchain? Types of Blockchain" (May 1, 2021), Online: Coinwut < https://coinwut.com/cryptocurrencies-use-blockchain-types/ >.
[28] CFI Team, "Distributed Ledger Technology" (October 9, 2022), Online: CFI < https://corporatefinanceinstitute.com/resources/cryptocurrency/distributed-ledger-technology/ >.
[29] *Ibid.*
[30] *Ibid.*
[31] Bhumika Dutta "5 Types of Distributed Ledger Technologies" (April 7, 2022), Online: analytic steps < https://www.analyticssteps.com/blogs/5-types-distributed-ledger-technologies-dlt >.
[32] Karim, *supra* note 39.

future technologies. Please see below an excerpt of the prefatory note to Article 12 which makes reference to DLT's.

> Article 12 creates a legal regime that is meant to apply more broadly than to electronic (intangible) assets that are created using existing technologies such as distributed ledger technology (DLT), including blockchain technology, which records transactions in bitcoin and other digital assets. It also aspires to apply to electronic assets that may be created using technologies that have yet to be developed, or even imagined.
>
> The adoption of DLT has underscored two important trends in electronic commerce. First, people have begun to assign economic value to some electronic records that bear no relationship to extrinsic rights and interests. For example, without any law or legally enforceable agreement, people around the world have agreed to treat virtual currencies such as bitcoin (or, more precisely "transaction outputs" generated by the Bitcoin protocol) as a medium of exchange and store of value. Second, people are using the creation or transfer of electronic records to transfer rights to receive payment, rights to receive performance of other obligations (e.g., services or delivery of goods), and other rights and interests in personal and real property.
>
> These trends will inevitably result in disputes among claimants to electronic records and their related rights and other benefits. Uncertainty as to the criteria for resolving these claims creates commercial risk. The magnitude of these risks will grow as these trends continue.[33]

This excerpt summarizes the need for the regulation of all crypto-assets but expands the scope of regulation to future technology-based assets as well. I do not recommend the adoption of the wide scope of regulation in the UCC 2022 amendments due to the risk involved in regulating assets based on technologies that may not even have been imagined. There is no guarantee that the control mechanisms set out would be beneficial or suitable to secured parties engaged in transactions involving these future technologies.

In my view, the most important thing that should be considered in streamlining the scope of digital assets to be regulated under the PPSA should be, not whether the asset is controllable, but whether the asset possesses the characteristics that make control a virtual necessity for simple and efficient enforcement of the security interest. At this moment, "crypto-assets" are the only assets that have this attribute.

ii. **Controllable Electronic Record:** The term "Controllable Electronic Record" has been considered because of its use in the 2022 UCC amendments. It is defined under UCC Article 12 as follows:

[33] U.C.C, *supra* note 20, Prefatory Note to Article 12.

> a record stored in an electronic medium that can be subjected to control under Section 12-105. The term does not include a controllable account, a controllable payment intangible, a deposit account, an electronic copy of a record evidencing chattel paper, an electronic document of title, electronic money, investment property, or a transferable record.[34]

Apart from the exemptions listed, this definition provides that all other records stored in an electronic medium which can be subjected to control under Section 12-105 are categorized as controllable electronic records. Article 1 of the UCC defines a record as "information that is inscribed on a tangible medium or that is stored in an electronic or other medium and is retrievable in perceivable form."[35]

This broad terminology was intentionally chosen by the Committee to not only address crypto-asset regulation but to also encompass other electronic records capable of being controlled that may emerge in the future. The Committee adopts a proactive approach to digital asset regulation in commercial transactions by selecting this terminology. The use of this terminology may reduce the need for more amendments to commercial laws as technology evolves and more digital assets are regulated, but there are some concerns that exist with such broad categorization. It is generally argued whether the law should be proactive or reactive. In relation to crypto-assets, the law has mostly been reactive because lawmakers observed this asset class develop for over a decade before deciding to regulate it. However, it is possible that in adopting the broad categorization of "controllable electronic records", lawmakers attempt to be proactive but end up over-correcting and this leads to absurd results.

The 2022 UCC amendments assume that because an asset is capable of being controlled, it is best if the security interests in the asset are perfected by control. However, this may not always be the case. Incentives are offered to those who perfect their security interests in controllable electronic records by control and these incentives are unavailable to those that perfect their interests via registration. A secured party in control of a controllable electronic record will have priority over secured parties perfected by registration regardless of whether the registration was first in time[36] and a qualified purchaser of a controllable electronic record will take free of conflicting security interests.[37] A qualified purchaser will also

[34] *Ibid*, § 12-102(a)(1).
[35] U.C.C, *supra* note 20, § 1-201(b)(31).
[36] *Ibid*, § 9-326A.
[37] *Ibid*, § 12-104(e).

benefit from the rule that prohibits another party to bring an action against him in relation to the purchased asset.[38]

The concern that arises here is that significant rights are being given to secured parties with control of controllable electronic records when the scope of these records is uncertain. This means that when a new kind of digital asset that falls within the definition of a controllable electronic record is invented, the party in control will automatically gain all these benefits when the nature of the asset may not be one that should prioritize the secured party in control over other secured parties. For crypto-assets, it is understandable why control should be encouraged – there is no other way to ensure that the secured party would be able to enforce its security interest in a debtor's collateral if not for control, due to the irreversibility of transfers, and the difficulty in tracing the asset when a debtor transfers such an asset without authorization from the secured party. These are concerns that exist due to the unique nature of crypto-assets which control is supposed to prevent. These concerns may not exist with some future controllable digital assets. It may therefore be unfair to prioritize the security interests of secured parties with control of these kinds of assets over those who have perfected their interests in those assets by registration at an earlier date.

