

**ASSESSING THE EMERGENCE OF  
"ALTERNATIVE" CURRENCIES AND LEGAL  
RISK: THE CONSUMER'S PERSPECTIVE**



**PUBLIC INTEREST ADVOCACY CENTRE  
LE CENTRE POUR LA DÉFENSE DE L'INTÉRÊT PUBLIC**

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Assessing the Emergence of "Alternative" Currencies and Legal Risk: The  
Consumer's Perspective

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## Executive Summary

The emergence of cryptocurrencies less than a decade ago and their rapid growth both in terms of value and use has certainly captured the public imagination and has given rise to significant, and variable responses from the governments, central banks, regulators, media, and users. However, their actual use, application and prospects remain uncertain and unpredictable. This report seeks to assess their scope and impact on the average Canadian consumer. It specifically studies their viability as payment systems in the Canadian retail market and notes the regulatory initiatives and challenges in this respect. The goal of this project is to understand the risks for consumers in this context, and deduce the regulatory measures needed for consumer protection by drawing insight from documentary and literary research, input from stakeholders, and international practices and frameworks.

The first chapter outlines the scope of the report, including explanatory details as to the terminology used, resources relied on, and some of the challenges faced in writing this report. The second chapter explores the use and growth of cryptocurrencies as payments systems and as investment vehicles, globally and within Canada. The third chapter reviews the nature, working and distinguishing characteristics of some of the major cryptocurrencies currently in use. It includes an overview of different types of cryptocurrencies, identifying their distinctive applications and uses. This is followed by a discussion of the possibility of government issued digital currencies. The fourth chapter analyzes the relevance of cryptocurrencies to the average consumer, mainly as payment systems, with a brief discussion on their use as investment vehicles, focusing on identifying the consumer risks in both instances. The fifth chapter examines the emerging regulatory initiatives in different jurisdictions, and evaluates their relevance for Canada. Finally, the sixth chapter outlines our main findings and recommendations.

We hope that our report's findings and recommendations will initiate discussions, and create more awareness amongst stakeholders and governments on the consumer protection issues surrounding cryptocurrencies and on the types of regulatory frameworks that may be necessary in Canada.

Our findings and recommendations are as noted:

**Our Findings:**

- ❖ Presently, cryptocurrencies seem to have little relevance for the average consumer as payment systems. Their current design limitations, significantly limit their ability to provide the speed, or handle the volumes required of, typical retail payment systems in today's commercial environment. Further, their level of acceptance as payment mechanisms by both consumers and merchants is extremely limited.
- ❖ Use of cryptocurrencies as speculative investment vehicles also seems to be of little practical significance for the average consumer who needs predictability and security when using investment instruments for household savings and retirement provision. Given their volatility and unpredictable swings in value, cryptocurrencies are highly risky investment vehicles and consumers who use them should be prepared for potentially significant losses, as well as potential gains.
- ❖ Young consumers more likely to invest in cryptocurrencies, and generally deem such currencies to be less risky than older consumers.
- ❖ It is conceivable that in the future, cryptocurrencies could become more relevant for consumers, particularly as payment systems, but for that to happen significant challenges have to be overcome with respect to their volatility, their poor performance in terms of handling the volume and speed of transactions required, and the lack of basic consumer protections governing their use.
- ❖ Several countries have shown some willingness to regulate cryptocurrencies, but none of the studied countries have a single comprehensive regulatory regime in place. The present regulatory approaches abroad and in Canada have been found to be unclear, limited and cautious and none of the current regulatory regimes seem to govern the use of cryptocurrencies as payment systems.

Lack of a clear definition for cryptocurrencies that can be treated as assets, property, securities and or commodities, often in the same jurisdiction, makes it challenging to develop a comprehensive regulatory model.

- ❖ Central banks, in particular, seem unwilling to accept the idea of cryptocurrencies operating as mainstream payment systems; indeed, many prominent central bankers often dismiss such currencies as equivalent to speculative bubbles.
- ❖ Until clear regulatory reform is implemented and there is some stability in their value, cryptocurrencies will likely remain of limited relevance to an average consumer as payment systems and or investment vehicles in the near future.
- ❖ The idea of a central bank issued digital currency, also known as a CBDC, has been analysed by several central banks. However, at this time it does not appear as if any central bank views the issuance of a CBDC as something that they would engage in for the foreseeable future, although the benefits of such a currency for consumers, if it were to be proven to be feasible, could be substantial.

### **PIAC's Recommendations:**

**Recommendation 1:** Given the risks associated with cryptocurrencies, and their growing availability to consumers, governments and regulators should adopt an even more active role in developing consumer education and awareness initiatives on the risks involved in using such currencies. The Ontario Securities Commission and the Financial Consumer Agency of Canada have made a useful start in raising some consumer awareness. However, given the scale of the issue, and the potential for consumer harm, more needs to be done, with better publicizing of the existing resources, for greater consumer access.

**Recommendation 2:** Consumers must exercise caution when dealing with cryptocurrencies in any form, either for retail payments, investment opportunities or storing value; so as to mitigate risks, such as, losing money from hacking, theft, and scams.

**Recommendation 3:** Given the demonstrable significant risks that consumers can face when dealing with cryptocurrencies, the federal Department of Finance should convene a public and transparent working group of key stakeholders, including the FCAC, the Bank of Canada, securities commissions, financial institution regulators and consumer and investor protection groups to review the risks to consumers of using cryptocurrencies both as payment systems and investment vehicles.

The working group should consider what recommendations to make to both federal and provincial governments on appropriate consumer awareness and education initiatives and what new or enhanced rules and regulations are required to deal with cryptocurrencies as investment vehicles, the promotion of ICOs and businesses exchanging or trading in cryptocurrencies, and what consumer protections are necessary for cryptocurrency payment networks and businesses dealing in, exchanging or holding cryptocurrencies. The public working group should also consider setting rules for complaint processes, enforcement mechanisms and dispute resolutions.

**Recommendation 4:** The Canada Revenue Agency should consider introducing a comprehensive plain language guide for individuals about the tax liabilities they may incur when dealing with cryptocurrencies.

## Table of Contents

<b>Acknowledgements .....</b>	<b>iii</b>
<b>Executive Summary.....</b>	<b>iv</b>
<b>Chapter 1: Introduction.....</b>	<b>1</b>
1.1 Purpose and Organization .....	1
1.2 Definitions and Study Timeframe.....	2
1.3 Stakeholder Consultations .....	3
<b>Chapter 2: The Growth and Use of Cryptocurrencies Globally and in Canada.....</b>	<b>5</b>
Introduction .....	5
2.1 Overview: Emergence of Cryptocurrencies .....	5
2.2 Global Use and Growth .....	6
2.3 Use and Growth in Canada .....	13
2.4 Conclusion .....	15
<b>Chapter 3: What are Cryptocurrencies? .....</b>	<b>17</b>
Introduction .....	17
3.1 History and Development.....	17
3.2 Defining Cryptocurrencies.....	20
3.3 Cryptocurrencies vs. Digital Currencies .....	24
3.4 Cryptocurrencies vs. Fiat Currencies .....	25
3.5 Cryptocurrencies vs. Digital Payment Systems Based on Fiat Currencies	27
3.6 Types of Cryptocurrencies.....	29
3.7 Cryptocurrencies and Market Value? .....	36
3.8 Potential of Government issued Digital Currencies .....	38
3.9 Conclusion .....	41
<b>Chapter 4: Are Cryptocurrencies Really an Option for the Average Consumer – What are the Legal Risks in using them? .....</b>	<b>42</b>
Introduction .....	42

4.1	Using Cryptocurrencies as Payment Mechanisms.....	43
4.2	Using Cryptocurrencies as Store of Value .....	48
4.3	Using Cryptocurrencies as Units of Account.....	50
4.4	Using Cryptocurrencies as Investment Vehicles.....	51
4.5	Summary of Main Findings.....	54
<b>Chapter 5: Regulating Cryptocurrencies abroad and in Canada: Does Regulation have a benefit for the Average Consumer? .....</b>		<b>56</b>
Introduction .....		56
5.1	Reasons for Regulation.....	56
5.2	Regulatory Approaches and Challenges.....	61
5.3	United States of America (U.S.).....	62
5.4	European Union (EU).....	70
5.5	Australia .....	75
5.6	Other Jurisdictions .....	77
5.7	Canada .....	77
5.8	Conclusion .....	82
<b>Chapter 6: Conclusions and Recommendations.....</b>		<b>84</b>
6.1	How Significant are Cryptocurrencies for Consumers? .....	84
6.2	Using Cryptocurrencies as Store of Value .....	87
6.3	Using Cryptocurrencies as Units of Account.....	89
6.4	Recommendations.....	91

## Chapter 1: Introduction

### 1.1 Purpose and organization

This paper is designed to assess the implications for the average Canadian consumer of the recent advent of virtual or digital currencies and the legal risks that may emerge for consumers in using them, including as payment systems in the Canadian retail market.

Digital or virtual currencies, which in this paper we call “cryptocurrencies”, are of very recent origin. The very first cryptocurrency, Bitcoin, made its appearance in January 2009, and since that time, many other versions of cryptocurrencies have been launched. In fact, according to a media report (from February 2018), over 1,500 cryptocurrencies exist in the marketplace.<sup>1</sup> Cryptocurrencies’ total market capitalization saw a new record of over US\$700 billion in January 2018,<sup>2</sup> which was followed by a sharp drop to US\$ 331.7 billion, as on March 15, 2018.<sup>3</sup>

Bitcoin, is still the predominate cryptocurrency, representing over 70% of the market capitalization of cryptocurrencies in March 2017,<sup>4</sup> with reports confirming that Bitcoin still remains one of the most popular cryptocurrencies in March 2018.<sup>5</sup> By any measure, the level of growth experienced by cryptocurrencies in less than a decade is a remarkable one for any marketplace phenomenon, let alone an entirely new form of money, and worthy of study from a consumer perspective on those grounds alone.

In this paper we review in more detail the growth of cryptocurrencies and the uses to which they are being put. We also examine how these currencies function, how they are different from government issued, or fiat, currencies, the different varieties of

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<sup>1</sup> Matthew Veitch, “Cryptocurrency 101” *The Varsity* (25 February 2018), online: <<https://thevarsity.ca/2018/02/25/cryptocurrency-101/>>.

<sup>2</sup> Will Martin, “The global cryptocurrency market hit a new record high above \$700 billion” *Business Insider UK* (3 January 2018), online: <<http://uk.businessinsider.com/bitcoin-price-global-cryptocurrency-market-capitalisation-january-3-2018-1>>.

<sup>3</sup> Arjun Kharpal, “Over \$60 billion wiped off value of cryptocurrencies in 24 hours as bitcoin slide continues” *CNBC* (15 March 2018), online: <<https://www.cnbc.com/2018/03/15/bitcoin-price-over-60-billion-wiped-off-value-of-cryptocurrencies.html>>.

<sup>4</sup> Garrick Hileman and Michel Rauchs, “Global Cryptocurrency Benchmarking Study”(2017) - Cambridge: Centre for Alternative Finance, Judge Business School, University of Cambridge, at p. 16, online: <[https://www.jbs.cam.ac.uk/fileadmin/user\\_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf](https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf)>.

<sup>5</sup> Panos Mourdoukoutas, “Bitcoin, Ethereum And Litecoin Are The Most Popular Cryptocurrency Investments Among Millennials” *Forbes* (25 March 2018), online: <<https://www.forbes.com/sites/panosmourdoukoutas/2018/03/25/bitcoin-ethereum-and-litecoin-are-the-most-popular-cryptocurrency-investments-among-millennials/#41d148d776dd>>.

cryptocurrencies in the marketplace, and how they are distinguished one from another. We then move on to evaluate how relevant cryptocurrencies are for the average consumer from the perspective of their use as payment systems, as units of account (e.g. for comparing prices), as systems to store value, and finally as investment vehicles. In the context of this analysis we also assess the relative legal risks cryptocurrencies pose for consumers in each of those roles.

Having addressed the important questions of the attributes of cryptocurrencies and their use in the marketplace, we move on to examine the important question of the regulatory initiatives that have been taken, or are being considered, by governments to deal with cryptocurrencies, focusing on measures for consumer protection. Finally, in our concluding chapter, we speculate briefly on what the future might hold for consumers as cryptocurrencies evolve and whether changes in the regulatory approaches by governments may change the relative attractiveness of these currencies for consumers.

## 1.2 Definitions and Study Timeframe

Bitcoin and other types of computer generated currencies have been termed many things: digital currencies, virtual currencies, and even algorithmic currencies in order to distinguish them from traditional government issued money, or fiat currencies. The lack of an agreed term is not surprising given that they are a very new and unusual phenomenon. We have chosen the term “cryptocurrencies” for a number of reasons. First, cryptocurrency appears to be one of the most commonly used terms today to describe these currencies. Second, the term specifically describes the technology that is used to create these currencies: cryptographic algorithms which have been used to create, on computers, units of account that have distinct identities that cannot be duplicated - the digital equivalent of banknotes. Other terms, such as virtual or digital currencies, are in our view, too general as they can include electronic versions of fiat currency (e.g. credit card payment systems, or PayPal accounts), or other forms of currency of a non-money character (e.g. air miles, or game currencies).

Because the phenomenon of cryptocurrencies is both a new area and one that is changing rapidly, and often quite radically, keeping up-to-date and current in a research paper of this character is a challenging proposition and there is no way of avoiding the fact that, very soon after a manuscript is completed, the landscape may change quite substantially. For example, the data cited in this report, including but not limited to, cryptocurrencies’ market price, market caps and any other valuation figures, vary considerably over time

and are very volatile. Consequently, we have tried to include dates where possible with the data cited in the report so that it is clear to the reader the time period being addressed.

The reader is further cautioned that research and analysis for this paper ceased at the end of April, 2018 and does not take into account events that took place, or literature or reporting published, past that date. Considering the large volume of research and news available on this matter, this report does not purport to cover every consumer issue and risk regarding the use of cryptocurrencies as payment systems and investment vehicles. That said, we have endeavored to cover what we find as significant consumer risks, specifically, concerning cryptocurrencies' use as payment systems in Canada.

Finally, given the quickly changing character of the area we have been forced to rely heavily on secondary sources from online publications, periodicals and media reporting, especially online, given the paucity of academic literature on more recent events. The time it takes for peer reviewed articles and analysis to appear means that important issues that happen a year or two ago, often lack any serious published analysis in traditional academic journals. Nonetheless, we have relied on well-established news and online sources for our source material and feel the importance of being current in an area such as this outweighs the practice of relying solely, or principally, on peer reviewed academic source material.

### **1.3 Stakeholder Consultations**

To assist with this study, a stakeholder consultation was carried out in May 2018 after we had completed our documentary research and drafted our initial text. The consultation consisted of a questionnaire to financial industry participants including industry associations, government regulators, consumer groups and academics in Canada and some international regulatory organizations. We asked about: how they defined cryptocurrencies; their assessments of the benefits of cryptocurrencies for consumers; problems or complaints they had received about cryptocurrencies; views on regulatory initiatives required, and the future prospects of cryptocurrencies.

Of the 41 stakeholders we sent our questionnaire to, we received 8 responses in which some were in the form of information resources, and others, responses to our specific questions. In general, most stakeholders were guarded in their written comments to our questions, in particular because this was for them a relatively new area and stakeholders' experience with cryptocurrencies was somewhat limited.

In general, the responses we received on the issues and problems consumers face with cryptocurrencies broadly corresponded with the research we carried out for this study. Stakeholders were circumspect and guarded in terms of their assessment about the future prospects for cryptocurrencies as either investments or a payment system for consumers. The Canadian regulators that responded to our questionnaire reported only a few inquiries and complaints about cryptocurrencies from individuals over the last few years, again likely reflecting the newness of these currencies and the lack of clarity about which agency is responsible for them, given the very limited regulatory oversight that applies to cryptocurrencies at present.

That said, our report's findings and analysis is informed by this feedback; which has been helpful in clarifying concepts, and confirming our findings on key issues, and assisting us in making recommendations. Where specific evidence cited in the report was corroborated by stakeholders, or specific insights were provided by stakeholders, we have noted this in the text.

## Chapter 2: The Growth and Use of Cryptocurrencies Globally and in Canada

### Introduction

The excitement surrounding cryptocurrencies is hardly surprising, considering, they could significantly change how we pay for goods and services, store and exchange value, and conduct various financial transactions. However, whether these changes will prevail in the long-term, or gradually decline and disappear, is hard to decipher at the moment. Further, the increasing popularity of cryptocurrencies has also given rise to major concerns, such as their fluctuation in value, use to support unlawful activities, scams, hacking, and risks to data security, amongst other issues. Finally, there has been a great deal of uncertainty amongst analysts concerning the long term overall impact of cryptocurrencies on the economy and global markets.

This chapter provides an overview of cryptocurrencies' usage and market growth abroad, and in Canada. The first part of this chapter explores their use and growth in the global market as payment mechanisms, with some discussion of their use as investment vehicles. The second part discusses their use and growth in Canada. Some data limitations are also identified, which restrict the degree to which global and Canadian trends can be compared.

### 2.1 Overview: Emergence of Cryptocurrencies

Since their emergence, cryptocurrencies have regularly been in the news, largely due to their unique decentralized ledger technology, the potential they represent to alter the nature of how financial transactions take place, and because of their considerable value fluctuations.

Bitcoin, the most popular cryptocurrency, reached a market value of US\$20,000 per coin in December 2017, a dramatic jump from its initial value of \$0.06 per coin in 2010.<sup>6</sup> Simply put, this means that a Bitcoin investment of \$10 back in 2010, could now be worth about US\$2 million.<sup>7</sup> However, in early 2018, Bitcoin saw a drastic dip in its price.<sup>8</sup>

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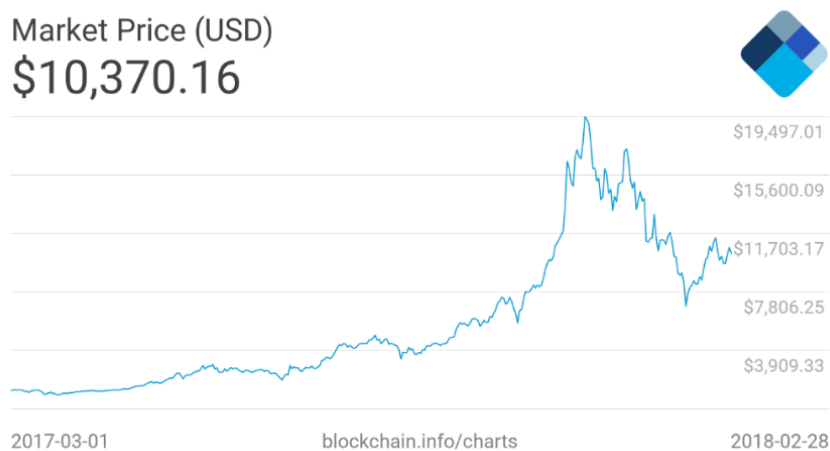
<sup>6</sup> Matthew Veitch, "Cryptocurrency 101" *The Varsity* (25 February 2018).

<sup>7</sup> *Ibid.*

<sup>8</sup> Some news stories covering this are; Alex Hern and Richard Partington, "Bitcoin's January fall wipes off \$44bn in value" *The Guardian* (2 February 2018), online: <<https://www.theguardian.com/technology/2018/feb/01/bitcoins-january-fall-wipes-off-44bn-in-value>>; and Annie Nova, "Bitcoin is having a nightmare year so far. Here's how to deal," *CNBC* (1 February 2018), online: <<https://www.cNBC.com/2018/02/01/january-was-bitcoins-worst-month-on-record-heres-how-to-stay-calm.html>>.

Bitcoin’s market value across major Bitcoin exchanges (on March 1, 2018) stood at around US\$10,731.14 per coin, with around 208,881 transactions per day.<sup>9</sup> Bitcoin’s market capitalization as on March 1, 2018 stood at US\$181.3 billion, with a 24-hour transaction value of US\$2.2 billion.<sup>10</sup> Overall, these are impressive growth numbers for a period of about a decade.

**Figure 2-1: Bitcoin Average Market Price from March 2017 to February 2018**



Source: [Blockchain.info](https://blockchain.info) (2018)

## 2.2 Global Use and Growth

A global cryptocurrency benchmarking study (2017) conducted by the Cambridge Centre for Alternative Finance, involving cryptocurrency companies and organizations across 38 countries and five world regions, including Canada, revealed that the active users of cryptocurrency wallets globally, at the time of the study, were estimated to be between 2.9 million and 5.8 million individuals.<sup>11</sup> The study noted that calculating the precise number of cryptocurrency holders and users remains challenging, because individuals can use more than one wallet at a time, and have exchange accounts for different cryptocurrencies.<sup>12</sup>

<sup>9</sup> Blockchain Charts, online: <<https://blockchain.info/charts>>. (Last accessed on March 1, 2018).

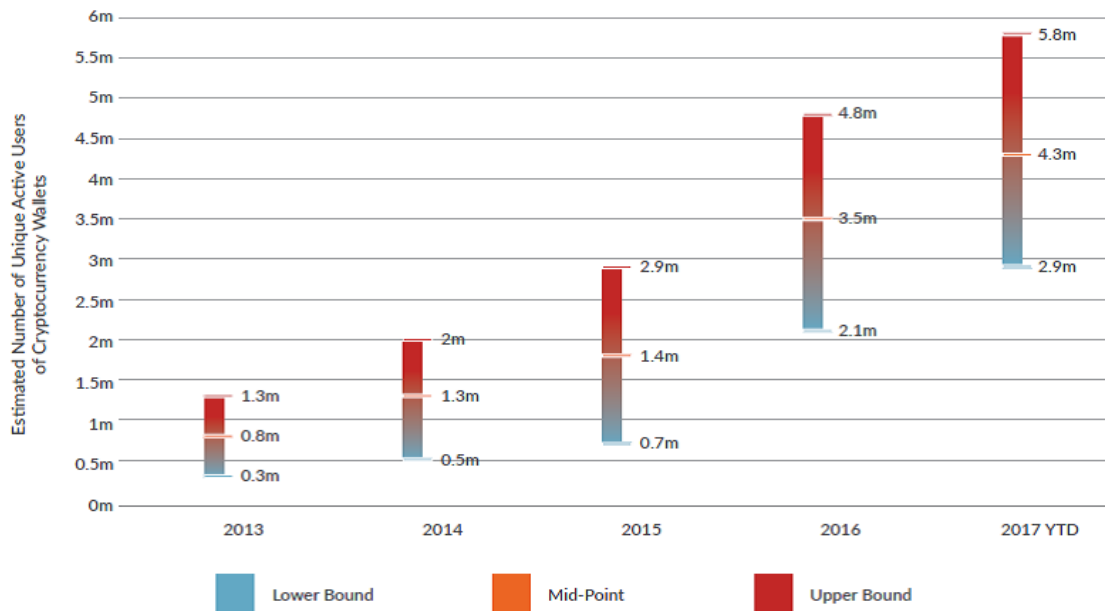
<sup>10</sup> Blockchain Market Statistics, online: <<https://blockchain.info/markets>>. (Last accessed on March 1, 2018).

<sup>11</sup> Garrick Hileman and Michel Rauchs, “Global Cryptocurrency Benchmarking Study” at p. 27.

<sup>12</sup> Garrick Hileman and Michel Rauchs, “Global Cryptocurrency Benchmarking Study” at p. 27.

## Figure 2-2: Growth in the number of active cryptocurrency users

Figure 10: The estimated number of unique active users of cryptocurrency wallets has grown significantly since 2013 to between 2.9 million and 5.8 million today



Source: [Global Cryptocurrency Benchmarking Study \(2017\)](#)

This benchmarking study referred to earlier studies indicating that in 2016, around 10 million people around the world owned Bitcoin, with 0.87% of US consumers owning cryptocurrency in 2015, which amounted to around 2.8 million people.<sup>13</sup> In recent years the valuation of cryptocurrency holdings has also expanded substantially with the combined market capitalization, (the market price multiplied by the number of existing currency units) increasing three fold since early 2016, reaching up to US\$27 billion in April 2017, just before the huge speculative growth in Bitcoin and other cryptocurrencies in the latter part of last year, but then collapsed in early 2018.<sup>14</sup> That said, the market capitalization for Bitcoin has grown substantially since then and, stood at US\$181.3 billion on March 1, 2018.<sup>15</sup>

It is interesting to note the age groups most involved in Bitcoin. Coin Dance's research (as on March 13, 2018) indicated that it is primarily millennials, those between 25-34,

<sup>13</sup> *Ibid.* (For US, it referred to a report from the Boston Federal Reserve (2016)).

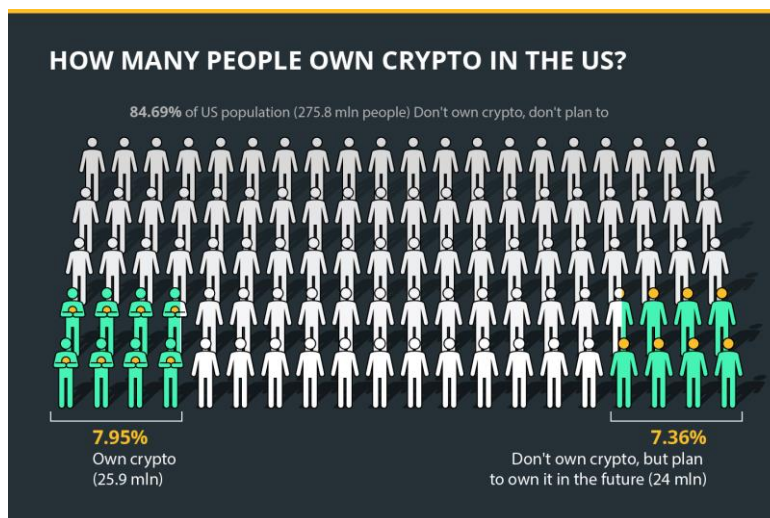
<sup>14</sup> *Id.* at p. 16.

<sup>15</sup> This reflects bitcoin's market cap on March 1, 2018. The market cap keeps on changing as its market price and exchange rate keeps on fluctuating.

who are most engaged in Bitcoin at 45.71%, next is the age group of 35-44 at 30.62%, followed by the cohort in the 45-54 age group at 12.3%.<sup>16</sup> Those over 55 represent less than 4% of users, despite the fact that this group is most likely to have the resources to be involved in investment activities.<sup>17</sup>

Similarly, a survey by Finder.com (March 2018) revealed that millennials showed more interest in purchasing cryptocurrencies.<sup>18</sup> Though, out of its 2,001 participants (American adults), only 7.95% had actually bought cryptocurrencies.<sup>19</sup> The survey suggested that there are several reasons holding back US consumers from buying cryptocurrencies. Some reasons cited for not using cryptocurrencies included: too complicated to understand, too difficult to use, it's a scam, there are too many fees, no need or disinterest, it's a bubble or because of high risks.<sup>20</sup>

**Figure 2-3: Number of Crypto Owners in the US**



Source: [Cointelegraph](#) with data from [Finder.com](#) (2018)

<sup>16</sup> CoinDance, Bitcoin Community Engagement by Age (18+ only) Summary, online: <https://coin.dance/stats/age>. (The statistics used in this report are from March 13, 2018).

<sup>17</sup> *Ibid.*

<sup>18</sup> Finder.com, “Why haven’t we all bought cryptocurrency yet?” online: <https://www.finder.com/why-people-arent-buying-cryptocurrency>; (Last accessed on March 26, 2018) and Molly Jane Zuckerman, “New Survey Shows Around 26 Mln Americans Own - And 8 Percent Plan To Buy – Cryptocurrencies” *Cointelegraph* (March 20, 2018), online:

<https://cointelegraph.com/news/new-survey-shows-around-26-mln-americans-own-and-8-percent-plan-to-buy-cryptocurrencies>. The numbers cited here may be subject to change.

<sup>19</sup> Finder.com survey, “Why haven’t we all bought cryptocurrency yet?”

<sup>20</sup> *Ibid.*

This data indicates that many consumers in the US are presently either cautious about, or not interested in, purchasing such currencies. Again, young consumers are found to have more interest in them. We will reflect on this fact in more detail ahead.

### 2.2.1 Global Use as Payment Systems

The two common global uses of cryptocurrencies appear to be: facilitating payment transactions; and serving as investment vehicles.<sup>21</sup> We consider each of these uses in some detail.

