

# THE CRYPTO-CURRENCY CONUNDRUM: REGULATING AN UNCERTAIN FUTURE

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## INTRODUCTION

“Bitcoin is, at best, a beta project.”<sup>1</sup> This statement was not made years ago, but rather in February 2014, one month after Overstock.com—a top-50 internet retailer that posted \$293.2 million worth of sales in the second quarter of 2013<sup>2</sup>—began accepting bitcoin as a form of payment.<sup>3</sup> February 2014 was a time when the volume of bitcoin traded at amounts in excess of \$30 million every 24 hours.<sup>4</sup> Yet, as the access to bitcoin and its use increases, situations arise that prove the system is still flawed.<sup>5</sup> “Transaction Malleability” is the name of one of these recently exposed flaws that allowed fraudulent users an outlet to engage in fake transactions, which paved the way for one of the oldest and most well known bitcoin exchanges, Mt. Gox, to halt all customer withdrawals.<sup>6</sup>

Many people think of bitcoin as a new and innovative payment system, yet bitcoin is also much like forms of money that the world has seen in the past,

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<sup>1</sup> Jose Pagilery, *Bitcoin is Under Attack*, CNN MONEY (Feb. 12, 2014, 7:14 PM), <http://money.cnn.com/2014/02/12/technology/security/bitcoin-attack/> (citing a quote from Alex Daley, chief technology investment strategist at Casey Research).

<sup>2</sup> Don Davis, *Overstock.com Reports a 22% Sales Increase in Q2 and a Big Profit Jump*, INTERNET RETAILER (July 18, 2013, 12:01 PM), <http://www.internetretailer.com/2013/07/18/overstockcom-reports-22-sales-increase-q2>.

<sup>3</sup> Cade Metz, *The Grand Experiment Goes Live: Overstock.com is Now Accepting Bitcoins*, WIRED (Jan. 9, 2014, 1:47 PM), <http://www.wired.com/business/2014/01/overstock-bitcoin-live/>.

<sup>4</sup> *Crypto-Currency Market Capitalizations*, COINMARKETCAP.COM (last visited Feb. 23, 2014), <http://coinmarketcap.com>.

<sup>5</sup> See, e.g., Pagilery, *supra* note 1 (explaining a design flaw which allowed attackers to use fake transactions to confuse the system’s accounting programs).

<sup>6</sup> Danny Bradbury, *What the ‘Bitcoin Bug’ Means: A Guide to Transaction Malleability*, COINDESK (Feb. 12, 2014, 7:26 PM), <http://www.coindesk.com/bitcoin-bug-guide-transaction-malleability/>. The following presents an example of transaction malleability:

Let’s say that Alice runs an exchange, and Eve has bitcoins sitting in that exchange. Eve decides to withdraw her coins, and asks Alice to send the bitcoins to her address. When Alice sends them, this automatically creates a transaction, which is transmitted for mining so that it can be included in the bitcoin block chain.

But Eve pretends that Alice never sent them. She uses the transaction malleability flaw to reproduce Alice’s original transaction, tweaking the signature slightly to produce a different hash. She then retransmits that transaction, with the different ID.

There is a chance that Eve’s transaction will be confirmed on the block chain first. If that happens, the network will assume that transaction is valid, and won’t record Alice’s. Eve can then complain to Alice that she didn’t receive the coins. When Alice checks for her transaction ID in the block chain, she won’t find it, and she might try to send more bitcoins, meaning that she’ll be out of pocket.

*Id.*

before governments and central banks exerted their control. In many ways, bitcoin completes the round trip of money that began to take hold in the Renaissance, when value and control was not determined by any government but rather by the issuers of notes and the customers who used those notes.<sup>7</sup>

The demand for an easily transferrable medium of exchange arose after the fall of the dark ages and with the emergence of trade during the Italian Renaissance.<sup>8</sup> Perhaps no entity had a greater influence on the ascent of money at this time than the Medici Bank of Italy.<sup>9</sup> The bank's business was centered on bills of exchange,<sup>10</sup> which were nothing more than non-interest-bearing written orders for future payment used in international trade, which were similar to checks and promissory notes.<sup>11</sup> For example, a creditor could draw a bill on the debtor and use the bill as a means of payment or obtain cash for it at a discount from a broker.<sup>12</sup> The bank quickly established itself as the central currency trader of the civilized world before moving to the commercial hub of Florence and later expanding with branches in Geneva, Pisa, London and Avignon.<sup>13</sup> Because of the Medici Bank's omnipresence in the commercial world, transactions based on the Medici bills transcended borders and operated and thrived outside the purview of government control.<sup>14</sup>

As the global marketplace becomes ever more pervasive, the pressure for a reversion to a simplified medium of exchange built on trust and ease of use continues to mount, and today, what are known as crypto-currencies, i.e. bitcoin, like the bills of exchange created by the Medici, are growing as an acceptable form of payment. Bitcoin and other crypto-currencies (cryptos)<sup>15</sup>

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<sup>7</sup> See discussion *infra* Part II.

<sup>8</sup> Robert S. Lopez, *The Dana of Medieval Banking*, in *THE DAWN OF MODERN BANKING* 1, 5 (1979).

<sup>9</sup> NIALL FERGUSON, *THE ASCENT OF MONEY: A FINANCIAL HISTORY OF THE WORLD* 41 (2009).

<sup>10</sup> *Id.* at 43.

<sup>11</sup> *Bill of Exchange Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/b/billofexchange.asp>. Many investors and people in the finance industry use Investopedia as a reference or an aid for assessing information. See *Investopedia.com*, INVESTIMONIALS, <http://investimonials.com/websites/reviews-investopedia-com.aspx>.

<sup>12</sup> FERGUSON, *supra* note 9, at 43–44.

<sup>13</sup> *Id.* at 42–43.

<sup>14</sup> *Those Medici*, *THE ECONOMIST*, Dec. 23, 1999, <http://www.economist.com/node/347333>.

<sup>15</sup> Crypto-currencies, for the purposes of this comment, will be called cryptos. One should consider cryptos as any of the numerous forms of electronic payment (or currencies) that have similar features to bitcoin. Not all cryptos are built on the same bitcoin protocol. See, e.g., Alvin Lee, *A New Wave of 2nd Generation Cryptocurrencies: NXT, eMunie, SkyCoin, EarthCoin*, ALUNA CRYPTO CURRENCY (Dec. 24, 2013, 7:20 AM), <http://alunacrypto.blogspot.com/2013/12/a-new-wave-of-2nd-generation.html>. Some have built in inflation rates, and some rely on proof-of-work rather than proof-of-stake or a hybrid. See generally ETHEREUM, <http://www.ethereum.org> (last visited Feb. 9, 2014); NXT, <http://www.nxt.org> (last visited Feb. 9,

can be accessed on computers throughout the world, not just in modern economies, but also through exchanges and other peer-to-peer networks.<sup>16</sup> A crypto is a virtual currency that uses cryptography (computer coding) for security.<sup>17</sup> Cryptos are not issued by any central authority, effectively rendering them immune from government interference.<sup>18</sup> And also like the Medici's bills of exchange, these cryptos can be converted into a nation's domestic currency.<sup>19</sup> In fact, cryptos are a return to an old world model that is supported by the private exchange of value.<sup>20</sup>

Bitcoin and its various iterations and competitors have not been without their detractors. Some claim that bitcoin's current use and increase in value is nothing more than a bubble, while others claim that its use in nefarious activities means it should be outlawed or heavily controlled.<sup>21</sup> Still, with the global reach of bitcoin and its growing use in countries around the world, a myriad of different policies concerning bitcoin has sprung up. From laissez-faire to varying degrees of control, different policies may lead to problems as cryptos, especially bitcoin, continue to become a more widely used form of exchange and payment.<sup>22</sup> Additionally, countries that choose to control the transfer of bitcoin may create enforcement and economic problems as more individuals and entities move into bitcoin and use it as a measure of exchange.<sup>23</sup> These methods by which nations control the inflow and outflow of

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2014). Developers are even trying to implement what is known as a "proof-of-burn" coin. [ANN] *Levelcoin—Proof of Stake/Proof of Burn Hybrid—Inflation Immune*, BITCOINTALK (Jan. 19, 2014), <https://bitcointalk.org/index.php?topic=422309.0;topicseen>. The market is expanding and, while bitcoin is certainly the leader in both market capitalization and fame, there is no telling where the industry might be in the ensuing years. This concern will be further addressed in this comment.

<sup>16</sup> Nikolei M. Kaplanov, *Nerdy Money: Bitcoin, The Private Digital Currency, and the Case Against its Regulation*, 25 LOY. CONSUMER L. REV. 111, 113 (2012).

<sup>17</sup> See *id.* at 116.

<sup>18</sup> Omri Marian, *Are Cryptocurrencies Super Tax Havens?*, 112 MICH. L. REV. FIRST IMPRESSIONS 38, 38–39 (2013); *Cryptocurrency Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/c/cryptocurrency.asp>.

<sup>19</sup> Peter Twomey, *Halting a Shift in the Paradigm: The Need for Bitcoin Regulation*, 16 TRINITY C.L. REV. 67, 69 (2013).

<sup>20</sup> See discussion *infra* Part III.

<sup>21</sup> Ivan Glinski, *The Critics Say Bitcoin is Doomed—Here's What They're Missing*, POLICY MIC (Nov. 11, 2013), <http://www.policymic.com/articles/71365/the-critics-say-bitcoin-is-doomed-here-s-what-they-re-missing>; Robert McMillan, *Bitcoin Values Plummet \$500m, Then Recover After Silk Road Bust*, WIRED (Oct. 2, 2013), <http://www.wired.com/2013/10/bitcoin-market-drops-600-million-on-silk-road-bust/>.

<sup>22</sup> See Nicholas A. Plassaras, *Regulating Digital Currencies: Bringing Bitcoin Within the Reach of the IMF*, 14 CHI. J. INT'L L. 377, 390–91 (2013).

<sup>23</sup> See generally *id.*

money across their borders are commonly known as capital controls.<sup>24</sup> Countries, through their central banks or other governmental agency, assert capital controls in many ways, one of the most common being a tax on inflows, although this is far from the only measure.<sup>25</sup>

This Comment proposes that regulatory bodies, whether international entities or national governments, must undertake the regulation of all cryptos, including bitcoin, with a delicate approach. Differing rules across borders regarding cryptos are not necessarily a recipe for disaster. However, heavy-handed and cumbersome regulation will simply spark innovation to circumvent these controls and foster the development of new cryptos, reduce demand for the established cryptos, and harm the international economy.<sup>26</sup> Clumsy, piecemeal regulation could very well lead to the emergence of the regulatory equivalent of whack-a-mole and fail to address one of the biggest issues many countries raise: the prevention of speculative attack (i.e. a massive devaluation of a nation's currency, brought on by speculators that force such devaluation).<sup>27</sup> Any ideal or framework to prevent speculative attacks on currencies based on faulty or over burdensome regulation could very well exacerbate the problem that the regulation seeks to correct.<sup>28</sup>

Cryptos are here to stay.<sup>29</sup> Who and what will regulate these cryptos will depend largely upon how they come to be defined.<sup>30</sup> Different countries are instituting differing regulations, and no custom has emerged as of yet.<sup>31</sup> Furthermore, international entities, such as the International Monetary Fund (IMF), have been conspicuously quiet on the subject. This Comment posits that a new definition may be needed—one that takes into account cryptos as an amalgam of different types of assets—but not necessarily a currency.

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<sup>24</sup> *Capital Control Definition*, INVESTOPEDIA, [http://www.investopedia.com/terms/c/capital\\_control.asp](http://www.investopedia.com/terms/c/capital_control.asp) (last visited Feb. 14, 2015). These measures can include just about anything to prevent the flow of money: taxes, tariffs, legislation, and volume restrictions. *Id.* These controls are designed to affect the full spectrum of asset classes. *Id.*

<sup>25</sup> Kristen J. Forbes, *Capital Controls: Mud in the Wheels of Market Efficiency*, 25 CATO J. 153, 153–54 (2005).

<sup>26</sup> See *infra* Part III.

<sup>27</sup> See *id.* For purposes of this comment a speculative attack will be considered a massive devaluation of a country's currency brought on by the selling or "shorting" of that country's currency. See *Speculative Attack*, TRADER'S LABORATORY, <http://www.traderslaboratory.com/forums/trading-dictionary/12855-speculative-attack-definition.html> (last visited Feb. 14, 2015).

<sup>28</sup> See Forbes, *supra* note 25.

<sup>29</sup> Many cryptos have sprung up in the wake of bitcoin's emergence. A cursory internet search illustrates this point. See generally *Crypto-Currency Market Capitalizations*, *supra* note 4.

<sup>30</sup> See discussion *infra* Part II.

<sup>31</sup> See discussion *infra* Part I.C.3.

Because of this, it would be hard to fit cryptos under the purview of either of the two main international commercial bodies, the IMF or the World Trade Organization (WTO). However, one must take the lead. While ideas have been floated to bring cryptos within the purview of the IMF, the format and structure of the WTO, while not completely ideal, could make it a more suitable forum for issues regarding cryptos. Nevertheless, regulation must not go too far. What constitutes “too far” is a subject of much debate, but whoever takes up the mantle for leading regulation should err on the side of too little regulation rather than too much. Too much regulation, especially in a finance-related field such as cryptos, would have the tendency to simply spur innovation to circumvent controls.<sup>32</sup>

Differing regulations across nations concerning cryptos are not necessarily problematic, and some countries may have valid reasons for asserting more stringent regulations. However, an international forum must be provided so countries can work together in order to avoid the possible dangers that may face less economically developed nations and their interaction with the growing use and popularity of cryptos. Concerns about bitcoin’s use on the Silk Road<sup>33</sup> or other surreptitious marketplaces for the purchase of drugs and weaponry, among other illegal goods and services, valid as they may be, have been analyzed extensively and lie outside the scope of this Comment.<sup>34</sup> This Comment deals specifically with the functionality of bitcoin and other cryptos, as well as how to prevent the threat of speculative attacks sparked by the use of bitcoin.

Part I of this Comment will provide a brief analysis of bitcoin, the most popular and widely used crypto,<sup>35</sup> as well as explore the present state of cryptos including the emergence of various “altcoins”<sup>36</sup> and the development of what is becoming known as the second generation of crypto-currencies.<sup>37</sup> Part II will provide an analysis of the various definitions that have been fixed

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<sup>32</sup> Charles W. Calomiris, *Financial Innovation, Regulation, and Reform*, 29 CATO J. 65, 65 (2009).

<sup>33</sup> Glinski, *supra* note 21.

<sup>34</sup> See generally Derek A. Dion, *I’ll Gladly Trade you Two Bits on Tuesday for a Byte Today: Bitcoin, Regulating Fraud in the E-Economy of Hacker-Cash*, 2013 U. ILL. J.L. TECH. & POL’Y 165 (2013); Joshua J. Douget, *The Nature of the Form: Legal and Regulatory Issues Surrounding the Bitcoin Digital Currency System*, 73 LA. L. REV. 1119 (2013); Twomey, *supra* note 19.

<sup>35</sup> See *Crypto-Currency Market Capitalizations*, *supra* note 4 (indicating bitcoin as the leader in market capitalization and volume traded).

<sup>36</sup> An “altcoin” is simply a commonly used term to describe cryptos that are not bitcoin. ALTCOINS, <http://altcoins.com> (last visited Feb. 9, 2014).

<sup>37</sup> Carrie Kirby, *Alternative Cryptocurrencies Thrive in Bitcoins Shadow*, COINDESK (Dec. 24, 2013), <http://www.coindesk.com/alternative-cryptocurrencies-thrive-bitcoins-shadow/>; Lee, *supra* note 15.

to bitcoin and other cryptos. Part III will explore past suggestions of bringing bitcoin within the purview of the IMF, but will also explain how these methods are flawed. Finally, Part IV will examine the ways that the WTO, even given its flaws, can assert guidance for the crypto-currency industry and why, given the current global entity structure, this is currently the optimal approach.