In summary, the term "controllable electronic record" is too broad because it confers rights that may not be advisable to bestow on an unknown range of controllable digital assets. A narrower term that focuses on crypto-assets specifically, or emerging digital assets that have more similarities with crypto-assets than merely being controllable, may be more appropriate for the regulation of digital assets in commercial transactions at this time.

iii. Cryptocurrency: This is a term commonly used to refer to the assets in question. It is defined by Merriam-Webster as "any form of currency that only exists digitally, that usually has no central issuing or regulatory authority but instead uses a decentralized system to record transactions and manage the issuance of new units, and that relies on cryptography to prevent counterfeiting and fraudulent transactions."[39]

As can be seen from this definition, the term "cryptocurrency" is used in reference to currency only and not the entire scope of crypto-assets. Though the term is sometimes used loosely

[38] *Ibid*, § 12-104(g).
[39] Merriam Webster Dictionary "Definition of Cryptocurrency" Online: Merriam-Webster < https://www.merriam-webster.com/dictionary/cryptocurrency >.

to refer to crypto-assets generally, cryptocurrency is in fact a subset of crypto-assets.[40] Menard and Barrette-Leduc have suggested limiting the scope of regulation to "cryptocurrency" only and not crypto-assets entirely.[41] This is their approach to creating a balance between the view that states should continue to observe the crypto-asset landscape and wait till the market matures before regulating, and the view that digital assets be regulated widely enough to cover digital assets that may emerge in the future. They have recommended that cryptocurrency be defined under the Securities Transfer Act ("STA") and the PPSA as follows:

> cryptocurrency means a digital or virtual currency that uses a decentralized system to record transactions and manage the issuance of new units, and that relies on cryptography to prevent counterfeiting and fraudulent transactions.[42]

In my view, "cryptocurrency" is too narrow a term for the regulation of crypto-assets at this time. If we are to use this term, we will only be making provision for the subset of crypto-assets used as mediums of exchange such as Bitcoin. Other established forms of crypto-assets such as stablecoins, utility tokens, privacy coins, decentralized finance tokens, and non-fungible tokens[43] will be excluded by this definition. Therefore, adopting this approach would not do enough for the regulation of crypto-assets in secured transactions. Some of these other subsets have been in existence for almost as long as the crypto-asset market as a whole. In relation to their use as collateral, these other subsets of crypto-assets are not any different from cryptocurrencies like bitcoin so there is no reason to exclude them from the scope of digital assets being regulated at this time. Regulating all assets that can be classified as crypto-assets would still be a much narrower approach than the regulation of "controllable electronic records" adopted in the 2022 UCC amendments.

iv. **Digital Assets:** The Wyoming digital assets statute categorizes crypto-assets using this term. It is not used in relation to crypto-assets alone but refers more generally to assets in digital form. The Statute defines the term as follows:

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[40] Kieran Smith "6 Types of Crypto Assets You Need to Know About" (June 8, 2020), Online: Crypto Currency News < https://cryptocurrencynews.com/6-types-crypto-assets/ >.
[41] Xavier Foccroulle Menard and Cecilia Barrette-Leduc, "Sound Regulations for Security Interests in Cryptocurrency" (December 1, 2021), 37:1 B.F.L.R 97 at 113.
[42] *Ibid.*
[43] Cristina Macias "Types of Crypto Assets" Soup.io < https://www.soup.io/types-of-crypto-assets#:~:text=Types%20of%20Crypto%20Assets%201%20Cryptocurrencies%20Digital%20currencies,5%20Privacy%20Coins%20...%206%20Crypto%20Collectibles%20 >.

> "Digital asset means a representation of economic, proprietary or access rights that is stored in a computer readable format, and includes digital consumer assets, digital securities, and virtual currency."[44]

Though the Wyoming Statute subdivides digital assets into digital consumer assets, digital securities, and virtual currency, it provides that digital consumer assets include any digital asset that does not fall into the other categories.[45] By doing this, it categorizes some crypto-assets with the residual class of digital assets and provides that these digital consumer assets be perfected only by registration. The crypto-assets placed under this sub-category are thereby at a disadvantage due to this broad categorization. This issue would not arise if crypto-assets are regulated using a more specific categorization. Aside from the manner in which the Wyoming Statute utilizes the term "digital assets", the term is as a general matter too broad for the regulation of crypto-assets and may lead to a situation where an unknown range of digital assets feature rights and benefits that have been bestowed on crypto-assets due to their unique nature. This may then lead to absurd results where unsuitable laws are applicable to a wide range of digital assets. There is a very high risk of unsuitable laws applying to a wide range of digital assets where the term "digital assets" is selected to categorize crypto-assets because it would be difficult for lawmakers to make rules that are suitable for the regulation of the entire spectrum of digital assets. It is important for lawmakers to always regulate novel issues cautiously and not infinitely broaden the scope in a way that may hinder innovation or lead to absurd results in the future.

4.3.2 Perfection by Control

It is recommended that the option of control be available to secured parties for the perfection of their security interests in crypto-assets. Registration would also be available for secured parties to utilize as an alternative to control, as registration is the universal perfection method under the PPSA. Perfection by control will ensure that secured parties can easily enforce their security interests in this asset in the event of default. Perfection by control places the crypto-assets in the hands of the secured party to ensure that they cannot be transferred or otherwise utilized by the debtor without their consent. This is particularly essential for crypto-assets because the transfers are untraceable (traceable to crypto addresses and not human beings) and irreversible. There are several definitions of control that have been used in US and Canadian secured transactions legislation. Some authors have also recommended definitions that may be

[44] Wyoming Statute*, supra* note 16, s 34-29-101(a)(i).
[45] *Ibid*, s 34-29-101 (a)(iii).

used to define control of security interests in crypto-assets in secured transactions law. For instance, Menard and Barrette-Leduc suggest that section 28.1 be added to the STA to define control as it relates to cryptocurrencies. They have recommended the following definition:

> **Secured creditor's control of cryptocurrency**
>
> 28.1 (1) A secured creditor has control of cryptocurrency if,
>
> (a) the cryptocurrency is delivered to the secured party;
> (b) the cryptocurrency is delivered to an intermediary that has agreed that it will comply with orders that are originated by the secured creditor without the further consent of the cryptocurrency holder; or
> (c) another person has control of the cryptocurrency on behalf of the secured creditor or, having previously obtained control of the cryptocurrency, acknowledges that the person has control on behalf of the secured creditor.
>
> (2) Delivery of cryptocurrency under s. 28.1 (1) occurs when, at minimum,
> (a) the private key is transferred from the debtor to either the secured creditor, the intermediary or another person having control of the cryptocurrency, and
> (b) there is a mechanism in place to prevent the debtor from unilaterally transferring the cryptocurrency.
>
> Consequently, deliverance includes, but is not limited to, the outright transfer of cryptocurrency from the debtor to either the secured creditor, the intermediary or another person having control of the cryptocurrency.[46]

These conditions are similar to the control standards for various forms of investment property under the STA. However, this definition is inadequate for crypto-assets because it lacks the component of exclusivity. It is vital for some of the conditions for control to be exclusive to prevent a situation where there are several unrelated parties in "control" of the collateral. Without this exclusivity of certain powers, there is nothing preventing the debtor from giving the same private key to several secured parties. If control according to the legislation can be achieved even when the debtor gives the same private key to several secured parties, then the problem of enforcing the security interest in the crypto-assets will still persist. This may also lead to disputes between secured parties. A better set of control standards are contained in the 2022 UCC amendments because they address the exclusivity concern. These provisions are as follows:

> (a) A person has control of a controllable electronic record if the electronic record, a record attached to or logically associated with the electronic record, or a system in which the electronic record is recorded:

[46] Xavier Foccroulle Menard and Cecilia Barrette-Leduc, "Sound Regulations for Security Interests in Cryptocurrency" (December 1, 2021), 37:1 B.F.L.R 97 at 113.