A growing number of businesses are now accepting cryptocurrencies for buying their goods and services. These include, Overstock.com, Expedia, Microsoft, Shopify stores, eGifter, and others.<sup>22</sup> Some countries where cryptocurrencies are playing an active role in the retail sector, include: Japan, which began to accept Bitcoin as a legal payment method for retail markets in April 2017;<sup>23</sup> the U.S., where merchants are increasingly accepting cryptocurrencies as a payment method and store of value; and Australia, which has also has indicated support for use of cryptocurrencies.<sup>24</sup> Germany's Finance Minister recently announced that it would not tax Bitcoin users when they use it as a means of payment.<sup>25</sup>

Some reports find that cryptocurrencies' use in the financial sector provides significant benefits, such as, relatively faster payments, no third-party interruptions, and potentially lower transaction fees.<sup>26</sup> However, other reports have indicated issues such as, Bitcoin's

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<sup>21</sup> Alex Hern, "Bitcoin and cryptocurrencies – what digital money really means for our future" *The Guardian* (29 January 2018), online: <<https://www.theguardian.com/technology/2018/jan/29/cryptocurrencies-bitcoin-blockchain-what-they-really-mean-for-our-future>>; and Ben Chapman, "Bitcoin: What is it, where can you use it and is it worth investing?" *Independent* (5 January 2018), online: <<https://www.independent.co.uk/news/business/news/bitcoin-what-is-cryptocurrency-where-use-investment-dark-web-illegal-explained-value-exchange-rate-a8082491.html>>.

<sup>22</sup> Elise Moreau, "13 Major Retailers and Services That Accept Bitcoin" *lifewire* (1 March 2018), online: <<https://www.lifewire.com/big-sites-that-accept-bitcoin-payments-3485965>>.

<sup>23</sup> Lester Coleman, "Japan Accepts Bitcoin as Legal Payment Method. What's Next?" *CCN* (5 April 2017), online: <<https://www.ccn.com/japan-accepts-bitcoin-as-legal-payment-method-whats-next/>>.

<sup>24</sup> Lorenzo Fioramonti, "Alternative currencies are the future: why it matters for development" *The Conversation* (2 July 2017), online: <<http://theconversation.com/alternative-currencies-are-the-future-why-it-matters-for-development-80036>>.

<sup>25</sup> Nikhilesh De, "Germany Won't Tax You for Buying Coffee With Bitcoin" *CoinDesk* (28 February 2018), online: <<https://www.coindesk.com/germany-considers-crypto-legal-equivalent-to-fiat-for-tax-purposes/>>.

<sup>26</sup> Ameer Rosic, "7 Incredible Benefits Of Cryptocurrency" *HuffPost* (23 November 2016, last updated on 6 December 2017), online:

<[https://www.huffingtonpost.com/ameer-rosic-/7-incredible-benefits-of-1\\_b\\_13160110.html](https://www.huffingtonpost.com/ameer-rosic-/7-incredible-benefits-of-1_b_13160110.html)>; and MyBitcoin.com, "The Top 7 Benefits of Using Bitcoins Over Normal Currencies" online: <<https://www.mybitcoin.com/cryptocurrency-vs-fiat-bitcoin-benefits/>>.

higher transaction fees,<sup>27</sup> slow transaction times,<sup>28</sup> and high production costs (energy consumption)<sup>29</sup> as hindering its wide-scale adoption as a payment system. These inconsistent findings suggest that, at present, there appears to be no consensus as to the future viability, and precise benefits of using cryptocurrencies as payment systems.

Many merchants' interest in accepting Bitcoin in retail and online stores, was reported to have seen a dip in January 2018 because of Bitcoin's increasing transaction fees and unstable price.<sup>30</sup> And some reports claim that Bitcoin, as a payment system, may really be of interest only to relatively well-off consumers.<sup>31</sup>

Also, the scope for using cryptocurrencies as a payment mechanism may be further reduced because of the knock-on effects of concerns about fraudulent or misleading marketing methods associated with sales offers for cryptocurrencies, marketing of Initial Coin Offerings or financing of mining operations. For example, Facebook banned advertisements for all cryptocurrencies in early 2018, as a policy objective to address deceptive marketing practices.<sup>32</sup> Google also announced recently that effective from June 2018, all ads for cryptocurrencies, including Bitcoin, will be banned, aiming to address risks, such as online scams<sup>33</sup> Twitter and LinkedIn have followed in the footsteps of Google and Facebook, and implemented bans on cryptocurrency ads, in an apparent bid to secure their reputation in protecting their users.<sup>34</sup>

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<sup>27</sup> Ryan Browne, "Big transaction fees are a problem for bitcoin — but there could be a solution" *CNBC* (19 December 2017, last updated on 21 December 2017), online:

<https://www.cnn.com/2017/12/19/big-transactions-fees-are-a-problem-for-bitcoin.html>

<sup>28</sup> *Ibid.*

<sup>29</sup> Alex Hern, "Bitcoin's energy usage is huge – we can't afford to ignore it" *The Guardian* (17 January 2018), online: <<https://www.theguardian.com/technology/2018/jan/17/bitcoin-electricity-usage-huge-climate-cryptocurrency>>.

<sup>30</sup> Noelle Acheson, "What Can You Buy with Bitcoin?" *CoinDesk* (20 January 2018), online: <<https://www.coindesk.com/information/what-can-you-buy-with-bitcoins/>>.

<sup>31</sup> Darryn Pollock, "Can Bitcoin Claw its Way Back to Being a Payment System?" *Cointelegraph* (29 January 2018), online: <<https://cointelegraph.com/news/can-bitcoin-claw-its-way-back-to-being-a-payment-system>>.

<sup>32</sup> Adi Robertson, "Facebook bans all ads for Bitcoin, ICOs, and other cryptocurrency" *The Verge* (30 January 2018), online: <<https://www.theverge.com/2018/1/30/16951670/facebook-cryptocurrency-bitcoin-ico-deceptive-marketing-ban>>.

<sup>33</sup> Samuel Gibbs, "Google bans bitcoin adverts in cryptocurrency crackdown" *The Guardian* (14 March 2018), online: <<https://www.theguardian.com/technology/2018/mar/14/google-bans-bitcoin-adverts-cryptocurrency-crackdown>>.

<sup>34</sup> Thomas Wilson, "Twitter and LinkedIn ban cryptocurrency adverts – leaving regulators behind" *Independent* (28 March 2018), online: <<https://www.independent.co.uk/news/business/analysis-and-features/twitter-ban-cryptocurrency-adverts-regulators-bitcoin-facebook-social-media-a8277176.html>>.

As the principal cryptocurrency payment mechanism, these actions against Bitcoin could have impacts for its future growth as a payment mechanism.<sup>35</sup> However, this may not be the case for all cryptocurrencies. For example, some experts have indicated that other cryptocurrencies such as Ethereum and Ripple have technical characteristics that may make them better suited as payment systems compared to Bitcoin.<sup>36</sup>

Nevertheless, many merchants are still accepting Bitcoin as a form of payment and Bitcoin remains the most frequently used and traded cryptocurrency.<sup>37</sup> Bloomberg reports that in the last three months of 2017, Bitcoin's blockchain network processed around US\$150 billion in payment transactions, which is almost ten times more than what it did in 2016, and seven times more than what Western Union processed in the way of average payment transactions in a quarter.<sup>38</sup> It would, therefore, be unwise at this stage to discount Bitcoin's, and other cryptocurrencies' future as a payment method. If cryptocurrencies' value stabilizes, their use as a payment mechanism may grow, which is why it is important to be aware, and be prepared to deal with, the consumer implications from their use as payment mechanisms.

### 2.2.2 Global Use as Investment Vehicles

The initial idea behind Bitcoin seemed to be about developing a fast and cheap payment method. As its future role as a payment system now seems to be less promising, interest in Bitcoin seems to be shifting with the attention now tilting more towards trading Bitcoin and many other cryptocurrencies and treating them as speculative investments:

Although merchant adoption of bitcoin appears to be on the decline, people are still very much interested in bitcoin as a speculative asset. Coinbase was the most popular app in the Apple app store near the end of 2017, according to Recode.

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<sup>35</sup> Kellie Ell, "Despite its name, bitcoin is not really a currency, says digital currency entrepreneur" *CNBC* (25 January 2018), online: <<https://www.cnbc.com/2018/01/25/despite-its-name-bitcoin-is-not-really-a-currency-expert.html>>.

<sup>36</sup> Panos Mourdoukoutas, "Cryptocurrency Rating Agency Says Ethereum Is Better Than Bitcoin And Ripple Should You Trust It?" *Forbes* (28 January 2018), online: <<https://www.forbes.com/sites/panosmourdoukoutas/2018/01/28/cryptocurrency-rating-agency-says-ethereum-is-better-than-bitcoin-and-ripple-should-you-trust-it/#bcea39c15386>>.

<sup>37</sup> Justin Jaffe, "Bitcoin, Ethereum or Litecoin: Which is best for you?" *CNET* (12 February 2018), online: <<https://www.cnet.com/how-to/bitcoin-ethereum-or-litecoin-which-cryptocurrency-is-best-for-you/>>.

<sup>38</sup> Elaine Ou, "Yes, Bitcoin Is a Means of Payment. Just Not Yet for You" *Bloomberg* (22 January 2018), online: <<https://www.bloomberg.com/view/articles/2018-01-22/yes-bitcoin-is-a-means-of-payment-just-not-yet-for-you>>.

It turns out people don't want to have some bitcoin on their smartphones in order to buy coffee at Starbucks. Instead, people want to speculate on the price of Bitcoin and other crypto assets at the tap of a button.<sup>39</sup>

Cryptocurrency investments reportedly showed large returns in 2017.<sup>40</sup> CNBC reports based on research by Autonomous Next (a financial research firm) that more than 90 funds focused on assets like Bitcoin were launched in 2017, increasing the total crypto-funds to 124, with the total assets under management by crypto-funds estimated to be \$2.3 billion.<sup>41</sup> Finder.com found that within a week, the total volume of cryptocurrency exchanged for Bitcoin from January 10, 2018, to January 16, 2018, reached US\$64.25 billion.<sup>42</sup> Cryptocurrency exchanges saw significant activity in early 2018, with Binance, a cryptocurrency exchange, reported as adding 250,000 new users in just one day.<sup>43</sup> Kraken, another exchange was found to be adding 50,000 new accounts daily.<sup>44</sup>

Thomas Reuter's survey revealed that cryptocurrency trading by financial firms could see a further rise in 2018, with almost 20% of the survey participants showing interest in trading cryptocurrencies in the coming three to twelve months.<sup>45</sup> *Forbes* reports that in 2016, the total market cap for cryptocurrencies was over \$12 billion, and on February 21, 2018, it was under \$500 billion.<sup>46</sup>

It is too early to say whether in the future, average consumers will be investing in cryptocurrencies, and on what scale. Presently, many experts have recommended against investing and warned of the considerable risks involved.<sup>47</sup> Other fears surrounding these

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<sup>39</sup> *Ibid.*

<sup>40</sup> Ranjeet Sethi, "Cryptocurrencies as Investment Vehicles in Today's Financial Markets" *Equities.com* (15 December 2017), online: <<https://www.equities.com/news/cryptocurrencies-as-investment-vehicles-in-todays-financial-markets>>.

<sup>41</sup> Evelyn Cheng, "There are now more than 120 hedge funds focused solely on bitcoin, digital currencies" *CNBC* (27 October 2017), online: <<https://www.cnbc.com/2017/10/27/there-are-now-more-than-120-hedge-funds-focused-solely-on-bitcoin.html>>.

<sup>42</sup> Finder.com, "Cryptocurrency exchange statistics," online: <<https://www.finder.com/cryptocurrency-exchange-statistics>>.

<sup>43</sup> Guest Author, "Institutional Investors Will Bet Big on Cryptocurrencies in 2018" *Cointelegraph* (18 January 2018), online: <<https://cointelegraph.com/news/institutional-investors-will-bet-big-on-cryptocurrencies-in-2018>>.

<sup>44</sup> *Ibid.*

<sup>45</sup> Thomas Reuters (Press Release), "Thomson Reuters survey finds one in five financial institutions considering cryptocurrency trading in 2018" *Thomas Reuters* (24 April 2018), online: <<https://www.thomsonreuters.com/en/press-releases/2018/april/thomson-reuters-survey-finds-one-in-five-financial-institutions-considering-cryptocurrency-trading-in-2018.html>>.

<sup>46</sup> Kenneth Rapoza, "Remember When Cryptocurrencies Were On Their Way To 'Zero'" *Forbes* (21 February 2018), online: <<https://www.forbes.com/sites/kenrapoza/2018/02/21/remember-when-cryptocurrencies-were-on-their-way-to-zero/#40b34190133b>>.

<sup>47</sup> Mr Money Mustache, "So you're thinking about investing in bitcoin? Don't" *The Guardian* (15 January 2018), online: <<https://www.theguardian.com/technology/2018/jan/15/should-i-invest-bitcoin-dont-mr>>.

currencies concern their misuse, hacking and fraudulent transactions. These risks shall be considered in detail ahead.

### 2.3 Use and Growth in Canada

Some reports indicate Canada as one of the top ten Bitcoin friendly countries.<sup>48</sup> With Toronto and Vancouver noted to be “Bitcoin hubs.”<sup>49</sup> The volume of Bitcoin transactions in Canada has been growing at a constant pace since 2013.<sup>50</sup> Bitcoin can be bought in Canada through 21 bitcoin exchanges.<sup>51</sup> The Canadian Bitcoin Index value was at CAD \$13,952.65 (as on March 2, 2018).<sup>52</sup> According to the Global Benchmarking study, in 2017 Canada accounted for about 6% of the total cryptocurrency exchanges worldwide;<sup>53</sup> with Europe and other Asia pacific countries having the most number of exchanges.<sup>54</sup> Canada is reported to have a total number of 506 Bitcoin ATMs, with 234 Bitcoin ATMs in Ontario alone.<sup>55</sup>

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[money-moustache](#)>; and Bernard Marr, “Should You Invest In Bitcoins? Here Are The Top Reasons For And Against” *Forbes* (1 December, 2017), online: <<https://www.forbes.com/sites/bernardmarr/2017/12/01/should-you-invest-in-bitcoins-here-are-the-top-reasons-for-and-against/#2b70a5274fd5>>.

<sup>48</sup> Allen Scott, “These are the World’s Top 10 Bitcoin-Friendly Countries” *Bitcoin.com* (29 March 2016), online: <<https://news.bitcoin.com/worlds-top-10-bitcoin-friendly-countries/>>.

<sup>49</sup> *Ibid.*

<sup>50</sup> Allen Scott, “These are the World’s Top 10 Bitcoin-Friendly Countries” *Bitcoin.com* (29 March 2016).

<sup>51</sup> Buy Bitcoin Worldwide, online: <<https://www.buybitcoinworldwide.com/canada/>>. (Last accessed on March 2, 2018). Also, see: Erica Alini, “Bitcoin for Canadians: Where to buy it – and the taxes you’ll pay” *Global News* (6 December 2017), online: <<https://globalnews.ca/news/3899651/bitcoin-canadians-where-to-buy-taxes/>>.

<sup>52</sup> Canadian Bitcoin Index, online: <<https://www.cbix.ca/>>. (Last accessed on March 2, 2018).

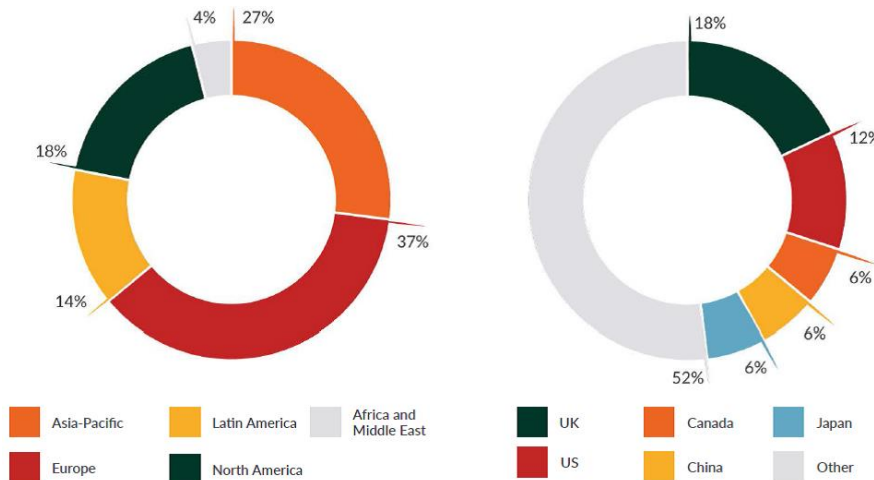
<sup>53</sup> Garrick Hileman and Michel Rauchs, “Global Cryptocurrency Benchmarking Study” at p. 31.

<sup>54</sup> *Ibid.*

<sup>55</sup> Coin ATM Radar, online: <<https://coinatmradar.com/country/38/bitcoin-atm-canada/>>.

## Figure 2-4: Number of Exchanges (in Percentage) in Different Countries

Figure 11: Europe has the most number of exchanges in our study sample, followed by Asia-Pacific



Source: [Global Cryptocurrency Benchmarking Study \(2017\)](#)

Lack of nation-wide data on the use of cryptocurrencies in Canada makes it difficult to determine the actual usage and awareness of cryptocurrencies here. A Bank of Canada’s staff paper on Bitcoin awareness and usage in Canada, attempted to address this limit on empirical data by launching a pilot study, the “Bitcoin Omnibus Survey”.<sup>56</sup> It found that 64% of Canadians have heard of Bitcoin, whereas, only 2.9% have actually used it.<sup>57</sup> The younger age group was noted to own Bitcoin.<sup>58</sup> Scarcity of data restricts the means to analyze and see where do cryptocurrencies stand in Canada, and where are they heading in terms of use and adoption in the retail market, as compared to other countries.

That said, we have some provincial data available on the use cryptocurrencies. A survey conducted by the Ontario Securities Commission (OSC) studied the ownership of cryptocurrencies within Ontario, and the participants’ perception of risks.<sup>59</sup> It revealed

<sup>56</sup>Christopher Henry, Kim Huynh and Gradon Nicholls, “Bitcoin Awareness and Usage in Canada” (2017) Bank of Canada-Staff Working Paper 2017-56, online: <<https://www.bankofcanada.ca/2017/12/staff-working-paper-2017-56/>>.

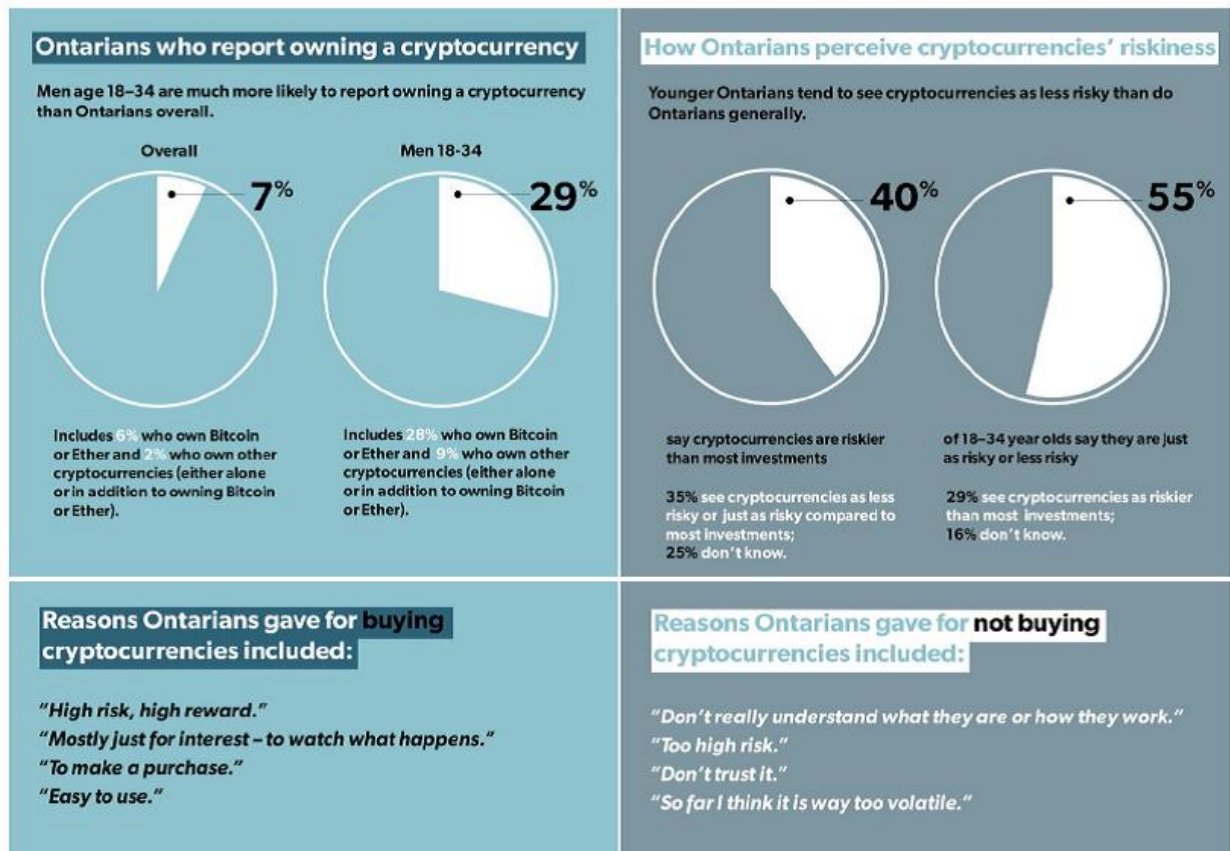
<sup>57</sup> *Ibid.*

<sup>58</sup> *Ibid.*

<sup>59</sup> Ontario Securities Commission, “Ontarians and Cryptocurrencies: A First Look” (11 December 2017), online: <<https://www.getsmarteraboutmoney.ca/resources/publications/research/ontarians-cryptocurrencies-first-look/>>.

that young consumers in the age bracket of 18-34 were more likely to own cryptocurrency, and this age group viewed cryptocurrencies as less risky than others.<sup>60</sup>

**Figure 2-5: OSC Survey on Cryptocurrencies in Ontario**



Source: [Ontario Securities Commission](#) (2017)

## 2.4 Conclusion

This chapter sought to provide an overview of cryptocurrencies' global usage and market growth. Cryptocurrencies bring interesting possibilities for consumers in terms of potentially being an entirely new form of currency in the long-term; however, more research is needed to fully gauge its risks, and understand whether and what regulatory measures are needed to balance the benefits and risks of these currencies. The next

<sup>60</sup> *Ibid.*

chapter provides the history, and evolution of cryptocurrencies, with analysis of its conceptual framework.

## Chapter 3: What are Cryptocurrencies?

### Introduction

In this chapter we review the essential nature of cryptocurrencies. First, we provide a brief overview of their origin, history and conceptual framework. We then distinguish between other forms of private digital currency and cryptocurrencies, and between cryptocurrencies and fiat currencies.

Finally, we provide a brief review of some key cryptocurrencies currently being used in the marketplace, and their important characteristics and differences. This includes a discussion of the possibility of government issued digital currencies, based in part, on recent research and discussion papers issued by the Bank of Canada.

### 3.1 History and Development

The appearance of the first cryptocurrency, Bitcoin, was certainly unusual and mysterious. In August 2008, the domain name *bitcoin.org* was registered and later that year, on October 31<sup>st</sup>, a paper entitled “Bitcoin: A Peer-to-Peer Electronic Cash System,” was posted to a cryptography mailing list, which laid out the technical details of how a Bitcoin virtual currency could function. It was purportedly authored by an individual calling themselves Satoshi Nakamoto<sup>61</sup> who claimed that Bitcoin represented a system for transactions which did not rely on trust to function effectively.<sup>62</sup> The system was designed so that no more than 21 million Bitcoins could be mined, and given the nature of the mining process, the computational time required to mine each additional Bitcoin would grow with each new coin issued.<sup>63</sup>

A few months after the publication of Nakamoto’s technical paper (in early January, 2009) the Bitcoin network came into existence with the minting of the first coins by Nakamoto and the first exchange of coins between Nakamoto and an American cryptographer, Hal Finney.<sup>64</sup> At this stage Bitcoin was simply a technical experiment which engaged the interest of programmers and cryptographers who were anxious to see

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<sup>61</sup> Many individuals have been proposed as, or have claimed to, be the person, or group of persons, behind what appears to be a nom de plume. Most of those individuals who have been identified as Nakamoto have denied being him and the identity of Satoshi Nakamoto has never been satisfactorily proved.

“Nakamoto” mysteriously ceased to write and post on line about Bitcoin after 2010. While the name is obviously of Japanese origin, many suspect that the writer came from elsewhere.

<sup>62</sup> Wikipedia, “History of bitcoin”, online: <[www.wikipedia.org](http://www.wikipedia.org)>. (Last accessed on 22 February 2018),

<sup>63</sup> Today Bitcoins must be mined using large banks of computers and use substantial quantities of electricity to do so.

<sup>64</sup> Andrea Peterson, “Hal Finney Received the first Bitcoin transaction. Here’s how he describes it.” *The Washington Post*, (3 January 2014).

if the technology could be made to function as outlined in Nakamoto's paper. The first transaction in which Bitcoin was accepted for commercial purposes is claimed to have taken place in 2010 when 10,000 bitcoins were exchanged for two pizzas.<sup>65</sup> They were very expensive pizzas, as that transaction was estimated to have been worth over US\$100 million if it had happened in late 2017.<sup>66</sup>

Over the next few years the commercial use of Bitcoin as a speculative investment vehicle and as a payment mechanism grew, as did the number of coins being mined or minted. By 2013 Bitcoins were trading at about US\$1,000 after a steady rise in value over the previous three years.<sup>67</sup> However, in that same year Bitcoin suffered its first significant collapse in value, falling to US\$300.<sup>68</sup> It took two years, to 2015, for the currency to recover its previous highpoint.<sup>69</sup>

And Bitcoin's checkered history continued when, in January 2014, it suffered its most significant security failure to date. One of the currency's largest exchanges, Mt. Gox, which at one time processed 70% of all Bitcoin transactions, suffered a security failure in which 850,000 Bitcoins were stolen through a hack in the exchange's computer system.<sup>70</sup> The theft amounted to 7% of the Bitcoins in circulation at the time (worth US\$ 470 million).<sup>71</sup> Trading on the exchange was suspended and later that year Mt. Gox filed for bankruptcy protection.

Since then, there have been a significant number of thefts and security breaches of Bitcoin exchanges and digital wallets up to the present time equivalent in value to millions of US dollars.<sup>72</sup> These events point to the vulnerability of cryptocurrency holders to the possibility of theft and to the lack of any system of redress or protection. For example, a similar event in a conventional bank would have resulted in depositors being reimbursed

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<sup>65</sup> Bernard Marr, "A Short History of Bitcoin and Cryptocurrency Everyone Should Read" *Forbes* (6 December 2017) online: <<https://www.forbes.com/sites/bernardmarr/2017/12/06/a-short-history-of-bitcoin-and-crypto-currency-everyone-should-read/2/#7d0ba82c533c>>. (Last accessed on 22 February 2018).

<sup>66</sup> *Ibid.*

<sup>67</sup> *Ibid.*

<sup>68</sup> *Ibid.*

<sup>69</sup> *Ibid.*

<sup>70</sup> Judith Lee, Arthur Long, Marcellus McRae, Jeff Steiner and Stephanie Gosnell Handler, "Bitcoin Basics: A Primer on Virtual Currencies" (2015) at p. 25.

<sup>71</sup> *Ibid.*

<sup>72</sup> Wikipedia, "History of Bitcoin" online: <[https://en.wikipedia.org/wiki/History\\_of\\_bitcoin](https://en.wikipedia.org/wiki/History_of_bitcoin)>. (Last accessed on 24 February 2018).

by a government deposit insurance agency, if the bank had financially failed as a result of a major theft.<sup>73</sup>

By 2011, other rival cryptocurrencies were making their appearance on the web and the number of competitors has grown steadily up to today.<sup>74</sup> Later in this chapter we review some leading cryptocurrencies used in the marketplace today and their principal characteristics.