## I. A BITCOIN OVERVIEW

This Part will explain the development and growth of bitcoin leading up to the present day. Some of the differing treatments by regulators will be discussed to highlight the need for an international forum that can bring countries together to discuss potential issues. While Part I.A. highlights bitcoin development and the mechanics behind bitcoin, Part I.B. explains the reasons for bitcoin's emergence. To conclude, Part I.C. analyzes the current state of the crypto market.

### A. *Bitcoin Development and Mechanics*

Developed in 2009,<sup>38</sup> bitcoin is a decentralized digital currency that relies on peer-to-peer technology<sup>39</sup> for online transactions between a buyer and seller in an online marketplace.<sup>40</sup> Unlike traditional currency that is deposited at a bank and accessible online, users can both hold bitcoin as electronic files on a computer's hard drive,<sup>41</sup> and store it online in one of the many accessible online wallets.<sup>42</sup> One user can transfer bitcoin to another by entering the amount to be transferred in the wallet, entering the address, and clicking send.<sup>43</sup>

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<sup>38</sup> Tal Yellin, Dominic Aratari, & Jose Pagilery, *What is Bitcoin*, CNN MONEY, <http://money.cnn.com/infographic/technology/what-is-bitcoin/> (last visited Feb. 9, 2014). The developer is an anonymous group, or individual using the alias "Satoshi Nakamoto." *Id.*

<sup>39</sup> *Id.*

<sup>40</sup> Kaplanov, *supra* note 16, at 123. The white paper for bitcoin provides helpful background information concerning the mechanics and specifics of the transaction process and the inner workings of bitcoin. See generally Satoshi Nakamoto, *Bitcoin: A Peer to Peer Electronic Cash System*, available at <https://bitcoin.org/bitcoin.pdf>.

<sup>41</sup> Plassaras, *supra* note 22, at 379.

<sup>42</sup> Vitalik Buterin, *Bitcoin Wallet Reviews—Ease of Use and Security*, BITCOIN MAGAZINE (Mar. 5, 2012), <http://bitcoinmagazine.com/327/bitcoin-wallet-options/>. See, e.g., COINBASE, [www.coinbase.com](http://www.coinbase.com) (last visited Feb. 18, 2015).

<sup>43</sup> *How Does Bitcoin Work?*, BITCOIN.ORG, <http://bitcoin.org/en/how-it-works> (last visited Feb. 18, 2015). An address is simply a stream of characters that a user would enter into a wallet to identify the recipient, something like: 1Bw4AXysTrRpEeCEYEZv8rUCSdSTJ8APu7. *Id.*

Bitcoin's innovation lies in its ability to self-regulate against the problem of what is known as double spending.<sup>44</sup> Imagine sending someone an email with an attachment.<sup>45</sup> You send it to the individual, but after you send it, the message remains in your mailbox.<sup>46</sup> This does not give most users a second thought; however, what if that attachment happened to be \$100, or a bitcoin. What would stop someone from spending it again? With bitcoin, the system distributes—or broadcasts—a ledger throughout the bitcoin community—or bitcoin system—that registers each transaction.<sup>47</sup> This ledger is called a block chain and all new transactions are compared against this block chain to ensure that bitcoins are accurately transferred thus preventing double spending—or forgery—and preserving the integrity of bitcoin.<sup>48</sup>

The process of confirming these transactions is what is known as mining.<sup>49</sup> Mining allows miners to earn bitcoin as opposed to buying them on an exchange or transacting directly with another party.<sup>50</sup> Mining is a computational mathematical process that confirms transactions within the bitcoin system.<sup>51</sup> Simply put, mining is the process of adding transaction records to bitcoin's public ledger, i.e., the block chain.<sup>52</sup> The block chain serves to confirm to the network that transactions between any parties have actually taken place and are legitimate.<sup>53</sup> By legitimizing transactions in this way, the system prevents users from engaging in such fraudulent activities as double spending.<sup>54</sup>

A helpful way to look at mining is to walk through a bitcoin transaction. Imagine Jack sends Jill a bitcoin. Jack and Jill's transaction will be broadcast to the entire bitcoin system on what is known as a block.<sup>55</sup> Each block contains a digest—or review—of the last block that has already been confirmed—or

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<sup>44</sup> JERRY BRITO & ANDREA CASTILLO, BITCOIN: A PRIMER FOR POLICYMAKERS 3–4 (2013), available at [http://mercatus.org/sites/default/files/Brito\\_BitcoinPrimer\\_embargoed.pdf](http://mercatus.org/sites/default/files/Brito_BitcoinPrimer_embargoed.pdf).

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* at 4.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> *Id.* at 5–6.

<sup>50</sup> See John Biggs, *How to Mine Bitcoins*, TECHCRUNCH (Apr. 8, 2013), <http://techcrunch.com/2013/04/08/how-to-mine-bitcoins/>.

<sup>51</sup> *Mining*, BITCOIN WIKI (Oct. 10, 2014, 7:19 PM), <https://en.bitcoin.it/wiki/Mining>.

<sup>52</sup> *Id.*

<sup>53</sup> *Id.*

<sup>54</sup> *Double-spending*, BITCOIN WIKI (Dec. 4, 2014, 1:26 AM), <https://en.bitcoin.it/wiki/Double-spending>.

<sup>55</sup> J.P. & G.T., *Bits and Bob*, THE ECONOMIST (June 13, 2011), <http://www.economist.com/blogs/babbage/2011/06/virtual-currency>.



mined—by the bitcoin system, i.e. the tip of the block chain—or official transaction log.<sup>56</sup> For a new block to be deemed valid, as well as the new transactions within it, some computer on the bitcoin system must create a log for it that connects the block to the previous blocks on the block chain.<sup>57</sup> To prevent fake transactions from being added to the chain, the method by which these transactions are confirmed needs to be costly for an individual, but cheap for the network as a whole.<sup>58</sup> The system thus designates a “task” which involves using valid blocks and the new transactions to generate a digest consisting of random numbers.<sup>59</sup> Once the task is solved by the network, the new block is added to the block chain.<sup>60</sup> In order to create a fraudulent block and have it validated by the system, the user would have to outpace the combined network’s computational power.<sup>61</sup> This is very difficult to achieve, but not impossible, which is an issue that will be explained in greater detail below.

Developers intentionally designed the mining process to be resource intensive; in other words, some form of energy, in this case computational power, must be expended by the “miner” in order to participate in the mining process.<sup>62</sup> As miners add blocks to the block chain, the system must contain what is known as a “proof of work” so that these blocks may be considered valid.<sup>63</sup> Upon discovering a block, miners are awarded with a disbursement of newly created coins as well as any transaction fees on the exchange of bitcoin within the block.<sup>64</sup> The system rewards miners for discovering these blocks, as it is both resource intensive and a necessity for the bitcoin system.<sup>65</sup> Currently, the reward is 25 newly minted bitcoin.<sup>66</sup> This value will halve every 210,000

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<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Mining*, *supra* note 51. By keeping the mining process resource intensive, the number of blocks found by miners and their reward distributions allows for a steady increase in the amount of bitcoin added to the system. *Id.*

<sup>63</sup> *Id.* A “proof of work” is a piece of data that took some process or some level of difficulty for the user to produce. *Proof of work*, BITCOIN WIKI (Oct. 29, 2013), [https://en.bitcoin.it/wiki/Proof\\_of\\_work](https://en.bitcoin.it/wiki/Proof_of_work). A different approach, what is known as “proof of stake,” allows for miners to confirm transactions and receive rewards based on their “stake” within the system (i.e. the likelihood of confirming the transactions increases with the amount of units a user holds rather than the amount of processing power employed). *Proof of Stake*, BITCOIN WIKI (Jan. 17, 2014), [https://en.bitcoin.it/wiki/Proof\\_of\\_Stake](https://en.bitcoin.it/wiki/Proof_of_Stake).

<sup>64</sup> *Mining*, *supra* note 51.

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

block until the maximum 21 million bitcoin has been distributed.<sup>67</sup> Figures estimate that the total will be reached by 2024, at which point miners will be rewarded solely based on transaction costs.<sup>68</sup> At the time of this writing, current bitcoin in circulation is approaching 14,000,000.<sup>69</sup>

### B. *The Allure of Bitcoin*

The reasons for bitcoin's emergence have been discussed extensively in news articles and other publications;<sup>70</sup> therefore, nothing more than a brief synopsis for purposes of this Comment is needed here. The three main reasons for the development of bitcoin are cost, security, and anonymity.<sup>71</sup>

The bitcoin protocol allows for users to conduct transactions directly between other system's participants at almost zero cost.<sup>72</sup> Because of the mining process described above, the need for a third-party verification, such as PayPal, is eliminated.<sup>73</sup> This lack of third-party intervention prevents the reversal of transactions; rather, a bitcoin transaction acts as an electronic cash transaction.<sup>74</sup> Merchants accepting bitcoin from international customers bypass the laborious and costly task of converting foreign currency to domestic currency.<sup>75</sup> Users generally do not incur any additional costs with regards to

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<sup>67</sup> *Controlled Supply*, BITCOIN WIKI, [https://en.bitcoin.it/wiki/Controlled\\_Currency\\_Supply](https://en.bitcoin.it/wiki/Controlled_Currency_Supply) (last updated Oct. 10, 2014).

<sup>68</sup> *Id.*; *Bitcoin Transaction Fees Explained*, BITCOIN FEES, <http://bitcoinfoees.com> (last updated Feb. 12, 2014).

<sup>69</sup> *Total Bitcoin in Circulation*, BLOCKCHAIN, <https://blockchain.info/charts/total-bitcoins> (last visited Feb. 14, 2015); Ken Tindell, *Geeks Love the Bitcoin Phenomenon Like They Loved the Internet in 1995*, BUSINESS INSIDER (Apr. 5, 2013, 5:42 PM), <http://www.businessinsider.com/how-bitcoins-are-mined-and-used-2013-4>. A useful, if somewhat simplistic analogy, that may help to explain bitcoin mining to the uninitiated would be to consider the search for prime numbers (numbers that can be divided evenly only by 1 or itself). Tindell, *supra* note. Small prime numbers are relatively easy to find but the search for larger ones have become harder and harder to find, up until the point where high performance computers are now needed to conduct these calculations. *See id.* Mining is essentially this process, and as users continue to enter into bitcoin, the transactions increase and it becomes harder and harder to confirm these transactions. *See id.*

<sup>70</sup> *See generally Bitcoin Under Pressure*, THE ECONOMIST, Nov. 30, 2013, available at <http://www.economist.com/news/technology-quarterly/21590766-virtual-currency-it-mathematically-elegant-increasingly-popular-and-highly>; Alex McAdams, *Why I Use Bitcoin, and Why You Should, Too*, DAILY FINANCE (Feb. 9, 2014, 1:46 PM), <http://www.dailyfinance.com/2014/02/09/why-i-use-bitcoin-and-why-you-should-too/>.

<sup>71</sup> Kaplanov, *supra* note 16, at 125.

<sup>72</sup> *Bitcoin Under Pressure*, *supra* note 70.

<sup>73</sup> *Id.*

<sup>74</sup> Kaplanov, *supra* note 16, at 125.

<sup>75</sup> *See* Brian Patrick Eha, *More Major Retailers Are Getting Ready to Accept Bitcoin*, ENTREPRENEUR (Jan. 29, 2014), available at <http://www.entrepreneur.com/article/231134>.

transporting bitcoin across various regions.<sup>76</sup> Bitcoin is stored electronically and can be accessed wherever the user may go.<sup>77</sup>

Bitcoin provides security to users through several different mechanisms. First, as described above, the mining function currently allows for a self-monitoring mechanism to prevent other users from engaging in such fraudulent activities as double spending.<sup>78</sup> Secondly, no central authority controls bitcoin,<sup>79</sup> so users are not subject to the whim of a government or central bank.<sup>80</sup> This cuts both ways. A fixed supply of bitcoin prevents inflation.<sup>81</sup> However, with no central authority, there is no way to prevent fluctuations against traditional currencies.<sup>82</sup> Nevertheless, the more the value of bitcoin increases, and as the supply approaches the maximum, the less one single trade impacts the market price.<sup>83</sup> An interesting conundrum therefore develops: although the volatility of bitcoin may prevent new users from participating, the more users there are, the greater the price stabilization.<sup>84</sup>

Anonymity provides another reason why users sometimes turn to bitcoin. The addresses (also known as keys) attached to each bitcoin are not tied to any public identity.<sup>85</sup> The addresses, as well as all transactions connected with the addresses, are stored in the block chain.<sup>86</sup> The system publicly logs a record of transactions.<sup>87</sup> Yet, the addresses tied to the transactions, since they are just a set of random numbers, are not tied to any specific individual or entity.<sup>88</sup> However, as the popularity of bitcoin grows and more and more users,

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<sup>76</sup> See Kaplanov, *supra* note 16, at 126.

<sup>77</sup> See *id.* at 116.

<sup>78</sup> See discussion *supra* Part I.A.

<sup>79</sup> Twomey, *supra* note 19, at 67.

<sup>80</sup> See BRITO & CASTILLO, *supra* note 44, at 17.

<sup>81</sup> See Rahul Gupta, *How Bitcoin Is Helping Ordinary People Overcome Currency Control in Their Country*, INVESTOPEDIA, [www.investopedia.com/articles/investing/120414/how-bitcoin-ordinary-people-overcome-currency-control-their-country.asp](http://www.investopedia.com/articles/investing/120414/how-bitcoin-ordinary-people-overcome-currency-control-their-country.asp) (last visited Feb. 14, 2015).

<sup>82</sup> See Radaslov Albrecht, *Bitcoin Volatility—The 4 Perspectives*, BITCOIN MAGAZINE (Aug. 27, 2013), <http://bitcoinformagazine.com/6543/bitcoin-volatility-analysis/>.

<sup>83</sup> *Id.*

<sup>84</sup> *Id.*

<sup>85</sup> BRITO & CASTILLO, *supra* note 44, at 8–9.

<sup>86</sup> *Id.* at 8.

<sup>87</sup> *Protect Your Privacy*, BITCOIN FOUNDATION, <https://bitcoin.org/en/protect-your-privacy> (last visited Feb. 14, 2015).

<sup>88</sup> *Anonymity*, BITCOIN WIKI, <https://en.bitcoin.it/wiki/Anonymity> (last updated Nov. 8, 2014).

including established merchants, accept bitcoin, some users may be willing to forgo anonymity so as to facilitate transactions.<sup>89</sup>

### C. *The Current State of Bitcoin and Other Crypto-Currencies*

This last subpart of the bitcoin overview will highlight the growing popularity and concern with bitcoin and the emergence of other cryptos. Some of the differing regulations will be introduced in an effort to further highlight some of the conflicting views about the treatment of bitcoin and introduce the question of whether such conflicting regulation is both warranted and a cause for concern.

#### 1. *Bitcoin is Emerging as a Legitimate Medium of Exchange*

Recent developments in international markets are beginning to solidify bitcoin's status as a commercial necessity. In mid-January 2014 the market capitalization of bitcoin approached \$11.3 billion when the total supply of bitcoin was at just under 12.25 million.<sup>90</sup> At this time, one bitcoin was valued at \$919.60; one year later, the value has dropped off with prices located at around \$300 per bitcoin.<sup>91</sup> Yet, the Winklevoss twins, of Facebook fame,<sup>92</sup>

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<sup>89</sup> See BRITO & CASTILLO, *supra* note 44, at 9. It has already been suggested that bitcoin is not really anonymous but rather pseudonymous with the way that the addresses attach to a certain user. *Id.* Some scholars have foreseen that as more and more intermediaries gain traction with bitcoin, current regulation will impinge on this "anonymity" that users have so far held. *Id.* Users that have tried to use bitcoin to escape taxes or purchase other illicit goods have found mixed results. See generally Cameron Keng, *Bitcoin is Not Anonymous and is Always Taxable*, FORBES, Dec. 12, 2013, available at <http://www.forbes.com/sites/cameronkeng/2013/12/16/bitcoin-is-not-anonymous-is-always-taxable/3/>; Winston Ross, *Robbery on the Silk Road*, NEWSWEEK, Jan. 10, 2014, <http://www.newsweek.com/robbery-silk-road-225708>.