(1) gives the person:

(A) power to avail itself of substantially all the benefit from the electronic record; and

(B) exclusive power, subject to subsection (b), to:

(i) prevent others from availing themselves of substantially all the benefit from the electronic record; and

(ii) transfer control of the electronic record to another person or cause another person to obtain control of another controllable electronic record as a result of the transfer of the electronic record; and

(2) enables the person readily to identify itself in any way, including by name, identifying number, cryptographic key, office, or account number, as having the powers specified in paragraph (1).[47]

These control rules ensure that persons in control of crypto-assets are truly distinguishable from other secured parties due to the exclusive powers they possess. The official comments to UCC Article 12 suggest that these control standards may be achieved through a multi-signature arrangement.[48] This arrangement would require that the collateral may only be transferred or otherwise dealt with once all the parties have signed the agreement consenting to have the collateral dealt with in that way. The multi-signature arrangement has also been suggested by Wyoming legislators.[49]

Another mechanism that may be explored to achieve control is the use of smart contracts, whereby the collateral is held in the system governed by that smart contract and the collateral would be dealt with in the manner agreed upon by the parties when the smart contract was executed. The smart contract would be triggered when its conditions have been met, and the secured party will automatically receive the crypto-assets (for the purpose of realization) where an event of default has occurred and the conditions of the smart contract provide for the release of the assets. On the other hand, where no default occurs, the smart contract will automatically trigger the return of the crypto-assets to the debtor upon expiry of the term of the loan term.

I believe that it would be beneficial if control standards similar to those contained in the 2022 UCC amendments are adopted in relation to crypto-assets under the Canadian PPSA. The use of multi-signature agreements and smart contracts may also be mentioned in the PPSA to guide parties on how these control standards may be achieved in practice.

[47] U.C.C, *supra* note 20, § 12-105(a).
[48] *Ibid*, Comment 5 at 249.
[49] Wyoming Statute, *supra* note 16, s 34-29-103 (e)(i).

4.3.3 Negotiability of Crypto-Assets

It is recommended that transferees of crypto-assets be able to take their crypto-assets free of conflicting security interests where the transferee gives value in good faith and has no notice of any conflicting claim to the crypto-assets. This benefit is already enjoyed by transferees of negotiable collateral under the PPSA[50] and will also be beneficial to transferees of crypto-assets to ensure that third parties who accept crypto-assets are protected. This right is especially vital to ensure that innocent third parties who accept crypto-assets as a method of payment are not liable to secured parties for those assets. The rights of the third parties in this context should especially be prioritized over existing security claims because the pseudonymity of crypto-asset transactions and the difficulty involved in tracing title to these assets prevent a third party from knowing who has title to those assets or whether the assets are encumbered. Even if pseudonymity were not a concern with crypto-assets, it would still be vital for innocent third parties to take free of these interests because it is impractical to expect a person who takes these assets as payment for goods and services, to do the due diligence necessary to understand the title to those assets before accepting them as payment.

There should be no exceptions to the innocent third-party rule as long as the transferee meets all requirements for this rule to apply. This rule will apply even in a situation where the person who transferred the crypto-assets to the transferee stole those assets. For clarification, the innocent third-party rule will be applicable to transferees of crypto-assets who meet the following criteria a) obtains control of the crypto-assets, b) gives value in exchange for those crypto-assets c) has no notice of existing security interests in the crypto-assets. The importance of this rule is explained in UCC Article 12 as follows:

> The ability to take a controllable electronic record free of third-party property claims appears to be necessary for a controllable electronic record to have commercial utility. As is the case with Articles 2, 3, 7, and 9, Article 12 would facilitate commerce by affording to certain good-faith purchasers for value greater rights than their transferors had or had power to transfer.[51]

UCC Article 12 refers to these kinds of transferees as "qualifying purchasers". This term is similar to the term "protected purchaser" employed in relation to investment property under the STA and has a similar meaning. For consistency, Canadian lawmakers may want to adopt the term "protected purchaser" in relation to these transferees.

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[50] SPPSA, *supra* note, s 31.
[51] U.C.C, *supra* note 20, Prefatory Note to Article 12, Comment 3.

4.3.4 Amendment of the Existing Definition of Money and the Introduction of an Electronic Money Definition under the PPSA

The PPSA currently defines money as:

> a medium of exchange that is:
>
> (i) authorized by the Parliament of Canada as part of the currency of Canada; or
> (ii) authorized or adopted by a foreign government as part of its currency;[52]

The literal interpretation of this definition is that bitcoin may be categorized as money due to its declaration as legal tender in El Salvador and the Central African Republic. As discussed in earlier chapters, this categorization is problematic because it is clear from the treatment of money under the PPSA that money was intended to apply to tangible currency only.

Due to this issue, the definition of money has been amended under the UCC Article 1 as follows:

> "Money" means a medium of exchange that is currently authorized or adopted by a domestic or foreign government. The term includes a monetary unit of account established by an intergovernmental organization, or pursuant to an agreement between two or more countries. The term does not include an electronic record that is a medium of exchange recorded and transferable in a system that existed and operated for the medium of exchange before the medium of exchange was authorized or adopted by the government."[53]

This definition includes tangible and electronic forms of money authorized by a foreign or domestic government as a medium of exchange. It however excludes any electronic mediums of exchange that were not invented specifically to be used as medians of exchange by a particular government. This means that bitcoin will cease to be categorized as money under the UCC, even though it has been declared as legal tender by some governments. This definition will include Central Bank Digital Currencies ("CBDCs") such as the Bahamas Sand Dollar, Bakong Cambodia, and Eastern Caribbean DCash.[54]

The 2022 amendments to UCC Article 9 adopt this new definition of money as follows:

> "Money" has the meaning in Section 1-201(b)(24) but does not include (i) a deposit account or (ii) money in an electronic form that cannot be subjected to control under Section 9-105A."[55]

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[52] SPPSA, *supra* note 3, s 2(1)(bb).
[53] U.C.C, *supra* note 20, § 1-201(24).
[54] "An Introduction to Central Bank Digital Currencies ("CBDCs")", Online: Deloitte: < https://www2.deloitte.com/global/en/pages/financial-services/articles/cbdc-central-bank-digital-currency.html >.
[55] U.C.C, *supra* note 20, § 9-102(a)(54A).