While the use of Bitcoin as a payment mechanism has gradually continued to grow, the cryptocurrency was tainted to some degree in its early years as it was often used to buy illicit items such as drugs, on sites on the “darknet.”<sup>75</sup> On one such site was Silk Road, which only accepted Bitcoin as a means of payment. This was because of its “attribute” of being able to transfer funds pseudonymously, which was of considerable advantage to the types of buyers and sellers anxious to use Silk Road and the types of commodities they were buying and selling.<sup>76</sup> Indeed, before Silk Road was shut down by the US Federal Bureau of Investigation in October 2013, it accounted for about half of all Bitcoin commercial transactions at that time.<sup>77</sup>

Since then, the commercial use of Bitcoin as a payment system has grown considerably, as outlined in Chapter 2, and moved well beyond the quasi-illicit purposes for which its early years were noted. Even as early as the summer of 2014, it was estimated that 63,000 retailers accepted Bitcoin for direct payments, and subsequently gift cards have become available for purchase with Bitcoins which can be used at a wider range of retail outlets.<sup>78</sup> A debit card has been issued in Bitcoin and Bitcoin ATMs are now available for making transactions among Bitcoin accounts and purchasing Bitcoins.<sup>79</sup>

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<sup>73</sup> See, Judith Lee, Arthur Long, Marcellus McRae, Jeff Steiner and Stephanie Gosnell Handler, “Bitcoin Basics: A Primer on Virtual Currencies” (2015) at p. 37-38.

<sup>74</sup> Two of the first cryptocurrencies were Litecoin and Namecoin each trying to improve on, or offer different features from, the original Bitcoin. Later in this chapter we outline some of the major current cryptocurrencies, including Bitcoin, and discuss their relative merits and features. See Marr, *op.cit.*

<sup>75</sup> Judith Lee et al, *op. cit.*, p. 24-25.

<sup>76</sup> Judith Lee et al, *op. cit.*, p. 24.

<sup>77</sup> Judith Lee et al, *op. cit.*, p. 24.

<sup>78</sup> *Ibid.*

<sup>79</sup> Judith Lee et al, *op. cit.*, p. 21 and 25.

## 3.2 Defining Cryptocurrencies

### 3.2.1 Digital Creations by Non-State Actors Using Cryptography

First, it would be useful to recap what we mean and do not mean by cryptocurrencies, versus other digital currencies. By cryptocurrencies we mean those currencies, also called digital representations of value, which are issued by non-state actors, through the use of algorithms based on computer and internet technologies. Many types of cryptocurrencies are intended to have almost the same uses as currencies issued by sovereign states except they have no standing as legal tender as hardly any government is known to have recognized any cryptocurrency as legal tender. That said, some countries, such as Japan have recognized Bitcoin as a legal payment mechanism.<sup>80</sup>

The algorithms that generate cryptocurrencies on computers are complex and for well-established cryptocurrencies such as Bitcoin, it now takes significant computational effort (and electrical power) to generate each incremental currency unit. Each cryptocurrency unit has a unique identifier that cannot be modified as it is encrypted. This purports to reduce the risk of counterfeiting, one of the primary risks of issuing any currency. The algorithms also limit the total number of units (or coins) that can be generated, thus helping to create a potentially non-inflationary form of currency that is likely to retain its initial value, and if demand for the currency increases, increase its value through scarcity. Finally, much like fiat currencies, cryptocurrencies can usually be exchanged in fractional units, which in the case of Bitcoin in particular has been of considerable advantage of late as individual coins are now worth multi-thousands of US dollars.

### 3.2.2 Cryptocurrencies operate through Blockchain Technology

The process of exchanging these units or coins is managed through computer networks linked to the internet using a technology known as “blockchain” which is a distributed public ledger<sup>81</sup> This technology allows an automatic record to be kept of the transactions that each coin or unit has gone through (in the ledger) from its “mining” (i.e. creation by computers within the public network), to the present, so that the provenance of each coin can be determined. This further reduces the risk of any coin being duplicated or both spent and kept at the same time, with the entire transaction history being open to public inspection.

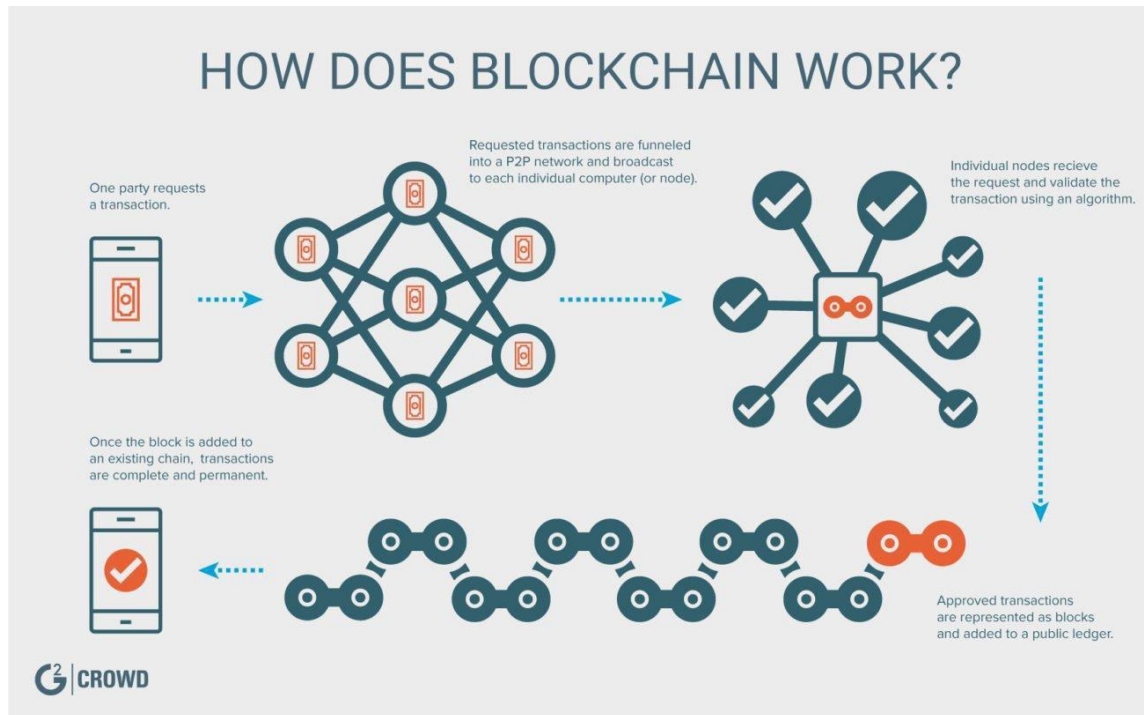
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<sup>80</sup> Arjun Kharpal, “Bitcoin value rises over \$1 billion as Japan, Russia move to legitimize cryptocurrency” *CNBC* (12 April 2017), online: <<https://www.cnbc.com/2017/04/12/bitcoin-price-rises-japan-russia-regulation.html>>.

<sup>81</sup> Matthew Veitch, “Cryptocurrency 101” *The Varsity* (25 February 2018).

The exchange of files in the ledger happens directly between peers, without any intermediary, and is totally decentralized. The information in this ledger is public, and stored at different sites rather than just one, and can be authenticated by different users.<sup>82</sup>

**Figure 3-1: How does Blockchain work**



Source: [G2 Crowd](#) (2018)

Many analysts view cryptocurrencies as “revolutionary,” because they challenge the conventional understanding of how money may be stored and exchanged.<sup>83</sup> Money in its ordinary sense, is stored and managed by government authorities and the banks they regulate, reflecting a centralized system mediated by the state. However, with cryptocurrencies, this exchange is peer-to-peer, bypassing intermediaries and governments.

To recap, one can view blockchain as an open public database, or a Google spreadsheet, which contains details of its users, and their transactions, that are verified and processed

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<sup>82</sup> That said, Ripple, a type of cryptocurrency is asserted by some analysts to be rather centralized, because its majority shares are concentrated in one company, and its main utility is to facilitate faster international payment transactions for financial institutions. See: Richard Silverman, “Pros And Cons Of Ripple; Huge Ambitions And Risks” *Ethereum World News* (26 October 2017), online: <https://ethereumworldnews.com/pros-cons-ripple-huge-ambitions-risks/>.

electronically in a transparent manner. Don Tapscott, CEO of Tapscott Group in an interview to McKinsey & Company, shared some interesting ideas about blockchain, and how it could transform the global economy:

The blockchain is basically a distributed database. Think of a giant, global spreadsheet that runs on millions and millions of computers. It's distributed. It's open source, so anyone can change the underlying code, and they can see what's going on. It's truly peer to peer; it doesn't require powerful intermediaries to authenticate or to settle transactions.

It uses state-of-the-art cryptography, so if we have a global, distributed database that can record the fact that we've done this transaction, what else could it record? Well, it could record any structured information, not just who paid whom but also who married whom or who owns what land or what light bought power from what power source. In the case of the Internet of Things, we're going to need a blockchain-settlement system underneath. Banks won't be able to settle trillions of real-time transactions between things.

So this is an extraordinary thing. An immutable, unhackable distributed database of digital assets. This is a platform for truth and it's a platform for trust. The implications are staggering, not just for the financial-services industry but also right across virtually every aspect of society.<sup>84</sup>

This computer-based system of exchange and recording of the exchange of Bitcoins also has the added benefit of appearing to be, at least in part, anonymous.<sup>85</sup> That is to say, the seller and buyer of the coin are only identified by their unique encrypted code in the record of exchanges for each coin. As such, the account from which the coin left, or to which it entered is known by the system or blockchain, but the identity of the account holder is not. That said, the risk of compromising consumers' privacy remains within a blockchain.<sup>86</sup>

### 3.2.3 How are Cryptocurrencies produced and used?

Most cryptocurrencies can generally be acquired by mining, purchased directly from other coin owners, from a digital currency exchange, or through brokers such as Coinbase, Bitstamp, Kraken, and Gatehub.<sup>87</sup> One can also purchase Bitcoin from automated

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<sup>84</sup> Rik Kirkland, "How blockchains could change the world" *McKinsey & Company* [Interview with Don Tapscott], (May 2016).

<sup>85</sup> See, Matthew Elias, "Bitcoin: Tempering the Digital Ring of Gyges or Implausible Pecuniary Privacy" (2011) at 23-32, available online: <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1937769](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1937769)>.

<sup>86</sup> See, Quora, Contributor, "Why Blockchain Might End Up Eroding Your Online Privacy" *Forbes* (13 March 2018), online: <<https://www.forbes.com/sites/quora/2018/03/13/why-blockchain-might-end-up-eroding-your-online-privacy/#46f3a86137e6>>.

<sup>87</sup> Kirsten Korosec, "This Is Your Guide to Buying Bitcoin" *Fortune* (3 January 2018), online: <<http://fortune.com/2018/01/03/bitcoin-buy-how-to-cryptocurrency/>>.

exchangers (Bitcoin ATMs). Depending on the exchange, cryptocurrencies such as Bitcoins can be purchased with cash, credit cards or bank transfer.<sup>88</sup> That said, some banks in the U.S., UK, and now also Canada, no longer allow the purchase of Bitcoins and other cryptocurrencies on credit.<sup>89</sup> Individual users of cryptocurrencies need to have access to electronic applications called “digital wallets”, with public and private keys, to transfer and store their cryptocurrencies, and gain access to the blockchain transfer system. One can obtain these wallets online by registering with services such as Coinbase, blockchain.info and others.<sup>90</sup>

Generally speaking, there appear to be two basic types of wallets: hot wallets and cold wallets.<sup>91</sup> Hot wallets, are connected to the internet and because of this they remain more vulnerable to risks such as hacking; while cold wallets are those which are not connected to the internet, and store their contents offline.<sup>92</sup>

**Figure 3-2: Different types of Cryptocurrency Wallets**

<u>Type of Wallets</u>	<u>Specific Features</u>	<u>Risk factors and Use</u>
Hot Wallets	<ul style="list-style-type: none"> <li>• Connected to the Internet</li> <li>• Specific types include, Mobile, Desktop and Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• More vulnerable to hacking</li> <li>• More suitable for day-to-day transactions than long-term investments</li> </ul>
Cold Wallets	<ul style="list-style-type: none"> <li>• Offline</li> <li>• Stored on physical paper or hardware or USB drive</li> <li>• Specific types are paper, hardware and USB drive</li> </ul>	<ul style="list-style-type: none"> <li>• Less chances of hacking</li> <li>• More suitable for long term use</li> </ul>

Source: Data extracted from different sources<sup>93</sup> including [CryptoDaily](#) and [Bitcoin IRA](#)

<sup>88</sup> Kirsten Korosec, “This Is Your Guide to Buying Bitcoin” *Fortune* (3 January 2018).

<sup>89</sup> David Meyer, “Another Bank Says Its Credit Cards Can't Be Used to Buy Bitcoin” *Fortune* (5 February 2018), online: <<http://fortune.com/go/ledger/bitcoin-buy-credit-card-bank-lloyds/>>; and The Canadian Press, “BMO joins TD in banning customers from buying bitcoin on credit cards” *CBC* (16 March 2018), online: <<http://www.cbc.ca/news/business/bitcoin-bmo-1.4579483>>.

<sup>90</sup> *Ibid.*

<sup>91</sup> CryptoDaily, “Types Of Cryptocurrency Wallets Explained”, online: <<https://cryptodaily.co.uk/types-cryptocurrency-wallets-explained/>>.

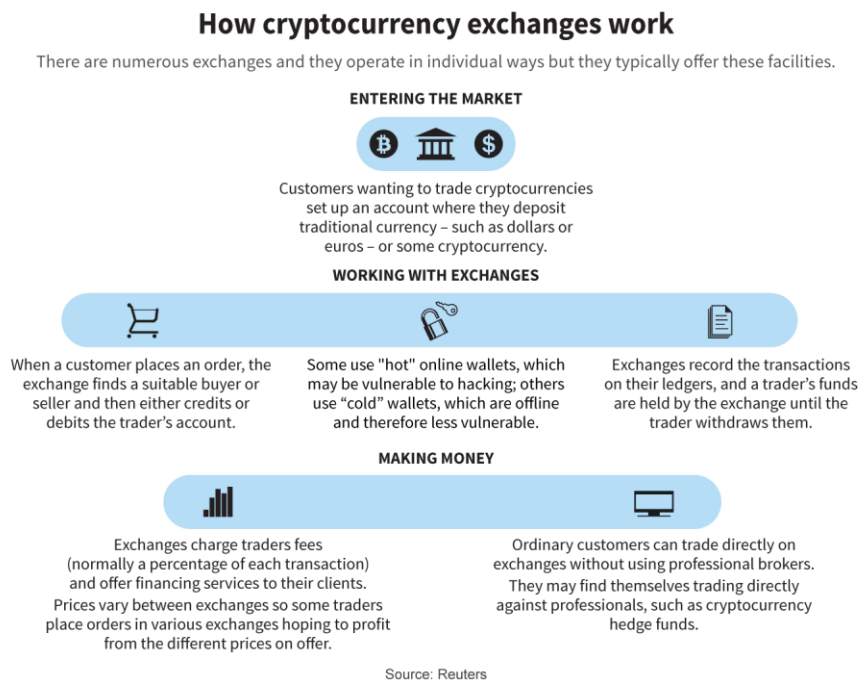
<sup>92</sup> *Ibid.*

<sup>93</sup> Sources referred: CryptoDaily, “Types Of Cryptocurrency Wallets Explained”, online: <<https://cryptodaily.co.uk/types-cryptocurrency-wallets-explained/>>; Blockchain Contributor, “Bitcoin IRA: Hot Wallets Vs. Cold Wallets” *Bitcoin IRA* (18 January 2018), online:

As mentioned, a digital wallet requires public and private keys to access and transfer funds. Public keys are used to identify one’s wallet, like an email address. Whereas, private keys are like passwords, and used to unlock one’s wallet and access money.<sup>94</sup>

While peer-to-peer transfers of cryptocurrencies are possible, users can also access them through cryptocurrency exchanges, which act much like banks as places to store accounts and make transfers of coins. Unlike banks, however, these exchanges are essentially unregulated, have no mandated levels of security to prevent unauthorized access to accounts, and have no redress system if deposits are lost, stolen, or if transfers fail. The risks of this happening, unfortunately, are not insignificant.

**Figure 3-3: How Cryptocurrency Exchanges work**



Source: [Reuters](#) (2017)

### 3.3 Cryptocurrencies vs. Digital Currencies

One of the unique characteristics of cryptocurrencies, in contrast to other digital currencies like airline points or virtual currencies that are part of massive multiplayer on-

<<https://bitcoinira.com/articles/hot-wallets-vs-cold-wallets>>; and Daniel Nyairo, “7 Types of Bitcoin Wallets” *CoinOutlet* (16 May 2015), online:<<http://coinoutletatm.com/7-types-of-bitcoin-wallets/>>.

<sup>94</sup> Financial Consumer Agency of Canada, “Digital currency,” online: <<https://www.canada.ca/en/financial-consumer-agency/services/payment/digital-currency.html>>.

line games (MMOG), is that they are intended to be used to purchase goods and services in their own right without the use of an intermediary that can redeem the currency for a good or service, or in some cases for fiat currency (e.g. US or Canadian dollars).<sup>95</sup> As such, theoretically, cryptocurrencies are potentially much more useful than other digital currencies because they take on the attributes of true payment systems. This later point was key to the creation of cryptocurrencies in the first place as they were conceived of as mechanisms that could act as if they were currencies, but without the need to have any sovereign states stand behind them and control their issuance or regulate the manner in which they were used or transacted.

### 3.4 Cryptocurrencies vs. Fiat Currencies

We are all very familiar with fiat or national currencies: bank notes and coins issued by national central banks and mints and denominated in national currency units and subunits, such as dollars and cents, pounds and pence or rupees and paisa.

As their name denotes, fiat currencies are created by legal decree and that decree is issued by a sovereign state. The distinction is important because a sovereign state has the power and capacity to create laws and, in extremis, enforce them through the seizure of property and the imprisonment of individuals. As such, sovereign states can enforce through their legal systems the acceptance of the currency they issue for the payment of debts, its use as a medium of exchange and a unit of account, and most crucially, its use to pay the taxes the government imposes.

As well, states back the issuance of their currency by controlling how much of it is issued; as they have the monopoly on its creation, by ensuring its legitimacy by preventing (or realistically, significantly limiting) the counterfeiting of their currency; and by controlling the transactions associated with the exchange of their currency (e.g. through regulating their national banking systems and controlling to what extent the currency can be taken out of the country through exchange controls). All of these powers and capacities mean that fiat currencies have wide acceptance and legitimacy as a store of value, a unit of account and a method of payment, which are the three key functions of any currency.

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<sup>95</sup> Reference drawn to Judith Lee et al, *op. cit.*, p. 22.

### **Cryptocurrencies lack Sovereign support, and have an in-built computer based-verification system:**

By their very nature cryptocurrencies lack a legitimacy infrastructure provided by a sovereign state as they are produced and distributed by private individuals who do not have access to the laws and enforcement mechanisms that would ensure their currency's acceptance in the economy and the broader national community.

To compensate for this, issuers of cryptocurrencies have attempted to use modern technologies (e.g. computer-based cryptography and internet facilitated ledger tracking systems based on blockchain) as described earlier.

Indeed, the key proposed advantage and claim to efficiency of any cryptocurrencies is that they are self-regulating and require no element of trust between the parties exchanging the currency. Like old fashioned fiat currency (and unlike modern digital payment systems based on fiat currency), cryptocurrencies also have the advantage of partial anonymity as the identity of the buyer and seller are hidden. And finally, unlike fiat currencies, where the issuing government can always print more banknotes or mint more coins, the finite limit placed on the number of units of cryptocurrency that can be produced purports to provide some protection against the diminishment of its value.

### **Cryptocurrencies: Limits on their use as Payment Systems and Stores of Value**

Unfortunately, cryptocurrencies do suffer from some significant drawbacks, which explain their limited acceptance as a payment system for consumers. The first problem is their tendency to fluctuate in value, often quite wildly, and over very short periods of time. This reduces their ability to be used as payment systems because currencies which fluctuate rapidly in value become hard to use as a unit of account (e.g. the price of something) for both buyers and sellers. This point was reinforced by our stakeholders who noted that cryptocurrencies' volatility is a limit to their acceptance; and that this price fluctuation could expose consumers to significant risks, which is otherwise not found in case of fiat currencies.

Likewise, cryptocurrencies can become unreliable stores of value (e.g. ways to save) as they can diminish or increase in value in unpredictable ways. Of course, this can happen to fiat currencies as well if a government prints too much money and causes runaway inflation, but generally fiat currencies tend to change their value domestically only

gradually and in relatively small amounts so that the changes can be well anticipated and accommodated.

### 3.5 Cryptocurrencies vs. Digital Payment Systems Based on Fiat Currencies

One final distinction that is important to make is between cryptocurrencies and digital payment systems based on fiat currencies. To some extent they are superficially similar as they are both based on computer-based technologies integrated with the internet and they exchange digital, as opposed to physical, units of value. However, they differ in very important and fundamental ways.

In the first instance, digital payment systems are simply systems designed to transfer fiat currency from one account holder to another; they are not independent currencies in their own right, they transfer fiat currencies held in accounts at one financial institution to another, electronically. In some cases, these systems are run by the financial institutions themselves (such as banks or credit unions), or by firms running electronic networks and hardware and software systems to make and accept payments that are contracted to financial institutions. In some cases, financial institutions also subscribe to franchises that also set common standards for electronic payments and transfers among financial institutions, merchants and individuals (e.g. branded credit card systems such as VISA and MasterCard and debit card payment systems such as Interac).

Critically, these payment systems are regulated, at least in part, by governments, as most states have legislation governing payment systems both from a fiduciary and a consumer protection perspective (although the level of such regulation in the latter case can vary quite widely) and because they regulate the financial institutions that to a significant degree operate these payment systems.<sup>96</sup> In contrast, the systems and institutions operating transfers and payments in cryptocurrencies are largely unregulated and operate as they see fit.

However, the landscape is changing with the emergence of new payment technologies being developed and deployed by companies which are not regulated financial institutions and which are often new to the financial sector. Many of these technologies offer better potential access to consumers to existing payment mechanisms, for example being available from mobile devices (Apple Pay) and/or offering greater options for security or redress (PayPal).

Indeed, some electronic payment mechanisms now allow direct payments between individuals using the internet or mobile devices such as Interac e-Transfer, or the newly

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<sup>96</sup> For example, in the case of Canada, the *Bank Act* and the *Canadian Payments Act*

announced Apple Pay Cash. Further, some of the services offered (such as by PayPal) are hybrids as they operate using a customer's credit card and thus are piggy backing on the payments system run by financial institutions, but also can make payments between PayPal account holders directly, avoiding financial institutions' payment systems entirely (except when accounts have to be topped up).<sup>97</sup>

In this kind of an environment the real potential of cryptocurrencies may be the example they provide to electronic payment systems operated by traditional financial institutions through their use of blockchain technologies to structure payment systems that are self-tracking and self-regulating.<sup>98</sup> If these blockchain technologies can be improved to deal with the huge volumes of transactions typical in today's digital payments systems (e.g. VISA and Mastercard transactions), they could logically be adopted by existing financial institutions to significantly reduce the costs of running their payment systems.

However, such blockchain systems could also be developed independently by companies which are not financial institutions (e.g. Apple Pay and PayPal), and which could completely bypass the existing payments system and offer greater advantages in terms of speed, convenience and lower cost, creating a more competitive payments ecosystem both nationally and internationally.

Unfortunately, these more advanced blockchain systems are by no means with us today and may take significant time to develop. The nature of blockchain transactions currently place significant limits on the volume of transactions that can be handled and the speed with which they can be processed. For example, Bitcoin only handles 500,000 transactions and Ethereum 800,000 per day, with Ethereum processing speeds of about 15 transactions per second, which is well below the kinds of volumes and speeds currently achieved by electronic payment systems dealing with fiat currencies such as VISA credit cards or debit card services.<sup>99</sup>

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<sup>97</sup> Competition Bureau of Canada, *Technology-Led Innovation in the Canadian Financial Services Sector*. (Ottawa: Department of Innovation, Science and Economic Development, December 2017), pp. 25-28

<sup>98</sup> Joichi Ito, Nevha Narula and Robieh Ali, "The Blockchain Will Do to the Financial System What the Internet Did to Media" (2017) *Harv. Bus. Rev.*, online: <<https://hbr.org/2017/03/the-blockchain-will-do-to-banks-and-law-firms-what-the-internet-did-to-media>>. See also BNY Mellon, *Innovation in Payments: The Future is Fintech*. (New York: BNY Mellon, 2015), pp. 6-7.

<sup>99</sup> At present there are significant problems with scaling up blockchain technology with large volume systems and in terms of dealing with regulatory requirements for transparency in transactions., see BNY Mellon, *op. cit.*, p.11, see also Sherman Lee, "Five Issues Preventing Blockchain from Going Mainstream" *Forbes* (22 December 2017) online:

<<https://www.forbes.com/sites/outofasia/2017/12/22/five-issues-preventing-blockchain-from-going-mainstream-the-insanely-popular-crypto-game-etheremon-is-one-of-them/#1e220adc6fad>>. (Last accessed on 13 March 2018).

Other problems exist today with blockchain’s wider adoption in processing cryptocurrency transactions, one of which is the current lack of interoperability among the various types of cryptocurrency processing systems.<sup>100</sup> These problems will inevitably delay the buildup of a critical mass of users to make cryptocurrency payment systems a significant challenge to those run by traditional financial institutions. That growth and acceptance would also probably require that these systems were appropriately regulated by government from both a fiduciary and consumer protection perspective for them to be trusted by consumers and it is far from clear at this stage that governments are prepared to do this. We shall discuss these regulatory concerns and initiatives in some detail in Chapter 5.

### 3.6 Types of Cryptocurrencies

Many types of cryptocurrencies are found in the market today, indeed at the time of writing, over 1500 cryptocurrencies are reported to exist.<sup>101</sup> These numbers continue to rise as new forms of cryptocurrencies are introduced. Bitcoin is generally deemed to be the first cryptocurrency, with others being improvements on, or variants of, Bitcoin’s design and underlying technology. Other cryptocurrencies, besides Bitcoin, are collectively called altcoins. However, they do not necessarily work in the same way and may not perform the same functions as Bitcoin. Many cryptocurrencies are designed for specific purposes<sup>102</sup>. This part of the chapter reviews some prominent cryptocurrencies, with a brief discussion on their creation, how they function, key features, uses, benefits and risks.

#### 3.6.1 Categories of Cryptocurrencies

Cryptocurrencies may differ in how they work, process transactions, and importantly, what purposes they serve in the marketplace. Some analysts divide cryptocurrencies in three broad categories:<sup>103</sup>

**Transactional Currencies:** designed to be used as money, stored and exchanged for value. These currencies are intended to potentially replace fiat currency. Some examples are Bitcoin, Litecoin and others.<sup>104</sup> They are also called, “Currency Cryptocurrencies.”<sup>105</sup>

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<sup>100</sup> *Ibid.*

<sup>101</sup> Matthew Veitch, “Cryptocurrency 101” *The Varsity* (25 February 2018).

<sup>102</sup> This point was emphasized by a respondent to our stakeholder consultations.

<sup>103</sup> David Goodboy, “3 Types Of Cryptocurrencies You Need To Know” *Nasdaq* (15 January 2018), online: <<https://www.nasdaq.com/article/3-types-of-cryptocurrencies-you-need-to-know-cm905488>>.

<sup>104</sup> *Ibid.*

<sup>105</sup> Phil Glazer, “The Different Categories of Cryptocurrencies” *Hacker Noon* (January 31), online: <<https://hackernoon.com/the-different-categories-of-cryptocurrencies-a57ba4d77c9a>>.

**Platform Currencies:** intended to remove intermediaries, create markets and launch new types of cryptocurrencies. An example is Ethereum, a cryptocurrency that enables direct digital exchange of money, property or anything of value based on smart contracts (a computer program that enforces a transfer when the conditions set by its creator in its cryptographic code are met);<sup>106</sup> and

**Utility Currencies:** intended for specific tasks. One significant example is Ripple (XRP), which aims to facilitate global transfers of fiat money and other cryptocurrencies in a more efficient and less costly way.<sup>107</sup> Presently, it seems to be designed for use by banks, payment providers, corporations and digital asset exchanges, and aiming to simultaneously help consumers by reducing remittance costs.<sup>108</sup> Consumers, on the other hand, seem to be interested in currencies such as Ripple mainly as an investment vehicle.

While our research focuses on assessing consumers' risks and benefits in using cryptocurrencies as payment mechanisms, we felt it useful to briefly review the most popular cryptocurrencies in the market today to gain a general understanding of how these currencies work in order to better assess how they may impact consumers.