<sup>90</sup> See Bitcoin Price Chart, BITCOIN CHARTS, <http://bitcoincharts.com/charts/bitstampUSD#rg60ztgSzmlg10zm2g25zv> (last visited Feb. 11, 2014).

<sup>91</sup> *Id.* The price of bitcoin has since dropped a bit and at the time of writing, Feb. 23, 2014, the price was \$615.

<sup>92</sup> Maureen Farrell, *Winklevoss Twins' Risky Bitcoin Bet*, CNN MONEY (July 2, 2013, 1:12 PM), <http://money.cnn.com/2013/07/02/investing/winklevoss-bitcoin-etf/index.html>.

Exchange-traded funds (ETFs) . . . are open-ended funds that investors can trade among themselves in secondary markets. The prices at which ETFs trade rarely differ much from net asset values because a class of investors, known as authorized participants (APs), has the option of trading directly with the ETF. If the market price of an equity ETF is sufficiently below its net asset value, APs will buy shares in the secondary market at market price and redeem shares at net asset value with the fund. Conversely, if the price of an ETF is sufficiently above its net asset value, APs will buy shares from the fund at net asset value and sell shares in the secondary market at market price. As a result, the market price and net asset values of ETFs tend to converge.

have announced plans to create a bitcoin exchange traded fund (ETF), and merchant adoption has steadily increased, which is exemplified by Microsoft's acceptance of bitcoin for the Xbox console.<sup>93</sup> Early plans for the ETF include tracking the price of bitcoin across multiple exchanges.<sup>94</sup> The twins recognize the risk involved with undertaking such an operation since many exchanges have already experienced their fair share of problems.<sup>95</sup>

German bank, Fidor Bank AG, has partnered with a bitcoin marketplace, bicoin.de, and a crypto exchange, Kraken.<sup>96</sup> This is the first time that a partnership has formed between a crypto exchange and a bank.<sup>97</sup> Participants believe that this partnership will add legitimacy and security for users of not only bitcoin, but other cryptos as well.<sup>98</sup> Whether this legitimacy and indirect regulation curtails the use of cryptos still remains to be seen.<sup>99</sup> There is hope, however, that more of these agreements will soon follow.<sup>100</sup>

Across the pond in North America, developments in Canada have furthered the cause of bitcoin's validity. Authorities in Canada took the initiative by offering interpretations of the tax code to apply it to bitcoin transactions.<sup>101</sup> According to a comment from the spokesman of Canada's Revenue Agency (CRA), "[b]arter transaction rules apply where bitcoin are used to purchase

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LARRY HARRIS, CHARTERED FINANCIAL ANALYST PROGRAM, CHARTERED FINANCIAL ANALYST: LEVEL I CURRICULUM: EQUITY AND FIXED INCOME 19 (2013).

<sup>93</sup> Stan Higgins, *Microsoft Adds Bitcoin Payments for Xbox Games and Mobile Content*, COINDESK (Dec. 11, 2014), <http://www.coindesk.com/microsoft-adds-bitcoin-payments-xbox-games-mobile-content/>.

<sup>94</sup> Farrell, *supra* note 92. Bitcoin values tend to deviate across exchanges. Alec Liu, *Its Still a Pain to Buy and Sell Bitcoins*, VICE (Dec. 4, 2013, 11:00 AM), <http://motherboard.vice.com/blog/its-still-a-pain-to-buy-and-sell-bitcoins>. One reason for this is that even though bitcoin itself is decentralized, there are a few large exchanges where much of the buying and selling is conducted. *Id.* Traditional and established assets do not have this issue because pathways for trading are relatively well established. *Id.* The same cannot be said at the moment for bitcoin, as regulations have made it difficult for users to transact across exchanges. *Id.*

<sup>95</sup> Farrell, *supra* note 92.

<sup>96</sup> Emily Spaven, *Kraken Partners with Fidor Bank to Offer Bitcoin Trading Services in the EU*, COINDESK (Oct. 9, 2013, 3:11 PM), <http://www.coindesk.com/kraken-partners-fidor-bank-offer-bitcoin-trading-services/>.

<sup>97</sup> Andrew Saks McLeod, *The Legitimization of Bitcoin: Kraken Partners with BaFin Regulated Fidor Bank*, FOREX MAGNATES (Oct. 9, 2013), <http://forexmagnates.com/the-legitimization-of-bitcoin-kraken-partners-with-bafin-regulated-fidor-bank/>.

<sup>98</sup> *Id.*

<sup>99</sup> *See id.*

<sup>100</sup> *Id.*

<sup>101</sup> Bonnie Allen, *Revenue Canada Says BitCoins Aren't Tax Exempt*, CBCNEWS (Apr. 26, 2013, 4:52 PM), <http://www.cbc.ca/news/business/revenue-canada-says-bitcoins-aren-t-tax-exempt-1.1395075>.

goods or services . . . .<sup>102</sup> Citizens attempting to use such barter transaction rules to document a taxable gain must apply them when a user receives an item in exchange for a certain amount of bitcoin.<sup>103</sup> However, when bitcoin is bought or sold like a commodity, regular tax rules dictate.<sup>104</sup> A taxpayer should treat gains or losses from bitcoin just like gains or losses on income or capital.<sup>105</sup> If private sector actions on taxed goods are any indication of the measure of repressiveness or the lack of such a tax, it is worth noting that Canada recently became the home of the first functional bitcoin ATM machines.<sup>106</sup>

Merchants and other entities have also started venturing into bitcoin. Overstock.com announced on January 9, 2014, that it would start accepting bitcoin as a form of payment.<sup>107</sup> Within twenty-four hours, customers purchased \$124,000 worth of items through 780 bitcoin orders.<sup>108</sup> Smaller businesses, including a deli in Michigan and other mom-and-pop shops in Washington D.C., have begun accepting bitcoin payments as a way to stand out from competitors.<sup>109</sup> A Texas congressman started accepting bitcoin for a senate run.<sup>110</sup> Even a lemonade stand run by two school-age girls accepted

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<sup>102</sup> *Id.*; see generally Robert Howse, *Beyond the Countertrade Taboo: Why the WTO Should Take Another Look at Barter and Countertrade*, 60 TORONTO L. J. 290, 290 (2010). Barter is simply the trading of goods and service between two or more parties without any exchange of cash involved. *Barter Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/b/barter.asp>.

<sup>103</sup> See Allen, *supra* note 101.

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*

<sup>106</sup> Aaron Pressman, *First ATM Offering Bitcoins Opens in Vancouver*, YAHOO FIN. (Oct. 29, 2013), <http://finance.yahoo.com/news/first-atm-offering-bitcoins-opens-in-vancouver-202352312.html>. This machine located in Toronto uses such new techniques as scanning a user's palm print and ID card to protect against fraud. *Id.*; see generally *Bitcoin Comes to Toronto*, CHCH (Jan. 10, 2014, 9:20 PM), <http://www.chch.com/bitcoin-comes-toronto/>.

<sup>107</sup> Rebecca Grant, *Overstock makes \$124k from 780 Bitcoin orders a day after giving the crypto-currency a thumbs up*, VENTURE BEAT (Jan. 10, 2014, 10:37 AM), <http://venturebeat.com/2014/01/10/overstock-makes-124k-from-780-bitcoin-orders-within-24-hours-of-accepting-it-as-payment/>. Overstock formed a partnership with the American based online wallet, Coinbase. See *id.* At the time of the announcement, Overstock became the largest merchant to start accepting bitcoin as payment. *Id.*

<sup>108</sup> *Id.*

<sup>109</sup> JC Reindl & Frank Witsil, *Growing number of Michigan retailers accepting bitcoin digital currency*, DETROIT FREE PRESS, Jan. 5, 2014, available at <http://www.freep.com/article/20140105/BUSINESS06/301050091/bitcoin-michigan-retailers-coinmap>; Mohana Ravidranath, *D.C. businesses starting to accept bitcoin*, THE WASH. POST, Dec. 22, 2013, available at [http://www.washingtonpost.com/business/on-it/dc-businesses-starting-to-accept-bitcoin/2013/12/22/a2d7dee2-6736-11e3-ae56-22de072140a2\\_story.html](http://www.washingtonpost.com/business/on-it/dc-businesses-starting-to-accept-bitcoin/2013/12/22/a2d7dee2-6736-11e3-ae56-22de072140a2_story.html).

<sup>110</sup> Rob Wile, *This Texas Congressman Is Now Accepting Bitcoins for His Senate Run*, BUSINESS INSIDER (Jan. 1, 2014, 12:11 PM), <http://www.businessinsider.com/steve-stockman-is-accepting-bitcoins-2014-1>.

Bitcoin.<sup>111</sup> Their venture netted the two young entrepreneurs 0.083 bitcoin, or about \$70 at the time.<sup>112</sup> Nearly one year after Overstock started accepting bitcoin, Microsoft announced that they would begin accepting bitcoin for various forms of the company's digital content.<sup>113</sup>

## 2. *Increasing Concern over the Growth of Bitcoin and Other Cryptocurrencies*

While these developments look promising for bitcoin and other cryptos, not all share in the same laissez-faire attitude. Additionally, there are concerns about the functionality of bitcoin, and increased competition from other cryptos.<sup>114</sup>

One major concern is the recent development of the growth of a pool (a collective of bitcoin miners) that controlled over forty-two percent of the computer processing power of the bitcoin network.<sup>115</sup> This is the first time that a group has come close to controlling more than fifty percent of the mining network.<sup>116</sup> When this happens, bitcoin stops being decentralized and comes under the control of the colluding group or pool.<sup>117</sup> This dominating collective may now prohibit transactions, effectively turning the protections of the

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<sup>111</sup> *These Girls Accept Bitcoins at Their Lemonade Stand*, HUFFINGTON POST (Jan. 23, 2014, 10:53 AM), [http://www.huffingtonpost.com/2014/01/08/bitcoins-lemonade-stand\\_n\\_4563348.html](http://www.huffingtonpost.com/2014/01/08/bitcoins-lemonade-stand_n_4563348.html).

<sup>112</sup> *Id.*

<sup>113</sup> Higgins, *supra* note 93.

<sup>114</sup> See Lee, *supra* note 15 (discussing the emergence of "2nd Generation" altcoins, alternate coins or essentially other cryptos).

<sup>115</sup> Rob Wile, *A Group of Miners Has Exposed One of Bitcoin's Fatal Flaws*, BUSINESS INSIDER (Jan. 10, 2014, 9:11 AM), <http://www.businessinsider.com/bitcoin-miners-approach-dangers-threshold-2014-1>. Once upon a time, a user could mine bitcoin alone using their CPU, and while users may still theoretically do so, the situation has changed. *What is Bitcoin Mining*, WE USE COINS, <http://www.weusecoins.com/en/mining-guide>. The cryptographic puzzles are now so complex, it has become close to impossible for a single individual person to mine on their own. *Bitcoin Vulnerability Could Allow Malicious Miners to Seize Control*, MIT TECHNOLOGY REVIEW (Nov. 8, 2013), <http://www.technologyreview.com/view/521521/bitcoin-vulnerability-could-allow-malicious-miners-to-seize-control/>. Therefore, miners work in groups in order to increase their chances of successful mining. *Id.* However, the process is becoming increasingly expensive, to power all of the electricity that goes into mining. Adrienne Jeffries, *Miner Problem: Big Changes are Coming for Bitcoin's Working Class*, THE VERGE (Nov. 16, 2012, 9:43 AM), <http://www.theverge.com/2012/11/16/3649784/bitcoin-mining-asics-block-reward-change>. Considering that just over half of the \$24 million bitcoins are currently in circulation and mining rewards will continue to be halved, there is concern about how profitable it will be for one to continue mining these coins. See generally Greg Ryder, *All About Bitcoin Mining: Road to Riches or Fool's Gold*, TOM'S HARDWARE (June 9, 2013, 10:00 PM), [http://www.tomshardware.com/reviews/bitcoin-mining-make-money\\_3514-2.html](http://www.tomshardware.com/reviews/bitcoin-mining-make-money_3514-2.html) (providing an anecdotal experience with mining).

<sup>116</sup> Wile, *supra* note 115.

<sup>117</sup> Ittay Eyal & Emin Gun Sirer, *Majority is not Enough: Bitcoin Mining is Vulnerable*, 1–2 (Cornell Univ. Dep't of Computer Sci., Nov. 15, 2013), available at <http://arxiv.org/pdf/1311.0243v5.pdf>.

mining algorithm on its head and establishing complete central and authoritative control.<sup>118</sup>

The group that approached this threshold, GHash, has said that they would take all necessary precautions to prevent reaching the threshold.<sup>119</sup> However, this news brought to light one of the fatal flaws within a system that heretofore had operated relatively smoothly.<sup>120</sup> Effects of a group reaching the threshold would bring the realization of the exact opposite of bitcoin's major attributes—complete centralization as opposed to decentralization.<sup>121</sup> Analysts presume that a situation such as this would cause prices to crash, as people would sell bitcoin immediately in an effort to pursue safer options.<sup>122</sup> Even though the group assuaged fears by backing away from their position, the situation nevertheless raised the specter of the possible outcomes if a group surreptitiously developed enough computing processing power and then released it all at once to take control of the system.<sup>123</sup>

The second development has been the proliferation of new cryptos competing with bitcoin. The website “Coinmarketcap.com” currently lists additional cryptos that number in the hundreds.<sup>124</sup> Many of those cryptos are readily accessible for users to purchase on various exchanges.<sup>125</sup> The goal of many of these alt-coins is to provide variations of the mining algorithm found in bitcoin, or the “proof-of-work” system, while users or investors keep their fingers crossed that the market will accept them.<sup>126</sup> Many do not foresee any of these alt-coins taking the place of bitcoin due to the network effect.<sup>127</sup> This means that the capital investment already made by the system's participants—

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<sup>118</sup> See *id.* at 1–2.

<sup>119</sup> Wile, *supra* note 115.

<sup>120</sup> *Id.*

<sup>121</sup> *Id.*

<sup>122</sup> See *id.*

<sup>123</sup> *Id.*

<sup>124</sup> See *Crypto-Currency Market Capitalizations*, *supra* note 4.

<sup>125</sup> See, e.g., CRYPTSY HOME PAGE, <https://www.cryptsy.com> (last visited Feb. 12, 2014).

<sup>126</sup> See David Z. Morris, *Beyond Bitcoin: Inside the Cryptocurrency Ecosystem*, FORTUNE (Dec. 24, 2013, 1:59 PM), <http://finance.fortune.cnn.com/2013/12/24/bitcoin-altcoin-cryptocurrency/>.

<sup>127</sup> *Id.*

The chief hurdle for any good or service which uses the network effect is to get enough users initially so that the network effects take hold. The amount of users required for significant network effects is often referred to as critical mass. After the critical mass is attained, the good or service should be able to obtain many new users since its network offers utility.

*Network Effect Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/n/network-effect.asp>.



miners, merchants, and simple users—will ensure that the bitcoin system will last.<sup>128</sup>

There are, however, other coins emerging. These new “second generation” cryptos act as an alternative to alt-coins.<sup>129</sup> One of the first to emerge, and currently holding a high market capitalization, is NXT.<sup>130</sup> Unlike the proof-of-work mining system employed by bitcoin and others, NXT uses what is known as a proof-of-stake system.<sup>131</sup> The system eliminates any possibility of the fifty-one percent attack that recently shook-up the bitcoin system.<sup>132</sup> The proof-of-stake system allows users to “forge” rather than mine for new coins.<sup>133</sup> This means that the amount of coins that a user may acquire is based on the amount of coins the user owns, rather than the processing power a user is able to amass.<sup>134</sup> Because there is no mining software needed, users of NXT can simply forge from their computers and save on the electricity that would otherwise be needed to mine.<sup>135</sup> Increasingly, bitcoin miners are finding it

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<sup>128</sup> *Id.*

<sup>129</sup> Alvin Lee, *How to Pick and Trade the Next Profitable Altcoin: An Insight in What Goes Through My Mind*, ALUNA CRYPTO CURRENCY (May 3, 2014), <http://alunacrypto.blogspot.com>. The site illuminates some of the more well-known alt-coins as well as their algorithm base:

1. Bitcoin; SHA-256.
2. Litecoin; Scrypt.
3. Quark; Multi-algorithm for higher security.
4. Dogecoin; Memecoin, also Scrypt.
5. Nxtcoin; 100% Proof-of-Stake coin - no mining involved.
6. Ethereum; A Layer/Protocol separate from Bitcoin, called Bitcoin 2.0 by some.
7. Mastercoin; Not really an altcoin, more like a Layer/Protocol on top of Bitcoin.
8. Vertcoin; Anti-ASIC, using Adaptive N-factor in Scrypt.
9. Peercoin; Proof-of-Work + Proof-of-Stake combination.