The Article 9 definition of money is the same as the UCC Article 1 definition. It limits the scope of money to tangible money and CBDCs. Article 9 also defines "electronic money" as "money in an electronic form."[56] Although money has already been defined under Article 9 to include electronic money, the term has been defined specifically because of the differences in treatment between tangible and intangible assets under UCC Article 9. A definition of "electronic money" is essential because security interests in these assets are perfected differently from tangible money. Under the UCC, a secured party perfects security interests in electronic money by control[57] and continues to perfect security interests in tangible money by possession.[58]

It is recommended that the PPSA adopt a similar approach as the UCC to defining money and include a definition for electronic money. Similar to the electronic chattel paper amendments under the PPSA, the definition of money should encompass tangible and electronic forms of money. Section 24(1)(f) on perfection by possession should be amended from "money" to "tangible money". Similar to the UCC, the definition of money should expressly exclude electronic medians of exchange that were not invented by a particular government to be used as a medium of exchange. The definition of "money" may be amended under the PPSA to read as follows:

> "money" means a medium of exchange that is:
> (i) authorized by the Parliament of Canada as part of the currency of Canada; or
> (ii) authorized or adopted by a foreign government as part of its currency.
> The term does not include a medium of exchange stored in a computer-readable format that existed and operated as a medium of exchange before the medium of exchange was authorized or adopted by Canada or a foreign government.

The PPSA should define electronic money for the purpose of creating control rules to apply to those assets. It is my view that the UCC definition of electronic money will suffice for utilization in the PPSA. Electronic money under the PPSA should be perfected by control and the control standards applicable to these assets should be identical to those adopted in relation to crypto-assets under the PPSA. Under UCC Article 9, security interests in money cannot be perfected by registration so this extends to electronic money under the 2022 amendments. Consequently, electronic money can only be perfected by control under the UCC. However, under the PPSA, security interests in all kinds of personal property including money can be

[56] *Ibid*, § 9-102(a)(31A).
[57] *Ibid*, § 9-105A.
[58] *Ibid*, § 9-313.

perfected by registration. So, in addition to perfection by control, secured parties should also have the option of perfecting their security interests in electronic money by registration under the PPSA.

4.3.5 Financial Asset "Opt-In" Clarification

One common ground that exists in the different attempts to legislate crypto-assets is that a secured party should be able to opt into the investment property framework under existing securities transfer legislation and release its crypto-assets to a securities intermediary to be treated as financial assets if the securities intermediary agrees to this arrangement. A provision that addresses this is covered under the Wyoming Statute[59] and the official comments to the new UCC Article 8 also specifically clarify that crypto-assets may be treated this way.[60] Unlike the URVCBA, these other laws do not impose the investment property framework on crypto-assets but simply provide parties with the option to treat their assets this way, in addition to also providing options for how security interests held directly by secured parties should be treated. The amendments to the official comments to UCC Article 8 also include clarification that a securities intermediary may include a cryptocurrency exchange.[61] Since the PPSA and the STA already include the provision for opting in for treatment as financial assets, legislative amendments should be made to give secured parties and intermediaries assurance that crypto-assets can be treated this way under the PPSA, and the STA.

4.4 Conclusion

The regulation of crypto-assets in secured transactions is necessary to give certainty to parties who engage in these kinds of transactions. One of the most important personal property security values is the ability of the law to facilitate commercial transactions involving different kinds of personal property. Commercial law is very party-centric and the law is supposed to give parties a wide array of freedoms to conduct their transactions as they please. The regulation of crypto-related secured transactions must therefore reflect that aim, and not put undue restrictions on the activities of secured parties.

The ULC has encouraged US states to adopt the UCC 2022 amendments because of the ability of the amendments to foster economic activity involving new types of property by providing

[59] Wyoming Statute, *supra* note 16, § 34-29-102(b).
[60] U.C.C, *supra* note 20, § 8-102, Comment 9 at 82.
[61] Ibid, Comment 14 at 83.

legal certainty, and the ability of the amendments to reduce transaction costs and the cost of credit through uniformity.[62] The regulation of crypto-related secured transactions will also have similar benefits for secured parties in Canada, but it is important for the law to balance the need to regulate these assets with the concern that overregulation of this asset class might stifle innovation. For this reason, it may be advisable for Canada and other jurisdictions that are yet to regulate crypto-related secured transactions to do so cautiously and resist the urge to regulate an unquantifiable number of digital assets. It is also important for Canada and these jurisdictions to strongly consider giving secured parties the option to perfect their security interests by control to ensure that they are able to enforce their security interests in the event of debtor default. It is also vital for the PPSA to protect the rights of third parties so as not to interfere with the commercial utility of crypto-assets.

[62] Uniform Law Commission "Why Your State Should Adopt The 2022 Amendments to the Uniform Commercial Code" <https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=e91a7611-ca92-c16e-5d19-6d275da97fcd&forceDialog=0>.

Bibliography

Bills, Legislation, Regulations, National Instruments & Guidelines

17 C.F.R. Part 275, Rules and Regulations, Investment Advisers Act of 1940.

Canadian Securities Administrators Staff Notice 21-332, *Crypto Asset Trading Platforms: Pre-Registration Undertakings, Changes to Enhance Canadian Investor Protection,* (February 22, 2023).

Canadian Securities Administrators, *CSA Staff Notice 46-307 Cryptocurrency Offerings* (2017).

Canadian Securities Administrators, *CSA Staff Notice 46-308, Securities Law Implications for Offerings of Tokens* (2018).

Enforcement of Money Judgments Act, SS 2010, c E-9.22.

Joint Canadian Securities Administrators / Investment Industry Regulatory Organization of Canada, CSA Staff Notice 21-327, *Guidance on the Application of Securities Legislation to Entities Facilitating the Trading of Crypto Assets,* (16 January 2020).

National Instrument 31-103*, Registration Requirements, Exemptions, and Ongoing Registrant Obligations* (1 March 2021).