### 3.6.2 Prominent Cryptocurrencies

Coin Dance's statistics on the market cap for cryptocurrencies (as on March 12, 2018), indicate that Bitcoin remains the most prominent and valuable cryptocurrency in the market, representing 43.57% of the total market capitalization of all cryptocurrencies.<sup>109</sup> It is followed by Ethereum at 19.07%, Ripple at 8.64%, Bitcoin Cash at 4.95%, Litecoin at 2.78%, and some other cryptocurrencies.<sup>110</sup> Of all the cryptocurrencies, Bitcoin still seems to predominate as the cryptocurrency of choice both as an investment vehicle and even as a payment method. Similarly, in an earlier study i.e. the Global Benchmarking study (2017), Bitcoin was found to be the most popular cryptocurrency amongst the exchanges, wallets and payments companies participating in the survey.<sup>111</sup>

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<sup>106</sup> Cointelegraph, "Smart Contracts, Explained", online: <<https://cointelegraph.com/explained/smart-contracts-explained>>; and Larissa Lee, "New Kids on the Blockchain: How Bitcoin's Technology Could Reinvent the Stock Market" (2016) 12:2 Hastings Business Law Journal 80 at 113-115.

<sup>107</sup> Ripple.com, online: <<https://ripple.com/>>.

<sup>108</sup> *Ibid.*

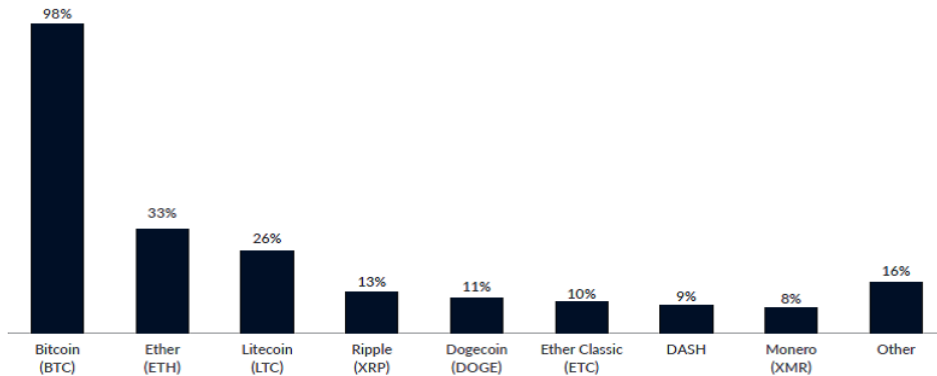
<sup>109</sup> Coin Dance, (figures as on March 12, 2018), online: <<https://coin.dance/stats>>. Please note these values remain variable, as market caps of these currencies are not constant.

<sup>110</sup> *Ibid.*

<sup>111</sup> Garrick Hileman and Michel Rauchs, "Global Cryptocurrency Benchmarking Study" at p. 20.

### Figure 3-4: Bitcoin most widely supported Cryptocurrency

Figure 6: Bitcoin is the most widely supported cryptocurrency among participating exchanges, wallets and payment companies



Source: [Global Cryptocurrency Benchmarking Study \(2017\)](#)

As may be noted, two different set of statistics are cited here, one is based on Coin Dance’s research, and another based on a survey conducted of the most widely used cryptocurrency by certain exchanges, wallets and payment companies. This suggests that Bitcoin has remained the most popular cryptocurrency, during 2017 and early 2018 by both measures.

Likewise, data from Coinmarketcap indicates that at present, Bitcoin remains the most valued cryptocurrency based on its market price and performance, with the other prominent ones being: Ethereum, Ripple, Bitcoin Cash, and Litecoin.<sup>112</sup> Our report studies these five cryptocurrencies.

Some common risks shared by these cryptocurrencies include: their volatile market value, being vulnerable to hacking, fraud, and theft, with fewer or no protections for recovering lost funds and lack of clear regulatory oversight.<sup>113</sup> We now consider their distinguishing characteristics.

<sup>112</sup> Coinmarketcap, “Cryptocurrency Market Capitalizations”, online: <https://coinmarketcap.com/>. (Last accessed on March 12, 2018).

<sup>113</sup> Consumer Financial Protection Bureau, “Risks to consumers posed by virtual currencies” (August 2014), online: [https://files.consumerfinance.gov/f/201408\\_cfpb\\_consumer-advisory\\_virtual-currencies.pdf](https://files.consumerfinance.gov/f/201408_cfpb_consumer-advisory_virtual-currencies.pdf); and Andrea Tan and Yuji Nakamura, “Cryptocurrency Markets Are Juicy Targets for Hackers: Timeline” *Bloomberg* (29 January 2018), online: <https://www.bloomberg.com/news/articles/2018-01-29/cryptocurrency-markets-are-juicy-targets-for-hackers-timeline>. In case of Ripple, its currency i.e. XRP’s value remains volatile. See: Joe Barnes and Alessandra Scotto Di Santolo, “Ripple price: Managing Director reveals why cryptocurrency price is so volatile” *Express Newspapers* (9 March 2018), online:

## Bitcoin



**Creation:** An open-source software introduced in 2009 by a pseudonymous writer, Satoshi Nakamoto.

**Working:** Based on blockchain technology, allows for decentralized direct peer-to-peer transactions, bypassing intermediaries. Transactions are validated by mining, which also adds new blocks to the blockchain.<sup>114</sup> Different computers on the network (called nodes, each have a copy of the public ledger file) verify transactions using computing power and a series of checks.<sup>115</sup> These computers compile recent transactions in a block, and use a special software to solve mathematical problems; when solved, a new block is added. The first miner to solve a problem is rewarded with a Bitcoin.<sup>116</sup>

**Figure 3-5: Transactions verified by multiple miners**



**Uses:** Payment mechanism for buying goods and services, and an investment vehicle. While some retailers have started accepting it as a payment method, currently there is limited evidence of its widespread use in the retail marketplace.<sup>117</sup>

**Key Features:** Decentralized, allows P2P payments, irreversible transfers, no double spending, purported to have lower processing fees, (whether this fee is less than any fiat currency and or other cryptocurrencies would vary depending on the subject currency being compared to), available to anyone, partial anonymity, transparent, and finite in

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<<https://www.express.co.uk/finance/city/929371/Ripple-price-news-bitcoin-price-cryptocurrency-news-market-crash-update>>; and Litecoin's risks, see; Ken Hanly, "Litecoin creator Lee warns about the risks of buying litecoin" *Digital Journal* (14 December 2017), online: <<http://www.digitaljournal.com/tech-and-science/technology/op-ed-litecoin-creator-lee-warns-about-the-risks-of-buying-litecoin/article/510028>>.

<sup>114</sup> Investopedia, "Bitcoin Mining", online: <<https://www.investopedia.com/terms/b/bitcoin-mining.asp>>.

<sup>115</sup> Antonio Madeira, "How does a Bitcoin node verify a transaction?" *CryptoCompare* (12 January 2018), online: <<https://www.cryptocompare.com/coins/guides/how-does-a-bitcoin-node-verify-a-transaction/>>.

<sup>116</sup> Investopedia, "Bitcoin Mining", online: <<https://www.investopedia.com/terms/b/bitcoin-mining.asp>>.

<sup>117</sup> Arjun Kharpal, "All you need to know about the top 5 cryptocurrencies" *CNBC* (14 December 2017), online: <<https://www.cnbc.com/2017/12/14/bitcoin-ether-litecoin-ripple-differences-between-cryptocurrencies.html>>.

amount.<sup>118</sup> Its transaction processing time has increased recently, which seems to have reduced its transaction speed.

## Ethereum



**Creation:** Open software platform, designed to build different blockchain applications, was introduced in 2015. In 2016, it was spilt into two versions: Ethereum (ETH) with enhanced attributes and the original software which was designated as Ethereum Classic.<sup>119</sup>

**Working:** Based on a custom-built blockchain technology, it runs smart contracts and creates other blockchain applications. Transactions are validated using smart contracts. This means that a contract written in code is entered into the blockchain (this is a little program entrusted with a value), which includes pre-programmed terms for both contracting parties. When the terms of the contract are met, it is enforced and the transaction completed.<sup>120</sup> It has its own platform-specific cryptographic token - Ether.

**Figure 3-6: Smart Contract is enforced when its code-based conditions are met.**



**Uses:** Creation of different applications, enforcing smart contracts.

**Key Features:** Decentralized platform, multi-purpose, provides irreversible transactions, faster transactions than Bitcoin, and not capped to a specific number of currency units.<sup>121</sup>

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<sup>118</sup> Jeff Desjardins, “Comparing Bitcoin, Ethereum, and Other Cryptos” *Visual Capitalist* (13 September 2017), online: <<http://www.visualcapitalist.com/comparing-bitcoin-ethereum-cryptos/>>. Also, referred: Bitcoin.org, “Frequently Asked Questions,” online: <<https://bitcoin.org/en/faq#what-is-bitcoin>>.

<sup>119</sup> Jeff Desjardins, “Comparing Bitcoin, Ethereum, and Other Cryptos” (2017).

<sup>120</sup> Jon Martindale, “What is Ethereum?” *Digital Trends* (31 January 2018), online: <<https://www.digitaltrends.com/cool-tech/what-is-ethereum-blockchain-cryptocurrency/>>; Cointelegraph, “What is Ethereum. Guide for Beginners”, online: <<https://cointelegraph.com/ethereum-for-beginners/what-is-ethereum>>; and Ethereum project, online: <<https://www.ethereum.org/>>

<sup>121</sup> Jeff Desjardins, “Comparing Bitcoin, Ethereum, and Other Cryptos” (2017).

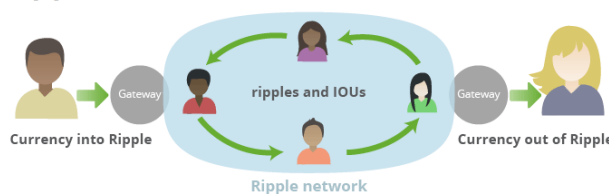


**Creation:** Introduced in 2012 as Opencoin (renamed to Ripple in 2015), as a global settlement network for exchanging different fiat currencies and other assets.<sup>122</sup>

**Working:** Ripple operates on blockchain technology (called Ripple ledger), where computers in the network use a consensus algorithm to confirm transactions. This means that computers connected to Ripple’s network mutually agree on the validity of transactions. It uses gateways to facilitate transfers, which connects users in the Ripple network to make exchanges.<sup>123</sup> A small fee in XRP (Ripple’s unit of exchange) needs to be paid for making any settlement.<sup>124</sup>

**Figure 3-7: Working of Ripple XRP**

### How Ripple XRP Work?



Source: [Crypto Quick News](#) (2017)

**Uses:** Network for fast international payments, with lower costs. Specifically, useful for banks and other financial institutions in facilitating such transfers.

**Key Features:** Used by some banks and financial institutions, it uses less computing power, with no mining involved, and works with any store of value, with a supply of 100 billion ripples.<sup>125</sup> Its other features include, payment tracking, one integration point,

<sup>122</sup> Coin and Crypto, “5 alarming reasons Ripple might not be what you think” *Hacker Noon*, (January 9), online: <<https://hackernoon.com/4-alarming-reasons-ripple-might-not-be-what-you-think-9debc3c86985>>.

<sup>123</sup> Investopedia, “Ripple (Cryptocurrency),” online: <<https://www.investopedia.com/terms/r/ripple-cryptocurrency.asp>>; and Benjamin Geva, “Disintermediating Electronic Payments: Digital Cash and Virtual Currencies” (2016) 31(12) J.I.B.L.R. 661-674, online: <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2958869](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2958869)>.

<sup>124</sup> Empirica, “Different types of Cryptocurrency,” online: <<http://empirica.io/blog/different-types-cryptocurrency/>>. (Last accessed on March 13, 2018).

<sup>125</sup> *Ibid.* And see, Jeff Desjardins, “Comparing Bitcoin, Ethereum, and Other Cryptos” (2017).

reduced costs, and faster settlements.<sup>126</sup> Unlike other cryptocurrencies, this is still partly controlled by the company Ripple, which owns 60% of all existing XRP coins, raising concerns that the company may infiltrate the market with these coins, leading to an oversupply.<sup>127</sup>

### Bitcoin Cash



**Creation:** Introduced as a spinoff to Bitcoin in August 2017.

**Working:** Based on blockchain technology, using the same algorithm as Bitcoin, with increased capacity to process transactions.

**Uses:** Payment mechanism for buying goods and services, and an investment vehicle.

**Key Features:** Decentralized, faster and cheaper transactions than Bitcoin.<sup>128</sup> Some of its core additional features include, on-chain scalability (increasing blockchain's ability to create blocks and process transactions), new transaction signatures (SigHash) to improve hardware wallet security, and simplified hashing (simplified value generation)<sup>129</sup> within the network.<sup>130</sup>

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<sup>126</sup> Ripple, "Use Cases," online: <<https://ripple.com/use-cases/>> [Click on each user to access Ripple's specific features and benefits]; and see, Shanna Leonard, "10 Things You Need to Know About XRP" *Ripple* (6 October 2017), online: <<https://ripple.com/insights/10-things-need-know-xrp/>>.

<sup>127</sup> Richard Silverman, "Pros And Cons Of Ripple; Huge Ambitions And Risks" *Ethereum World News* (26 October 2017), online: <<https://ethereumworldnews.com/pros-cons-ripple-huge-ambitions-risks/>>.

<sup>128</sup> Spencer Bogart, "Bitcoin Vs. Bitcoin Cash: A Story Of Prioritization & Healthy Competition In Money" *Forbes* (13 November 2017), online: <<https://www.forbes.com/sites/spencerbogart/2017/11/13/bitcoin-vs-bitcoin-cash-a-story-of-prioritization-a-healthy-competition-in-money/#7233691a4bcc>>.

<sup>129</sup> Techopedia, "Hashing", online: <<https://www.techopedia.com/definition/14316/hashing>>.

<sup>130</sup> Bitcoin Cash, online: <<https://www.bitcoincash.org/>>. Also, see; Cointelegraph, "Difference Between Bitcoin and Bitcoin Cash," online: <<https://cointelegraph.com/bitcoin-cash-for-beginners/btc-bch-differences#bitcoin-and-bitcoin-cash-in-your-wallet>>. (Last accessed on March 13, 2018).

## Litecoin



**Creation:** Launched in 2011, as an alternative to Bitcoin. Developed by a former Google employee and MIT graduate, Charlie Lee.<sup>131</sup>

**Working:** Based on blockchain technology, uses a simpler encryption algorithm than that used for Bitcoin called Scrypt, which authenticates and facilitates transactions. It has a block generation time of 2.5 minutes, as compared to 10 minutes in case of Bitcoin.<sup>132</sup>

**Uses:** A payment mechanism for buying goods and services, and an investment vehicle. It could also be used to exchange and swap cryptocurrencies directly by using a smart contract, without going through any exchange.<sup>133</sup>

**Key Features:** A simpler algorithm, four times faster block generation,<sup>134</sup> faster transaction speed than Bitcoin; more capacity to create coins (84 million) than Bitcoin (21 million).

### 3.7 Cryptocurrencies and Market Value?

Let's begin by asking how do cryptocurrencies get value? They get value, when people trust and agree that they hold value, like with any fiat currency. That said, a major difference between these currencies and fiat currencies is that for fiat currency, a value is denoted either by a central authority or by trading on public securities exchanges. Whereas, for cryptocurrencies, this is generally determined by trading on private cryptocurrency exchanges.

This section provides an overview of the market positions of the key cryptocurrencies in the latter part of the first quarter of 2018. All prices, market caps, and other numbers referred here are based on data from Coinmarketcap.com on March 12, 2018.

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<sup>131</sup> Jeff Desjardins, "Comparing Bitcoin, Ethereum, and Other Cryptos" (2017).

<sup>132</sup> Saul Bowden, "Litecoin for Beginners – How to Buy & Trade Litecoin Today" *Commodity*, online: <<https://commodity.com/cryptocurrency/litecoin/>>.

<sup>133</sup> Empirica, "Different types of Cryptocurrency."

<sup>134</sup> *Ibid.*

**Figure 3-8: Selected Cryptocurrencies Market Statistics at March 12, 2018** (All prices in this table are in US\$)

Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change
<b>Bitcoin</b>	\$151,501,148,200	\$8,956.43	\$6,102,190,000	16,915,350 BTC	-6.99%
<b>Ethereum</b>	\$67,150,546,552	\$684.18	\$1,568,550,000	98,147,055 ETH	-5.93%
<b>Ripple</b>	\$30,799,849,033	\$0.787882	\$348,806,000	39,091,956,706 XRP	-5.57%
<b>Bitcoin Cash</b>	\$17,388,997,275	\$1,022.03	\$423,736,000	17,014,175 BCH	-9.88%
<b>Litecoin</b>	\$9,790,830,169	\$176.10	\$557,862,000	55,598,443 LTC	-7.44%

Source: [Coinmarketcap](https://coinmarketcap.com) (March 12, 2018)

Notes:<sup>135</sup>

**Market cap-** total coins in circulation multiplied by the present market price.

**Price- average** current market price of the currency across different exchanges.

**Volume-** amount of coins traded in the past 24 hours (coins multiplied by market price, gets us the volume price, as shown in the above table).

**Circulating Supply-** number of coins that exist in the market.

The data in the table above show that Bitcoin’s price dropped by 6.99 percent in the 24 hours of March 12, 2018. Notably, all other cryptocurrencies also saw a decline in their market value. Bitcoin is seen to be valued at \$8,956.43 per unit. Ethereum is valued at \$684.18, Ripple at approximately \$0.79, Bitcoin Cash at \$1,022.03 and Litecoin at \$176.10. Market statistics are regularly updated, and expressed in graphs, allowing for an

<sup>135</sup> Sources referred: CryptoCurrency Facts, “Understanding CoinMarketCap.com: A Site With Every Crypto’s Price on It and Where to Trade Them,” online: <<https://cryptocurrencyfacts.com/exchanges/coinmarketcap-com/>>; and Coinmarketcap, “Frequently Asked Questions,” online: <<https://coinmarketcap.com/faq/>> (Both last accessed on March 14, 2018).

analysis of their price trends.<sup>136</sup> Numerous factors may affect the market price of these cryptocurrencies, including but not limited to, regulatory uncertainty, hacks or any other threat or uneven activity.

### 3.8 The Potential of Government issued Digital Currencies

The possibility of government issued digital currency has been studied by different central banks, including the Bank of Canada. In the scenarios studied by these central banks the proposed mode of operation would be centralized. This means that instead of the transactions being verified and processed by different individuals within a decentralized public ledger, they will be controlled and managed by a central ledger, in a manner somewhat similar to the current banking practices. However, if this is actualized, it may considerably impact the role of private sector banking and financial institutions in payment systems, and consumers' relationship and dealings with such institutions. That said, some risks associated with decentralized currencies may be reduced with a central authority controlling such transactions.

Yves Mersch, a member of the European Central Bank's executive board, in his lecture on the evolution of money, discussed the issues surrounding a central bank digital currency (CBDC), also referred to as digital base money (DBM).<sup>137</sup> He finds no clear motivation to issue such currencies, at the moment.<sup>138</sup> He also notes that there is no material evidence that eliminating cash will reduce crime, and that electronic money may well support unlawful activities.<sup>139</sup> Further, he asserts that there does not seem to be a global trend towards a cashless society.<sup>140</sup> A move to DBM, Mersch noted, also needs to consider the impact of such a currency on the financial system, noting that when there is no crisis, a readily available DBM could "[c]rowd out bank deposits,"<sup>141</sup> and put the "[t]wo-tier banking system at risk."<sup>142</sup>

The Bank of England's Governor, Mark Carney, in his speech on the future of money, at Edinburgh University, also briefly discussed the possibility of creating a CBDC.<sup>143</sup> He

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<sup>136</sup> CoinDesk, "Understanding Bitcoin Price Charts," online: <<https://www.coindesk.com/information/understanding-bitcoin-price-charts/>>. (Last accessed on March 14, 2018).

<sup>137</sup> Yves Mersch, "Virtual or virtueless? The evolution of money in the digital age" European Central Bank [Lecture] (8 February 2018), online:

<<https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp180208.en.html>>.

<sup>138</sup> *Ibid.*

<sup>139</sup> *Ibid.*

<sup>140</sup> *Ibid.*

<sup>141</sup> *Ibid.*

<sup>142</sup> *Ibid.*

<sup>143</sup> Mark Carney, "The Future of Money" Bank of England (Speech To the inaugural Scottish Economics Conference, Edinburgh University) (2 March 2018), online:

indicated that the central bank has an open mind about the creation of such a currency, with research being conducted on the issue.<sup>144</sup> However, he did not think that the Bank of England would issue such a currency for quite some time due to the technological limits of distributed ledger technologies, and other issues, including, managing the risks with providing central bank accounts.<sup>145</sup>

Another central banker, Australia's Reserve Bank governor Philip Lowe, claimed that in the shift to electronic money, the possibility that the Reserve Bank opening exchange settlement accounts for all Australians, would be contrary to the public interest.<sup>146</sup> He felt that such an action would bring the Reserve Bank in direct competition with the private sector and the banking sector, in respect of deposits and payment services.<sup>147</sup>

The Bank of Canada has issued a number of staff papers on a central bank issued digital currency. In its staff discussion paper 2017-16, "Central Bank Digital Currency: Motivations and Implications", the central bank's motivations for providing a digital currency to the general public was analyzed from an economic perspective.<sup>148</sup> The paper did not consider the technical and costs-based challenges in implementing such a currency.<sup>149</sup>

The central bank digital currency (CBDC) was viewed as a monetary value stored electronically (digitally, or as an electronic token).<sup>150</sup> The research found, amongst other findings, that the motivations analyzed for issuing CBDC, such as maintaining seigniorage and adequate central bank money, lowering some interest rates, inhibiting criminal activities, and other related matters; were not compelling enough to prompt a move towards a CBDC in the current environment, as such a move was deemed to be complex and uncertain.<sup>151</sup>

That said, the staff paper found some positive reasons for issuing a CBDC, such as, improving financial stability; increasing contestability; i.e. providing alternative retail

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<https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/the-future-of-money-speech-by-mark-carney.pdf?la=en&hash=A51E1C8E90BDD3D071A8D6B4F8C1566E7AC91418>.

<sup>144</sup> *Ibid.*

<sup>145</sup> *Ibid.*

<sup>146</sup> Philip Lowe, "An eAUD?" Reserve Bank of Australia, Address to the 2017 Australian Payment Summit Sydney (13 December 2017), online: <https://www.rba.gov.au/speeches/2017/sp-gov-2017-12-13.html>.

<sup>147</sup> *Ibid.*

<sup>148</sup> Walter Engert and Ben S. C. Fung, "Central Bank Digital Currency: Motivations and Implications", (November 2017) Bank of Canada Staff Discussion Paper 2017-16, online: <https://www.bankofcanada.ca/wp-content/uploads/2017/11/sdp2017-16.pdf>.

<sup>149</sup> *Ibid.*

<sup>150</sup> *Ibid.*

<sup>151</sup> *Ibid.*

payment systems, facilitate large-value payments among banks and firms, and allow access to central bank's balance sheet for a wide range of financial institutions; and promoting financial inclusion.<sup>152</sup> A CBDC could have considerable benefits for consumers in that it could provide a low cost, public utility, alternative to the payments systems currently run by federally and provincially regulated private financial institutions who earn significant income from their ability to level charges on consumers and retailers for the operation of these payments systems, an issue which will become increasingly important in the future as more and more payments become electronically based, increasing the opportunities for revenue generation by financial institutions by levying fees on such transactions.

While it is obvious that much work still needs to be done on this issue by central banks, this will be a key consumer issue in the future evolution of electronic payments systems. Not surprisingly, therefore, the need for such a CBDC was felt to by the Bank of Canada researchers to be a topic for future consideration.<sup>153</sup> At present, it remains unclear what position the Bank of Canada may eventually adopt with respect to a CBDC in the near, or distant, future.

In a related development, a project named "Jasper" was undertaken by the Bank of Canada with Payments Canada and other Canadian banks, in order to experiment with a wholesale interbank payment system using distributed ledger technology.<sup>154</sup> At the time of writing, the project found that there are several challenges, which must be addressed before such a ledger could be implemented in practice, such as, maintaining privacy of transactions, and scalability.<sup>155</sup>

Even if a centrally issued digital currency is introduced, some challenges faced by decentralized currencies may remain. Geva (2016) states that all types of digital currencies require laws relating to finality, mistake and fraud.<sup>156</sup> He notes that regulations may also be needed to govern the distribution of digital cash or CBDC to the public.<sup>157</sup>

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<sup>152</sup> *Ibid*

<sup>153</sup> *Ibid*

<sup>154</sup> Carolyn Wilkins and Gerry Gaetz, "Could DLT underpin an entire wholesale payment system?" *The Globe and Mail* (25 May 2017), online: <<https://www.theglobeandmail.com/report-on-business/rob-commentary/could-dlt-underpin-an-entire-wholesale-payment-system/article35106771/>>.

<sup>155</sup> *Ibid*.

<sup>156</sup> Benjamin Geva, "Disintermediating Electronic Payments: Digital Cash and Virtual Currencies" (2016) at p 7-8.

<sup>157</sup> *Ibid*.

### 3.9 Conclusion

This chapter sought to examine the nature and workings of cryptocurrencies, their economic implications, understand the differences between cryptocurrencies and fiat currencies, and assess the different types of cryptocurrencies, their operations, benefits and risks. The possibility and challenges of a centrally issued digital currency were also noted. It remains difficult to state at the moment, whether a government issued currency will materialize and if so, what benefits and risks consumers would face, but if implemented it may significantly change the financial landscape.

## Chapter 4: Are Cryptocurrencies Really an Option for the Average Consumer – What are the Legal Risks in using them?

### Introduction

In this chapter we look at the relevance of cryptocurrencies to the average consumer, mainly as a payment system. As such, we focus on cryptocurrencies as potential replacements for fiat currencies, such as the Canadian dollar, and assess their relative utility for consumers against the necessary key features of any currency:

- their potential to be accepted as a way to settle or pay accounts, in other words, their acceptance as a payment system;
- their ability to be used as a way to store value and transfer value;
- their suitability as units of account, or in other words, to provide a mechanism to compare prices; and finally,
- their use as investment vehicles.

In these discussions we also review the legal benefits and risks consumers might be exposed to when using cryptocurrencies as payment systems, as opposed to fiat currencies, as well as the economic benefits and costs they might experience. Most of these discussions are based on the assumption that cryptocurrencies will remain unregulated for the foreseeable future, although this could change in the coming years if cryptocurrencies' role in the economy grows. If regulatory mechanisms are introduced in the future some of the advantages and disadvantages to consumers of using cryptocurrencies could significantly alter the analysis presented here.

In chapter 5 we will look at current attempts by governments to regulate some aspects of the creation and use of cryptocurrencies to try to understand what aspects of cryptocurrencies maybe the subject of regulatory activity and further, based on the analysis presented here, what areas of regulatory activity might be most beneficial to consumers if cryptocurrencies came into more common usage.

## 4.1 Using Cryptocurrencies as Payment Mechanisms

As mentioned in Chapter 3, while most cryptocurrencies are designed to be used to settle accounts and serve as payment mechanisms, this has not proved to be the most significant use of these currencies so far in this stage of their development. The reasons for this are many and varied. We shall consider some general risk factors, which presently limit the use of cryptocurrencies as a medium of exchange, or a means to settle accounts; and then review some specific risks and limits pertaining to cryptocurrencies' use as a unit of account, store of value and as a payment mechanism.

### 4.1.1- Risks in using Cryptocurrencies as a means to settle accounts and as payment systems

Use of cryptocurrencies as a means to settle accounts is limited by two general risk factors; lack of acceptance; and their fluctuating value, which limits their ability to work as a payment system. We also consider the risk of losing funds when cryptocurrencies are used as a payment mechanism.

#### Lack of Acceptance

In the first instance cryptocurrencies must compete against the fact that fiat currencies are already well established as payment mechanisms within their respective countries and have been for centuries, and as discussed earlier, sovereign states have reinforced fiat currencies' role as payment mechanisms by designating them as legal tender. In other words, they have made their national currencies the legal mechanism by which accounts and debts can be settled within their respective national boundaries, legal advantages which cryptocurrencies such as Bitcoin do not possess.