*Id.*

<sup>130</sup> *Crypto-Currency Market Capitalizations*, *supra* note 4.

<sup>131</sup> *What is NXT?*, FREENXT.ORG, <http://freenxt.org/?menu=faq> (last visited Jan. 24, 2015).

<sup>132</sup> *Id.*; see discussion *supra* Part I.C.

<sup>133</sup> *What is NXT?*, *supra* note 131.

<sup>134</sup> See *id.* The math behind this innovation works like this:

If a wallet has 1 million NXT, then they have 1/1000 of a chance of forging any block and receiving any transaction fees in that block. The math here is 1 million (amount the client has) divided by 1 billion (total NXT in existence) is 1000, so that is 1/1000 of a chance.

David Parker, *What's NXT in the World of Cryptocurrencies?*, CRYPTOCOINS (Apr. 20, 2014, 6:28 PM), <https://www.cryptocoinsnews.com/whats-nxt-world-cryptocurrencies/>.

<sup>135</sup> *Id.* Forging is a process that acts almost like interest where a user is rewarded based on the amount of the crypto that the user holds. The NXT website provides a more detailed description:

It is elegantly simple: block generations with their transaction fees are competed for proportionally to all active forging wallets based on the amount of NXT a wallet has. So if a

harder and harder to engage in the mining process.<sup>136</sup> These new competitors are working to solve some of these issues and possibly extract users that would otherwise use bitcoin.

### 3. *Governments Are Taking Different Stands on Regulating Cryptocurrencies*

Unlike Canada and Germany, other governments have not been as receptive to the inflow of cryptos. Some developing countries that have experienced financial crises in the past<sup>137</sup> are more hesitant to adopt cryptos, leading one to believe that their concern may be warranted. This Part discusses how Thailand and China differ in their treatment of cryptos.

Thailand has attempted to prohibit the buying and selling of bitcoin as well as the buying and selling of goods and services in exchange for bitcoin.<sup>138</sup> Thailand's Foreign Exchange Administration and Policy Department stated that it based its decision on the fact that there were no existing applicable laws or capital controls concerning bitcoin and that bitcoin crosses multiple financial areas.<sup>139</sup> Essentially, the Department was concerned with the uncertainty surrounding bitcoin and is hesitant to offer a concrete definition or a set of guidelines.<sup>140</sup> The Department suggested that these regulations may not last, and may be repealed once the laws of Thailand are updated to account for bitcoin.<sup>141</sup> Some have expressed concern that a continued prohibition might be

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wallet has 1 million NXT, then they have 1/1000 of a chance of forging any block and receiving any transaction fees in that block. The math here is 1 million (amount the client has) divided by 1 billion (total NXT in existence) is 1000, so that is 1/1000 of a chance. An even added bonus is that it is your NXT balance that forges for you, not ASICs that requires lots of power, maintenance, and that depreciates in value and processing power. Instead of buying equipment to mine with, you just buy NXT to forge for more NXT with.

*Id.*

<sup>136</sup> *Bitcoin Miners Find it Increasingly Hard to Make Money*, SOUTH CHINA MORNING POST (Nov. 28, 2013), <http://www.scmp.com/lifestyle/technology/article/1351752/bitcoin-miners-find-it-increasingly-hard-make-money>. Some bitcoin miners have spent over \$20,000 to set up rigs, which does not even account for the electricity needed to keep these machines running for twenty-four hours per day. *Id.*

<sup>137</sup> See generally Andrea D. Roller, *Thailand's Banking Crises and Subsequent Reform: Could Thailand Benefit From an International Standard?*, 24 SUFFOLK TRANSNAT'L L. REV. 411 (2001).

<sup>138</sup> *Trading Suspended due to Bank of Thailand Advisement*, BITCOIN, <https://bitcoin.co.th/trading-suspended-due-to-bank-of-thailand-advisement/> (last visited Oct. 30, 2013).

<sup>139</sup> Matt Clinch, *Bitcoin Banned in Thailand*, CNBC (July 30, 2013, 6:20 AM), <http://www.cnbc.com/id/100923551>.

<sup>140</sup> See *id.*

<sup>141</sup> *Id.* The Central Bank of Thailand said that they would also consider the issue; however, no specific timeline was given for a final assessment on the matter. *Id.*

problematic for Thailand.<sup>142</sup> For one, the Central Bank of Thailand does not have the constitutional authority to outlaw bitcoin or any other crypto currency.<sup>143</sup> Additionally, as at least one analyst presumes, a continued ban on bitcoin would range from “difficult to almost impossible [and] it wouldn’t be worth the headaches.”<sup>144</sup> Nevertheless, in July 2014, after taking a hard stance on bitcoin regulation, the country decided to finally approve its first two legal bitcoin exchanges.<sup>145</sup>

Thailand was not alone in strictly regulating bitcoin. On December 5, 2013, the People’s Bank of China—China’s central bank—banned bitcoin, to “safeguard the interests and property rights of the public. . . [and] maintain financial stability.”<sup>146</sup> A Central Bank spokesman even went so far as to say that bitcoin should not be considered a currency as “[i]t is not issued by a central monetary authority, it does not have the properties of legal currency and it is not a currency in the real meaning of the word.”<sup>147</sup> After China’s announcement, bitcoin’s value plunged,<sup>148</sup> only to later regain its pre-announcement value,<sup>149</sup> possibly intimating that the crypto industry does not feel that China’s actions constitute a legitimate threat to curtail the use of cryptos.

Although the new Central Bank guidelines no longer allow customers to use payment processors to fund accounts, bitcoin exchanges established a voucher system that allow individuals to set up accounts without actually exchanging money.<sup>150</sup> Other exchanges permit users to wire money directly

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<sup>142</sup> Jake Maxwell Watts, *Thailand’s Bitcoin Ban is Not Quite What It Seems*, QUARTZ (July 31, 2013), <http://qz.com/110164/thailands-infamous-bitcoin-crackdown-is-not-quite-what-it-seems/>.

<sup>143</sup> Eric Markowitz, *Bank of Thailand Outlaws Bitcoin, Internet Laughs*, INC. (July 31, 2013), <http://www.inc.com/eric-markowitz/bank-of-thailand-outlaws-bitcoin.html>.

<sup>144</sup> Watts, *supra* note 142.

<sup>145</sup> Carlo Caraluzzo, *Thailand Approves Fully-Legal Bitcoin Exchange*, COINTELEGRAPH (July 10, 2014), <http://cointelegraph.com/news/112043/thailand-approves-fully-legal-bitcoin-exchange>.

<sup>146</sup> Neil Gough, *Bitcoin Value Sinks After Chinese Exchange Move*, N.Y. TIMES (Dec. 18, 2013), [http://www.nytimes.com/2013/12/19/business/international/china-bitcoin-exchange-ends-renminbi-deposits.html?\\_r=0](http://www.nytimes.com/2013/12/19/business/international/china-bitcoin-exchange-ends-renminbi-deposits.html?_r=0).

<sup>147</sup> *Id.*

<sup>148</sup> Robert McMillan, *After Crackdown, a New Bitcoin King Emerges in China*, WIRED (Jan. 9, 2014, 9:30 AM), <http://www.wired.com/wiredenterprise/2014/01/huobi/>.

<sup>149</sup> In January 2014, one bitcoin equaled \$880. SIMPLE BITCOIN CONVERTER, <http://preev.com>. As of February 2015, 1 BTC equals \$227.70. *Id.*

<sup>150</sup> McMillan, *supra* note 148.

[C]ustomers who want to cash out are selling their BTC-China dollars . . . [on] an online retail site similar to eBay. To fund a BTC-China account, they simply enter their voucher code on the

into exchange bank accounts.<sup>151</sup> This cycle of regulation and innovation within a financial system to respond to and circumvent regulation is not a novel concept.<sup>152</sup> For any regulation to be ultimately effective, especially with the international bodies, there should be nothing to cause an acceleration of innovation in response to regulation.<sup>153</sup>

Apprehension from developing countries—especially Asian countries such as China and Thailand—is not without reason. During the east-Asian economic crisis in the summer of 1997, Thailand experienced what is known as a speculative attack—a massive devaluation of currency brought on by speculators—on the Thai baht.<sup>154</sup> Consequently, although the baht had been largely pegged to the dollar up to this point, Thai authorities had to let the baht float—or let the exchange market determine the price—resulting in a weakening of the currency.<sup>155</sup> The economy suffered as foreign loans to domestic companies became more expensive to repay, causing a higher possibility of default, which in turn caused foreign capital investment, upon which Thailand was so heavily dependent, to dry up.<sup>156</sup> A similar case happened in the mid-90s in Latin America with the devaluation of the Argentine peso.<sup>157</sup>

In both the Argentine and Thai situations, the IMF attempted to corral the problems.<sup>158</sup> However, the policies implemented both before and after the crises led to great criticism. Some scholars thought that since the IMF had played a large role in the implementation of Argentina's economic program up until the devaluation, they should share a large amount of the blame.<sup>159</sup> As far as Thailand was concerned, the high interest rates associated with the IMF

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exchange's website. 'There's a healthy network of resellers who are selling vouchers,' says [Bobby] Lee [BTC China CEO].

*Id.*

<sup>151</sup> *Id.*

<sup>152</sup> See generally Calomiris, *supra* note 32, at 65.

<sup>153</sup> See discussion *infra* Part III–Part IV.

<sup>154</sup> T. Traisorat, *A 'Silver Lining' in the Crises Cloud? The Thai Financial and Economic Crises of 1997-1998: An Opportunity to Readdress the Fundamentals*, 2 Y.B. INT'L FIN. & ECON. L. 527, 529 (1997).

<sup>155</sup> Kristen Cunningham, *Fallen Tiger: The Story of Thailand's Currency Devaluation in 1997*, 21 HOUS. J. INT'L L. 451, 470 (1999).

<sup>156</sup> See *id.* at 471.

<sup>157</sup> See generally John V. Paddock, *IMF Policy and the Argentine Crises*, 34 MIAMI INTER-AMERICAN L. REV. 155, 155–56 (2002).

<sup>158</sup> See generally *id.* at 158. See also Cunningham, *supra* note 155, at 453–54.

<sup>159</sup> Paddock, *supra* note 157, at 177.

bailout package were thought to lengthen the crisis.<sup>160</sup> However, in what perhaps might be the most disturbing analysis of the IMF, studies on IMF loans have held no correlation between the loans and economic growth.<sup>161</sup>

Because cryptos cross borders with ease, and countries regulate them in a variety of ways, the question is: What can be done to enforce each country's regulations? International and regional organizations could provide a forum; self-regulation is also a possibility. Who and what will regulate cryptos will depend in large part on how an organization chooses to define these cryptos or what custom emerges which could eventually lead to a more formal and uniform definition.

## II. THE POSSIBLE BITCOIN CLASSIFICATIONS

Unfortunately for regulators, cryptos do not fit neatly into any defined category. For regulatory purposes, one country may try to pigeonhole cryptos into a certain category<sup>162</sup> while another may wait to define them.<sup>163</sup> However, without some outlet for one country to adhere to another country's definition, or for both countries to arrive at a common understanding of how to treat cryptos, enforcing control mechanisms over such a pervasive and borderless good will not be feasible. Part A discusses whether cryptos should be considered a form of currency or money. Part B looks at the commodity characteristics of cryptos. Part C looks at cryptos from an investment vehicle perspective. Part D discusses whether cryptos should be considered a digital asset, the broadest classification. Finally, Part E summarizes bitcoin and cryptos and attempts to offer a classification.

### A. *Is Bitcoin a Currency or Money?*

Up until the 1970s, western economies employed a monetary system that was backed by a valuable commodity such as gold or silver.<sup>164</sup> This link was supposed to prevent government from arbitrarily expanding the money

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<sup>160</sup> Cunningham, *supra* note 155, at 487.

<sup>161</sup> Paddock, *supra* note 157, at 179–80.

<sup>162</sup> See *'Bitcoin is a Currency': Federal Judge Says the Virtual Cash is Real Money*, RED ALERT POLITICS (Aug. 9, 2013), <http://redalertpolitics.com/2013/08/09/bitcoin-is-a-currency-federal-judge-says-the-virtual-cash-is-real-money/>.

<sup>163</sup> See discussion *supra* Part II.

<sup>164</sup> Angela Redish, *Anchors Aweigh: The Transition From Commodity Money to Fiat Money in Western Economies*, 26 CAN. J. ECON. 777, 777 (1993).

supply.<sup>165</sup> However, in the early 1970s, the United States broke the last tie to the gold standard, or what is known as “commodity money,” when it suspended the convertibility of U.S. dollars for gold.<sup>166</sup> Most currencies today are known as fiat money—in other words, currency that a government has declared legal tender despite the fact that it has no intrinsic value or backing by any reserves.<sup>167</sup> Paper currency is now commonly recognized as a form of money that is not backed by gold, silver, or any other precious commodity.<sup>168</sup>

Money is defined as a store of value, a unit of account, and a medium of exchange, accepted by a government.<sup>169</sup> Currency is a variation on money; it is money that is generally accepted as a form of money, and flows within an economy and is accepted as a medium of exchange.<sup>170</sup> Money essentially becomes authorized as part of a nation’s currency.<sup>171</sup> Therefore, while some might be tempted to classify bitcoin (or other cryptos) as a currency for holding the attributes of money,<sup>172</sup> there is one major distinction: no government, central bank, or other central authority controls or distributes bitcoin.<sup>173</sup> It could in theory, become money, upon authorization by a government, although no nation has gone to such great extent.<sup>174</sup> Consequently, as will be explored below, bringing cryptos under the purview of the IMF, in maintaining their goal of promoting exchange rate stability,<sup>175</sup> would be a stretch even though possible workarounds to this problem have been proposed.<sup>176</sup>

Although there is a tendency for some to classify bitcoin or other cryptos as a currency, nations have taken varying approaches to how they choose to

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<sup>165</sup> *Id.*

<sup>166</sup> *Id.* at 778.

<sup>167</sup> BLACK’S LAW DICTIONARY 1096 (9th ed. 2009); *Fiat Money Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/f/fiatmoney.asp>; see Redish, *supra* note 164, at 778.

<sup>168</sup> *Fiat Money Definition*, *supra* note 167.

<sup>169</sup> *Functions of Money—The Economic Lowdown Podcast Series*, FEDERAL RESERVE BANK OF ST. LOUIS, [http://www.stlouisfed.org/education\\_resources/economic-lowdown-podcast-series/functions-of-money/](http://www.stlouisfed.org/education_resources/economic-lowdown-podcast-series/functions-of-money/) (last visited Feb. 1, 2015).

<sup>170</sup> BLACK’S LAW DICTIONARY 440 (9th ed. 2009); *Currency Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/c/currency.asp> (last visited Feb. 1, 2015).

<sup>171</sup> BLACK’S LAW DICTIONARY 440 (9th ed. 2009).

<sup>172</sup> See Ruben Grinberg, *Bitcoin an Innovative Alternative Digital Currency*, 4 HASTINGS SCI. & TECH. L.J. 159, 201–04 (2012).

<sup>173</sup> *Bitcoin Under Pressure*, *supra* note 70.