Personal Property Security Act 1993, SS 1993, c P-6.2.

Personal Property and Security Regulations, RRS c P-6.2.

Securities Act 1933, 15 U.S.C.

Securities Transfer Act, SS 2007, c S-42.3.

Uniform Commercial Code 2010.

Uniform Commercial Code 2022.

United Nations Commission on International Trade Law (UNCITRAL) Legislative Guide on Secured Transactions (New York: United Nations, 2010).

Uniform Regulation of Virtual Currency Businesses Act 2017.

Uniform Supplemental Commercial Law for the Uniform Regulation of Virtual-Currency Businesses Act 2018.

Wyoming Statute 2021.

Books

Anthony J. Duggan & Jacob S. Ziegel, *Secured Transactions in Personal Property: Cases, Text, and Materials*, 6th ed. (Toronto: Emond Montgomery Publications Limited, 2013).

Clayton Bangsund, *Bangsund on the Personal Property Security Act: The CCPPSL Model* (Toronto: Carswell, 2021).

Ronald C.C. Cuming, Catherine Walsh & Roderick J. Wood, *Personal Property Security Law*, 2nd ed. (Toronto: Irwin Law, 2012).

Stephanie Ben-Ishai & David Percy, *Contracts: Cases and Commentaries*, 9th ed. (Toronto: Carswell, 2014).

Case Law

CFTC v McDonnell, 287 F. Supp. 3d 213 (E.D.N.Y. 2018).

Pacific Coast Coin Exchange v. OSC, [1978] 2 SCR 112.

Re Dole Food Co., Inc. Stockholder Litig., 110 A.3d 1257 (Del. Ch. 2015).

Re Escalera Res. Co., 563 B.R. 336 (Bankr. D. Colo. 2017)

Saulnier v Royal Bank of Canada, 2008 SCC 58.

Securities and Exchange Commission v. Ripple Labs Inc, 20 Civ. 10832 (AT) (S.D.N.Y. Oct. 4, 2021).

Securities and Exchange Commission v. Shavers, 2013 U.S Dist. LEXIS 110018, at 4 (E.D Tex. Aug. 6, 2013).

Securities and Exchange Commission v. W. J. Howey Co., 328 U.S. 293 (1946).

State Commissioner of Securities v. Hawaii Market Center, [1971] 485 P.2d 105.

State v. Espinoza, 264 So. 3d 1055 (Fla. Dist. Ct. App. 2019).

United States v. 50.44 Bitcoins, 2016 U.S. Dist. LEXIS 70404, at 3 (D. Md. May 31, 2016).

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

Journal Articles

Alan Schwartz, “Security Interests and Bankruptcy Priorities: A Review of Current Theories” (1981) 10 J. Legal Stud. 1.

Allen N. Berger and Gregory F. Udell, “Collateral, Loan Quality, and Bank Risk” (1990) 25 Journal of Monetary Economics 21.

Clayton Bangsund, “The Deposit Account & Chose in Action at Common Law & Under the PPSA: A Historical Review” (November 2014) 30 B.F.L.R 1.

Francis H. Buckley, “The Bankruptcy Priority Puzzle” (1986) 72 Va. L. Rev. 1393.

James Surowiecki, “Cryptocurrency: The Bitcoin, A Virtual Medium of Exchange, Could Be a Real Alternative to Government-Issued Money - But Only If It Survives Hoarding by Speculators”, MIT Tech. Rev. (Aug. 23, 2011), available at http://ilp.mit.edu/newsresults.jsp?tot=8774&page=730 .

John Armour, “The Law and Economics Debate About Secured Lending: Lessons for European Lawmaking?” (2008) 2 European Company and Financial Law Review 3.

Lucian A. Bebchuk and Jesse M. Fried, “The Uneasy Case for the Priority of Secured Claims in Bankruptcy: Further Thoughts and a Reply to Critics” (1997) 82 Cornell L. Rev. 1279.

Lynn M. LoPucki, “The Unsecured Creditor’s Bargain” (1994) 80 Va. L. Rev. 1887 at 1947; John Hudson, “The Case Against Secured Lending” (1995) 15 Int’l Rev. L. & Econ. 47.

Matt Crockett, “Wyoming’s DIY Project Gets Western with the UCC”, Wyoming Law Review, Vol. 20, No.1.

Mitchell Prentis, “Digital Metal: Regulating Bitcoin as A Commodity”, 66 Case W. Res. L. Rev. 609, 626 (2015).

Peter Schuck, “Legal Complexity: Some Causes, Consequences, and Cures” (1992) 42 Duke L.J. 1.

Robert Scott, “The Truth About Secured Lending” (1997) 82 Cornell Law Rev. 1436.

Roderick J. Wood, “Acquisition Financing of Inventory: Explaining the Diversity” (2014) 13(1) O.U.C.L.J. 49.

Ronald C.C. Cuming, “The Position Paper on Revised Bank Act Security: Rehabilitation of Canadian Personal Property Security Law or Curing the Illness by Killing the Patient” (1992) 20 Can. Bus. L.J. 336.

Ronald C.C. Cuming, Catherine Walsh and Roderick J. Wood, “Secured Transactions Law In Canada – Significant Achievements, Unfinished Business And Ongoing Challenges” (2011), C.B.L.J 50.

Ronald J. Mann, “Explaining the Pattern of Secured Credit” (1997) 110 Harv L. Rev. 625.

Roy Goode, “The Codification of Commercial Law” (1988) Monash U.L. Rev. 135.

Ryan Clements, “Emerging Canadian Crypto-Asset Jurisdictional Uncertainties and Regulatory Gaps” (2021) 37.1 B.F.L. R 25.

Sarah J. Hughes, ‘‘Property, Agency, and the Blockchain: New Technology and Longstanding Legal Paradigms” (2019) 65 Wayne L. Rev. 57, 65.

Sheng S. Chen, GHH Yeo, and KW Ho, “Further Evidence on the Determinants of Secured Versus Unsecured Loans” (1998) 25 Journal of Business Finance and Accounting 371.

Steven L. Harris and Charles W. Mooney, Jr., “A Property-Based Theory of Security Interests: Taking Debtors’ Choices Seriously” (1994) 80 Va. L. Rev. 2021.

Thomas H. Jackson and Anthony T. Kronman, “Secured Financing and Priorities Among Creditors” (1979) 88 Yale L.J. 1143.