Merchants are under no obligation to accept a cryptocurrency as a method of payment, for example, nor does a bank have to accept a cryptocurrency in the discharge of a mortgage or a loan, whereas they are legally required to accept a fiat currency for these transactions. While, as we have seen, some merchants have established mechanisms which allows them to accept cryptocurrency payments, relative to the economy as a whole they are a very small proportion of the merchants accepting payments in their respective countries. Some stakeholders we consulted, reinforced the low merchant acceptance of cryptocurrencies in Canada.

The existing payments system in a country like Canada, with all its various permutations and combinations (bank notes and coins, paper cheques, electronic debits and credits, credit and debit cards, etc.) has a long-established reputation for reliability and robustness in processing billions of payment transactions annually. Further, surrounding this entire ecosystem is a network of laws, regulations and industry practices, which ensure the solvency of the system and provides users (such as consumers) of these systems with legal and financial protections in the event of transaction failure, or the failure of the institutions managing the payments system.<sup>158</sup> No such backup mechanisms or systems of redress exist in the case of a failure in a cryptocurrency transaction when using it as a payment mechanism, or indeed for any other purpose, such as placing cryptocurrencies in currency exchanges or exchanging currencies.

### Fluctuating Value

In addition, as noted in Chapter 3, the fluctuation in the value of many cryptocurrencies is also a significant handicap to their use as a payment mechanism as it makes it difficult for the payor and the payee to be certain they are getting value for money in the exchange if the currency is increasing or decreasing in value. For example, a currency which is rapidly diminishing in value on a daily basis presents risks to an employee who gets paid every two weeks in that currency and who finds that the amount of groceries he can buy in the second week is radically diminished as the value of his pay packet declines (assuming his grocery store can quickly adjust their prices upwards).

This is particularly the case if these changes in value are rapid and large, as can often be the case with a cryptocurrency such as Bitcoin. This problem is compounded by the fact that some cryptocurrency exchanges can be quite slow in completing a transaction and none are designed at present to handle the volume of transactions that would be required to support a broadly-based retail payment system such as exists today in any national economy.

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<sup>158</sup> For an overview of the existing structure of regulatory and management infrastructure of the Canadian payments system see, Bank for International Settlements/Committee on Payments and Market Structures, *Payment, clearing and settlement systems in the CPSS countries*. Vol. 1, (Basel: BIS, September 2011), pp. 103-143. An example of the kinds of regulatory codes in place include the Canadian Code of Practice for Consumer Debit Card Services which lays out the responsibilities of payment processors, card issuers and consumers with respect to debit card transactions and the protections afforded to consumers. In Canada, federally regulated deposit institutions such as banks are regulated by the Bank Act, amongst other pieces of legislation, and regulated prudentially by the Office of the Superintendent of Financial Institutions and from a (limited) consumer protection perspective by the Financial Consumer Agency of Canada. Consumer deposits in federally regulated financial institutions are insured against loss by the Canada Deposit Insurance Corporation. Similar regulatory and insurance provisions exist at the provincial level for provincially regulated financial institutions such as credit unions.

In the case of Bitcoin, it took about an hour to process a single transaction between two parties for the standard confirmation through 6 transaction blocks in the chain in 2015,<sup>159</sup> and while this can appear fast compared to the time to clear cheques for example, which can take several days,<sup>160</sup> it can be very a significant disadvantage if the cryptocurrency fluctuates in value by several dollars a day, which is often the case, with the result that before the transaction has cleared the value of the currency has changed significantly. Not surprisingly, therefore, recently users of Bitcoin and Ethereum have been complaining about the length of time it takes to process transactions as the growth in transaction volumes has risen.<sup>161</sup> One respondent in our consultations, noted that current market frictions and limited liquidity have resulted in value fluctuation which, in turn, seems to be a "key deterrent" to cryptocurrencies being currently accepted as a form of "money." These frictions include, but are not limited to, public, regulatory policy and ongoing maturation of technology, which can result in limited trading and therefore asset liquidity.

### Losing Funds

Consumers face the risk of losing funds through several causes. For example, when the counterparty fails to meet their contractual payment or settlement duties, possibly because there were no clear contractual terms and conditions, or counterparties lacked the financial resources to comply with the payment.<sup>162</sup> Users can also lose funds if the money is sent to the wrong e-wallet,<sup>163</sup> there is a significant fluctuation in the exchange rate,<sup>164</sup> the subject cryptocurrency exchange goes out of business,<sup>165</sup> or the cryptocurrency machine (such as Bitcoin ATM) malfunctions. In all these cases there is no guarantee or mechanism for a consumer to be reimbursed for any losses.<sup>166</sup>

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<sup>159</sup> J. Bonneau, "How Long Does It Take for a Bitcoin Transaction to be Confirmed?" *Coincenter.org*, 3 November 2015, accessed at <https://coincenter.org/entry/how-long-does-it-take-for-a-bitcoin-transaction-to-be-confirmed>, on 13 March 2018.

<sup>160</sup> With modern cheque imaging technologies, which eliminate the need to physically move paper cheques through the payments systems, the time to clear a cheque today can be as little as a day. And many electronically based payments systems using fiat currencies, e.g. credit and debit cards, can process payments even faster, often in just a matter of hours.

<sup>161</sup> Sherman Lee, *op.cit.*

<sup>162</sup> European Banking Authority, "EBA Opinion on 'virtual currencies'" (4 July 2014), online: <<https://www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>> at p.26-28.

<sup>163</sup> *Ibid.*

<sup>164</sup> *Ibid.*

<sup>165</sup> *Ibid.*

<sup>166</sup> *Ibid.*

#### 4.1.2- Benefits of using Cryptocurrencies as Payment Mechanisms:

##### Individual benefits: Privacy and lack of reliance on public authorities

One major purported advantage of using cryptocurrencies is privacy. Unlike many electronic payment systems based on fiat currencies, cryptocurrencies do not require the provision of personal or sensitive data, such as credit card information to complete a transaction.<sup>167</sup> This is a particularly important advantage when increasing concern is being expressed about the ability of private sector organizations to monitor purchasing activity within the existing payments system and to use it as a device to target advertising to individuals, or to assess other economic aspects of their involvement in the market. The anonymity of cryptocurrency transactions, therefore, appears to offer a way to allow consumers to make their purchasing activity confidential.

However, this benefit needs to be viewed with caution, as some reports indicate that cryptocurrencies may not be as private and secure, as they are understood to be. Cryptocurrency transactions are pseudo-anonymous, instead of being anonymous.<sup>168</sup> This means that even though the senders and receivers to a transaction may not be known within the blockchain, their transactions, and payments history are public information.<sup>169</sup> This makes it possible to infer more information about the users and potentially to trace their identity.<sup>170</sup> Therefore, while keeping individuals' identities hidden is a major benefit, blockchain technology's transparency about the nature of transactions raises new privacy concerns.<sup>171</sup>

##### Economic benefits: Potentially Reduced Production Costs and Transaction Times

Proponents have claimed that a major potential benefit of using cryptocurrencies as a payment mechanism is their potential to reduce transaction costs. The blockchain technologies underlying cryptocurrencies allow the potential for individual to individual transfers of currency, or individual to company transfer of currency without using the existing payment infrastructure. In addition, one respondent noted in our consultations that cryptocurrencies may have significant benefits in cross-border transactions, where

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<sup>167</sup> European Banking Authority, "EBA Opinion on 'virtual currencies'" (2014), at p.19.

<sup>168</sup> Forbes Technology Council, "What Happens In Cyberspace Stays Online Forever: Cryptocurrencies And Privacy" *Forbes* (12 April 2018), online: <<https://www.forbes.com/sites/forbestechcouncil/2018/04/12/what-happens-in-cyberspace-stays-online-forever-cryptocurrencies-and-privacy/#6b0e83d22c49>>.

<sup>169</sup> *Ibid.*

<sup>170</sup> *Ibid.*

<sup>171</sup> Quora Contributor, "Why Blockchain Might End Up Eroding Your Online Privacy" *Forbes* (13 March 2018), online: <<https://www.forbes.com/sites/quora/2018/03/13/why-blockchain-might-end-up-eroding-your-online-privacy/#441c9fc737e6>>.

speed, high-costs and lack of transparency, remain typical concerns in case of conventional cross-border banking systems. Some of these benefits can already be seen in the use of Ripple's xRapid in tests conducted in Latin America, Japan, and South Korea. Nevertheless, the respondent noted that such benefits being realized on a wider scale will ultimately depend on the attitude towards exploring and adopting such technologies on the part of regulators and financial institutions. Like payments in cash, but unlike payments using other mechanisms (cheques, automatic transfers, debit and credit card transactions and transactions using fintech such as PayPal), cryptocurrency transfers could theoretically be processed free of charge using the internet, with the only requirement being the need to procure the necessary software to access the blockchain technology and establish digital wallets on a secure personal computer or similar device, which are onetime costs. The reality, is however, less attractive as apart from transactions between individuals who are known to each other most cryptocurrency transactions go through exchanges or other third party processors who do charge, sometimes significant, transaction fees.<sup>172</sup>

At present low or no cost transfers remain only a theoretical possibility as it appears that blockchain technologies are not yet robust enough to deal with the volume and complexity of transactions that would be required of any cryptocurrency that became broadly based enough to be a widely accepted payment mechanism in the retail economy. If these hurdles were overcome, however, and internet networks were able to handle the volume of transactions involved, the potential to disintermediate the existing payment mechanisms run by financial institutions, and their ability to levy transaction fees on payments without competitive alternatives, could be significant.<sup>173</sup>

Another potential advantage of cryptocurrencies is reduced transaction processing time. Transactions using cryptocurrencies can be conceivably settled faster than fiat currencies.<sup>174</sup> However, these initial promising processing times have significantly increased over the years as transaction volumes have grown, highlighting one of the key drawbacks to mass use of the current generation of blockchain technologies that back up most cryptocurrencies today. For example, in Bitcoin's early days processing time was

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<sup>172</sup> Jorn van Zwanenburg, "Cryptocurrency Transaction Fees: A Beginner's Guide" *Invest In Blockchain* (30 October 2017), online: <<https://www.investinblockchain.com/cryptocurrency-transaction-fees-for-beginners/>>.

<sup>173</sup> Existing cryptocurrency exchanges do charge transaction fees at present and sometime quite hefty conversion fees to convert a cryptocurrency to a fiat currency, so cryptocurrency transactions today are not without costs.

<sup>174</sup> European Banking Authority, "EBA Opinion on 'virtual currencies'" (2014) at p.19.

around 10-60 minutes, however, this has gradually increased to 78 minutes, making it less efficient as a payment mechanism.<sup>175</sup>

## 4.2 Using Cryptocurrencies as Stores of Value

For consumers, one of the most important attributes of any currency is the role it plays as a store of value. We keep currency in our wallets, in our bank accounts and sometimes under the metaphorical mattress and we expect the currency to hold its value while stored and for there to be places where it can be stored safely without significant risk of loss or theft. However, cryptocurrencies entail certain risks in their use as stores of value compared to fiat currencies.

### High Volatility

With respect to holding value, most cryptocurrencies suffer a significant disadvantage relative to fiat currencies in that, as we have outlined, they fluctuate in value quite markedly and often very quickly. Since they were created a decade or so ago, most cryptocurrencies have increased in value by, in some cases, very significant amounts and well in excess of any major fiat currency. This is a significant advantage if one is holding a currency for the long term, an issue we address in more detail in section 4.4. However, these increases have been quite unpredictable and have been punctuated by rapid and steep declines in value from time to time meaning that compared to the value of the Canadian dollar, one can never be sure what the value might be of the cryptocurrencies you hold at any one point in time.

### Counterfeiting

The second issue as a store of value is the degree to which the cryptocurrency you hold may be counterfeit. Theoretically, cryptocurrencies have an advantage over hard fiat currencies (coins and banknotes) in that their creation through algorithms based on cryptographic principles makes them inherently difficult to copy or counterfeit. However, it is impossible to guarantee that any encrypted code cannot be cracked and the high current value of some cryptocurrencies (Bitcoin was trading at around US\$10,000 in January 2018) offers a big incentive to attempt to copy or counterfeit crypto-coins.

Banknotes and coins offer a less attractive target as their nominal face value is much lower and many jurisdictions have in recent years eliminated high denomination

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<sup>175</sup> Ryan Browne, “Big transaction fees are a problem for bitcoin — but there could be a solution” (2017).

banknotes to reduce their use in criminal transactions and money laundering.<sup>176</sup> In addition, printing technologies for banknotes have also significantly improved, making it much more difficult to economically counterfeit them.<sup>177</sup>

### **Lack of a Secure Storage Mechanism and Fewer Protections**

Finally, and perhaps most significantly, one of the major weaknesses of cryptocurrencies as a store of value is the lack of a truly secure infrastructure for their storage, which has seen many instances of hacks and lost funds, as noted above. Disturbingly, the ways in which the systems were compromised are often not clear and in some cases operators of exchanges have been accused of fraud or deception.<sup>178</sup>

As these exchanges, and the cryptocurrency systems they contain, are effectively unregulated either from a fiduciary or a consumer protection perspective, there are no guarantees to the users of such exchanges and cryptocurrencies that they are properly run, have adequate financial reserves or robust security systems, or indeed that the cryptography at the core of the creation of the currency is impervious to being hacked at some point in the future.<sup>179</sup> Indeed, there are no independent guarantees that the cryptography surrounding the creation of the currencies contained in the exchanges or in individuals' digital wallets, or the blockchain systems tracking their exchange, are sufficiently robust or effective.

When things go wrong the holders of the cryptocurrency are totally at risk of losing their assets as there is no third party to stand behind the currency, or the operation of the exchange. The Financial Consumer Agency of Canada (FCAC), also shared similar concerns in our consultations, indicating that cryptocurrencies offer fewer protections, than fiat currencies, with issues, such as; limited consumer protections, uninsured deposits, high investment risks, difficulty exchanging digital currency, exposure to fraud, and irreversible transactions.

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<sup>176</sup> For example, Canada's 2018 Budget papers announced that the \$1000 Canadian banknote would be stripped of its status as legal tender along with several other banknotes that are no longer issued, including the \$1, \$2, \$25, and \$500 denominated notes. The \$1000 note ceased being issued in 2000. Monique Scotti, "Government to Phase out \$1000 bill and several older banknotes as legal tender" *Global News* (28 February 2018), online: <<https://globalnews.ca/news/4052577/old-canadian-banknotes-legal-tender-budget-2018/>>. (Last accessed on 6 March 2018).

<sup>177</sup> Australia, Canada and the UK have moved to issuing their banknotes on polymer which is very difficult to counterfeit and contains numerous anti-counterfeiting technologies including transparent windows containing three-dimensional colour holograms.

<sup>178</sup> Judith Lee et al, *op. cit.*, p. 31-33.

<sup>179</sup> Reuters, "Cryptocurrency Exchanges Are Increasingly Roiled by Hackings and Chaos" *Fortune* (29 September 2017), online: <<http://fortune.com/2017/09/29/cryptocurrency-exchanges-hackings-chaos/>>.

In contrast, with a fiat currency that is deposited in a bank, the holder of the money can be certain that the institution is fiduciarily regulated, and if the institution becomes insolvent or bankrupt, as a result of mismanagement, fraud or theft, their deposits are insured by a state owned or backed insurance program. Most advanced industrial countries such as Canada have state insurance programs that ensure that deposits are protected in the event of the failure of the institution holding them.

While it is possible to safely store your own cryptocurrencies in your digital wallet on your personal computer, it is critically important that the secure key code which allows you to transfer your cryptocurrency to another wallet is stored separately in a secure location (ironically the advice is often very old fashioned: to have it recorded on paper and stored in a safe).

While bank robberies do still take place and while fraud still occurs with the transfer electronically of fiat currencies within and between financial institutions, for example within the debit and credit card systems, the institutions managing those systems are sufficiently large to maintain sophisticated security systems to protect their systems and facilities against theft and fraud. Further, their sheer size also ensures that any such losses that do occur do not pose a financial risk to them. Finally, users (e.g. cardholders) are protected against losses from fraud by the institutions themselves and to a certain extent by government regulations and deposit insurance schemes.

One respondent, in response to our questionnaire, distinguished between centralized exchanges, and decentralized exchanges (DEX); noting that in case of centralized exchanges, safety and security concerns arise. On the other hand, large-scale, decentralized exchanges, are more secure, as they are built into blockchain protocol, allowing for increased user control over their data and transactions. The respondent expects increased adoption of DEX in the long-term. That said, these exchanges are still in their early stage of development, and it is uncertain whether they will be widely adopted or not, and whether they will offer an effective alternative or solution to the problems faced in using centralized exchanges.

#### **4.3 Using Cryptocurrencies as Units of Account**

Fiat currencies play an important role in the economy by serving as units of account. In other words, producers assign to a good or a service a unit of account (a price) that reflects their cost to produce or deliver the good or service, plus a profit. Consumers, likewise,

compare the prices offered by producers of a good or service with those offered by other providers to determine whether the price being offered is a fair one for the quality or quantity of the good or service on offer.

In order for a currency to serve as a unit of account it needs to possess a number of characteristics. First, it must be universally accepted as the medium of exchange in an economy so that all prices and accounts that are publicly available are measured by the same unit of value. Second, the currency or unit of value, must have a reasonably stable defined value over a reasonably long period of time so that growth in the economy can be measured, or at a minimum the level of inflation determined and accommodated in price adjustments and accounting methods.

Most fiat currencies perform these functions quite well primarily because they are ubiquitous within their national economies and accepted as payment mechanisms by the population within the state in which they operate. This is reinforced by the state giving their currencies the status of legal tender which means they are legally recognized, and in most cases required, as the unit of value by which goods are exchanged and accounts (e.g. debts) settled. Not surprisingly, in many cases consumer protection and other legislation requires the price of goods or services be displayed or advertised in national currency units.

Cryptocurrencies, by contrast, are not sufficiently widely accepted to serve as good units of account or measures of value and they lack any legal protection or authority as the unit of account to be used when purchasing goods or services or for the discharge of debts.

Further, there are so many cryptocurrencies, all with rapidly fluctuating valuations, that there seems little prospect that any one or two of them would become a widely enough accepted benchmark to serve as a unit of account. This weakness appears to reduce considerably their usefulness to consumers as mechanisms to compare prices or costs in the marketplace and the practical result is that one rarely, if ever, sees goods or services priced in cryptocurrencies today.

#### **4.4 Using Cryptocurrencies as Investment Vehicles**

We now come to the one attribute of a currency, albeit perhaps one of the less important attributes of a currency, where cryptocurrencies have been a remarkable success. That function is their use as speculative investment vehicles. Despite their rather poor

performance in terms of establishing themselves as payment mechanisms or units of account, cryptocurrencies definitely have captured the imagination of individual investors as speculative investment commodities and certainly, as can be seen from this report, the growth in the value and volume of cryptocurrencies as investment vehicles has been truly remarkable. Indeed, to the extent that national governments have attempted to deal with cryptocurrencies it has been, as we will see in Chapter 5, from the perspective of investment regulators attempting to regulate them as commodities or securities and for national tax authorities to treat them as investments or property for taxation purposes.

It is important to look at cryptocurrencies as investment instruments from two perspectives. First, how do they perform over the long term as investment vehicles, and second, what are the legal risks consumers run of investing in cryptocurrencies?

#### 4.4.1- Long term use as Investment Vehicles

At one level, cryptocurrencies have defied all expectations in terms of their performance as investments. As shown in Chapter 3, from their inception about a decade ago, cryptocurrencies have moved from worthless electronic tokens exchanged on an experimental basis by individuals interested in them as a proof of concept for a new form of self-regulating electronic currency, to the situation today where individual Bitcoins (the first and largest cryptocurrency) were trading in the first month of 2018 in US\$10,000 range.

As we have noted earlier, this growth in value has not been without some considerable volatility as these currencies can rise in price and then collapse very quickly. Perhaps the most dramatic rise and fall was from 2017 when Bitcoin rose in value by approximately 1000% to a valuation of approximately US\$ 20,000 only to crash to US\$10,000 in January 2018 wiping out about US\$50 billion in Bitcoin's market cap in January alone.<sup>180</sup>

There has been a lot disagreement amongst those involved in the investment community about the future of cryptocurrencies as investment vehicles. Many, particularly investment bankers and central bankers, have dismissed them as speculative commodities that are eventually going to fail and leave investors in them penniless. To quote one senior merchant banker, James Gorman, CEO of Morgan Stanley, "I'm not sure I understand [Bitcoin], I mean it's . . . totally surreal."<sup>181</sup>; and Nouriel Roubini, a former staff expert to the US President's Council of Economic Advisers (and a senior expert at the US

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<sup>180</sup> Eshe Nelson, "In One Brutal Month, Nearly \$50 billion was Wiped Off of Bitcoin's Market Value", *Quartz*, (1 February 2018) online: <<https://qz.com/1195511/bitcoin-lost-nearly-50-billion-in-market-value-in-january/>>. (Last accessed on 9 March 2018).

<sup>181</sup> Quoted in Nicholas Wenkler, "On-Line Currencies, Real-World Chaos: The Struggle to Regulate the Rise of Bitcoin", *Texas Review of Law and Politics*. Vol. 19, No. 1, (2014), p. 146.

Federal Reserve, the IMF and the World Bank) has called Bitcoin “the mother of all bubbles” which he predicts is bound to crash.<sup>182</sup> Robert Schiller, the Nobel Prize winning American economist was recently quoted as saying:

“I tend to think of bitcoin as an experiment. It is an interesting experiment, but it’s not a permanent feature of our lives,” said Shiller, who has previously warned that the bitcoin price could collapse. “We are over-emphasizing bitcoin, we should expand it out to blockchain, which will have other applications.”<sup>183</sup>

Nonetheless, Bitcoin has many advocates in the investment community, although it has to be said that many of them are those already heavily invested in cryptocurrencies or involved in cryptocurrency exchanges.

#### 4.4.2- Legal Risks of Investing in Cryptocurrencies

One of the big problems for consumers when participating as an investor in cryptocurrencies is that, like many other aspects of their uses as currencies, they are essentially unregulated. Unlike investing in stocks or bonds or mutual funds, cryptocurrencies are not currently regulated as investment vehicles<sup>184</sup>.

No securities commission or financial markets regulator in any country supervises the structure of cryptocurrencies issues (for example, by specifying standards for the software that determines how a cryptocurrency functions), although, as we will discuss in Chapter 5 and as we outlined in Chapter 3, some securities regulators are starting to attempt to regulate, or consider regulating, what appear to be fraudulent or misleading schemes that seek to raise (or appear to raise) money for ICOs, cryptocurrency exchanges, or mining operations.<sup>185</sup> So, unlike investing in equities markets, investors have no access to

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<sup>182</sup> Eric Lam, Dani Berger and Joanna Ossinger, “Bitcoin Whipsaws Investors As Bubble Shows Signs of Bursting”, *Bloomberg Technology* (2 February 2018), online:

<<https://www.bloomberg.com/news/articles/2018-02-02/bitcoin-drops-below-8-500-as-cryptocurrency-misery-continues>>. (Last accessed on 9 March 2018).

<sup>183</sup> Graeme Wearden, “Bitcoin Won’t Last in the World of Finance, Warns Nobel-Winning Economist” *The Guardian* (25 January 2018), online: <<https://www.theguardian.com/business/2018/jan/25/bitcoin-wont-last-in-world-of-finance-warns-nobel-winning-economist>>. (Last accessed on 9 March 2018).

<sup>184</sup> Cryptocurrency exchanges are regulated in some countries, such as the United States in the sense they are required to register with the Financial Crimes Enforcement Network of the US Treasury Department as money services businesses, mainly to track money flows. It does not necessarily mean that the exchange is trustworthy. See, Consumer Financial Protection Bureau, *Consumer Advisory: Risks to consumers posed by virtual currencies*. (Washington: CFPB, August 2014) at p. 2.

<sup>185</sup> See Nathaniel Popper, “Subpoenas Signal S.E.C. Crackdown on Initial Coin Offerings” *New York Times* (28 February 2018), online: <https://www.nytimes.com/2018/02/28/technology/initial-coin-offerings-sec.html>. See also: North American Securities Administrators Association (NASAA), “NASAA Reminds Investors to Approach Cryptocurrencies, Initial Coin Offerings and Other Cryptocurrency-Related Investment Products with Caution” (4 January 2018), online: <http://www.nasaa.org/44073/nasaa->

information on the currency they are investing in apart from reports on their performance in cryptocurrency exchanges, which are themselves unregulated.

Further, purchasing cryptocurrencies as investments is fundamentally different from purchasing a stock or mutual fund investment where you can analyze the performance of the company or fund, assess its net worth, profitability and so forth, review detailed compulsory disclosures when a company issues a public offering of stock, as well as the performance of the company or the fund of over a period of time on regulated stock exchanges and know that the information you are looking at is essentially verifiable.

In purchasing a cryptocurrency the only analytical exercise you can engage in is to make a guess, based on previous patterns of market valuations, what the trading value of the currency will be in the future. Unlike stock, cryptocurrencies have no intrinsic value in themselves, they are not backed by the business worth of a company, or a specific set of physical assets, or indeed the good faith of a government which is able to sequester resources within its sovereign territory to back its currency.<sup>186</sup>

In summary, while cryptocurrencies have offered in the last few years impressive results as speculative investment vehicles, recent collapses in their value strongly suggests that that they may be speculative bubbles and of interest only to those well-informed investors who can afford to lose the sums they have invested in speculation. They certainly do not, at this stage in their evolution, constitute investments that would find a place in any standard investment or retirement portfolio designed to build value or generate income for the average retail investor who generally has relatively low tolerances for risk.

#### 4.5 Summary of Main Findings

Judging cryptocurrencies as useful tools for consumers and assessing the legal risks for consumers in using cryptocurrencies has been the main focus of this chapter. In summary, we believe it would be fair to say that, in their current forms, cryptocurrencies offer few practical benefits for consumers. They are poorly developed as payment mechanisms in that they are not generally useable for most of the retail payments that the average consumer would engage in, and for minor transactions the current user fees in place make them expensive to use.

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[reminds-investors-approach-cryptocurrencies-initial-coin-offerings-cryptocurrency-related-investment-products-caution/](#).

<sup>186</sup> Jay Adkisson, “Bitcoin Hurt by Lack of a Viable Pricing Model and the Ghostbusters Stairs Syndrome”, *Forbes* (21 January 2018), online:

<https://www.forbes.com/sites/jayadkisson/2018/01/21/bitcoin-hurt-by-lack-of-viable-pricing-model-and-the-ghostbusters-stairs-syndrome/2/#55b7bdac3c3c>. (Last accessed on 9 March 2018).

Further, their rapid and significant fluctuations in value make them poor candidates at present as both stores of value and as units of account, both key functions of any currency that a consumer would use. And finally, as investment vehicles their speculative character make them poor candidates for the typical retail investor who cannot afford the potential level of risk these types of investments carry.

In terms of the legal risk cryptocurrencies pose for consumers, the challenges are significant. The supposed advantage of cryptocurrencies, the fact that they can function outside of the context of a state supported currency system, actually poses a significant risk for consumers due to the lack of consumer protections covering cryptocurrencies compared to those that are available in the case of payment systems based on fiat currencies.

Cryptocurrencies by their very nature are not considered as legal tender in any country, and so merchants or banks are not obliged to accept them for payment for purchases or for the payment of debts. Further, the legal protections that exist in fiat currency payment systems that provide protection in the case of a failure of a payment, payment fraud, or perhaps most importantly, the financial failure of the institutions handling payments do not exist in the case of cryptocurrencies. This is particularly the case in terms of the role of the institutions that also serve as places to store value, the currency exchanges, which again unlike their equivalent in the fiat currency system, banks and credit unions, carry no protections against fraud, theft or their financial failure.

There are some key advantages of cryptocurrencies, such as the potential anonymity that the blockchain system seems to provide to consumers when making payments and the blockchain's ability to provide an alternate, competitive and potentially more cost-effective and less time-consuming way to make payments. However, these significant advantages for consumers can only be realized if, in the future, the blockchain system can be further developed and improved in terms of its ability to handle large volumes of transactions quickly, and if cryptocurrencies could be effectively regulated to overcome the significant risks they pose for consumers as payment systems, stores of value and units of account.

## Chapter 5: Regulating Cryptocurrencies abroad and in Canada: Does Regulation have a benefit for the Average Consumer?

### Introduction

This chapter outlines the emerging regulatory landscapes governing cryptocurrencies in different jurisdictions, specifically, in the U.S., European Union, and Australia; aiming to assess their relevance and application in Canada. In particular, we examine selected countries' regulatory measures, institutional basis for regulation, and evaluate the importance of these governing tools for consumers' use of cryptocurrencies. This is a large and evolving area, and for the purposes of this report, we focus on the regulatory initiatives pertinent to protecting consumer interests in this context.