<sup>174</sup> See *id.*; BLACK’S LAW DICTIONARY 1096 (9th ed. 2009).

<sup>175</sup> *Overview*, INTERNATIONAL MONETARY FUND, <http://www.imf.org/external/about/overview.htm> (last visited Feb. 1, 2015).

<sup>176</sup> See Plassaras, *supra* note 22, at 390, 400.

define. Some countries, such as Germany, acknowledge bitcoin's money attributes by classifying it as a "unit of account,"<sup>177</sup> while others like China specifically state that it is not a currency,<sup>178</sup> and while Thailand has chosen to wait to define bitcoin,<sup>179</sup> others such as Canada base their definition on the type of transaction for which bitcoin is used.<sup>180</sup>

### *B. Is Bitcoin a Commodity?*

A "commodity" is defined as a "basic good used in commerce that is interchangeable with other commodities of the same type."<sup>181</sup> Black's Law Dictionary defines commodity as "[an] article of trade or commerce."<sup>182</sup> This definition embraces commodities from a tangible good point of view, distinguishing it from services.<sup>183</sup> Thus, a commodity is designated as an economic good—either "a raw material or an agricultural product."<sup>184</sup> Because quality measures between goods of the same commodity are almost uniform across producers, there is a high degree of interchangeability between commodities made by different producers.<sup>185</sup> Little differentiation from varying producers is the defining characteristic of commodities.<sup>186</sup>

Bitcoin is clearly not a raw material or agricultural product.<sup>187</sup> However, bitcoin's interchangeable characteristics and its uniformity across users could lead a regulator to classify it as an economic good.<sup>188</sup> Bitcoin does have attributes similar to what are known as a "hard commodities."<sup>189</sup> Hard

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<sup>177</sup> *Bitcoin Under Pressure*, *supra* note 70.

<sup>178</sup> Gough, *supra* note 146.

<sup>179</sup> *See* discussion, *supra* Part I.C.3.

<sup>180</sup> *See* discussion, *supra* Part I.C.1.

<sup>181</sup> *Commodity Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/c/commodity.asp> (last visited Jan. 24, 2015).

<sup>182</sup> BLACK'S LAW DICTIONARY 310 (9th ed. 2009).

<sup>183</sup> *Id.*

<sup>184</sup> *Id.*

<sup>185</sup> Kaplanov, *supra* note 16, at 147. The idea is that corn from Nebraska is the same as corn from Mexico.

<sup>186</sup> *See id.*

<sup>187</sup> *See* BLACK'S LAW DICTIONARY 310 (9th ed. 2009); *see also id.* at 147. The author gives an insightful discussion of the ramifications of labeling bitcoin a commodity from a U.S. perspective. In discussing whether to bring bitcoin under the purview of the Commodities Future Trading Commission, the author suggests that classifying bitcoin as a commodity would make its exchange a commodity futures contract. *See id.* at 147–48.

<sup>188</sup> *See generally* ADAM B. LEVINE, ENCYCLOPEDIA BRITANNICA, BITCOIN: THE RISE OF VIRTUAL CURRENCY: YEAR IN REVIEW (2013).

<sup>189</sup> *See Types of Commodities*, HARD ASSETS INVESTOR, <http://www.hardassetsinvestor.com/hard-assets-university/18-hard-assets-101-an-introduction-to-commodities/431-types-of-commodities.html?Itemid=4> (last visited Feb. 1, 2015).

commodities are defined as those that are usually mined.<sup>190</sup> Precious metals such as gold and silver, to which bitcoin has drawn comparisons,<sup>191</sup> are considered hard commodities.<sup>192</sup>

Nevertheless, applying a hard commodity label to bitcoin would be problematic for a number of reasons. First, mining is commonly considered and defined as the process of extracting minerals from the earth,<sup>193</sup> not using a computer to solve complex functions thereby verifying transactions within the crypto universe and possibly receiving additional cryptos.<sup>194</sup> Secondly, the new “2nd Generation” cryptos either do not engage the mining process or use a variation of mining tied into a proof-of-work algorithm.<sup>195</sup>

As unlikely as it may be for bitcoin to ever become defined as a “hard commodity,” this example illustrates the problem of defining bitcoin too narrowly. Suppose regulators just consider bitcoin (or its mechanics) when instituting a definition to set a regulatory framework. What would then happen in the event that another crypto ascends that has the same affect and user attributes as bitcoin, but because of its functionality, would lie outside of the jurisdiction of the leading regulatory body? There is no clear answer to this question, and it reiterates the problem of pigeonholing bitcoin or any crypto into something that it is not, even though it may hold certain similar characteristics.

Even defining bitcoin from a broader standpoint as a “commodity” and therefore by definition a “good”<sup>196</sup> could significantly alter its regulatory implications. For example, the WTO is designated with supervising and facilitating trade transactions (the movement of goods) across borders.<sup>197</sup> Yet, the IMF holds such precious commodities as gold in its coffers and may accept

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<sup>190</sup> *Id.*

<sup>191</sup> Alec Liu, *Why Bitcoins Are Just Like Gold*, VICE (Mar. 21, 2013), <http://motherboard.vice.com/blog/why-bitcoins-are-just-like-gold>.

<sup>192</sup> *Types of Commodities*, *supra* note 189.

<sup>193</sup> *Mining Definition*, MERRIAM-WEBSTER, <http://www.merriam-webster.com/dictionary/mining> (last visited Jan. 24, 2015).

<sup>194</sup> *See* discussion *supra* Part I.A.

<sup>195</sup> *See, e.g., supra* note 15. Many of these new crypto currencies have released what are known as “white papers” to describe the process and economics behind their crypto. Bitcoin released one. *See generally* Nakamoto, *supra* note 40. Ethereum, a proposed alternate currency, is another example that provides a helpful comparison. *See generally* VITALIK BUTTERIN, A NEXT GENERATION SMART CONTRACT AND DECENTRALIZED APPLICATION PLATFORM (2014).

<sup>196</sup> *Commodity Definition*, *supra* note 181.

<sup>197</sup> *Understanding the WTO: What We Do*, WORLD TRADE ORGANIZATION, [http://www.wto.org/english/thewto\\_e/whatis\\_e/what\\_we\\_do\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/what_we_do_e.htm) (last visited Feb. 1, 2015).



gold as payment in rare situations.<sup>198</sup> Still, labeling all cryptos as a commodity does not allow for other value additions for which users seek.

### C. *Is Bitcoin an Investment Vehicle?*

An “investment” is a purchase of goods that are not consumed today but used to generate wealth in the future.<sup>199</sup> An “investment vehicle” is an asset or item that an investor purchases in the hope that it will generate income or appreciate in value.<sup>200</sup> For example, a product used by investors such as stocks, bonds, options, mutual funds, or ETFs is considered an investment vehicle.<sup>201</sup>

The last characteristic bears significance for bitcoin regulators. Bitcoin is purchased with fiat currency with the idea—at least for some users—that the value of bitcoin will appreciate relative to a certain currency.<sup>202</sup> Perhaps no example better exemplifies the treatment of bitcoin as an investment vehicle than the development of the bitcoin ETF.<sup>203</sup> Just like stocks, ETFs trade on secondary exchanges for people to purchase shares with the hope that they will increase their wealth by gaining positive returns.<sup>204</sup> When users purchase bitcoin to capture this value appreciation, whether through just buying bitcoin or through an ETF, they are using bitcoin as an investment.<sup>205</sup>

However, defining cryptos as simply investment vehicles does nothing more than muddy the waters even more. While there have been pleas for a type of “World Financial Authority,” there currently is not any system that regulates investments across borders, even though measures in that direction have been

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<sup>198</sup> *Gold*, INTERNATIONAL MONETARY FUND, <https://www.imf.org/external/about/gold.htm> (last visited Feb. 1, 2015). The situations when gold may be sold can be found on the IMF website. Limited sales of gold are approved by the Executive Board of the IMF and are used with the goal of providing concessional loans to low-income countries. *IMF and Gold Sales*, INTERNATIONAL MONETARY FUND, <https://www.imf.org/external/NP/EXR/faq/goldfaqs.htm> (last updated Aug. 5, 2013).

<sup>199</sup> BLACK’S LAW DICTIONARY 902 (9th ed. 2009); *Investment Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/i/investment.asp> (last visited Jan. 24, 2015).

<sup>200</sup> *Investment Vehicle Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/i/investmentvehicle.asp> (last visited Jan. 24, 2015).

<sup>201</sup> *Id.*; see BLACK’S LAW DICTIONARY 902–03 (9th ed. 2009).

<sup>202</sup> See Kashmir Hill, *How You Should Have Spent \$100 in 2013 (Hint: Bitcoin)*, FORBES (Dec. 26, 2013, 3:58 PM), <http://www.forbes.com/sites/kashmirhill/2013/12/26/how-you-should-have-spent-100-in-2013-hint-bitcoin/> (explaining that had one invested \$100 in bitcoin at the beginning of 2013, the investor would have close to \$5000 near the end of the year).

<sup>203</sup> See Farrell, *supra* note 92.

<sup>204</sup> See HARRIS, *supra* note 92, at 19.

<sup>205</sup> See *id.*; Hill, *supra* note 202.

taken.<sup>206</sup> Accords such as Basel III—a set of reform measures to strengthen the risk management sector and regulation of the banking industry—have been implemented.<sup>207</sup> The Basel Committee on Banking Supervision, of which the United States is a member along with the other G20 countries and major banking centers such as Hong Kong and Singapore, is charged with implementing these reforms.<sup>208</sup> However, implementation efforts have met challenges.<sup>209</sup> The United States, through the Federal Reserve, indefinitely postponed implementation of the rules owing to financial industry participants filing notices that they would not be able to meet the necessary requirements in time for implementation.<sup>210</sup> Additionally, European Union regulators pushed back the proposed start-date for various financial disclosures.<sup>211</sup> Therefore, domestic institutions still control the majority of financial institution regulation.<sup>212</sup> Accords such as Basel III act more like ideals, requiring member states to police each other, than like systems regulating investments across borders.<sup>213</sup>

#### D. *Is Bitcoin a Digital Asset?*

The last category in which bitcoin could fall might be that of a “digital asset.” A digital asset has been traditionally thought of as electronic programs, files, etc. that have no specific location but are rather stored in multiple locations including tangible assets such as a computer or smart phone, among

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<sup>206</sup> See JOHN EATWELL & LANCE TAYLOR, *GLOBAL FINANCE AT RISK: THE CASE FOR INTERNATIONAL REGULATION 6–7* (2000).

<sup>207</sup> *International Regulatory Framework for Banks*, BANK FOR INTERNATIONAL SETTLEMENTS, <http://www.bis.org/bcbs/basel3.htm> (last visited Feb. 1, 2015).

<sup>208</sup> *Basel Committee on Banking Supervision*, BANK FOR INTERNATIONAL SETTLEMENTS, <http://www.bis.org/bcbs/> (last visited Feb. 1, 2015).

<sup>209</sup> Coby Mangels, *International Financial Regulation Since 2008: Why Implementation Delays of Basel III are Likely to Persist in the U.S. and EU*, TRAVAUX (Feb. 26, 2013), <http://berkeleytravaux.com/international-financial-regulation-since-2008-why-implementation-delays-of-basel-iii-are-likely-to-persist-in-the-u-s-and-eu/>.

<sup>210</sup> Press Release, Board of Governors of the Federal Reserve System, *Agencies Provide Guidance on Regulatory Capital Rulemakings* (Nov. 9, 2012), <http://www.federalreserve.gov/newsevents/press/bcreg/20121109a.htm>.

<sup>211</sup> Jim Brunsten, *EU Said to Weigh Bank Debt Rule Delay in Blow to Basel Timetable*, BLOOMBERG (Jan. 28, 2013), <http://www.bloomberg.com/news/2013-01-28/eu-said-to-weigh-bank-debt-rule-delay-in-blow-to-basel-timetable.html>.

<sup>212</sup> Tom Braithwaite, *Enforcement of Basel III Should be Focus*, FINANCIAL TIMES (Oct. 1, 2012), <http://www.ft.com/intl/cms/s/0/ada55f5a-0bcc-11e2-b8d8-00144feabdc0.html#axzz2qF2Z7Oig>.

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

others.<sup>214</sup> Digital assets may have the capacity for their value to be created and defined by contract between two parties and the asset has the capacity to be duplicated.<sup>215</sup>

Is bitcoin a digital asset? One common definition of digital asset states that a digital asset is anything stored in a digital file.<sup>216</sup> Bitcoin's self-regulatory group, the Digital Asset Transfer Authority (DATA), certainly classifies bitcoin as a digital asset.<sup>217</sup> DATA, as a self-regulatory body, works to legitimize those who engage in the crypto-currency industry.<sup>218</sup>

However, defining cryptos in this manner does not help to provide a clear picture of how they should be regulated. Even though DATA recognizes bitcoin as a digital asset, such a view does not account for the methods by which people use the asset.<sup>219</sup> One could use the asset as money, investment, or commodity.

#### *E. Bitcoin is a Digital Asset, But is this Enough?*

Of all of the bitcoin classifications, the most logical classification would be that of a digital asset. While there have been other suggestions for how to classify bitcoin, based on the attributes discussed above, this crypto appears to most resemble a digital asset. An asset is a resource with economic value that an individual, corporation, or country owns or controls with the expectation that it will provide a future benefit.<sup>220</sup> The term "digital" implies that the object described is electronic or operates on a computer.<sup>221</sup> Clearly, all cryptos fit this

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<sup>214</sup> Holly K. Towle, *Estate Planning In a Digital Age Letter*, GUIDE TO COMPUTER LAW (Nov. 18, 2005), [http://www.klgates.com/files/Publication/babe2366-3d35-4a88-bc95-309d565ca4fb/Presentation/PublicationAttachment/c2c91b04-7c80-48af-a1b4-3501c3c92216/289\\_HKT\\_CCH.pdf](http://www.klgates.com/files/Publication/babe2366-3d35-4a88-bc95-309d565ca4fb/Presentation/PublicationAttachment/c2c91b04-7c80-48af-a1b4-3501c3c92216/289_HKT_CCH.pdf)

<sup>215</sup> *Id.*

<sup>216</sup> Kristina Sherry, *What Happens To Our Facebook Accounts When We Die?: Probate Versus Policy and the Fate of Social-Media Assets Postmortem*, 40 PEPP. L. REV. 185, 194 (2012).

<sup>217</sup> Secretariat, Strengthening Global Research with Prime Policy Partnership, DIGITAL ASSET TRANSFER AUTHORITY (Oct. 30, 2014), <http://info.dataauthority.org/wordpress/blog/2014/10/30/data-and-prime-policy-partner/>.

<sup>218</sup> *See id.*

<sup>219</sup> *See discussion supra* Part I.C.3–Part II.C.

<sup>220</sup> *Asset Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/a/asset.asp> (last visited Jan. 24, 2015).

<sup>221</sup> *See* Sherry, *supra* note 216, at 194. Sherry, in defining "digital asset", cites to Evan Carrol, a co-founder of the The Digital Beyond blog which first identifies two major categories of digital assets: those stored locally on electronic devices and those stored elsewhere on devices that are accessed by contract with device owner; commonly known as clouds. *Id.* Sherry then goes on to describe five other types of digital assets:

definition. However, the digital asset classification is too broad. Applying this definition simply does not negate the fact that cryptos could still be considered as a currency, investment vehicle, or a good.