Xavier Foccroulle Menard and Cecilia Barrette-Leduc, “Sound Regulations for Security Interests in Cryptocurrency” (December 1, 2021), 37:1 B.F.L.R 97.

Xavier Foccroulle Menard, “Cryptocurrency: Collateral for Secured Transactions?” (28 April 2020) 34:3 Banking & Finance Law Review 347.

Non-Journal Articles

Adam Driedger, "Bitcoin and Bankruptcy: Implications for Canadian Insolvency Law" (June 15, 2018), online: Insolvency Institute of Canada, <www.insolvency.ca/en/iicresources/resources/Bitcoin-and-Bankruptcy_Adam-Driedger.pdf>.

Adrian Chen, "The Underground Website Where You Can Buy Any Drug Imaginable" (June 1, 2011), online: Gawker < https://www.gawker.com/the-underground-website-where-you-can-buy-any-drug-imag-30818160 >.

Alix d'Anglejan-Chatillon, Ramandeep Grewal, Eric Levesque "Blockchain & Cryptocurrency Laws and Regulations 2023 | Canada" online: GLI < https://www.globallegalinsights.com/practice-areas/blockchain-laws-and regulations/canada#chaptercontent10 >.

Andrea Tinianow, "A Split Emerges In Blockchain Law: Wyoming's Approach Versus The Supplemental Act"(March 7, 2019), Online: Forbes < https://www.forbes.com/sites/andreatinianow/2019/03/07/a-split-emerges-in-blockchain-law-wyomings-approach-versus-the-supplemental-act/?sh=595be37a719a >.

Andrew Griffin, "Why is Facebook changing its name to Meta? The official reason – and why it might really be happening" (October 29, 2021), online: Yahoo finance < https://finance.yahoo.com/news/why-facebook-changing-name-meta-082701191.html >.

Andrew Norry, "The Complete History of Cryptocurrency for Beginners" (February 14, 2018), online: Parameter < https://parameter.io/history-of-cryptocurrency/ >.

Andrew Norry, "The History of the Mt Gox Hack: Bitcoin's Biggest Heist", (March 31, 2020) online: Blockonomi < https://blockonomi.com/mt-gox-hack/ >.

Angela Monaghan, "Bitcoin biggest bubble in history, says economist who predicted 2008 crash" (February 2, 2018), online: The Guardian < https://www.theguardian.com/technology/2018/feb/02/bitcoin-biggest-bubble-in-history-says-economist-who-predicted-2008-crash >.

Anne Gaviola, "Coinsquare execs step down after accusations of market manipulation" (22 July 2020), online: BNN Bloomberg < https://www.bnnbloomberg.ca/coinsquare-executives-step-down-after-accusations-of-market-manipulation-1.1468791 >.

Antoine Tardif, "An Analysis of the SEC vs Ripple Labs Inc Complaint", (December 23, 2020), Online: Securities.io < https://www.securities.io/an-analysis-of-the-sec-vs-ripple-labs-inc-complaint/ >.

Ashlyn Robinson, "Crypto-Collateral? Securing Loans with Digital Currency" (March 21, 2019) online: Yahoo Finance <finance.yahoo.com/news/crypto-collateral-securing-loans-digital-070045279.html>.

Bhumika Dutta "5 Types of Distributed Ledger Technologies" (April 7, 2022), online: analytic steps < https://www.analyticssteps.com/blogs/5-types-distributed-ledger-technologies-dlt >.

Bill Conerly “Global Economy Headed Into Recession” (September 23, 2022), online: Forbes < https://www.forbes.com/sites/billconerly/2022/09/23/global-economy-headed-into-recession/?sh=4b1477daabfa >.

Caitlin Long, “Seismic News About State Virtual Currency Laws: ULC Urges States To Withdraw Model Act”, (March 25, 2019) online: Forbes <https://www.forbes.com/sites/caitlinlong/2019/03/25/seismic-news-about-state-virtual-currency-laws-ulc-urges-states-to-withdraw-model-act/?sh=23610d8c5fda >.

Caitlin Long, “Seismic News About State Virtual Currency Laws: ULC Urges States To Withdraw Model Act”, (March 25, 2019) online: Forbes <https://www.forbes.com/sites/caitlinlong/2019/03/25/seismic-news-about-state-virtual-currency-laws-ulc-urges-states-to-withdraw-model-act/?sh=23610d8c5fda >.

Caitlin Long, “What do Wyoming’s 13 New Blockchain Laws Mean?”(March 4, 2019), Online: Forbes < https://www.forbes.com/sites/caitlinlong/2019/03/04/what-do-wyomings-new-blockchain-laws-mean/?sh=2e419e8b5fde >.

Chris Davis, “Market Capitalization: What It Is and Why It’s Important” (May 2, 2022), online: nerdwallet < https://www.nerdwallet.com/article/investing/what-is-market-cap >.

Clayton Bangsund, “Another Appeal for Pragmatic Reform: The Future of Section 427 Bank Act Security and Canadian Personal Property Security Law”, (2012) Social Science Research Network (posted January 31, 2012), online: SSRN.

Clayton Bangsund, “Control v. Registration: Contemplating A Potential Paradigm Shift in The PPSA’s Governance of Security Interests in Deposit Accounts” (JuliusErwin, 2018).

Collins Valentin, “Crypto Timeline: The Evolution of Bitcoin, Blockchain, and Cryptocurrency Technologies” (March 30, 2020), online: BlockPublisher < https://blockpublisher.com/crypto-timeline-the-evolution-of-bitcoin-blockchain-and-cryptocurrency-technologies/ >.

Cory Kapeller, “Keeping Up with the Joneses: A Review, Critique and Analysis of Electronic Chattel Paper Approaches and Proposals” (23 January, 2019), online: JuliusErwin <www.juliuserwin.com/commercial-law1>.

Cristina Macias “Types of Crypto Assets” Soup.io < https://www.soup.io/types-of-crypto-assets#:~:text=Types%20of%20Crypto%20Assets%201%20Cryptocurrencies%20Digital%20currencies,5%20Privacy%20Coins%20...%206%20Crypto%20Collectibles%20 >.

Emily “Cryptoassets: the different types of cryptoassets” (May 26, 2018) online: Coin Weez < https://coinweez.com/different-types-cryptoassets/ >.

Francisco Memoria “The First Bitcoin Transactions: From a Test to the Famous Pizza Purchase” (October 7, 2021), online: CryptoCompare < https://www.cryptocompare.com/coins/guides/the-first-bitcoin-transactions-from-a-test-to-the-famous-pizza-purchase-1/ >.