#### 5.1 Reasons for Regulation

Some academics find consumer protection to be one of the most important reasons for regulating cryptocurrencies.<sup>187</sup> Consumers generally lack the technical know-how required to deal with the challenges associated with cryptocurrencies, making them more prone to losses when such technologies are left unregulated.<sup>188</sup>

Among the reasons to have regulations, consumer protection might be one of the best. Indeed, consumers are usually the first victims because of their lack of sophistication and/or access to the information necessary to protect themselves. With respect to Bitcoin, there is an agreement that this is an area in which regulatory intervention would "make a lot of sense," as put by Gavin Andresen, chief scientist at the Bitcoin Foundation. He even went further to say that consumer protection was one way that governments could perform "useful oversight." Many articles have tried to highlight the various consumer risks caused by Bitcoin. Among those risks, the most important is the possibility of losing your Bitcoin if they are not secured enough. This risk has materialized with the loss of \$6 billion worth of Bitcoin due to hack of Mt. Gox, as will be discussed below. Other risks include lack of disclosures, Bitcoin's high volatility, and some internal mining mechanisms.<sup>189</sup>

Our research indicates that one of the main reasons for regulatory action in this space is addressing and mitigating consumer risks, i.e. when consumers use cryptocurrencies as payment systems and investment vehicles. It would appear that clear regulations are

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<sup>187</sup> Tara Mandjee, "Bitcoin, Its Legal Classification and Its Regulatory Framework" (2014) 15 *J. Bus. & Sec. L.* 1 at 40.

<sup>188</sup> *Ibid.*

<sup>189</sup> *Ibid.* [Footnotes in the quote are omitted here].

needed to effectively address different consumer risks. We note that particular attention might be needed to be focused on protecting younger adult consumers, as millennials are reported to be particularly interested in cryptocurrencies compared to other demographic groups, with some actively participating in cryptocurrency transactions.

### 5.1.1 Significant Risks for Consumers

Consumer risks in the cryptocurrency world are significant and include: scams related to the sale of cryptocurrencies, especially relating to new coin offerings; being misled into investing in manipulated or fake cryptocurrency exchanges; loss of cryptocurrencies in wallets or exchanges through hacking; investment losses because of cryptocurrencies' high volatility; receiving counterfeited cryptocurrencies, and losing private keys, to name but a few.

Arguments for greater regulatory oversight have been prompted, in particular, by hacks of major cryptocurrency exchanges. For instance, the hack of Mt. Gox in 2014, one of the largest Bitcoin exchanges at the time, was reported to have caused a loss of Bitcoins valued at over US\$400 million.<sup>190</sup> In early 2018, another Japanese exchange, Coincheck was hacked, resulting in the loss of Bitcoins worth over US\$530 million.<sup>191</sup> These are merely two of the most significant hacks from the last decade, and do not include various other smaller losses from exchanges, resulting from operational failures and scams, which have cost owners significant losses.<sup>192</sup> These incidents have made many countries increase their scrutiny of several exchanges, including calls for clarity as to what security measures and filters are needed to minimize risks.

Another issue stimulating regulatory concern is the use of cryptocurrencies for unlawful activities, including tax evasion and other illicit activities.<sup>193</sup> This remains a significant

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<sup>190</sup> Alexandra Harney and Steve Stecklow, "Twice burned - How Mt. Gox's bitcoin customers could lose again" *Reuters* (16 November 2017), online: <<https://www.reuters.com/investigates/special-report/bitcoin-gox/>>. Various reports indicate different numbers, the numbers referred here are only an estimate, based on cited reports.

<sup>191</sup> Taiga Uranaka and Thomas Wilson, "Japan raps Coincheck, orders broader checks after \$530 million cryptocurrency theft" *Reuters* (28 January 2018), online: <<https://www.reuters.com/article/us-japan-cryptocurrency/japan-raps-coincheck-orders-broader-checks-after-530-million-cryptocurrency-theft-idUSKBN1FI06S>>.

<sup>192</sup> Andrea Tan and Yuji Nakamura, "Cryptocurrency Markets Are Juicy Targets for Hackers: Timeline" *Bloomberg* (29 January 2018), online: <<https://www.bloomberg.com/news/articles/2018-01-29/cryptocurrency-markets-are-juicy-targets-for-hackers-timeline>>.

<sup>193</sup> Wolfie Zhao, "IMF Chief Lagarde: Global Cryptocurrency Regulation Is 'Inevitable'" *CoinDesk* (12 February 2018), online: <<https://www.coindesk.com/imf-chief-lagarde-global-cryptocurrency-regulation-is-inevitable/>>.

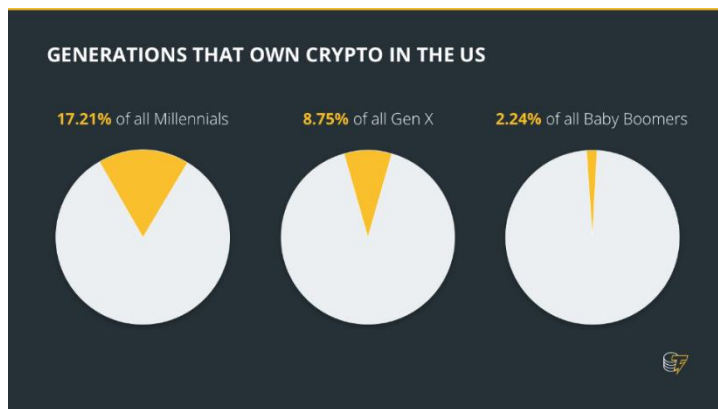
concern, however, as this is outside the scope of our present research, we will not be engaging in an analysis of these issues here.

### 5.1.2 Increasing Interest of Millennial and other Younger Consumers

Another reason we find critical for regulatory oversight is the rising interest of younger consumers investing in cryptocurrencies. There is increasing evidence that while younger adults are much more likely to invest in cryptocurrencies, it would appear that many may not fully understand the risks associated with cryptocurrency investments. A survey conducted by Pollfish on behalf of the Student Loan Report (February to March 2018) revealed that out of 1000 participants, 21.2% of current college students with a student loan debt had used financial aid money to fund a cryptocurrency investment.<sup>194</sup>

The Student Loan Report estimates that more than one-fifth of college students are “[d]ipping their toes, or maybe diving in head-first, in the virtual currency space, and they are using their student loans to do it.”<sup>195</sup> Research by Finder.com revealed that millennials had a 17.21% cryptocurrency ownership rate out of the 2,001 American adults surveyed, a significantly higher level of engagement in cryptocurrency ownership than any other demographic group, suggesting that young American adult consumers are most likely to think of cryptocurrencies as an attractive investment proposition<sup>196</sup>

**Figure 5-1: Generations that own crypto in the US**



Source: [Cointelegraph](#) with original research by [Finder.com](#) (2018)

<sup>194</sup> Drew Cloud, “Financial Aid Funding Cryptocurrency Investments” *the student loan report* (March 22, 2018), online: <<https://studentloans.net/financial-aid-funding-cryptocurrency-investments/>>.

<sup>195</sup> *Ibid.*

<sup>196</sup> Finder.com, “Why haven’t we all bought cryptocurrency yet?” online: <<https://www.finder.com/why-people-arent-buying-cryptocurrency/>> (Last accessed March 31, 2018).

Another report by *Forbes* revealed that according to a survey by Blockchain Capital, 30% of those in the 18-34 year old age group would rather invest \$1000 in Bitcoin, than in government bonds or stocks.<sup>197</sup> This study also showed that 42% of millennials have heard about Bitcoin, as compared to 15% of those aged 65 and above.<sup>198</sup>

Some reports indicate that millennials are drawn towards investing in cryptocurrencies to save for retirement.<sup>199</sup> A millennial, Jeremy Gardner (26 years old), who is managing partner at Ausum Ventures, has been investing in cryptocurrencies for five years.<sup>200</sup> While speaking to *Forbes*, he stated:

As a millennial, I personally put much greater faith in scarce digital assets that are determined by math and auditable code, rather than a group of bankers at the Federal Reserve. This is because dollars depreciate in value, while crypto assets historically have appreciated, and will continue to exponentially, should they be successful. That being said, I've put away savings for my unborn children's education and my retirement, [...].<sup>201</sup>

In Canada, an online survey conducted by the Ontario Securities Commission (OSC) in November 2017, surveying Ontarians aged 18 and above, also found that younger Ontarians saw cryptocurrencies as less risky than Ontarians generally.<sup>202</sup>

Another survey of male employees (aged 25-30) in Japan, indicated that 14% of those surveyed owned cryptocurrency.<sup>203</sup> The reasons given for entering the cryptocurrency market were: investment (92%), simply following a trend (37.4%) or influenced by media reports (19.9%).<sup>204</sup>

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<sup>197</sup> Andrew Arnold, "30% Of Millennials Would Rather Invest In Cryptocurrency: Here Are 3 Tips To Help You Do It Smarter" *Forbes* (7 January 2018), online: <<https://www.forbes.com/sites/andrewarnold/2018/01/07/30-of-millennials-invest-in-cryptocurrency-here-are-3-tips-to-help-you-do-it-smarter/#4a27472a7861>>.

<sup>198</sup> *Ibid.*

<sup>199</sup> Rachel Wolfson, "Millennials Speak Out About Investing In Cryptocurrencies For Retirement Funds" *Forbes* (28 March 2018), online: <<https://www.forbes.com/sites/rachelwolfson/2018/03/28/millennials-speak-out-about-investing-in-cryptocurrencies-for-retirement-funds/#16e23b4e1a38>>.

<sup>200</sup> *Ibid.*

<sup>201</sup> *Ibid.*

<sup>202</sup> *Ibid.*

<sup>203</sup> Molly Jane Zuckerman, "14 Percent Of Japan's Young Male Workforce Invest In Cryptocurrencies, Study Shows" *Cointelegraph* (April 5, 2018), online: <<https://cointelegraph.com/news/14-percent-of-japans-young-male-workforce-invest-in-cryptocurrencies-study-shows>>.

<sup>204</sup> *Ibid.*

One news report found that younger Koreans are eagerly participating in cryptocurrency investments to make quick money.<sup>205</sup> The report indicated that 56.7% of people participating in crypto transactions are in their 20s and 30s.<sup>206</sup> Some of the reasons this younger group of Koreans cited as driving them towards cryptocurrency markets included: lack of jobs, job insecurity, desire to retire early and rising unemployment.<sup>207</sup>

The limited number of surveys that have been conducted indicate that globally younger consumers, including in Canada, are disproportionately interested in cryptocurrencies, with many using them primarily as investment vehicles. There is lack of data to assess their awareness about the risks in this space, the extent to which they know how to secure their interests, and whether, and what, protective measures have they taken, if any, in this regard.

### 5.1.3 Regulation to draw out the Right Balance

Considering the risks involved in using cryptocurrencies, some analysts consider their regulation by government as inevitable.<sup>208</sup> However, this is not a universally held view with many cryptocurrency proponents remaining skeptical of the need for regulation, citing the negative impact of regulation on innovation in the sector. Nevertheless, several experts find that regulations are necessary to not only protect consumers, but to also ensure the growth of cryptocurrencies.<sup>209</sup> For example, many industry participants support the view that “regulatory certainty” is needed if Bitcoin is to become widely accepted by the merchants and retail consumers.<sup>210</sup> Other analysts also view regulating cryptocurrencies, as essential for bringing them into mainstream financial markets, and enabling their future development, by providing them with legitimacy amongst a broader range of potential users or consumers.<sup>211</sup>

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<sup>205</sup> Santiment Content, “Why are young people in Korea going crazy for Cryptocurrencies?” *Santiment* (21 March 2018), online: <<https://medium.com/santiment/why-are-young-people-in-korea-going-crazy-for-cryptocurrencies-d30494e016ba>>.

<sup>206</sup> *Ibid.*

<sup>207</sup> *Ibid.*

<sup>208</sup> Nigel Green, “Cryptocurrency regulation is inevitable – and this should be welcomed” *International Business Times* (1 March 2018), online: <<https://www.ibtimes.co.uk/cryptocurrency-regulation-inevitable-this-should-welcomed-1664688>>. Reference is also drawn to Tara Mandjee, “Bitcoin, Its Legal Classification and Its Regulatory Framework” (2014) at 27 and 61.

<sup>209</sup> Komfie Manalo, “Regulation to Play Crucial Role in Cryptocurrency, Bitcoin Comeback” *Cryptovest* (8 February), online: <<https://cryptovest.com/news/regulation-to-play-crucial-role-in-cryptocurrency-bitcoin-comeback/>>. (Last accessed on March 26, 2018)

<sup>210</sup> Tara Mandjee, “Bitcoin, Its Legal Classification and Its Regulatory Framework” (2014) at 61.

<sup>211</sup> Kim Larkin, “How we regulate cryptocurrencies and ICOs is key to their success” *South China Morning Post* (10 March 2018), online: <<http://www.scmp.com/business/companies/article/2136527/how-we-regulate-cryptocurrencies-and-icos-key-their-success>>.

In light of the above observations, a more appropriate question appears to be what kind of regulatory framework would be adequate for safeguarding consumer interests, not whether regulation is needed. Mandjee (2014) rightly discerns that what is important is to identify how much regulation is required for cryptocurrencies such as Bitcoin, and specifically, what would be its limits,<sup>212</sup> and to whom would it apply.<sup>213</sup> There is general consensus amongst a number of different analysts that end users should not be subject to regulation, instead it should apply to currency exchanges, or those entities involved in producing cryptocurrencies, or exchanging cryptocurrencies to fiat or other cryptocurrencies.<sup>214</sup>

## 5.2 Regulatory Approaches and Challenges

### 5.2.1 Regulatory Approaches

At the time of writing, most countries are implementing, or are planning to implement, regulations to monitor cryptocurrency transactions, and in a limited number of cases apply some safeguards to deal with the risks of cryptocurrencies.<sup>215</sup> At present, many European countries seem to be inclining towards imposing clear and strict regulatory frameworks, specifically the U.K., which has been resolutely warning about the magnitude of risks arising from these unregulated currencies.<sup>216</sup>

### 5.2.2 Regulatory Challenges

Our research has revealed that there are several challenges when it comes to regulating cryptocurrencies. For example; it is not always easy to track who is involved in a transaction because of cryptocurrencies' decentralized technology, thus determination of accountability is complex; and irreversibility of these transactions makes it hard to monitor and trace funds.

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<sup>212</sup> Tara Mandjee, "Bitcoin, Its Legal Classification and Its Regulatory Framework" (2014) at 27, citing reference to *Hearing on Virtual Currencies Before the N.Y. Dep't of Fin. Servs.*, (2014).

<sup>213</sup> *Id.* at 28.

<sup>214</sup> *Id.* at 28.

<sup>215</sup> Francine McKenna, "Here's how the U.S. and the world regulate bitcoin and other cryptocurrencies" *MarketWatch* (28 December 2018), online: <<https://www.marketwatch.com/story/heres-how-the-us-and-the-world-are-regulating-bitcoin-and-cryptocurrency-2017-12-18>>; and Andrew Nelson, "Cryptocurrency Regulation in 2018: Where the World Stands Right Now" *Bitcoin Magazine* (1 February 2018), online: <<https://bitcoinmagazine.com/articles/cryptocurrency-regulation-2018-where-world-stands-right-now/>>.

<sup>216</sup> Molly Jane Zuckerman, "UK Financial Regulator To Release Crypto Review This Year With BoE And Treasury" *Cointelegraph* (9 April 2018), online: <<https://cointelegraph.com/news/uk-financial-regulator-to-release-crypto-review-this-year-with-boe-and-treasury>>.

Other matters requiring clarification include: which existing regulatory bodies should regulate cryptocurrencies, or whether new regulatory bodies are required. Finally, there is the important question of what aspects of cryptocurrencies should be regulated and to what level. As we will see, several countries have started to regulate cryptocurrencies, but to date most of the emphasis has been on issues relating to transaction reporting and taxation issues and in some cases to issues relating to investment fraud. Little attention has been paid to date to consumer protection initiatives as such, or to regulating cryptocurrencies as payment systems. We consider the regulatory initiatives being undertaken in selected jurisdictions.

### 5.3 United States of America (U.S.)

#### 5.3.1 Regulatory Measures, and Institutional Basis for Regulation

While the U.S. is the jurisdiction that has arguably moved furthest in regulating cryptocurrencies, presently, there is no comprehensive legal or regulatory framework on cryptocurrencies in the U.S. A useful general definition for virtual currencies (this is the terminology used on some of the official sources cited here, which for the purposes of this report means the same as cryptocurrencies) from the U.S. perspective is provided by the Internal Revenue Service (IRS), and included in the Commodity Futures Trading Commission’s (CFTC) primer on virtual currencies, which defines them as “[a] digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value.”<sup>217</sup>

In general, governance of cryptocurrencies in the U.S. is spread across different regulatory bodies, with some controls at the federal and some at the state level. The application of these controls, varies according to the legal classification given to cryptocurrencies by the regulating agency. This classification depends, in turn, on their use and context, specifically, whether the cryptocurrencies are viewed as an asset, property, a commodity or as a security. No uniform and clear set of rules are laid out for this classification; therefore, it remains challenging to determine how this classification works. Even the most popular cryptocurrency, Bitcoin, does not appear to have one official status. This lack of clarity also makes it difficult to identify what regulations apply when cryptocurrencies are used in the U.S. retail payment market. More so because cryptocurrencies are not presently recognized as legal tender in U.S.

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<sup>217</sup> U.S. Commodity Futures Trading Commission, “A CFTC Primer on Virtual Currencies” (October 17, 2017), online: <[https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/labcftc\\_primercryptocurrencies100417.pdf](https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/labcftc_primercryptocurrencies100417.pdf)>.

The institutional basis for regulating cryptocurrencies in U.S. appears to be linked to their claimed legal classification and contextual use. For instance; if they are viewed as commodities, CFTC’s regulations apply, if deemed to be property, IRS’s general tax principles and liability provisions would apply, and if deemed to be securities, they become subject to the U.S. Securities and Exchange Commission’s legal framework. We now consider the regulatory initiatives adopted by specific institutions within the U.S., in detail.

### Financial Crimes Enforcement Network (FinCEN):

In 2013, FinCEN issued guidelines on “virtual currencies,” and made them subject to regulations applicable to money transmitters.<sup>218</sup> FinCEN’s regulations apply to Money Service Businesses (MSBs), including exchangers, and administrators.<sup>219</sup> Users are defined as persons who only obtain a cryptocurrency to purchase goods and services; whereas, exchangers are those who engage in a business of exchanging cryptocurrency for fiat or other cryptocurrencies; and administrators are the businesses who have authority to redeem such currency, such as accepting and transmitting convertible cryptocurrency, or buying and selling it.<sup>220</sup>

Businesses which are deemed to be MSBs, need to comply with FinCEN’s anti-criminal regulatory regimes, with specific requirements entailing record keeping requirements for certain transactions, and mandatory reporting of suspicious activities.<sup>221</sup> Earlier, some U.S. states, such as North Carolina, appeared to exclude some Bitcoin related businesses from its Money Transmitter Act’s requirements, such as exempting them from licensing requirements. The reason for this exemption seemed to be an attempt to foster competition.<sup>222</sup> This appears to have changed now with North Carolina becoming stricter in its regulatory efforts concerning cryptocurrency exchanges.<sup>223</sup> As FinCEN is not

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<sup>218</sup> Tara Mandjee, “Bitcoin, Its Legal Classification and Its Regulatory Framework” (2014) at 29-34. Also referred, Trevor I. Kiviat, “Beyond Bitcoin: Issues in Regulating Blockchain Transactions” (2015) 65 Duke L.J. 569 at 589-594, online:

<<https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=3827&context=dlj>>.

<sup>219</sup> Tara Mandjee, “Bitcoin, Its Legal Classification and Its Regulatory Framework” (2014) at 29-34.

<sup>220</sup> *Ibid.*

<sup>221</sup> *Ibid.* FinCEN’s cryptocurrency practices are to be audited by the Department of Treasury, the results of this are presently not known. See: Stan Higgins, “US Treasury to Audit FinCEN’s Cryptocurrency Practices” *CoinDesk* (6 November 2017), online: <<https://www.coindesk.com/us-treasury-audit-fincens-cryptocurrency-practices/>>.

<sup>222</sup> Sean McLeod, “Bitcoin: The Utopia or Nightmare of Regulation” (2017) 9:2 *Elon L. Rev.* 553 at 574-576.

<sup>223</sup> State of North Carolina, Office of Commissioner of Banks, “Consumer Alert: Virtual Currencies”, online:<[https://www.nccob.gov/Public/docs/Financial%20Institutions/Money%20Transmitters/OCOB\\_Virtual\\_Currency\\_Alert.pdf](https://www.nccob.gov/Public/docs/Financial%20Institutions/Money%20Transmitters/OCOB_Virtual_Currency_Alert.pdf)>; and also see, Todd Bryant, “Bitcoin Provisions in the North Carolina Money

concerned with transactions where Bitcoin is being used as a payment method, it would appear that the average U.S. consumer using cryptocurrencies in the domestic retail sector is likely to be exempted from FinCEN regulations. Conversely, the fact that exchanges are registered for reporting purposes with FinCEN, does not provide the consumer with any protections or redress when using them, as the regulations apply only to reporting requirements, not to the fiduciary soundness of the business, or its obligations to provide redress in the event of a loss of a transaction, fraud or theft during a transaction.<sup>224</sup>

### CFTC:

As noted in an earlier chapter of this report, virtual currencies are viewed as commodities by the CFTC, making them subject to the Commodity Exchange Act (CEA).<sup>225</sup> CFTC has claimed since 2015 that cryptocurrencies are commodities and this was confirmed by a federal judge in March 2018.<sup>226</sup> Some analysts find that this could mean that brokers who do transactions on behalf of users may be required to register with the CFTC, and be members of the National Futures Association (NFA), and may also need to pass the series 3 National Commodity Futures Examination administered by the Financial Industry Regulatory Authority (FINRA).<sup>227</sup>

CEA's provisions apply to cryptocurrencies when they are used in a derivatives contract (contract whose value is based upon an agreed upon financial asset), or if there is fraud or manipulation involving these currencies, traded in interstate commerce.<sup>228</sup> CFTC has also issued consumer alerts to warn of the risks involved with cryptocurrencies.<sup>229</sup> The consumer risks identified by CFTC include: unpredictability of the performance of these currencies; cash markets for these currencies are largely unregulated; cash market platforms may lack critical system safeguards or customer protections; digital wallets

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Transmitter Act" *CoinDesk* (2 October 2016), online: <<https://www.coindesk.com/bitcoin-provisions-north-carolina-money-transmitter-act/>>.

<sup>224</sup> Consumer Financial Protection Bureau, "Risks to consumers posed by virtual currencies" (August 2014), online: <[https://files.consumerfinance.gov/f/201408\\_cfpb\\_consumer-advisory\\_virtual-currencies.pdf](https://files.consumerfinance.gov/f/201408_cfpb_consumer-advisory_virtual-currencies.pdf)>.

<sup>225</sup> U.S. Commodity Futures Trading Commission, "Bitcoin Basics," online: <<https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/oceo-bitcoinbasics0218.pdf>>. (Last accessed on March 27, 2018).

<sup>226</sup> Adam Bergman, "Cryptocurrencies Are Commodities, Says Federal Judge" *Forbes* (9 March 2018), online: <<https://www.forbes.com/sites/greatspeculations/2018/03/09/cryptocurrencies-are-commodities-says-federal-judge/#245e67d5c09d>>.

<sup>227</sup> *Ibid.*

<sup>228</sup> U.S. Commodity Futures Trading Commission, Bitcoin Basics.

<sup>229</sup> U.S. Commodity Futures Trading Commission, "Customer Advisory: Beware "IRS Approved" Virtual Currency IRAs," online: <[https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/custo-meradvisory\\_irs020218.pdf](https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/custo-meradvisory_irs020218.pdf)>. (Last accessed on March 27, 2018).

could be hacked; there may be no way to retrieve stolen or lost digital assets; high volatility and price swings; and market manipulation.<sup>230</sup>

In a backgrounder to its oversight of, and approach to, virtual currency future markets, the CFTC highlights the key features of its regulatory responsibility for ensuring an open, transparent, competitive and financially sound market prohibiting fraud, manipulation and abusive practices, as noted below in Figure 5-2.<sup>231</sup>

**Figure 5-2: CFTC’s Key Features of Regulatory Responsibility**

<b>Consumer Education</b>	<b>Asserting Legal Authority</b>	<b>Market Intelligence</b>	<b>Robust Enforcement</b>	<b>Government wide-coordination</b>
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Source: [CFTC Backgrounder on Oversight of and Approach to Virtual Currency Futures Markets \(2018\)](#).<sup>232</sup>

In early 2018, CFTC filed complaints against My Big Coin Pay, Inc. and two of its operators, Randall Crater and Mark Gillespie, charging them with operating fraudulent schemes, which caused investors an estimated loss of US\$ 6 million.<sup>233</sup> Reportedly, CFTC has also filed fraud charges against three other operators.<sup>234</sup>

**Securities and Exchange Commission (SEC):**

In 2013, SEC’s Chair, Mary Jo White, indicated that irrespective of a virtual currency’s status as a security by itself, the interests issued by entities owning virtual currencies or providing returns based on such assets, would be deemed as securities by the SEC.<sup>235</sup> The SEC appears to be involved in regulating cryptocurrencies in two forms: conducting

<sup>230</sup> *Ibid.*

<sup>231</sup> U.S. Commodity Futures Trading Commission, “CFTC Backgrounder on Oversight of and Approach to Virtual Currency Futures Markets,” (4 January 2018), online: <[https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/backgrounder\\_virtualcurrency01.pdf](https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/backgrounder_virtualcurrency01.pdf)>.

<sup>232</sup> This data has been extracted from CFTC’s backgrounder, and placed here in a table for easy reference.

<sup>233</sup> Taylor Hatmaker, “US government files charges in \$6 million My Big Coin cryptocurrency Ponzi scheme” *TechCrunch* (24 January 2018), online: <<https://techcrunch.com/2018/01/24/mybigcoin-cryptocurrency-scam-cftc/>>.

<sup>234</sup> Jon Fingas, “US charges cryptocurrency creators over \$6 million scam” *Engadget* (24 January 2018), online: <<https://www.engadget.com/2018/01/24/us-charges-cryptocurrency-creators-over-scam/>>.

<sup>235</sup> Judith Lee, Arthur Long, Marcellus McRae, Jeff Steiner and Stephanie Gosnell Handler, “Bitcoin Basics: A Primer on Virtual Currencies” (2015) 16 *Bus. L. Int'l* 21 at 31.

enforcement actions, and issuing investor advisory notices.<sup>236</sup> SEC enforced an action against Trendon Shavers in 2013, and found it to be involved in defrauding investors.<sup>237</sup> Trendon Shavers was the founder and operator of Bitcoin Savings and Trust, it offered and sold Bitcoin investments online, raising at least 700,000 Bitcoins; this was alleged to be a “Ponzi scheme.”<sup>238</sup> In 2014, SEC suspended the trading for Imogo Mobile Technologies, a company engaged in developing a mobile platform for Bitcoin. The suspension order was issued because of Imogo’s failure to provide accurate and adequate information about the company to the public.<sup>239</sup>

More recently, SEC has issued subpoenas to different tech companies and individuals involved in cryptocurrencies, including companies that have set up initial coin offerings (ICOs).<sup>240</sup> These subpoenas are reported to request information concerning the ICOs’ sales and the identities of investors who have purchased digital tokens.<sup>241</sup> CNBC has reported that SEC is looking at applying securities laws to a broad range of activities and entities connected to cryptocurrencies, such as cryptocurrency exchanges, and digital asset storage companies, called wallets.<sup>242</sup>

The precise scope of the SEC’s regulatory scope and ambition remains unclear. What can be deduced from the above account is that the SEC is likely to consider online cryptocurrency exchanges, initial coin offerings and companies engaged in related businesses, such as those providing digital wallets, as legitimate targets of enforcement action in order to combat investor fraud. Indeed, the SEC has publicly stated that it will look into a wide variety of issues related to cryptocurrencies and investments associated with them that could include and implicate activities related to cryptocurrency production or trading including fraudulent or unregistered securities, Ponzi schemes, theft or misappropriation of funds or securities, manipulation of a security’s price or volume, failure to file required reports with the SEC and other such activities.<sup>243</sup>

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<sup>236</sup> *Ibid.*

<sup>237</sup> *Id.* at 31-32.