Some analysts define bitcoin as currency,<sup>222</sup> however this definition may be misleading if one thinks of currencies as the equivalent of money, when they are not equivalent.<sup>223</sup> Money implies acceptance, whereas currency implies issuance by a central authority as China so indicated.<sup>224</sup> The European Central Bank—one of the first international bodies to analyze bitcoin and other “virtual currencies”—has labeled bitcoin a currency, and has provided sub classifications for such others like Linden Dollars, used in the virtual world role playing simulation, Second Life.<sup>225</sup> Nevertheless, because there is no central authority and thus no feasible way for the issuance of bitcoin specifically for reserves, there could be problems classifying it as such.<sup>226</sup>

Bitcoin may act like a commodity. Like any product that is highly uniform and undifferentiated, users of bitcoin can enter into contracts involving the transfer of bitcoin.<sup>227</sup> Plus, because of the way that new bitcoin are “mined,” bitcoin can be said to resemble another famous commodity, gold.<sup>228</sup> However, bitcoin is not a physical or tangible product, nor has it any inherent value, all of which are requirements for something to be classified as a commodity.<sup>229</sup>

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The first is *devices and data*, such as a [person]’s computer and the documents contained therein. The second is *electronic mail* (“*e-mail*”), which, from an assets perspective, includes both *messages received* and *continued access* to the account. Third is *online accounts*, which, like e-mail, typically require a username and password, but may store content in addition to textual messages, such as photographs and videos, and thus may include social media. The fourth type, *financial accounts*, overlaps somewhat with online accounts given that the latter may be linked directly to banking and other financial accounts. Lastly, the fifth type, *online businesses*, includes online stores with potential for revenue streams.

*See id.* at 194–96 (citations omitted).

<sup>222</sup> *See* Yellin, *supra* note 38.

<sup>223</sup> *See supra* Part II.A.

<sup>224</sup> *Id.*

<sup>225</sup> *See* EUROPEAN CENT. BANK, VIRTUAL CURRENCY SCHEMES 21, 28–30 (2012).

<sup>226</sup> *See* discussion *infra* Part III–Part IV.

<sup>227</sup> Grinberg, *supra* note 172, at 199.

<sup>228</sup> Tindell, *supra* note 69.

<sup>229</sup> Dion, *supra* note 34, at 190–92. The author provides a detailed and varying analysis and even suggests that bitcoin may be considered something akin to a non-dividend paying stock without voting rights: . . . Bitcoins do not fall within the category of “notes”—there is no promise to pay for Bitcoin, though some are willing to trade for them. Nor can Bitcoin be considered a commodity, which refers to tangible goods rather than intangible object. There are more similarities between Bitcoins and stocks—for the more CPU an individual invests in solving block chains, she receives a proportional amount of Bitcoins. However, Bitcoin,

Bitcoin does not appear to quite fit the investment vehicle profile either. First, it is not inherently a form of ownership that allows an owner of such investment or shareholder to receive dividends contingent upon a corporate management agreement to distribute profits.<sup>230</sup> Secondly, it does not purely act like a note because there is no promise to pay an entity a sum of money.<sup>231</sup> Nevertheless, because one can purchase bitcoin, and make a profit by converting it back into currency, it does retain some aspects of an investment.<sup>232</sup> One could almost treat cryptos as a non-dividend paying stock without ownership or voting rights,<sup>233</sup> yet the lack of a central body to regulate such instruments is troublesome.<sup>234</sup>

Bitcoin and its fellow cryptos cross a wide spectrum of possible labels. How cryptos come to be labeled is important, because the label will likely impact the regulation under which the industry falls. Groups should be careful in fixing a label to cryptos that is either too narrow or too broad. Yet, a simple term such as a “good” or considering cryptos as a good, could lead to the most beneficial and fluid form of regulation needed in this developing and pervasive market.

This Comment will now explore two of the more prominent international financial and trade regulatory bodies: the IMF and the WTO. At first glance, given cryptos’ money characteristics, one might be tempted to assume that regulation under the purview of the IMF is the most appropriate path. However, for a number of reasons, this approach is misguided and will not account for cryptos’ other characteristics, which indicates that the WTO, or a system similar to the WTO, is a more appropriate form of regulation implementation.

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of course lacks the organization of a corporation, and there are no “voting rights” associated with owning more Bitcoins.

*See id.* at 193.

<sup>230</sup> *See id.*; Grinberg, *supra* note 172, at 195. Grinberg also goes further arguing that it is neither a note, indicating that it lacks the promise by the maker to pay a sum of money to another party. *See id.* at 195–96. However, the author believes as with any currency, bonds or notes or other contracts can be formed on top of an asset indicating a promise to release the asset at a specified date or upon a specified action. *Note Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/n/note.asp> (last visited Jan. 24, 2015); *Option Definition*, INVESTOPEDIA, <http://www.investopedia.com/terms/o/option.asp> (last visited Jan. 24, 2015).

<sup>231</sup> *See* Grinberg, *supra* note 172, at 195–96.

<sup>232</sup> *See* discussion *supra* Part II.A.

<sup>233</sup> *See* Dion, *supra* note 34, at 193.

<sup>234</sup> *See* discussion *infra* Part III.C.

### III. THE INTERNATIONAL MONETARY FUND

This Part will provide an introduction to the IMF and discuss one of the most central IMF objectives—prevention of speculative attacks. Concern that speculators may use cryptos, namely bitcoin, to launch such speculative attacks on a nation's currency will also be weighed. As legitimate of a concern that this may be, IMF regulation of cryptos, will not provide a sufficient mechanism for enforcement. This Part will begin with an introduction to the IMF in Part III.A. followed by an overview of speculative attacks in Part III.B. Lastly, in Part III.C., the flaws of undertaking such an approach for IMF intervention will be covered.

#### A. *An Introduction to the IMF*

The IMF was established in 1945, just after the close of World War II.<sup>235</sup> Twenty-nine member countries signed the Articles of Agreement in December 1945 and the IMF began operations in 1947.<sup>236</sup> The IMF first acted as an international body when France filed a request to draw funds from the IMF reserves in May 1947.<sup>237</sup> The establishment of the IMF served “to overcome the collective action problem of allowing individual countries to enact self-interested economic policies without jeopardizing the global economy.”<sup>238</sup> The impetus for adopting such a structure came in the wake of the Great Depression and the economic devastation following World War II.<sup>239</sup>

Today, 188 countries are members of the IMF.<sup>240</sup> Article 1 of the Articles of Agreement lays out the purposes of the IMF.<sup>241</sup> Notably, these include the IMF's goals to promote international monetary cooperation, to facilitate the expansion and balance of international trade, to promote exchange rate

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<sup>235</sup> *About the IMF: Construction and Reconstruction (1944-71)*, INT'L MONETARY FUND <http://www.imf.org/external/about/histcoop.htm> (last visited Feb. 11, 2015).

<sup>236</sup> *Id.*

<sup>237</sup> *Id.* See also *IMF Chronology*, INT'L MONETARY FUND, <http://www.imf.org/external/np/exr/chron/chron.asp> (last visited Jan. 18, 2015).

<sup>238</sup> Plassaras, *supra* note 22, at 393.

<sup>239</sup> See Bryan T. Johnson & Brett D. Schaefer, *The International Monetary Fund: Outdated, Ineffective, and Unnecessary*, BACKGROUNDERS (Heritage Found., D.C.), May 6, 1997, at 1, available at [http://thf\\_media.s3.amazonaws.com/1997/pdf/bg1113.pdf](http://thf_media.s3.amazonaws.com/1997/pdf/bg1113.pdf).

<sup>240</sup> *The IMF at a Glance*, INT'L MONETARY FUND (Sept. 18, 2014), <http://www.imf.org/external/np/exr/facts/glance.htm>.

<sup>241</sup> INT'L MONETARY FUND, ARTICLES OF AGREEMENT OF THE INTERNATIONAL MONETARY FUND art. I (2011) [hereinafter ARTICLES OF AGREEMENT], available at <https://www.imf.org/external/pubs/ft/aa/pdf/aa.pdf>.

stability, and to provide assistance to member nations in achieving the aforementioned.<sup>242</sup> Summed up, the IMF works towards stabilizing the international monetary system.<sup>243</sup>

The IMF has jurisdiction over exchange rates.<sup>244</sup> Although in certain limited situations the IMF may condone exchange restrictions, generally, the Articles work toward removing any such restrictions.<sup>245</sup> Typically, the IMF imposes such restrictions only in those situations where the currency that the IMF holds is scarce,<sup>246</sup> when a new member state has such impositions upon admittance,<sup>247</sup> or when the IMF simply gives approval.<sup>248</sup> Typically exchange restrictions come in the form of any one of the following situations: 1) if the country is in debt to a foreign entity, the country may refuse to continue servicing the debt; 2) the country may enact legislation instituting a moratorium or cancellation on the external debt of national residents, be it either public or private residents; 3) the country may prohibit conversion of any national currency into a foreign currency; and 4) the country may artificially alter the exchange rate between the two currencies so that the foreign currency depreciates.<sup>249</sup>

The IMF acts as a repository for each member's currency and a portion of each member's foreign exchange reserves.<sup>250</sup> Upon admittance to the IMF, each member receives an assigned quota of currency to submit to the IMF's reserve.<sup>251</sup> This quota is based on the nation's economic size relative to the international economy.<sup>252</sup> The amount of the quota represents a nation's share

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<sup>242</sup> See *id.*

<sup>243</sup> *The IMF at a Glance*, *supra* note 240.

<sup>244</sup> JONATHAN E. SANFORD, CONG. RESEARCH SERV., RS22658, CURRENCY MANIPULATION: THE IMF AND WTO (2011), available at <http://www.fas.org/sgp/crs/misc/RS22658.pdf>.

<sup>245</sup> See ARTICLES OF AGREEMENT, *supra* note 241, art. I; Deborah Siegel, *Legal Aspects of the IMF/WTO Relationship: The Fund's Articles of Agreement and the WTO Agreements*, 96 AM. J. INT'L L. 561, 563 (2002).

<sup>246</sup> ARTICLES OF AGREEMENT, *supra* note 241, art. VII § 3(b).

<sup>247</sup> *Id.* art. XIV § 2.

<sup>248</sup> *Id.* art. VIII § 2(a).

<sup>249</sup> See François Gianviti, *The International Monetary Fund and External Debt*, 215 RECUEIL DES COURS 205, 264–65 (1989).

<sup>250</sup> TREASURER'S DEPT., INT'L MONETARY FUND, NO. 45, FINANCIAL ORGANIZATION AND OPERATIONS OF THE IMF 8 (2001).

<sup>251</sup> See Robert J. Barro & Jong-Wha Lee, *IMF Programs: Who is Chosen and What are the Effects*, 52 J. MONETARY ECON. 1245, 1247 (2005).

<sup>252</sup> *Where the IMF Gets Its Money*, INT'L MONETARY FUND (Oct. 3, 2014), <http://www.imf.org/external/np/exr/facts/finfac.htm>. These quotas are reviewed every five years. *Id.* A country normally pays up to one quarter of its quota in the form of widely accepted foreign currencies, or Special Drawing Rights (SDRs). *Id.* The rest is paid in the national currency. *Id.* SDRs are a claim on the currencies of IMF members. *Special Drawing Rights*, INT'L MONETARY FUND (Oct. 3, 2014), <http://www.imf.org/external/np/exr/facts/pdf/sdr.pdf>.

in the IMF, which is significant because eight director's seats of the twenty-four member Executive Board go to the eight largest shareholders.<sup>253</sup> Although the top branch of the IMF is the Board of Governors—of which each member nation appoints a governor—this group delegates most of the decision-making power to the Executive Board.<sup>254</sup>

When a member is in need of financial assistance, it may make a formal request to the IMF for assistance.<sup>255</sup> These submissions are generally directed to the IMF's Executive Board.<sup>256</sup> A special voting majority must approve requests for assistance.<sup>257</sup> The special voting majority must amount to eighty-five percent of total quota amounts; thus, those countries with larger quotas have special influence on approval of loans.<sup>258</sup> Once an arrangement has been made, the IMF releases payments in installments subject to the provisions of the particular lending agreement.<sup>259</sup> Countries must repay loans from the IMF.<sup>260</sup>

### *B. An Introduction to Speculative Attacks*

To further its goal of preserving a stable international monetary system, the IMF provides loans to help prevent speculative attacks on a domestic nation's

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<sup>253</sup> See Barro & Lee, *supra* note 251, at 1247.

<sup>254</sup> See *id.*; *IMF Members' Quotas and Voting Power, and IMF Board of Governors*, INT'L MONETARY FUND, <http://www.imf.org/external/np/sec/memdir/members.aspx> (last updated Jan. 14, 2015) [hereinafter *IMF Members' Quotas*].

<sup>255</sup> *IMF Lending*, INT'L MONETARY FUND, <http://www.imf.org/external/np/exr/facts/howlend.htm> (last updated Sept. 2014).

<sup>256</sup> *Id.*; see *IMF Members' Quotas*, *supra* note 254.

The *Board of Governors*, the highest decision-making body of the IMF, consists of one governor and one alternate governor for each member country. The governor is appointed by the member country and is usually the minister of finance or the governor of the central bank. All powers of the IMF are vested in the Board of Governors. The Board of Governors may delegate to the Executive Board all except certain reserved powers. The Board of Governors normally meets once a year [at the IMF-World Bank Annual Meetings].

*Id.*; see also *The 2014 Annual Meetings*, INT'L MONETARY FUND (Sept. 18, 2014), <http://www.imf.org/external/np/exr/facts/ams.htm> (noting that the Annual Meetings allow for an open discussion among central bankers, finance ministers, private executives, civil society, and academics on the outlook of the global economy).

<sup>257</sup> See Barro & Lee, *supra* note 251, at 1247. Under the current arrangement, the U.S. and three major European contributors hold veto power. *Id.*

<sup>258</sup> See *id.*

<sup>259</sup> *IMF Lending*, *supra* note 255 (describing the various other lending instruments that the IMF has developed).

<sup>260</sup> Thomas Ehrlich & Gerald M. Meier, *Legal Problems of International Monetary Reform*, 20 STAN. L. REV. 870, 940 (1968).



currency system.<sup>261</sup> A speculative attack is considered a massive devaluation of a country's currency brought on by the selling of that country's currency.<sup>262</sup> While it is usually developing countries—specifically those that use a pegged or fixed exchange to the U.S. dollar—that fall victim to such attacks, developed countries such as Great Britain, have also experienced problems.<sup>263</sup>

There is at least one scholar who believes that bitcoin and other cryptos should fall under the purview of the IMF.<sup>264</sup> A country that might fall victim to a speculative attack is one that employs a fixed exchange rate regime, in other words, a country that matches the value of its domestic currency to that of another country.<sup>265</sup> Countries maintain a “peg,” usually against the dollar, in order to maintain a stable exchange rate against a trusted currency thus incentivizing foreign investment.<sup>266</sup>

There is a surfeit of literature and documentation on the subject of speculative attacks; therefore only a brief description will be given here.<sup>267</sup> Imagine that there are two countries: X and Y. Investors believe that the economy in country Y will drop—or is dropping currently—and that the country's currency will devalue. Speculators can profit from this by taking up what is known as a short position.<sup>268</sup> A short position is a way of profiting from the decrease in price of an asset.<sup>269</sup> So, in this example, speculators would

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<sup>261</sup> See *id.* at 883.

<sup>262</sup> See *Speculative Attack*, TRADERS LABORATORY, <http://www.traderslaboratory.com/forums/trading-dictionary/12855-speculative-attack-definition.html> (last visited Jan. 19, 2015).

<sup>263</sup> See Barry Eichengreen et al., *Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks*, 10 *ECON. POL'Y* 249, 252 (1995).

<sup>264</sup> See generally Plassaras, *supra* note 22, at 393 (arguing that the IMF is the best institution to address the negative effects of bitcoin on the foreign currency exchange market). The Managing Director of the IMF, Christine Lagarde, appeared on Australian television to field a few questions, at least one pertaining to bitcoin. James Canning, *IMF Managing Director Christine Lagarde Answers Bitcoin Question*, BITCOIN BETTING GUIDE (Feb. 11, 2014), <http://bitcoin-betting-guide.com/james-cannings-blog/imf-managing-director-christine-lagarde-to-answer-bitcoin-questions-on-abcs-qa/>.

<sup>265</sup> See David Folkerts-Landau et al., *Capital Flow Sustainability and Speculative Currency Attacks*, *FIN. & DEV.*, Dec. 1997, at 8, 9, available at <http://www.imf.org/external/pubs/ft/fandd/1997/12/pdf/imfstaff.pdf>.