Friedrich A. Hayek, “The Road to Serfdom” [London: The Institute of Economic Affairs, 2005].

George Michael Belardinelli "U.S stocks plummet, cryptocurrency and real estate follow" (August 29, 2022), online: the Cryptonomist < https://en.cryptonomist.ch/2022/08/29/us-down-real-estate-stocks-crypto/ >.

Greg Muecke, "What Makes for a Good Collateral Asset?" (January 6, 2021), online: Nasdaq < https://www.nasdaq.com/articles/what-makes-for-a-good-collateral-asset-2021-01-06 >.

James Chen "Margin Call" (January 4, 2022), online: Investopedia < https://www.investopedia.com/terms/m/margincall.asp >.

James Nehf, "Security Interests in Virtual Currencies" (March 2, 2020), Online: SSRN < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547540 >.

Jean Murray, "What is the Uniform Commercial Code: Definitions & Examples of the UCC" (11 September 2020), online: the balance small business < https://www.thebalancesmb.com/what-is-the-uniform-commercial-code-398505 >.

Jon Matonis, "What's Your Bitcoin Strategy? WordPress Now Accepts Bitcoin Across The Planet" (November 16, 2012), online: Forbes < https://www.forbes.com/sites/jonmatonis/2012/11/16/whats-your-bitcoin-strategy-wordpress-now-accepts-bitcoin-across-the-planet/?sh=2b9e80325f62 >.

Karim, "Do All Cryptocurrencies Use Blockchain? Types of Blockchain" (May 1, 2021), online: Coinwut < https://coinwut.com/cryptocurrencies-use-blockchain-types/ >.

Kieran Smith "6 Types of Crypto Assets You Need to Know About" (June 8, 2020), online: Crypto Currency News < https://cryptocurrencynews.com/6-types-crypto-assets/ >.

Kieran Smith, "6 Types of Crypto Assets You Need to Know About" (June 8, 2020), online: Crypto Currency News < https://cryptocurrencynews.com/6-types-crypto-assets/#:~:text=6%20Types%20of%20Crypto%20Assets%20You%20Need%20to,4%20Utility%20Tokens.%205%20Tokenized%20Assets.%20More%20items >.

Krutika Adani, "15 Major Companies That Accept Crypto Payments" (July 21, 2021), online: CoinsCapture < https://coinscapture.com/blog/15-major-companies-that-accept-crypto-payments >.

Kyle Peterdy, "Collateral Quality" (July 7, 2022) online: CFI < https://corporatefinanceinstitute.com/resources/knowledge/credit/quality-of-collateral/ >.

Mark Kolakowski "El Salvador Becomes Bitcoin Laboratory as First Nation to Adopt it as Legal Tender" (September 07, 2021), online: Investopedia < https://www.investopedia.com/el-salvador-accepts-bitcoin-as-legal-tender-5200470#:~:text=Bitcoin%20officially%20became%20legal%20tender%20in%20El%20Salvador,increasingly%20popular%20among%20many%20investors%20and%20speculators%20globally. >.

Meziane A. Lasfer, "Debt Structure, Agency Costs and Firm's Size: An Empirical Investigation", working paper, Cass Business School (2000).

Michael Sheetz, "A single anonymous market manipulator caused bitcoin to top $20,000 two years ago, study shows" (4 November 2019), online: CNBC <

https://www.cnbc.com/2019/11/04/study-single-anonymous-market-manipulator-pushed-bitcoin-to-20000.html >.

Mike Antolin, Toby Bochan, "Fiat-Backed Stablecoins: What You Need to Know About Tether, USD Coin and others" (March 22, 2023) online: CoinDesk < https://www.coindesk.com/learn/fiat-backed-stablecoins-what-you-need-to-know-about-tether-usd-coin-and-others/ >.

Nathan Reiff, "Top 5 Cryptocurrencies by Market Cap" (June 25, 2019), online: Investopedia < https://www.investopedia.com/news/top-5-cryptocurrencies-market-cap/ >.

Norman Siebrasse, "A Review of Secured Lending Theory" (The World Bank, 1997) online: ResearchGate < https://www.researchgate.net/publication/237830835_A_Review_of_Secured_Lending_Theory >.

Ontario Securities Commission, "QuadrigaCX, A Review of Staff of the Ontario Securities Commission" (14 April 2020), online: Ontario Securities Commission < https://www.osc.ca/sites/default/files/2020-10/QuadrigaCX-A-Review-by-Staff-of-the-Ontario-Securities-Commission.pdf >.

Oscar Lopez & Ephrat Livni, "In Global First, El Salvador Adopts Bitcoin as Currency" (September 7, 2021), online: The New York Times <www.nytimes.com/2021/09/07/world/americas/el-salvador-bitcoin.html>.

Owen D. Kurtin, "Wyoming's Digital Assets Law and How to Use It" (18 January 2022), online: Lexology < https://www.lexology.com/library/detail.aspx?g=72a5d03a-98c2-45d5-8bdd-ff98ac7b9730 >.

Paul de Havilland "Report Suggests Financial Advisors Moving into Crypto" (February 10, 2020), Online: CryptoBriefing < https://cryptobriefing.com/report-suggests-financial-advisors-moving-crypto/#:~:text=Only%206%25%20of%20financial%20advisors%20currently%20have%20crypto,also%20designed%20to%20measure%20intentions%20rather%20than%20actions >.

Rahul Nambiampurath, "These Countries Are Considering Making Bitcoin A Legal Tender" (June 30, 2022), online: IBT < https://www.ibtimes.com/these-countries-are-considering-making-bitcoin-legal-tender-3557424 >.

Robert T. Isham III "Wyoming's Digital Assets Amendments: Marked Out or Missed Out? A Review of Recent Amendments to Article 9 of the Wyoming UCC" (October 1, 2019) Online: ABA < https://www.americanbar.org/groups/business_law/publications/blt/2019/10/digital-assets/ >.

Ryan Browne, "Central African Republic becomes second country to adopt bitcoin as legal tender" (April 28, 2022), online: CNBC < https://www.cnbc.com/2022/04/28/central-african-republic-adopts-bitcoin-as-legal-tender.html >.

Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System" (2008), online: Bitcoin < https://bitcoin.org/bitcoin.pdf >.

Sean William, “20 Real-World Uses for Blockchain Technology” (April 11, 2018) online: TheMotleyFool < https://www.fool.com/investing/2018/04/11/20-real-world-uses-for-blockchain-technology.aspx#:~:text=20%20Real-World%20Uses%20for%20Blockchain%20Technology%201%20Payment,...%205%20Data%20sharing.%20...%20More%20items...%20 >.