<sup>238</sup> *Id.* at 31.

<sup>239</sup> *Id.* at 32.

<sup>240</sup> Shannon Liao, “The SEC is probing cryptocurrency companies with initial coin offerings” *The Verge* (1 March 2018), online: <<https://www.theverge.com/2018/3/1/17066828/sec-cryptocurrency-companies-icos-initial-coin-offerings-regulation>>.

<sup>241</sup> *Ibid.*

<sup>242</sup> Evelyn Cheng, “The SEC just made it clearer that securities laws apply to most cryptocurrencies and exchanges trading them” *CNBC* (7 March 2018), online: <<https://www.cnbc.com/2018/03/07/the-sec-made-it-clearer-that-securities-laws-apply-to-cryptocurrencies.html>>.

<sup>243</sup> U.S. Securities and Exchange Commission, “Report Suspected Securities Fraud or Wrongdoing” online: <<https://www.sec.gov/tcr>>. (Last accessed on April 12, 2018).

## IRS:

As discussed earlier, in 2014 the IRS issued a notice concerning virtual currencies and their tax implications. The notice indicated that virtual currencies are to be treated as property for U.S. federal tax purposes, and therefore, general tax principles for property transactions would apply.<sup>244</sup> This means, that any capital gains and losses resulting from the sale or purchase of cryptocurrencies would need to be reported as if it was an exchange involving property.<sup>245</sup> Further, if one receives a cryptocurrency in exchange for goods and services, it needs to be included as gross income, valued at its fair market value on the date when it was received.<sup>246</sup> Finally, employee wages, when paid in cryptocurrencies would be taxable and need to be reported on the required form, and payments made to independent contractors in cryptocurrencies would be taxable and self-employment tax rules would apply.<sup>247</sup>

IRS's present position appears to be the same, as it was in 2014.<sup>248</sup> That said, CNBC reports that hardly anyone is paying taxes on their capital gains, made from investments in Bitcoin and other cryptocurrency investments.<sup>249</sup> Out of the 250,000 recent filers on the Credit Karma Tax platform, less than 100 people have reported capital gains on their cryptocurrency investments.<sup>250</sup>

Some analysts have critiqued IRS's approach of taxing cryptocurrencies as property, finding it as burdensome and complex for regular users. Broadly speaking most U.S. state tax authorities are adopting an approach similar to the IRS, although a few states seem to be moving in a somewhat different direction, such as Wyoming, which has passed a bill to exempt cryptocurrencies from property taxes.<sup>251</sup>

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<sup>244</sup> IRS, "IRS Virtual Currency Guidance: Virtual Currency Is Treated as Property for U.S. Federal Tax Purposes; General Rules for Property Transactions Apply," online: <<https://www.irs.gov/newsroom/irs-virtual-currency-guidance>>. (Last accessed on March 27, 2018).

<sup>245</sup> *Ibid.* Also see: IRS, Notice 2014-21, online: <<https://www.irs.gov/pub/irs-drop/n-14-21.pdf>>.

<sup>246</sup> Jamie Hopkins, "As Tax Season Approaches, Don't Forget About Bitcoin and Cryptocurrencies" *Forbes* (26 February 2018), online: <<https://www.forbes.com/sites/jamiehopkins/2018/02/26/as-tax-season-approaches-dont-forget-about-bitcoin-and-cryptocurrencies/#29d809ea7ee1>>.

<sup>247</sup> IRS, "IRS Virtual Currency Guidance." See note 253.

<sup>248</sup> Anna Bahney, "4 things to know about your cryptocurrency at tax time" *CNN Money* (26 March 2018), online: <<http://money.cnn.com/2018/03/26/pf/how-to-pay-taxes-on-cryptocurrency/index.html>>.

<sup>249</sup> Evelyn Cheng, "Hardly anyone is paying taxes on their bitcoin gains as filing deadline nears" *CNBC* (April 13, 2018), online: <<https://www.cnn.com/2018/04/13/hardly-anyone-is-paying-taxes-on-their-bitcoin-gains-as-filing-deadline-nears.html>>.

<sup>250</sup> *Ibid.*

<sup>251</sup> Gerelyn Terzo, "Wyoming Moves to Lift Cryptocurrency Property Tax" *CCN* (19 February 2018), online: <<https://www.ccn.com/wyoming-moves-to-lift-cryptocurrency-property-tax/>>.

### Consumer Financial Protection Bureau (CFPB) and Federal Trade Commission (FTC):

The CFPB has taken some regulatory initiatives regarding cryptocurrencies. In 2014, it issued a consumer alert, sharing general risks of using, or investing in, virtual currencies, such as volatile trading valuations, hacking, scams, fewer protections, losing funds if an exchange or wallet company fails, and other related risks.<sup>252</sup> In addition to issuing such advisory notes, it also announced that it will accept complaints on cryptocurrency products and services. However, news reports, indicate that only seven people complained to CFPB in 2016 about cryptocurrency services.<sup>253</sup>

### Federal Trade Commission (FTC):

The FTC has acknowledged that regulation of cryptocurrencies comes within its ambit, especially when it comes to marketplace fraud.<sup>254</sup> According to a press release issued by FTC in March 2018, a federal court stopped the activities of four individuals at FTC's request, who were alleged to be promoting fraudulent money-making schemes, involving cryptocurrencies.<sup>255</sup>

### State-level Initiatives:

Several U.S states have taken measures in terms of consumer alerts, seeking to raise awareness about the risks relating to cryptocurrencies. Mandjee (2014) rightly finds that if the need to protect consumers when using Bitcoin, arises from their lack of awareness of the risks of using cryptocurrencies, then providing them with guidance appears to be more than relevant.<sup>256</sup> Some states have more permissive regulations in place, whereas, others have taken more rigorous measures.<sup>257</sup>

For example, Kansas, reportedly has a friendly (which in this context means less stringent) policy as their state government has officially declared that cryptocurrency

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<sup>252</sup> Consumer Financial Protection Bureau, "Risks to consumers posed by virtual currencies" (August 2014).

<sup>253</sup> Stan Higgins, "Just 7 People Complained to the CFPB About Bitcoin in 2016" *CoinDesk* (12 January 2017), online: <<https://www.coindesk.com/seven-complaints-cfpb-virtual-currency-2016/>>.

<sup>254</sup> Tara Mandjee, "Bitcoin, Its Legal Classification and Its Regulatory Framework" (2014) at 41.

<sup>255</sup> Federal Trade Commission, "FTC Shuts Down Promoters of Deceptive Cryptocurrency Schemes" (16 March 2018), online: <<https://www.ftc.gov/news-events/press-releases/2018/03/ftc-shuts-down-promoters-deceptive-cryptocurrency-schemes>>.

<sup>256</sup> Tara Mandjee, "Bitcoin, Its Legal Classification and Its Regulatory Framework" (2014) at 41.

<sup>257</sup> Rachel McIntosh, "The Good, the Bad, and the Ugly: Crypto Regulation in the USA" *Finance Magnates* (9 January 2018), online: <<https://www.financemagnates.com/cryptocurrency/news/good-bad-ugly-crypto-regulation-usa/>>.

holders, traders, and exchanges do not need to obtain licensure;<sup>258</sup> some states like New York, Connecticut, Georgia, have more stringent policies requiring compliance with measures such as licensing, and or capital requirements.<sup>259</sup> This data is based on research undertaken in early 2018, and may be subject to change.

New York State’s Department of Financial Services (NYDFS) has arguably adopted the most stringent regime in this respect. It issued its final “BitLicense” framework for regulating cryptocurrency businesses in 2015. This framework covers most business activities involving cryptocurrencies, which include: transmitting them, holding them on behalf of others, buying and selling for business reasons, providing exchange services as a business, and controlling, administering or issuing cryptocurrencies.<sup>260</sup> This framework requires that anyone required to register under BitLicense has to implement consumer protection measures, such as requirements for custody and protection of consumer assets, and also lay out anti-money laundering programs.<sup>261</sup> Additionally, the registrants have to maintain the form and amount of capital as determined by the superintendent, this is to address any financial stability concerns.<sup>262</sup>

Media reports draw attention to the unpopularity of this licensing initiative amidst blockchain and cryptocurrency start-ups, and new companies, who indicate that compliance with BitLicense’s capital and legal requirements are quite burdensome.<sup>263</sup> Some media reports about potential changes to the BitLicense regime have surfaced, however, what changes will take place, if any, remains to be seen.<sup>264</sup> At the time of writing, the New York’s licensing regime remains applicable in its current form.

### 5.3.2 Key Observations

From the consumer perspective most of the regulatory activity in the US presently has been directed at the use of cryptocurrencies when they serve as traded commodities or securities, in the context of investment prospecting such as ICOs, or when income earned from them is subject to tax. Critically none of the US regulatory initiatives appear to deal with cryptocurrencies being used as currencies or especially payment mechanisms, except

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<sup>258</sup> *Ibid.*

<sup>259</sup> *Ibid.*

<sup>260</sup> Trevor I. Kiviat, “Beyond Bitcoin: Issues in Regulating Blockchain Transactions” (2015) at 597-602.

<sup>261</sup> Hilary J. Allen, “\$=Euro=Bitcoin” (2017) 76 Md. L. Rev. 877 at p. 922

<sup>262</sup> *Ibid.*

<sup>263</sup> Maria Terekhova, New York's BitLicense may see reform” *Business Insider* (27 February 2018), online: <<http://www.businessinsider.com/new-yorks-bitlicense-may-see-reform-2018-2>>.

<sup>264</sup> Leigh Cuen, “This New York Lawmaker Wants to End the BitLicense” *CoinDesk* (20 March 2018), online: <<https://www.coindesk.com/meet-the-new-york-lawmaker-who-wants-to-replace-the-bitlicense/>>.

in the case of money laundering, or tracking exchanges that maybe involved in suspicious transactions (e.g. drug trading, and financing illegal activities).

## 5.4 European Union (EU)

### 5.4.1 Regulatory Measures, and Institutional Basis for Regulation

The EU is on record to the effect that if the risks related to cryptocurrencies are not “tackled,” it will intervene.<sup>265</sup> Valois Dombrovskis, vice president of the European Commission, warned that cryptocurrencies’ price volatility holds clear risks for investors and consumers, and has alerted financial regulators of a “potential bubble.”<sup>266</sup>

Insight into some EU decision-makers’ views, such as the European Central Bank (ECB), can be drawn from a lecture on the evolution of money in the digital age by Yves Mersch, a member of the ECB’s executive board.<sup>267</sup> Mersch does not believe that virtual currencies (referred to as cryptocurrencies here) will be the latest form of money in the foreseeable future.<sup>268</sup> He cites several reasons to support this deduction, the principal one being that cryptocurrencies generally fail to perform the three defining functions of money, namely: be a medium of exchange, unit of account and a store of value.<sup>269</sup>

Mersch notes four broad areas that require regulatory attention when determining the potential impact of cryptocurrencies, namely: the cryptocurrencies themselves; the facilitators (exchanges, wallet-providers and brokers); financial market infrastructures (FMIs); and the banking sector.<sup>270</sup> On regulating cryptocurrencies themselves, Mersch finds that cryptocurrencies cannot be regulated in the absence of a centralized governance or legal framework.<sup>271</sup> In this respect, warnings have been issued by different regulatory bodies. Retail investors, he finds need to be cautious because of cryptocurrencies’ speculative nature and the risks that they bring about.<sup>272</sup> Mersch calls for regulators and legislators to pay close attention to the risks arising from cryptocurrencies, however, he

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<sup>265</sup>Samuel Gibbs “EU finance head: we will regulate bitcoin if risks are not tackled” *The Guardian* (26 February 2018), online: <<https://www.theguardian.com/technology/2018/feb/26/eu-finance-head-regulate-bitcoin-cryptocurrencies-risks>>.

<sup>266</sup> Stephen Shankland, “Beware cryptocurrencies, European authorities warn” *CNET* (12 February 2018), online: <<https://www.cnet.com/news/beware-cryptocurrency-bitcoin-investing-european-authorities-warn/>>.

<sup>267</sup> Yves Mersch, “Virtual or virtueless? The evolution of money in the digital age” European Central Bank [Lecture] (8 February 2018), online: <<https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp180208.en.html>>.

<sup>268</sup> *Ibid*

<sup>269</sup> *Ibid*

<sup>270</sup> *Ibid*.

<sup>271</sup> *Ibid*.

<sup>272</sup> *Ibid*.

does not appear to expressly advocate for regulating them. In another news report, Mersch has called for a “global clampdown” on Bitcoin and other cryptocurrencies because of their apparent threat to financial stability.<sup>273</sup>

The European Commission itself has expressed interest in cryptocurrencies’ global regulation. In early 2018, the Commission’s vice-president referred to the fact that cryptocurrencies operate in a global environment with Europe only reflecting a small share of cryptocurrency trading.<sup>274</sup> This suggests that EU may realize that any regulatory action it takes within the boundaries of the EU may need to be supported by a set of international rules which would require collaboration with other countries outside the EU and potentially international organizations.

Based on the above, it appears that the use of cryptocurrencies in the EU, including in the retail sector, may be subject to some significant regulatory oversight. What regulations we should expect, and whether they will encourage or restrict the growth of these currencies as payment systems is at present uncertain.

We now briefly study individual EU countries’ regulatory practices and views to gain a better understanding of their existing or proposed frameworks.

#### UK:

The UK has recently launched a task force, including the Bank of England (BoE) and the country’s Financial Conduct Authority (FCA), to analyze the risks and benefits of cryptocurrencies.<sup>275</sup> The task force is working on a discussion paper on cryptocurrencies.<sup>276</sup> The FCA plans to release its policy guidelines on cryptocurrencies later in 2018.<sup>277</sup> Jacob Ghanty, a financial regulator partner at Kempt Little, a law firm in the UK, while speaking to the *Independent*, stated: “Ultimately, the FCA is trying to develop a coherent strategy for dealing with the issues and risks that cryptocurrencies raise [...]”<sup>278</sup>

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<sup>273</sup> Julia Kollwe, “ECB official backs bitcoin clampdown” *The Guardian* (8 February 2018), online: <<https://www.theguardian.com/technology/2018/feb/08/ecb-official-backs-bitcoin-clampdown>>.

<sup>274</sup> C. Edward Kelso, “EU Losing Patience – Urges Global Crypto Regulation” *Bitcoin.com* (2 March 2018), online: <<https://news.bitcoin.com/eu-losing-patience-bitcoin-needs-global-regulation/>>.

<sup>275</sup> Ryan Browne, “UK launches task force to scrutinize cryptocurrency risks and benefits” *CNBC* (23 March 2018), online: <<https://www.cnbc.com/2018/03/21/uk-launches-cryptocurrency-task-force-as-part-of-fintech-strategy.html>>.

<sup>276</sup> Anthony Cuthbertson, “Cryptocurrency: Uk Regulator Focuses On Bitcoin Policy” *Independent* (9 April 2018), online: <<https://www.independent.co.uk/life-style/gadgets-and-tech/news/cryptocurrency-bitcoin-regulation-fca-price-updates-market-a8296411.html>>.

<sup>277</sup> *Ibid.*

<sup>278</sup> *Ibid.*

The UK House of Commons' Treasury Committee also started an inquiry into cryptocurrencies and blockchain technology, early this year.<sup>279</sup> One of the goals of this inquiry is to provide adequate protection for consumers and businesses, without inhibiting innovation.<sup>280</sup> Nicky Morgan, a Member of Parliament and Chair of the Treasury Committee, told the *Independent* that while people are becoming more and more aware of cryptocurrencies, they are unaware that cryptocurrencies are currently unregulated, with no safeguards for individual investors.<sup>281</sup> Earlier, the BoE Governor, Mark Carney also called for more regulation in this area, referring to the price volatility of these currencies as "speculative mania."<sup>282</sup>

The BoE's Governor, in a speech on the Future of Money, given to the Scottish Economics Conference at Edinburgh University in March 2018, discussed the future of cryptocurrencies and their place in the financial system.<sup>283</sup> He indicated his preference to refer to cryptocurrencies as crypto-assets, as in his view they are not true currencies.<sup>284</sup> He spoke about focusing on regulating "elements of the crypto-asset ecosystem" to combat crime, promote market integrity and protect the financial system.<sup>285</sup>

On whether cryptocurrencies would work as money or not, he observed:

"The long, charitable answer is that cryptocurrencies act as money, at best, only for some people and to a limited extent, and even then only in parallel with the traditional currencies of the users. The short answer is they are failing."<sup>286</sup>

The Governor discussed specific factors which showed how cryptocurrencies were ill-suited to be a payment system, as such: they are a poor store of value with their steep price deviations, and with no intrinsic value, nor any external backing.<sup>287</sup> He finds that it is not clear if they would ever be an effective medium of exchange with no major high street or online retailer noted to accept Bitcoin as a payment mechanism in UK, and only

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<sup>279</sup> *Ibid.*

<sup>280</sup> *Ibid.*

<sup>281</sup> *Ibid.*

<sup>282</sup> Roger Aitken, "Cryptocurrencies Slammed As 'Speculative Mania' By Central Banker Carney; Cites High Bitcoin Fees" *Forbes* (2 March 2018), online: <<https://www.forbes.com/sites/rogeraitken/2018/03/02/cryptocurrencies-slammed-as-speculative-mania-by-central-banker-carney-cites-high-bitcoin-fees/#447137514404>>.

<sup>283</sup> Mark Carney, "The Future of Money" Bank of England (Speech To the inaugural Scottish Economics Conference, Edinburgh University) (2 March 2018), online: <<https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/the-future-of-money-speech-by-mark-carney.pdf?la=en&hash=A51E1C8E90BDD3D071A8D6B4F8C1566E7AC91418>>.

<sup>284</sup> *Ibid.*

<sup>285</sup> *Ibid.*

<sup>286</sup> *Ibid.*

<sup>287</sup> *Ibid.*

a handful noted to do so in U.S., and these transactions were also noted to be generally slow and costly.<sup>288</sup>

It is apparent that the UK's central bank remains doubtful about cryptocurrencies' role as a payment system, and it seems unlikely they would see a need to regulate them in that context. With respect to other issues such as cryptocurrencies' use as investment vehicles by retail investors and various other related activities such as the operation of exchanges, ICOs and investment schemes involving mining operations, or even activities related to consumer education, the intentions of the UK government are currently unclear. We will have to await the results of work of the task force on cryptocurrencies lead by the BoE and the FCA and the report of the House of Commons Treasury Committee, both due later this year, to get some idea of what issues the UK government will focus on in terms of regulation.

In terms of tax policy, the UK taxation authorities, HM Revenue and Customs (HMRC) appear to have classified cryptocurrencies as private currency for tax purposes.<sup>289</sup> HMRC's Brief (2014) on Bitcoin and other cryptocurrencies provides details on how these currencies would be taxed. The brief appears to apply to other cryptocurrencies and users, along the same lines as Bitcoin.

As per HMRC's brief, Bitcoin and similar cryptocurrencies may be exempted from VAT (Value added tax) under certain circumstances.<sup>290</sup> The application of other taxes such as Corporation tax, Income tax, Capital gains tax would depend on the activities and parties involved.<sup>291</sup> For retail businesses that accept Bitcoin as payment for goods and services, their profits and losses from those transactions appear to be subject to corporation tax.<sup>292</sup> Income tax would apply to the profits and losses in Bitcoin transactions of a non-incorporated business.<sup>293</sup> And, if a profit or loss on a currency is not within trading profits,

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<sup>288</sup> *Ibid.*

<sup>289</sup> Joon Ian Wong, "Will UK Tax Authority HMRC Reclassify Bitcoin as 'Private Currency'?" *CoinDesk* (16 January 2014), online: <<https://www.coindesk.com/uk-tax-authority-hmrc-reclassify-bitcoin-private-currency/>>.

<sup>290</sup> HM Revenue and Customs, "*Revenue and Customs Brief 9 (2014): Bitcoin and other cryptocurrencies*" (Policy paper), online: <<https://www.gov.uk/government/publications/revenue-and-customs-brief-9-2014-bitcoin-and-other-cryptocurrencies/revenue-and-customs-brief-9-2014-bitcoin-and-other-cryptocurrencies>>. For instance; income received from Bitcoin mining activities will be generally exempted from VAT as it does not constitute an economic activity for VAT purposes; income received by miners for activities besides mining, such as verifying transactions for which certain charges are made, then VAT will not apply; when Bitcoin is exchanged for Sterling or for foreign currencies, no VAT will apply; and any charges made over and above the value of Bitcoin for arranging or carrying out Bitcoin transactions will be exempt from VAT.

<sup>291</sup> *Ibid.*

<sup>292</sup> *Ibid.*

<sup>293</sup> *Ibid.*

it would be generally be taxed as a chargeable gain, or allowed as a loss for corporation tax or capital gains tax.<sup>294</sup>

#### Other European Union Countries:

France's finance minister has asked for a joint regulation of Bitcoin at the 2018 G20 summit;<sup>295</sup> and proposed to create a draft legal framework to monitor cryptocurrency offerings.<sup>296</sup> Similarly, Italy has shown support for France's regulatory propositions on Bitcoin. Spain's Minister of Economy, Industry and Competitiveness, Román Escalano Olivares, also placed emphasis on the need to actively monitor cryptocurrencies at the G20 Summit; and suggested that the European Union may not wait for a global effort to regulate them.<sup>297</sup>

Germany's central bank has shown support for global regulation of cryptocurrencies.<sup>298</sup> Germany's finance ministry has decided to treat cryptocurrencies as payment systems when individuals use them for buying and selling goods or services; this means that only the EU's VAT Directive will apply to the price of Bitcoin when transactions are processed.<sup>299</sup> This suggests that Bitcoin would not be treated as property for tax purposes when used to pay for goods or services, although it would appear that the transaction would be subject to value added tax in accordance with the EU VAT Directive.<sup>300</sup>

#### **5.4.2 Observations on the EU Position**

The EU's current regulatory discussions indicate that cryptocurrencies are unlikely to get the status of legal tender in the EU anytime soon, nor will their use as a payment system be regulated. That said, it appears that at least some EU countries have started to tax some aspects of cryptocurrency transactions. Significantly, while both at the EU level and in a number of member countries there have been indications that some aspects of the use of

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<sup>294</sup> *Ibid.*

<sup>295</sup> Reuters staff, "France to create legal framework for cryptocurrency offerings" *Reuters* (22 March 2018), online: <<https://www.reuters.com/article/us-france-cryptocurrencies/france-to-create-legal-framework-for-cryptocurrency-offerings-idUSKBN1GY0YE>>.

<sup>296</sup> *Ibid.*

<sup>297</sup> Francisco Memoria, "The EU Won't Wait for Global Agreement on Cryptocurrencies: Spain's Economy Minister" *CCN* (22 March 2018), online: <<https://www.ccn.com/european-union-wont-wait-for-global-agreement-on-cryptocurrencies-spanish-minister-reveals/>>.

<sup>298</sup> Nikhilesh De, "German Central Banker: Cryptocurrencies Must Be Regulated On a Global Scale" *Coin Desk* (15 January 2018), online: <<https://www.coindesk.com/german-central-banker-cryptocurrencies-must-be-regulated-on-a-global-scale/>>.

<sup>299</sup> Carlos Terenzi, "Germany Will Not Tax Individuals Using Cryptocurrencies as a Means of Payment" *Use The Bitcoin* (1 March 2018), online: <<https://usethebitcoin.com/germany-cryptocurrency-payments-taxes/>>.

<sup>300</sup> *Ibid.*

cryptocurrencies, particularly their use as investments, will be regulated, it is unclear at the present time what specific aspect would come under regulatory oversight. Certainly neither the EU nor any member country has moved as far as some US regulators to deal with fraudulent and misleading investment activity or the operation of ICOs or exchanges.

## 5.5 Australia

### 5.5.1 Regulatory Measures, and Institutional Basis for Regulation

Australia's position on cryptocurrencies indicates a lack of support for their use and adoption in the retail payment market. In an address to the 2017 Australian Payment Summit, the Reserve Bank's governor, Philip Lowe, expressed his reservations about cryptocurrencies functioning as a payment system. He noted that they are not an effective payment method because of their volatility, high transaction costs, high energy consumption (for mining them), and they are more likely to be used for unlawful activities, rather than everyday payments.<sup>301</sup>

One class of technology that has emerged that can be used for payments is the so-called cryptocurrencies, the most prominent of which is Bitcoin. But in reality, these currencies are not being commonly used for everyday payments and, as things currently stand, it is hard to see that changing. The value of Bitcoin is very volatile, the number of payments that can currently be handled is very low, there are governance problems, the transaction cost involved in making a payment with Bitcoin is very high and the estimates of the electricity used in the process of mining the coins are staggering. When thought of purely as a payment instrument, it seems more likely to be attractive to those who want to make transactions in the black or illegal economy, rather than everyday transactions. So the current fascination with these currencies feels more like a speculative mania than it has to do with their use as an efficient and convenient form of electronic payment.<sup>302</sup>

Overall, the Governor's comments suggest that it remains unlikely that cryptocurrencies will be adopted in Australian mainstream payments system anytime soon, if at all.<sup>303</sup> However, again as noted for UK, this might change with better cryptocurrency technologies, and wider adoption by consumers as a result of better understanding of their strengths and weaknesses.

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<sup>301</sup> Philip Lowe, "An eAUD?" Reserve Bank of Australia, Address to the 2017 Australian Payment Summit Sydney (13 December 2017), online: <<https://www.rba.gov.au/speeches/2017/sp-gov-2017-12-13.html>>.

<sup>302</sup> *Ibid.*

<sup>303</sup> *Ibid.* Also see, Swati Pandey and Wayne Cole, "Australia central bank governor says bitcoin fascination is 'speculative mania'" *Reuters* (12 December 2017), online: <<https://www.reuters.com/article/us-australia-rba-bitcoin/australia-central-bank-governor-says-bitcoin-fascination-is-speculative-mania-idUSKBN1E62XT>>.

The Australian Tax Office (ATO) has made its views known with regard to the tax status of cryptocurrencies. It defines cryptocurrency as “[a] digital asset in which encryption techniques are used to regulate the generation of additional units and verify transactions on the blockchain. Cryptocurrency generally operates independently of a central bank, central authority or government.”<sup>304</sup> As per ATO’s policy, while cryptocurrencies are not considered money, they are viewed as property or an asset, which attracts capital gains taxes. Its policy reads:

“If you are involved in acquiring or disposing of cryptocurrency, you need to be aware of the tax consequences. These vary depending on the nature of your circumstances. Everybody involved in acquiring or disposing of cryptocurrency needs to keep records in relation to their cryptocurrency transactions.

One example of cryptocurrency is Bitcoin. Our view is that Bitcoin is neither money nor Australian or foreign currency. Rather, it is property and is an asset for capital gains tax (CGT) purposes. Other cryptocurrencies that have the same characteristics as Bitcoin will also be assets for CGT purposes and will be treated similarly for tax purposes.”<sup>305</sup>

ATO has posted tax guidelines on its website, covering matters such as: transacting with cryptocurrencies; using them as an investment; personal asset; using them for business transactions (receiving cryptocurrency for goods and services provided as a part of the business); for exchanging one cryptocurrency for another cryptocurrency; and for paying salary or wages in cryptocurrency.<sup>306</sup> Depending on the use, different capital gains tax may apply. Recently, the ATO has sought public input on its approach to taxing cryptocurrencies.<sup>307</sup> It is particularly interested in what issues taxpayers may face in calculating capital gains tax.<sup>308</sup>

### 5.5.2 Key Observations

Australia’s current regulatory approach to cryptocurrencies seems to mirror somewhat the position taken by the EU. In light of this analysis, adoption of cryptocurrencies as a payment system appears unlikely in Australia, although unlike the EU there appears not to be much enthusiasm to look at regulatory controls on the trade in cryptocurrencies or

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<sup>304</sup> Australian Tax Office, “Tax treatment of cryptocurrencies,” online: <<https://www.ato.gov.au/General/Gen/Tax-treatment-of-crypto-currencies-in-Australia---specifically-bitcoin/>>. (Last accessed on March 29, 2018)

<sup>305</sup> *Ibid.*

<sup>306</sup> *Ibid.*

<sup>307</sup> Molly Jane Zuckerman, “Australia’s Tax Office Seeks Public Feedback On Taxing Cryptocurrency” *Cointelegraph* (27 March 2018), online: <<https://cointelegraph.com/news/australias-tax-office-seeks-public-feedback-on-taxing-cryptocurrency>>.