<sup>266</sup> See Reem Heikal, *Currency Exchange: Floating Rate Vs. Fixed Rate*, INVESTOPEDIA, <http://www.investopedia.com/articles/03/020603.asp> (last visited Jan. 19, 2015).

<sup>267</sup> For a more detailed discussion on the subject of speculative attacks, see Folkerts-Landau, *supra* note 265.

<sup>268</sup> Plassaras, *supra* note 22, at 397.

<sup>269</sup> See *Short Sale*, INVESTOPEDIA, <http://www.investopedia.com/terms/s/shortsale.asp> (last visited Jan. 19, 2015). A short position is generally considered to be the opposite of what is known as a long position. *Id.* A brief example—not related to currency—is provided below:

first enter the market by borrowing currency Y from an entity (likely a bank), then sell currency Y for currency X, and lastly (hopefully) buy back more of currency Y with the same amount of X so that there will be a profit after the Y loan has been paid back.<sup>270</sup> When this happens on an extremely large scale, it can cause a tremendous strain on a central bank of a nation that employs a fixed, or “pegged,” exchange rate because central banks generally have a limited amount of reserves to combat such an attack.<sup>271</sup>

In order to combat this devaluation, Y’s central bank has two weapons: either to raise interest rates or to sell X’s currency on reserve.<sup>272</sup> When the Y’s central bank raises interest rates, the speculator will face higher financing costs that will hopefully reduce the demand to borrow funds and deter speculation.<sup>273</sup> However, raising interest rates is not a particularly popular choice.<sup>274</sup> Raising interest rates may serve little deterrent to speculators.<sup>275</sup> Even if a speculator is short on currency, if interest rates rise, the speculator will only lose out on the increased financing costs when the speculator repays

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[A short sale is a] market transaction in which an investor sells borrowed securities in anticipation of a price decline and is required to return an equal number of shares at some point in the future.

The payoff to selling short is the opposite of a long position. A short seller will make money if the stock goes down in price, while a long position makes money when the stock goes up. The profit that the investor receives is equal to the value of the sold borrowed shares less the cost of repurchasing the borrowed shares.

Suppose 1,000 shares are short sold by an investor at \$25 apiece and \$25,000 is then put into that investor’s account. Let’s say the shares fall to \$20 and the investor closes out the position. To close out the position, the investor will need to purchase 1,000 shares at \$20 each (\$20,000). The investor captures the difference between the amount that he or she receives from the short sale and the amount that was paid to close the position, or \$5,000.

*Id.*

<sup>270</sup> See Plassaras, *supra* note 22, at 397; Folkerts-Landau, *supra* note 265; *Speculative Attack on a Currency*, KHAN ACADEMY, <https://www.khanacademy.org/economics-finance-domain/macroeconomics/forex-trade-topic/currency-reserves/v/speculative-attack-on-a-currency> (last visited Jan. 19, 2015) [hereinafter KHAN ACADEMY]. For a more detailed analysis, see Alpo Willman, *Devaluation Expectations and Speculative Attacks on the Currency*, 91 SCANDINAVIAN J. ECON. 97, 103–12 (1989); Gregor W. Smith, *Speculative Attacks with Unpredictable or Unknown Foreign Exchange Reserves*, 34 CANADIAN J. ECON. 882, 885–87 (2001); Stephen W. Salant, *The Vulnerability of Price Stabilization Schemes to Speculative Attack*, 91 J. POL. ECON. 1, 5–11 (1983).

<sup>271</sup> See Eichengreen et al., *supra* note 263, at 256; KHAN ACADEMY, *supra* note 270.

<sup>272</sup> See Eichengreen et al., *supra* note 263, at 253; Plassaras, *supra* note 22, at 398.

<sup>273</sup> See Plassaras, *supra* note 22, at 399.

<sup>274</sup> See *id.*

<sup>275</sup> See KHAN ACADEMY, *supra* note 270.

the borrowed currency.<sup>276</sup> Additionally, interest rate increases have a tendency to harm the broader economy.<sup>277</sup> Commercial borrowers will see the return on their projects decrease due to higher financing costs and demand for domestic currency will rise causing people to hold on to their money longer.<sup>278</sup> When individuals—citizens or entities—hold on to their money rather than using it to invest or consume, the result is an increase in prices and a slowdown in the economy.<sup>279</sup>

Besides raising interest rates, central banks have the option to enter the foreign exchange market directly to combat speculative attacks.<sup>280</sup> By selling the reserves of currency X and buying currency Y the central bank can stabilize the currency of country Y.<sup>281</sup> In the event that the central bank of Y runs out of currency X, they can turn to the IMF for a loan and stabilize the currency through the drawing mechanism mentioned above.

The growing popularity and further development of bitcoin in the global economy have led to calls to bring bitcoin within the purview of the IMF.<sup>282</sup> Consider the following speculative attack scenario: bitcoin replaces the role of Y, and the peso replaces currency X. Thus bitcoin is the strong currency that is attacking the peso.<sup>283</sup> In this scenario, speculators would borrow the peso and convert it into bitcoin.<sup>284</sup> As more speculators enter the market and the supply of the peso increases, the peso devalues.<sup>285</sup> The central bank of the country that distributes the peso, or the “peso country,” in an effort to balance and preserve

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<sup>276</sup> See *id.*

<sup>277</sup> Plassaras, *supra* note 22, at 399.

<sup>278</sup> See *id.*; Joseph E. Stiglitz & Andrew Weiss, *Credit Rationing in Markets with Imperfect Information*, 71 AM. ECON. REV. 393, 393–94 (1981).

<sup>279</sup> See Stiglitz, *supra* note 278, at 393; Plassaras, *supra* note 22, at 399 (explaining that for an already weak economy, an increase in interest rates and subsequent increase in prices could lead to a recession and further hurt the domestic economy).

<sup>280</sup> See, e.g., Plassaras, *supra* note 22, at 398.

<sup>281</sup> See *id.*; KHAN ACADEMY, *supra* note 270. When the central bank sells a currency in the open market for another currency, there is more of the currency sold and less of the currency bought in the market. KHAN ACADEMY, *supra* note 270. By increasing the supply of X, the demand for X will decrease relative to the supply and the price will drop. *Id.* By reducing the supply of Y, the demand for Y will increase relative to the supply and the price will increase. *Id.* This effect tends to stabilize prices relative to each other. *Id.* While not related to speculative attacks, a topical situation where a central bank has released vast amounts of currency in the market has been the credit easing by the Federal Reserve. See generally Ben S. Bernanke, Chairman, Fed. Reserve, Stamp Lecture at the London School of Economics: The Crises and the Policy Response (Jan. 13, 2009).

<sup>282</sup> See Plassaras, *supra* note 22, at 393.

<sup>283</sup> See *id.* at 397.

<sup>284</sup> See *id.*

<sup>285</sup> See *id.*

the currency, would prefer to sell bitcoin for peso.<sup>286</sup> Raising interest rates might not serve as much of a deterrent for speculators.<sup>287</sup> Thus, the “peso country” central bank would have to sell bitcoin for peso.<sup>288</sup> If the “peso country” had foresight, it could have built some reserves by buying bitcoin on an exchange.<sup>289</sup> However, less developed countries might find it hard to engage in these purchases owing to the high volatility of bitcoin, and the benefits of making these bulk purchases would likely prove to be costly.<sup>290</sup> The other option would be to turn to the IMF for a loan; however, the IMF does not currently hold any bitcoin balance.<sup>291</sup>

### C. *Bitcoin, the IMF, and Speculative Attacks*

Two measures have been suggested for combating this apparent problem.<sup>292</sup> The first is asserting indirect control over bitcoin under the IMF Articles of Agreement Article IV, Section 5, and the second is asserting direct control by granting digital currencies quasi-membership to the IMF.<sup>293</sup>

Article IV, Section 5 of the IMF Articles of Agreement holds that member nations are responsible not only for their national currency but also for any separate currency under that nation’s control.<sup>294</sup> Historically, “separate currencies” have been understood to apply to the colonies of a member nation or to its various territories.<sup>295</sup> Under this notion, IMF member nations would be required to pay their share of bitcoin under the quota system requirements.<sup>296</sup> Including bitcoin as a separate currency necessitates a change in quota requirements, which, in turn, necessitates a vote from the Board of Governors, requiring a supermajority of eighty-five percent of the total voting power for approval.<sup>297</sup> Under Article IV, Section 5, the IMF would obtain an adequate

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<sup>286</sup> See *id.* at 397–98 (noting that in a speculative attack, the central bank is forced to buy the weaker currency for more than the currency is actually worth).

<sup>287</sup> See KHAN ACADEMY, *supra* note 270.

<sup>288</sup> See Plassaras, *supra* note 22, at 397–98.

<sup>289</sup> *Id.* at 399.

<sup>290</sup> See *id.* at 390–91.

<sup>291</sup> See *id.* at 395, 399.

<sup>292</sup> *Id.* at 401.

<sup>293</sup> *Id.* at 401–02.

<sup>294</sup> ARTICLES OF AGREEMENT, *supra* note 241, art. IV § 5; Plassaras, *supra* note 22, at 402.

<sup>295</sup> See ARTICLES OF AGREEMENT, *supra* note 241, art. XXXI § 2(g); Plassaras, *supra* note 22, at 403.

<sup>296</sup> Plassaras, *supra* note 22, at 403–04.

<sup>297</sup> See ARTICLES OF AGREEMENT, *supra* note 241, art. XXVIII.

supply of bitcoin from which to draw, and this, it has been proposed, would reinforce the legitimacy of bitcoin.<sup>298</sup>

The second measure requires the IMF to enter the market and purchase bitcoin on an exchange.<sup>299</sup> This requires amending Article II to grant quasi-membership to bitcoin.<sup>300</sup> Such an amendment would require the same voting procedures as the previous measure.<sup>301</sup> Through quasi-membership with the IMF, users of bitcoin would still be able to trade with non-member nations while the IMF would have greater control over bitcoin supply.<sup>302</sup> Problems with this path include the lack of a leading authority to work with the IMF concerning bitcoin—or other cryptos, as the case may be.<sup>303</sup> And given that the supply of bitcoin is fixed, users may be wary of parting with bitcoin as it becomes a more precious commodity.<sup>304</sup>

Many other disconcerting issues present themselves when attempting to bring bitcoin under IMF regulation. The first concern centers on the influence of the Members of the Board of Governors and the Executive Governors. An eighty-five percent super-majority vote from the Board of Governors would be required for a change in the suggested quota requirement necessary to bring bitcoin within IMF purview.<sup>305</sup> However, voting by the Board of Governors is not a vote per member, but rather, based on shares in the IMF—i.e., the amount that a country has submitted to reserves through its quota.<sup>306</sup> Currently, the U.S. and the three largest Western European contributors have veto power within the fund.<sup>307</sup> Thus, an attempt to bring bitcoin within the Fund by amending the “separate currency” provision and effectively changing the quota requirement could be blocked by the four nations.<sup>308</sup> Not only that, this situation leaves open the possibility that future quota rates may need to be adjusted. Perhaps the possibility of a speculative attack from a new crypto or a drastic change in price in bitcoin—the two are likely not mutually exclusive—would bring about another vote.<sup>309</sup> Additionally, the Board only meets once a

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<sup>298</sup> Plassaras, *supra* note 22, at 404.

<sup>299</sup> *See id.* at 405.

<sup>300</sup> *Id.*

<sup>301</sup> *Id.*; ARTICLES OF AGREEMENT, *supra* note 241, art. XXVIII.

<sup>302</sup> Plassaras, *supra* note 22, at 405–06.

<sup>303</sup> *Id.*

<sup>304</sup> *Id.* at 407.

<sup>305</sup> *See* ARTICLES OF AGREEMENT, *supra* note 241, art. XXVIII.

<sup>306</sup> *See* Barro & Lee, *supra* note 251, at 1247.

<sup>307</sup> *Id.*

<sup>308</sup> *See id.*

<sup>309</sup> *See* ARTICLES OF AGREEMENT, *supra* note 241, art. XXVII.

year.<sup>310</sup> It is unlikely that the Board or the IMF structure has the ability to adapt quickly and effectively to the still nascent and burgeoning crypto currency industry.<sup>311</sup>

Even if the IMF adopted bitcoin, thus requiring member nations to submit quotas for Bitcoin, not every country would be able to pay the same amount for bitcoin. Due to such factors as differing regulations—not only on bitcoin, but on the broader ability to transfer various funds—bitcoin prices fluctuate around the world.<sup>312</sup> One country may have to pay a higher cost to purchase bitcoin as a percentage of their quota than another country.<sup>313</sup> While countries with greater domestic reserves may absorb these costs, smaller economies could very well become constrained in meeting any requirements, especially if the value increases. The suggested response would be for the IMF to repay the nation in their currency for the amount submitted in bitcoin for the quota.<sup>314</sup> In this situation, bitcoin would enter in to the reserve and a currency would come out of the reserve.<sup>315</sup> There are a number of problems associated with this.

What if bitcoin is relatively expensive compared to that nation's currency? If this was the case, then that currency would exit IMF reserves at an increasing rate relative to the exchange of other currencies and bitcoin.<sup>316</sup> Should IMF reserves of a given currency become depleted, it will only hamper the IMF's ability to provide loans in that currency and may possibly affect the IMF's ability to counter a speculative attack against that currency.<sup>317</sup> Thus, the problem that building bitcoin IMF reserves would ideally solve, could very

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<sup>310</sup> *Factsheet: IMF at a Glance*, INTERNATIONAL MONETARY FUND, Sept. 24, 2013, <http://www.imf.org/external/np/exr/facts/glance.htm>.

<sup>311</sup> See Pagilery, *supra* note 1.

<sup>312</sup> Brian Fung, *Why Do Bitcoin Exchanges Quote Different Prices*, THE SWITCH (Nov. 24, 2013), <http://www.washingtonpost.com/blogs/the-switch/wp/2013/11/24/why-do-bitcoin-exchanges-quote-different-prices/>; see generally MT. GOX HOMEPAGE, <https://www.mtgox.com> (last visited Feb. 19, 2014); CRYPTSY HOMEPAGE, <https://www.cryptsy.com> (last visited Feb. 19, 2014); *24-hour Volume rankings*, COINMARKETCAP, <http://coinmarketcap.com/currencies/volume/24-hour/> (last visited Feb. 19, 2014). The first two are general exchanges, but the last cite details all of the various exchanges that go into calculating the average price. The price for some of the newer currencies has a tendency to fluctuate more dramatically than bitcoin across exchanges.

<sup>313</sup> See *24-hour Volume Rankings*, COINMARKETCAP, *supra* note 312.

<sup>314</sup> Passaras, *supra* note 22, at 403–04.

<sup>315</sup> See *id.*

<sup>316</sup> See *IMF Lending*, *supra* note 255.

<sup>317</sup> While the notion of the IMF running out of reserves may seem novel, in 2008 there was concern that IMF reserves were not sufficient to cover some needs. Ambrose Evans-Pritchard, *IMF May Need to "Print Money" as Crises Spreads*, THE TELEGRAPH (Oct. 27, 2008, 7:11 PM), [http://www.telegraph.co.uk/finance/comment/ambroseevans\\_pritchard/3269669/IMF-may-need-to-print-money-as-crisis-spreads.html](http://www.telegraph.co.uk/finance/comment/ambroseevans_pritchard/3269669/IMF-may-need-to-print-money-as-crisis-spreads.html).

well hamper the IMF's ability to protect against the traditional form of speculative attack.