Stephen Graves & Daniel Philips, “The 10 Public Companies With the Biggest Bitcoin Portfolios” (July 25, 2022), online: Decrypt < https://decrypt.co/47061/public-companies-biggest-bitcoin-portfolios >.

Syed Shoeb, “Why Borrow Cryptocurrencies against Your Collateral?” (October 3, 2019), online: Medium < https://medium.com/nuo-news/why-borrow-cryptocurrencies-against-your-collateral-nuo-network-2082875cec76#:~:text=Well%2C%20they%20can%20pledge%20them%20as%20collateral%20to,obtain%20funds%20to%20use%20without%20selling%20their%20holdings. >.

Timothy Jones & Dillon Collett, “Cryptocurrency Assets Under Insolvency and Personal Property Security Law” (February 15, 2018), online: Aird & Berlis, <www.airdberlis.com/insights/publications/publication/cryptocurrency-assets-under-insolvency-and-personal-property-security-law>.

Vanya Gautam, “Countries Where Cryptocurrency Is Taxed” (February 12, 2022), online: India Times < https://www.indiatimes.com/worth/investment/countries-where-crypto-is-taxed-561760.html >.

Wes Kaplan, “Digitized Gold: Why Going Digital is The Smartest Way to Own Gold” (January 29, 2021) online: Nasdaq < https://www.nasdaq.com/articles/digitized-gold%3A-why-going-digital-is-the-smartest-way-to-own-gold-2021-01-29 >.

Online Sources

“An Introduction to Central Bank Digital Currencies (“CBDCs”)”, online: Deloitte: < https://www2.deloitte.com/global/en/pages/financial-services/articles/cbdc-central-bank-digital-currency.html >.

“Bitcoin Year in Review: 2014 – A Year to Remember” (March 4, 2021) online: CCN < https://www.ccn.com/bitcoin-year-in-review-2014/ >.

“Canada Revenue Agency “What is Cryptocurrency?” (January 26, 2022), online: Canada.ca < https://www.canada.ca/en/revenue-agency/news/newsroom/tax-tips/tax-tips-2022/what-cryptocurrency.html >.

Canadian Securities Administrators “Crypto Assets”, online: CSA: <https://www.securities-administrators.ca/investor-tools/crypto-assets/>.

CFI Team, “Distributed Ledger Technology” (October 9, 2022), online: CFI < https://corporatefinanceinstitute.com/resources/cryptocurrency/distributed-ledger-technology/ >.

CFI Team, "Overcollateralization" (February 2, 2021), online: CFI < https://corporatefinanceinstitute.com/resources/knowledge/credit/overcollateralization/#:~:text=Overcollateralization%20is%20a%20credit%20enhancement%20technique%20and%20limits,the%20collateral%20to%20redeem%20any%20potential%20loan%20losses. >.

CFI Team "Smart Contracts" (January 29, 2021) online: CFI < https://corporatefinanceinstitute.com/resources/knowledge/deals/smart-contracts/ >.

Department of the Treasury, Financial Crimes Enforcement Network, "FIN-2013-G001: Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies", (March 18, 2013), online: FinCen < https://www.fincen.gov/sites/default/files/guidance/FIN-2013-G001.pdf >.

Merriam Webster Dictionary, online: Merriam-Webster < https://www.merriam-webster.com/dictionary/cryptocurrency >.

Ontario Securities Commission, "CSA Staff Notice 46-307 Cryptocurrency Offerings" (August 24, 2017), Online: Ontario Securities Commission < https://www.osc.ca/en/securities-law/instruments-rules-policies/4/46-307/csa-staff-notice-46-307-cryptocurrency-offerings >.

Ontario Securities Commission, "In the Matter of CoinLaunch Corp.- Settlement Agreement" (July 18, 2019), online: Ontario Securities Commission < https://www.osc.ca/sites/default/files/pdfs/proceedings/set_20190719_coinlaunch.pdf >.

Oxford Learner's Dictionary, < https://www.oxfordlearnersdictionaries.com/us/ >.

Prefatory Note to 2022 ULC Annual Meeting (February 23, 2023), online: ULC < https://higherlogicdownload.s3-external-1.amazonaws.com/UNIFORMLAWS/2e456b4d-7e6a-18b7-116c-7971f84a8393_file.pdf?AWSAccessKeyId=AKIAVRDO7IEREB57R7MT&Expires=1677474432&Signature=Zei4iU1K65FYNgldXWEl8Pm2HX4%3D >.

"Secured Transactions in the United States", online: Primidi.com < https://www.primidi.com/secured_transactions_in_the_united_states >.

TechnologyHQ, "Blockchain Smart Contracts: Challenges and Opportunities" (January 29, 2019) Online: TechnologyHQ < https://www.technologyhq.org/smart-contracts-challenges-and-opportunities/ >.

Today's Cryptocurrency Prices by Market Cap" (10 January 2023) online: CoinMarketCap < https://coinmarketcap.com/ >.

Top Cryptos by Volume (all currencies, 24hr)" (August 9, 2022), online: Yahoo finance < https://finance.yahoo.com/u/yahoo-finance/watchlists/crypto-top-volume-24hr/ >.

Uniform Law Commission "Why Your State Should Adopt The 2022 Amendments to the Uniform Commercial Code" < https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=e91a7611-ca92-c16e-5d19-6d275da97fcd&forceDialog=0>.

Uniform Law Commission, "Overview of 2022 Amendments to the Uniform Commercial Code – Emerging Technologies" Online: ULC <

https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=a116549b-6067-5f82-83ac-3501c7ad882d&forceDialog=0 >.

UCC, 2022 Amendments to, (October 11, 2022) Online: ULC < https://www.uniformlaws.org/committees/community-home?communitykey=1457c422-ddb7-40b0-8c76-39a1991651ac >.

What is Mining?" (13 February 2023), online: Coinbase < https://www.coinbase.com/learn/crypto-basics/what-is-mining >.

Why was Cryptocurrency Created, Was there a Reason?" (September 30, 2021), online: CryptoSetGo < https://cryptosetgo.com/why-was-cryptocurrency-created-was-there-a-reason/#:~:text=The%20main%20reason%20why%20Bitcoin%20was%20created%20back,on%20time%20Crypto%20is%20the%20new%20international%20currency. >.