<sup>308</sup> *Ibid.*

their use as speculative investments. On the tax treatment of cryptocurrencies Australia seems to have adopted a position similar to the UK and the US, which is to say that revenues obtained from the trade in cryptocurrencies will be treated as income for corporate and personal income tax purposes.

## 5.6 Other Jurisdictions:

Other jurisdictions' have had variable reactions to cryptocurrencies. At the time of writing, some countries such as India and China have imposed outright bans on cryptocurrencies and/or initial coin offerings.<sup>309</sup> Others have imposed registration requirements on cryptocurrency exchanges. For instance, the Japanese authorities, which reportedly recognized Bitcoin as a payment system,<sup>310</sup> require cryptocurrency exchanges to register with the government. The Japanese Financial Services Agency states that so far sixteen exchanges have been registered in Japan.<sup>311</sup> South Korea's regulatory position has remained uncertain,<sup>312</sup> with some reports indicating that at one point, it considered a full ban on such currencies.<sup>313</sup>

## 5.7 Canada

### 5.7.1 Regulatory Measures, and Institutional Basis for Regulation

Canada's regulatory approach to cryptocurrencies was initially called the "wild west" because of its refusal to design a regulatory framework.<sup>314</sup> However, in 2014, Canada passed a law to regulate organizations trading in cryptocurrencies, such as exchanges, as "Money Service Businesses," requiring businesses dealing in cryptocurrencies to register with the Financial Transactions and Reports Analysis Centre of Canada (FINTRAC), and

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<sup>309</sup> Darius Mcquaid, "India BANS cryptocurrencies: RBI clamps down on businesses using bitcoin" *Express* (5 April 2018), online: <<https://www.express.co.uk/finance/city/942006/india-bans-cryptocurrency-bitcoin-regulation>>; and Andrew Nelson, "Cryptocurrency Regulation in 2018: Where the World Stands Right Now" *Bitcoin Magazine* (1 February 2018), online: <<https://bitcoinmagazine.com/articles/cryptocurrency-regulation-2018-where-world-stands-right-now/>>.

<sup>310</sup> Reuters, "ADVISORY-References to bitcoin as 'legal tender' in Japan" *CNBC* (13 December 2017), online: <<https://www.cnb.com/2017/12/13/reuters-america-advisory-references-to-bitcoin-as-legal-tender-in-japan.html>>.

<sup>311</sup> Evelyn Cheng, "Japanese regulator warns major cryptocurrency exchange for operating without a license, bitcoin falls" *CNBC* (23 March 2018), online: <<https://www.cnb.com/2018/03/23/japanese-regulator-warns-major-cryptocurrency-exchange-for-operating-without-a-license-bitcoin-falls.html>>.

<sup>312</sup> Andrew Nelson, "Cryptocurrency Regulation in 2018: Where the World Stands Right Now" *Bitcoin Magazine* (1 February 2018).

<sup>313</sup> Charlie Osborne, "What we can expect from future cryptocurrency regulation worldwide" *ZDnet* (5 February 2018), online: <<https://www.zdnet.com/article/the-state-of-cryptocurrency-regulation-worldwide-and-what-the-future-will-bring/>>.

<sup>314</sup> Stephen Small, "Bitcoin: The Napster or Currency" (2015) 37 *Hous. J. Int'l L.* 581 at 618.

comply with its regulatory requirements.<sup>315</sup> However, the scope and application of this statute remains unclear.<sup>316</sup> FINTRAC released its concerns regarding use of cryptocurrencies in criminal activities in 2017.<sup>317</sup>

Cryptocurrencies are not considered legal tender in Canada.<sup>318</sup> Their legal classification remains uncertain as noted for other jurisdictions: they seem to be deemed as securities in some instances, or commodities, or properties in other instances; and have accordingly attracted the regulatory attention of different regulatory agencies, such as the provincial securities commissions, and the Canada Revenue Agency (CRA).

### Canada Revenue Agency (CRA):

CRA in its policy statements in 2013, indicated that cryptocurrencies are not money, rather they are a type of commodity for the purposes of Income Tax Act, which would attract tax implications as in any barter transactions.<sup>319</sup> This means that any resulting gains or losses could be treated as taxable income. This is explained in simple terms in a recent CTV news report, which states:

For example, if a merchant accepted Bitcoin in exchange for a desk, a pair of glasses or jewelry -- all items that can currently be bought using Bitcoin -- the seller will need to include the fair market value of the good or service sold in their income for tax purposes.<sup>320</sup>

This means that when a consumer uses cryptocurrencies for purchasing goods and services, the seller must include the income for tax purposes and GST/HST would apply on the fair market value of any goods or services bought.<sup>321</sup> In cases where the

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<sup>315</sup> Christine Duhaime, “Canada implements world’s first national digital currency law; regulates new financial technology transactions” Ontario Securities Commission (22 June 2014), online: <<http://research.osc.gov.on.ca/c.php?g=699050&p=4969862>>.

<sup>316</sup> Stephen Small, “Bitcoin: The Napster or Currency” (2015) at 618-619.

<sup>317</sup> Rachel Rose O’Leary, “Report: Canadian Finance Watchdog Has Concerns Over Blockchain Anonymity” *CoinDesk* (5 September 2017), online: <<https://www.coindesk.com/report-canadas-fintrac-has-concerns-over-blockchain-anonymity/>>. (Last accessed on March 29, 2018).

<sup>318</sup> Financial Consumer Agency of Canada, “Digital currency” (last updated on 19 January 2018), online: <<https://www.canada.ca/en/financial-consumer-agency/services/payment/digital-currency.html>>.

<sup>319</sup> CRA Document No. 2013-0514701I7 “Bitcoins,” online: <<http://www.canadiantaxlitigation.com/wp-content/uploads/2014/01/2013-0514701I7.txt>>.

<sup>320</sup> Armina Ligaya, The Canadian Press, “If you sold or used Bitcoin last year, the CRA needs to collect its due” *CTV News* (1 February 2018), online: <<https://www.ctvnews.ca/business/if-you-sold-or-used-bitcoin-last-year-the-cra-needs-to-collect-its-due-1.3785161>>.

<sup>321</sup> Financial Consumer Agency of Canada, “Digital currency.”

cryptocurrency was bought or sold like a commodity, then any capital gains and losses must be reported for income tax purposes.<sup>322</sup>

### Ontario Securities Commission (OSC):

Ontario Securities Commission (OSC) appears to be involved in regulating cryptocurrencies as part of its overall efforts to combat investor fraud. Its CSA Staff Notice 46-307, regarding Cryptocurrency Offerings, indicates specifics concerning what securities law requirements apply to cryptocurrency exchanges and initial coin offerings.<sup>323</sup> OSC has also been involved in some measures aimed at raising consumer awareness.<sup>324</sup> Its website has information resources, meant to provide consumers with cryptocurrency basics, such as: what are cryptocurrencies, how do they work, how to purchase cryptocurrencies and what are their risks.<sup>325</sup> Some risks highlighted on its website include: high volatility; lack of oversight; and risk of fraud.<sup>326</sup> OSC has a separate webpage providing warning signs of investment fraud,<sup>327</sup> and specific investment risks when dealing with cryptocurrencies,<sup>328</sup> and contact details for inquiries.<sup>329</sup>

OSC conducted a small survey in late 2017, to gather information about consumers who are buying cryptocurrencies in Ontario, and to see what these participants thought about investing in cryptocurrencies, and particularly, their perceptions of the risks involved in such transactions, the details of which are noted above in this chapter.<sup>330</sup> This research merely reflects a small group of consumers in Ontario, and remains insufficient to gain a comprehensive understanding about consumers' awareness of, and involvement with, cryptocurrencies within Canada. That said, it is apparent from this survey that young users

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<sup>322</sup> Financial Consumer Agency of Canada, "Digital currency." Also see, Armina Ligaya, The Canadian Press, "If you sold or used Bitcoin last year, the CRA needs to collect its due" *CTV News* (1 February 2018).

<sup>323</sup> Ontario Securities Commission, CSA Staff Notice 46-307, (August 24, 2017), online: <[http://www.osc.gov.on.ca/en/SecuritiesLaw\\_csa\\_20170824\\_cryptocurrency-offerings.htm](http://www.osc.gov.on.ca/en/SecuritiesLaw_csa_20170824_cryptocurrency-offerings.htm)>.

<sup>324</sup> Ontario Securities Commission, "Cryptocurrency basics," online: <<https://www.getsmarteraboutmoney.ca/invest/investment-products/cryptocurrencies/cryptocurrency-basics/>>. (Last accessed on March 29, 2018)

<sup>325</sup> *Ibid.*

<sup>326</sup> *Ibid.*

<sup>327</sup> Ontario Securities Commission, "4 signs of investment fraud," online: <<https://www.getsmarteraboutmoney.ca/protect-your-money/fraud/protecting-against-fraud/4-signs-of-investment-fraud/>>.

<sup>328</sup> Ontario Securities Commission, "Types of investment risk," online: <<https://www.getsmarteraboutmoney.ca/invest/investing-basics/understanding-risk/types-of-investment-risk/>>.

<sup>329</sup> Ontario Securities Commission, Contact Us page, online: <[http://www.osc.gov.on.ca/en/contactus\\_index.htm](http://www.osc.gov.on.ca/en/contactus_index.htm)>.

<sup>330</sup> Ontario Securities Commission, "Ontarians and Cryptocurrencies: A First Look" (11 December 2017).

are more likely to invest or use cryptocurrencies, and they seem to underestimate the risks associated with them.

Senator Howard Wetston, the former head of OSC, recently told BNN that more regulatory action is required to regulate Bitcoin in order to protect consumers.<sup>331</sup> Wetston referred to OSC's earlier findings on this matter in June 2015, which he thinks should be reviewed again to gauge "[t]he appropriateness of the regulatory environment in the next three years."<sup>332</sup> An increase in the number of cryptocurrencies, their trading platforms and initial coin offerings, is noted by the news report to have strengthened the need for a regulatory framework.<sup>333</sup>

Wetston, former federal Finance Minister Joe Oliver, and Pat Chaukos, chief of the OSC's LaunchPad initiative, all find that at least a basic framework of rules is needed.<sup>334</sup> Speaking to BNN, Joe Oliver highlighted some issues that should prompt regulatory action:<sup>335</sup>

"There are issues of transparency, volatility, valuation, custody, liquidity, unregulated cryptocurrency exchanges, potential for illegal schemes; and, certainly in a lot of cases, investors don't have a fundamental understanding of what they're getting into," Oliver said. "Those are all very legitimate issues that the securities commissions should be concerned about in the context of investor protection."<sup>336</sup>

More recently, the OSC has been collecting information on different cryptocurrency trading platforms after it received several complaints. A spokeswoman for OSC told CTV News in April 2018 that such platforms may be subject to the rules governing exchanges or alternate trading systems.<sup>337</sup> The precise scope of these regulations and their application has not been clearly laid out, at the time of writing.

### Bank of Canada:

The Bank of Canada, similar to other central banks, remains doubtful about the use of cryptocurrencies as payment systems. The Bank of Canada's senior deputy governor,

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<sup>331</sup> Jameson Berkow, "'People could lose their shirts': Canada urged to regulate cryptocurrencies" *BNN* (25 January 2018), online: <<https://www.bnn.ca/people-could-lose-their-shirts-canada-urged-to-regulate-cryptocurrencies-1.978316>>.

<sup>332</sup> *Ibid.*

<sup>333</sup> *Ibid.*

<sup>334</sup> *Ibid.*

<sup>335</sup> *Ibid.*

<sup>336</sup> *Ibid.*

<sup>337</sup> The Canadian Press, "OSC gathering info on cryptocurrency trading platforms after complaints" *CTV News* (6 April 2018), online:

<<https://www.ctvnews.ca/business/osc-gathering-info-on-cryptocurrency-trading-platforms-after-complaints-1.3874602>>.

Carolyn Wilkins, whilst addressing a conference at the University of Toronto in March 2018 called for a global regulatory framework on cryptocurrencies, and referred to cryptocurrencies as crypto assets, asserting that “they do not perform any of the key functions of money.”<sup>338</sup> Earlier, in January 2018, the central bank’s governor, Steven Poloz, referred to Bitcoin trading as “gambling”.<sup>339</sup> While talking to CNBC, Poloz stated: “They are crypto but they are not currencies [...]”<sup>340</sup> He further added that cryptocurrencies are possibly not even assets, just securities, with no intrinsic value.<sup>341</sup> Whether the central bank’s stance would change with the growth in cryptocurrencies’ use in retail or investment transactions remains to be seen.

### 5.7.2 Key Observations

The present regulatory status with respect to the use of cryptocurrencies as payment systems in the retail market in Canada appears to be uncertain at best. Similar to other jurisdictions reviewed here, Canada seems to believe that cryptocurrencies are unlikely to have the attributes necessary to serve either as a broadly useable retail payment system or as a currency in the near future. Canada’s treatment of cryptocurrencies for tax purposes seems to follow fairly closely the approach in both the UK and the US. And finally, with the possible exception of the OSC, Canada has been relatively slow in introducing any protections for consumers in using cryptocurrencies as investment vehicles, although the OSC has been indicating that it will move to treat cryptocurrency investment offerings (e.g. ICOs) as securities offerings and regulate them as such.

The lack of more consumer awareness initiatives on the risks in investing or transacting in cryptocurrencies is somewhat surprising given that knowledge of these currencies is becoming more widespread, especially amongst younger consumers and investors, although to its credit the OSC has been relatively active on this front. More empirical research is needed to determine whether and to what extent Canadian consumers are aware of the transactional and investment risks connected with cryptocurrencies, but given the risks documented elsewhere this should be a high priority for regulators as should be evaluation of appropriate regulatory and awareness initiatives.

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<sup>338</sup> The Canadian Press, “Global alignment needed on cryptocurrency policy, BoC deputy governor says” CBC (22 March 2018), online: <<http://www.cbc.ca/news/business/carolyn-wilkins-bank-canada-cryptocurrency-1.4588759>>.

<sup>339</sup> Karen Tso and Arjun Kharpal, “Bitcoin is ‘gambling’ and regulations are needed, Canada central bank head says” CNBC (25 January 2018), online: <<https://www.cnbc.com/2018/01/25/bitcoin-trading-is-gambling-canada-central-bank-governor.html>>.

<sup>340</sup> *Ibid.*

<sup>341</sup> *Ibid.*

## 5.8 Conclusion

This chapter sought to identify and review different cryptocurrency regulatory frameworks, particularly, in the context of payment systems, for assessing their application in the Canadian retail market. The research indicated that many countries are far from recognizing cryptocurrencies as a payment mechanism, or as a currency. Significantly, in most countries central bankers appear to be particularly adamant that as they stand, cryptocurrencies are unsuitable for either role.

However, there seems to be some coalescence of view amongst tax authorities that income earned through trading in cryptocurrencies and capital gains derived from it, are taxable for both businesses and individuals, but there appears to be some variance of view about how cryptocurrency production and trading are treated for sales or value added tax purposes.

Likewise, cryptocurrency exchanges and similar organizations, have been required in a number of countries to register and report on currency transactions to national financial transaction monitoring agencies, in the interests of fighting money laundering and other criminal activities, but these initiatives do not in themselves ensure the trustworthiness or security of these registered companies/entities and provide no real protections for the consumers using them.

There seems to be also some emerging view, particularly in the United States, that the burgeoning role that cryptocurrencies play as investment assets requires some regulatory effort by securities and commodity trading regulators, especially to deal with issues such as fraudulent investment offerings, misleading or inaccurate information provision, especially related to investments in ICOs, or related mining operations, or the establishment of exchanges and other cryptocurrency transaction agents. In addition, some of these agencies have engaged in investor education initiatives designed to make investors aware of the risks of engaging in such markets, both as speculative investments in cryptocurrencies themselves and in mining and exchange companies. However, the degree of intervention by regulators has varied widely among countries.

Because cryptocurrencies have not made much progress as viable retail payment systems, or really as currencies as such, there has been little incentive to engage in either significant consumer information initiatives about the risks of using these currencies as payment

mechanisms, even given the significant risks involved in such transactions (e.g. lost or misdirected payments, potential financial failures of exchanges) or in regulating them. Some agencies, for example the CFPB, have undertaken some consumer education initiatives, but in general these efforts are relatively modest and uncoordinated.

## Chapter 6: Conclusions and Recommendations

### 6.1 How Significant are Cryptocurrencies for Consumers?

**Finding 1:**

Presently, cryptocurrencies seem to have little relevance for the average consumer as payment systems. Their current design limitations, significantly limits their ability to provide the speed, or handle the volumes required of, typical retail payment systems in today's commercial environment. Further, their level of acceptance as payment mechanisms by both consumers and merchants is extremely limited.

From their first appearance in 2009, less than a decade ago, the growth in the presence of cryptocurrencies in the economy worldwide has been truly remarkable. They represent a new type of digital currency, totally independent of government, with no need of the backing of an independent authority, and with built-in trust mechanisms. In short, cryptocurrencies appeared initially to hold the potential to totally revolutionize the concept of money, in terms who controls it and how it is used.

However, while their growth has been large, and their conception revolutionary, our research indicates that to date, they have had little relevance for the average consumer as an everyday payment system. This is primarily because they do not currently meet the major tests for an effective currency for consumers. Namely, they are not a) widely accepted payment mechanisms, b) they are not an effective a way to store and transfer value, and c) they do not serve as a useable unit of account.

The reasons for these failures are found to arise from two main issues;

- (a) *the internal design limitations of cryptocurrencies*, which include: high transaction costs, slow processing times, high energy consumption in their creation, complex working mechanisms, and lack of safe and secure means to be stored and transacted. The exchanges and businesses facilitating cryptocurrency transactions are often found to lack the financial scale to invest in adequate security, and also appear to lack sufficient resources to address the financial risks arising from hacking, theft and any other losses, making them susceptible to insolvency. The result has been losses to users of exchanges and similar

businesses for consumers, often in the range of tens or hundreds of millions of US dollars;

These design limits indicate that many cryptocurrencies in their present form are unlikely to have the desired efficacy to work as a payment system because these restraints prevent them from being transacted at the speed, volume and low costs required for consumer retail markets. This also makes them less competitive than many electronic payment systems based on fiat currency; and

- (b) their *current volatility*; cryptocurrencies became speculative commodities, unbacked by alternative forms of value, very early in their growth, and experience rapid, large and unpredictable gains and losses in their traded value. Cryptocurrencies' rapid and large swings in value make them a poor tool to compare values and prices and a poor predictable store of value. Indeed, these shifts in value can be so rapid that their value can significantly change between the start and end of a transaction.

These two issues fundamentally weaken the capacity of cryptocurrencies to serve as an effective currency for consumers, despite their early promise. And currently, cryptocurrencies seem unlikely to be a substitute for fiat currency, or as alternate payment mechanisms for consumers, for the foreseeable future.

**Finding 2:** Use of cryptocurrencies as speculative investment vehicles also seems to be of little practical significance for the average consumer who needs predictability and security when using investment instruments for household savings and retirement provision. Given their volatility and unpredictable swings in value, cryptocurrencies are highly risky investment vehicles and consumers who use them should be prepared for potentially significant losses as well as potential gains.

Our research showed that one area of undisputed significance and success with respect to cryptocurrencies, is their use as speculative investment vehicles. That said, this also appears to be of little practical use to the average consumer who may need to use investment vehicles for the purposes of savings or retirement provision.

Cryptocurrencies are too volatile, unpredictable and speculative (i.e. risky), to form the basis of a relatively secure and predictable investment portfolio that most consumers need to ensure long term savings growth to contribute to typical life cycle goals such as saving for a house, a car, or for retirement provision. This is true of not only direct investments in cryptocurrencies themselves, but also investments in currency mining and initial coin offering and various businesses involved in establishing exchanges and related businesses, all of which are currently largely unregulated, although this is gradually starting to change as some regulators have begun to react to cases of fraud and misrepresentation.

In their current form investments in cryptocurrencies are only of interest to those limited numbers of consumer investors seeking short term and dramatic earnings results with very high risk profiles, i.e. those who can afford to lose their investment stake.

**Finding 3:** Young consumers more likely to invest in cryptocurrencies, who generally deem such currencies to be less risky than older consumers.

Our research revealed that young consumers are more likely to invest in such currencies. These include investors who are more comfortable and familiar with the technological novelty and sophistication of cryptocurrencies and who are, by definition, early on in their process of wealth accumulation, and who may be less risk averse than older investors. Nevertheless, some of the research that we reviewed on this younger investor cohort indicates that some of this higher risk tolerance may be misplaced and based on a poor understanding of the risks involved, for example using student loans to finance the purchase of cryptocurrencies as speculative investments.

**Finding 4:** It is conceivable that in the future, cryptocurrencies could become more relevant for consumers, particularly as payment systems, but for that to happen significant challenges have to be overcome with respect to their volatility, their poor performance in terms of handling the volume and speed of transactions required, and the lack of basic consumer protections governing their use.

If the current limitations of cryptocurrencies can be overcome, particularly those related to their use as payment system, then possibly their relevance to consumers may significantly increase. However, this implies three things:

- (a) the volatile value of cryptocurrencies can somehow be tamed, the prospects for which at present seem uncertain;
- (b) the technological limitations of cryptocurrencies can be overcome with respect to both the scale and speed at which they can operate as payment mechanisms and the deficiencies they face in the security of cryptocurrency transactions and storage, particularly related to currency exchanges, can be solved; and
- (c) governments become more willing to legislate and regulate the issuance, exchange and storage of cryptocurrencies, both as payment mechanisms and as investment vehicles, so that consumers have basic legal and regulatory protections when they use cryptocurrencies in these contexts.

It is to this latter issue, the role of government in regulating cryptocurrencies, that we now turn our attention.

## 6.2 How Willing Have Governments Been to Regulate Cryptocurrencies?

### **Finding 5:**

Several countries have shown some willingness to regulate cryptocurrencies, but none of the studied countries have a single comprehensive regulatory regime in place. The present regulatory approaches abroad and in Canada have been found to be unclear, limited and cautious and none of the current regulatory regimes seem to govern the use of cryptocurrencies as payment systems.

Lack of a clear definition for cryptocurrencies that can be treated as assets, property, securities and or commodities, often in the same jurisdiction, makes it challenging to develop a comprehensive regulatory model.

Our survey of the regulatory initiatives of selected governments, both in Canada and abroad, indicates that the appetite to regulate the use of cryptocurrencies has been, and

continues to be, somewhat vague, limited and cautious. To date, almost all of the focus of legislative and regulatory activity has been on the use of cryptocurrencies when they are defined as assets, commodities, property or investment securities. Specific areas of current legislative and regulatory focus we found include:

- (a) expanding existing regulatory regimes for money transfer businesses governing money laundering and the international funding of illegal activities to include cryptocurrency exchanges and related businesses;
- (b) bringing cryptocurrencies under the purview of taxation authorities, when transactions in them realize revenue in fiat currencies for the purposes of corporate tax, income tax or value added tax; and
- (c) initiatives by securities and commodity trading regulators to deal with fraudulent or misleading marketing and other related initiatives tied to promoting the sale of cryptocurrencies to investors, investments in cryptocurrency mining operations or Initial Coin Offerings, and to some extent the creation, investment in, or operation of, cryptocurrency exchanges.

In short, these are relatively limited expansions of traditional government roles related to dealing with fraud and criminal activity, or to capture income realization for the purposes of taxation. They certainly have not broached the wider issue of the consumer protection issues associated with the use of cryptocurrencies as currencies themselves or as payment systems and have only in a very limited way addressed the use of cryptocurrencies as investment vehicles.

**Finding 6:** Central banks, in particular, seem unwilling to accept the idea of cryptocurrencies operating as mainstream payment systems; indeed, many prominent central bankers often dismiss such currencies as equivalent to speculative bubbles.

Our research showed that central bankers, in particular, have been quite disparaging in their comments on cryptocurrencies as potential money and as payment systems, and this fact may have discouraged any broader regulatory initiatives by governments with respect to the use of cryptocurrencies in those roles.

This has probably been reinforced by the fact that despite their growth as speculative investments, cryptocurrencies have not made much headway as currency or payment systems in the consumer marketplace and, therefore, are not a significant presence in the consumer payments environment. As a result, the share of consumers who have been harmed by using cryptocurrencies as money or payment systems appears to be relatively low, although as we have seen, the losses that some consumers have experienced in the failures of cryptocurrency exchanges or in investing in cryptocurrencies have been significant.

In summary, therefore, at the present time there seems to be little appetite amongst governments to extend regulatory protections further than the quite limited areas outlined above.

### 6.3 What Does the Future Hold for Canadian Consumers' Use of Cryptocurrencies?

**Finding 7:** Until clear regulatory reform is implemented and there is some stability in their value, cryptocurrencies will likely remain of limited relevance to an average consumer as payment systems and or investment vehicles in the near future.

Until the future regulatory landscape changes with respect to cryptocurrencies, and significant technical improvements take place with respect to the performance of cryptocurrencies as payment mechanisms and stores of value, including stability in their value, it is unlikely that cryptocurrencies will be of much relevance to the average consumer.

Nevertheless, cryptocurrencies are a significant presence in the speculative investment market and attract considerable attention in the media these days, so there are many opportunities for consumers today to encounter them and potentially use them. From the evidence presented in this study it is self-evident that consumers should exercise considerable caution in the present environment in using cryptocurrencies as payment mechanisms, stores of value (i.e. savings) or as investment vehicles.

The risks of fraud, theft, hacking and other misfortunes are high, as are the risks in rapid and substantial losses in value. Further, there are virtually no protections available to consumer using cryptocurrencies as there would be with respect to fiat currencies when using them as stores of value or payment mechanisms.

**Finding 8:** The idea of a central bank issued digital currency, also known as a CBDC has been analysed by several central banks. However, at this time it does not appear as if any central bank views the issuance of a CBDC as something that they would engage in for the foreseeable future, although the benefits of such a currency for consumers, if it were to be proven to be feasible, could be substantial.

There has been some speculation that governments themselves may in the future issue their own form of cryptocurrency (really an electronic form of fiat currency using blockchain technology) which could offer some competition to traditional payment mechanisms and offer cost and other advantages to consumers. A parallel payments system run by a central bank and open to all consumers, could potentially offer individuals a cost free method to make payments to other individuals, businesses and institutions.

However, at the present time there appears no urgency from central banks to engage in this activity, as most do not see, in the current environment, any significant challenge from cryptocurrencies to fiat currency, or to the conventional and electronic payments systems operated by central banks and the privately-owned banking systems operating in most countries.

In fact, the real legacy benefit for consumers from the emergence of cryptocurrencies may be that the blockchain technologies they use may be improved and adopted by payment system operators (both conventional and new entrants) and thereby help make our payment systems more efficient, more competitive and more cost effective.

## 6.4 Recommendations

**Recommendation 1:** Given the risks associated with cryptocurrencies, and their growing availability to consumers, governments and regulators should adopt an even more active role in developing consumer education and awareness initiatives on the risks involved in using such currencies. The Ontario Securities Commission and the Financial Consumer Agency of Canada have made a useful start in raising some consumer awareness. However, given the scale of the issue, and the potential for consumer harm, more needs to be done, with better publicizing of the existing resources, for greater consumer access.

**Recommendation 2:** Consumers must exercise caution when dealing with cryptocurrencies in any form, either for retail payments, investment opportunities or storing value; so as to mitigate risks, such as, losing money from hacking, theft, and scams.

**Recommendation 3:** Given the demonstrable significant risks that consumers can face when dealing with cryptocurrencies, the federal Department of Finance should convene a public and transparent working group of key stakeholders, including the FCAC, the Bank of Canada, securities commissions, financial institution regulators and consumer and investor protection groups to review the risks to consumers of using cryptocurrencies both as payment systems and investment vehicles.

The working group should consider what recommendations to make to both federal and provincial governments on appropriate consumer awareness and education initiatives and what new or enhanced rules and regulations are required to deal with cryptocurrencies as investment vehicles, the promotion of ICOs and businesses exchanging or trading in cryptocurrencies, and what consumer protections are necessary for cryptocurrency payment networks and businesses dealing in, exchanging or holding cryptocurrencies. The public working group should also consider setting rules for complaint processes, enforcement mechanisms and dispute resolutions.

**Recommendation 4:** The Canada Revenue Agency should consider introducing a comprehensive plain language guide for individuals about the tax liabilities they may incur when dealing with cryptocurrencies.