Even requiring nations to submit bitcoin reserves under the “separate currency” doctrine is misguided.<sup>318</sup> Separate currencies for which a member nation is responsible are “separate currencies of all territories,” and for which that nation will be responsible upon accepting the terms of the IMF Agreement.<sup>319</sup> Bitcoin, or any crypto, is not a currency of any territory; nor does any government back it.<sup>320</sup> Why would a government want to purchase bitcoin on an exchange if it did not feel like it needed the added protection of IMF reserves? Again, it is worth noting that the U.S. and the three largest economies of Western Europe have veto power over any decision such as changing the quota requirements under “separate currency.”<sup>321</sup> Germany, currently the third largest IMF shareholder,<sup>322</sup> has displayed favorable treatment toward bitcoin.<sup>323</sup> Japan—the second largest shareholder behind the US—along with France—the fourth largest—and the U.K.—the fifth largest—have not deemed bitcoin so much as a threat, as evidenced by the fact that none, as of the time of this writing, have released any official regulation or definitions concerning the crypto.<sup>324</sup>

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<sup>318</sup> Plassaras, *supra* note 22, at 403.

<sup>319</sup> See ARTICLES OF AGREEMENT, *supra* note 241, art. IV § 5.

<sup>320</sup> See Plassaras, *supra* note 22, at 380.

<sup>321</sup> See Barro & Lee, *supra* note 251, at 1247.

<sup>322</sup> See *id.*; Martin A. Weiss, CONG. RESEARCH SERV., INTERNATIONAL MONETARY FUND: BACKGROUND AND ISSUES FOR CONGRESS 5 (2014).

<sup>323</sup> See Mcleod, *supra* note 97; Spaven, *supra* note 96.

<sup>324</sup> GLOBAL LEGAL RESEARCH DIRECTORATE STAFF, REGULATION OF BITCOIN IN SELECTED JURISDICTIONS 9, 10, 14, 23 (2014), available at [http://cdn1.sbnation.com/assets/3952017/2014-010233\\_Law\\_Library\\_of\\_Congress\\_Bitcoin\\_jurisdictional\\_survey.pdf](http://cdn1.sbnation.com/assets/3952017/2014-010233_Law_Library_of_Congress_Bitcoin_jurisdictional_survey.pdf). Concerning Germany:

The German Federal Financial Supervisory Authority (Bundesamt für Finanzdienstleistungen, BaFin) issued a communication on bitcoins on December 19, 2013. According to BaFin, bitcoins are legally binding financial instruments that fall into the category of units of account, according to the first sentence of section 1(11) of the German Banking Act. Within that group of financial instruments, the bitcoin is related to foreign currencies. Accordingly, bitcoins are units that are not expressed in the form of legal tender. Instead, they are units of value that have the function of private means of payment within private trading exchanges, or they are substitute currencies that are used as a means of payment in multilateral trading transactions on the basis of legal agreements of private law. The manner in which bitcoins are currently given as payment, accepted as payment, or “mined” does not require bank supervisory licensing. However, licensing could become necessary under various circumstances, such as the creation or maintenance of a market in bitcoins.

*Id.* at 10.

Any contention that IMF control would add legitimacy to bitcoin<sup>325</sup> is both ill advised and sets a dangerous precedent. Merchant's increased use<sup>326</sup> and favorable government treatment in some modern economies<sup>327</sup> are already providing the legitimacy that bitcoin needs. The increased trust and confidence users place in bitcoin can be seen through its price.<sup>328</sup> Additionally, one of the many reasons that entities use bitcoin is because it is outside the control of any central authority.<sup>329</sup> Centralizing bitcoin could lead to disastrous consequences.

In the rare event that the IMF is able to assert any form of control over bitcoin, simply adding the crypto to its reserves would likely cause bitcoin demand to drop and along with the price.<sup>330</sup> This means that the bitcoin reserves that the IMF had acquired would decrease in value and pave the way for other cryptos to take its place.<sup>331</sup> Eventually, this proposed plan of action could result in a circle that would lead the IMF to return back to the place where it had started—the concern about a speculative attack from bitcoin would become a concern about a speculative attack from another crypto.

If this is not enough reason for preventing IMF oversight, with technology in the industry expanding, especially in the wake of the issues concerning bitcoin mining, and transaction malleability problems,<sup>332</sup> it is reasonable to speculate that the industry could look very different in only a short time. Simply put, IMF oversight of crypto-currencies, including bitcoin would be an exercise in futility. Any regulation should try to avoid centralization problems and allow the international market to adjust on its own. Assuming bitcoin—or another crypto—is a currency and permitting the IMF to assert control is not the ideal method of regulation. Maybe treating the cryptos like something else—a good possibly, or even an asset—and letting the WTO provide regulation or oversight might be a better alternative.

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<sup>325</sup> See Plassaras, *supra* note 22, at 406.

<sup>326</sup> See *supra* text accompanying note 93.

<sup>327</sup> See *supra* text accompanying note 90.

<sup>328</sup> See *Bitcoin Price for All Periods*, BITCOIN CHARTS, <http://bitcoincharts.com/charts/bitstampUSD#tgSzm1g10zm2g25zv> (last visited Feb. 19, 2014).

<sup>329</sup> *Why Use Bitcoin*, COINDESK (Nov. 26, 2014), <http://www.coindesk.com/information/why-use-bitcoin>.

<sup>330</sup> See Vitalik Buterin, *Mining Pool Centralization At Crises Levels*, BITCOIN MAGAZINE (Jan. 9, 2014), <http://bitcoinmagazine.com/9402/mining-pool-centralization-crisis-levels/>. See generally ARTHUR GERVAIS ET AL., IS BITCOIN A DECENTRALIZED CURRENCY?, available at <https://eprint.iacr.org/2013/829.pdf> (explaining that users believe it to be de-centralized but it might be more centralized than users actually believe).

<sup>331</sup> See *supra* note 106.

<sup>332</sup> Caleb Garling, *Bitcoin's Transaction Malleability Rattles System*, SFGATE (Feb. 15, 2014), <http://www.sfgate.com/technology/article/Bitcoin-s-transaction-malleability-rattles-system-5236912.php>; *Transaction Malleability*, BITCOIN WIKI (Feb. 11, 2014), [https://en.bitcoin.it/wiki/Transaction\\_Malleability](https://en.bitcoin.it/wiki/Transaction_Malleability).



#### IV. THE WORLD TRADE ORGANIZATION

Any international regulatory body regulating crypto currencies must allow for flexibility and for countries to assert more stringent regulations if they feel the need to do so. Perhaps the best available option to fulfill this need is the WTO.

This Part will discuss the makeup of the WTO, its structure, and why it should provide, at the very least, a starting point for bringing not necessarily uniformity, but order, to this growing and uncertain market. Part A provides a brief introduction concerning the goals of the WTO, followed by a brief description of its history in Part B, and its structure in Part C. Part D contemplates the reasoning by which cryptos could fall under WTO purview. Part E comments on how the WTO could regulate cryptos which will lead into the ways that member nations could assert action within the WTO framework in Part F. Lastly, in Part G, the reasons why the WTO, as opposed to the IMF, may be best suited to provide oversight are contemplated.

##### *A. Introduction*

The WTO is an international body that operates within the sphere of international trade to provide the overarching goal of liberalizing trade, thus helping it flow as freely as possible across borders.<sup>333</sup> Notably, the WTO serves as a forum where member governments can go to try to sort out any trade issues between one another.<sup>334</sup> Formed as a composite of a set of agreements, the WTO implements ground rules for international commerce and acts as a contract binding on governments to keep their trade policies within agreed limits.<sup>335</sup> Several fundamental principles set the basis on which the WTO asserts fair trade practices.<sup>336</sup> These include: trade without discrimination, gradual free trade through negotiation, transparency, fair competition, and economic development and reform.<sup>337</sup> The WTO works to stem protectionist policies because, as evidence has shown, when protectionist measures are enforced, there is a tendency for international trade to suffer.<sup>338</sup>

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<sup>333</sup> WORLD TRADE ORGANIZATION, UNDERSTANDING THE WTO 9 (2011), available at [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/understanding\\_e.pdf](http://www.wto.org/english/thewto_e/whatis_e/tif_e/understanding_e.pdf) [hereinafter WTO].

<sup>334</sup> *Id.*

<sup>335</sup> *Id.*

<sup>336</sup> *Id.* at 10–12.

<sup>337</sup> *Id.*

<sup>338</sup> See David M. Trubek, *Protectionism and Development: Time For a New Dialogue?*, 25 N.Y.U. J. INT'L L. & POL. 345, 345 (1992).

This is exacerbated when economically powerful countries assert such measures.<sup>339</sup>

### B. WTO History

The WTO was formally established in 1995.<sup>340</sup> Delegates initially proposed the WTO precursor, the General Agreement on Trade and Tariffs (GATT) at the same Bretton-Woods Conference in 1948 where the IMF was originally proposed.<sup>341</sup> Although GATT was merely provisional, international trade skyrocketed after its implementation and up to the mid 1990s.<sup>342</sup> Specifically, GATT, while limited because it contained no formal dispute resolution mechanisms, helped pave the way for tariff reductions in the wake of the economic turmoil in Europe during the reconstruction period following World War II.<sup>343</sup> However, once the recessions of the 1970's and 1980's hit, governments began to institute greater forms of protectionism.<sup>344</sup> As economic systems deteriorated, greater need for a more formal mechanism for regulating international trade arose.<sup>345</sup> Representatives from various nations met in 1986 to address these concerns and, after much deliberation and many rounds of conferences, in 1995, an agreement was reached and the WTO was formed.<sup>346</sup>

While the WTO officially replaced the GATT, the GATT still exists as an umbrella treaty for the trade of goods.<sup>347</sup> The Uruguay Final Round Act—the final agreement that “formed” the WTO—serves as the final agreement, thus adopting the original GATT and its subsequent side agreements.<sup>348</sup> 159 countries now adhere to these Uruguay Round Agreements.<sup>349</sup> Six main sections form the framework of the WTO.<sup>350</sup> These encompassed the umbrella agreement (establishing the WTO): agreements on goods, services, and intellectual property; reviews of government's trade policies; and a dispute

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<sup>339</sup> *Id.*

<sup>340</sup> *See* WTO, *supra* note 333, at 15.

<sup>341</sup> *Id.*

<sup>342</sup> *Id.*

<sup>343</sup> *See* Thomas J. Dillon Jr., *The World Trade Organization: A New Legal Order For World Trade?*, 16 MICH. J. INT'L L. 349, 353–54 (1995).

<sup>344</sup> *See* WTO, *supra* note 333, at 17.

<sup>345</sup> *See id.*

<sup>346</sup> *See id.* at 19.

<sup>347</sup> *See id.*; Dillon, *supra* note 343, at 355.

<sup>348</sup> Dillon, *supra* note 343, at 355; *See* WTO, *supra* note 333, at 19.

<sup>349</sup> *Understanding the WTO: The Organization Members and Observers*, THE WORLD TRADE ORGANIZATION (Mar. 2, 2013), [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/org6\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm).

<sup>350</sup> *See* WTO, *supra* note 333, at 23.

settlement mechanism.<sup>351</sup> Finally, organizers believed that the benefits resulting from world economic and political convergence through comprehensive trade policy surveillance and integrated dispute mechanisms could be realized.<sup>352</sup> Going forward the dispute mechanism procedure could serve as a means to bring about further economic integration.<sup>353</sup>

### C. *WTO Structure*

The Ministerial Conference heads the WTO and the General Council sits just below it.<sup>354</sup> The Ministerial Conference, as the WTO's governing body, derives its power from the agreements covered under the WTO and has the ability to make decisions by request of any member nation.<sup>355</sup> The Ministerial Conference is composed of representatives from all member countries and makes decisions usually by consensus.<sup>356</sup> The General Council is also composed of representatives of all of the members of the WTO.<sup>357</sup> The General Council supervises the general functioning and operation of the WTO, and in practice, serves as the decision making arm of the WTO.<sup>358</sup> Numerous decision-making bodies, including the Dispute Settlement Body, work under the guise of the General Council.<sup>359</sup>

### D. *Bitcoin and Other Crypto-Currencies Within the WTO*

For the WTO to take jurisdiction over bitcoin, it would mean for the WTO to mimic Canada's approach by classifying crypto transactions as essentially barter transactions and thus implicitly classifying cryptos as a good.<sup>360</sup> The WTO could assert that the exchange of cryptos constitutes a trade in goods rather than a currency exchange, since no actual domestic currency has changed hands. This would help move away from the common misconception that trade in cryptos constitutes an exchange transaction—leading to IMF oversight.<sup>361</sup> Theoretically, one nation could raise the question before the WTO

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<sup>351</sup> *Id.*

<sup>352</sup> See Dillon, *supra* note 343, at 361.

<sup>353</sup> *Id.*

<sup>354</sup> *Id.* at 362.

<sup>355</sup> *Id.*

<sup>356</sup> *Id.*; UN ENV'T PROGRAMME, ENVIRONMENT AND TRADE: A HANDBOOK 26 (2005), available at [http://www.iisd.org/trade/handbook/3\\_1.htm](http://www.iisd.org/trade/handbook/3_1.htm) [hereinafter ENVIRONMENT AND TRADE].

<sup>357</sup> Dillon, *supra* note 343, at 363; ENVIRONMENT AND TRADE, *supra* note 356, at 28.

<sup>358</sup> ENVIRONMENT AND TRADE, *supra* note 356, at 28.

<sup>359</sup> Dillon, *supra* note 343, at 363.

<sup>360</sup> See *supra* text accompanying notes 101–06.

<sup>361</sup> See Siegel, *supra* note 245, at 563.

by filing a matter before the Ministerial Conference begging the question on cryptos.<sup>362</sup>

Should the WTO take up this barter view and treat cryptos like a good that is traded, then cryptos and their trade between nations will be subject to the “most favored nation” clause of the WTO.<sup>363</sup> This clause stipulates that all nations must treat each other equally when dealing with trade; i.e., a country cannot prohibit the entry of goods from one country or charge a country higher taxes than it would for another country.<sup>364</sup> While there are exceptions,<sup>365</sup> should a country decide to ban their domestic market from the importation, or inflow of cryptos, they should have no trouble doing so, as long as they ban cryptos from all member nations.<sup>366</sup> While governments would have a very difficult time enforcing the trading of cryptos outside of exchanges, or through peer-to-peer trades,<sup>367</sup> placing tariffs on businesses or banks that use the cryptos, and/or exchanges that trade the crypto could possibly limit its use by speculators to launch a speculative attack.<sup>368</sup>

### 1. *The Emergency Safeguard Mechanism*

In the event that cryptos flow into a country at what the domestic nation would consider a rapid pace, one possible way that a country could assert control over this inflow would be through the emergency safeguard mechanism provided in GATT Article XIX.<sup>369</sup> Article XIX provides that a member may enforce restrictive trade policies when the importing products cause or threaten to cause serious injuries to domestic producers in that territory.<sup>370</sup> The country may enforce these restrictions for that time necessary to prevent a crisis.<sup>371</sup> Grey area measures outside of the GATT purview, by which countries use bilateral negotiations to limit trade, have been prohibited under the WTO agreement.<sup>372</sup> Additionally, a “sunset clause” has since been instituted which

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<sup>362</sup> See Dillon, *supra* note 343, at 362.

<sup>363</sup> General Agreement on Tariffs and Trade art. I, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 [hereinafter GATT].

<sup>364</sup> *Id.*

<sup>365</sup> WTO, *supra* note 333, at 11.

<sup>366</sup> See GATT, *supra* note 363, art. 1.

<sup>367</sup> See discussion *supra* Part I.C.3.

<sup>368</sup> See *Aggregate Demand: Shifts in the Aggregate Demand Curve*, SPARK NOTES, <http://www.sparknotes.com/economics/macro/agggregatedemand/section3.rhtml> (last visited Jan. 16, 2015).

<sup>369</sup> WTO, *supra* note 333, at 47.

<sup>370</sup> See GATT, *supra* note 363, art. XIX.

<sup>371</sup> *Id.* § 3(b).

<sup>372</sup> WTO, *supra* note 333, at 47.

sets a time limit of four years on such constraints, and may not be increased unless the member country feels that such continued measures are necessary for protection.<sup>373</sup>

In order to regulate cryptos under this article, a crypto would likely need to be considered by the WTO—and a nation would need to assert—that it is a competing product of some domestic product.<sup>374</sup> One possible way that the WTO could apply the restrictions would be to consider domestic currency a competing “product” of cryptos. While this idea might seem far-fetched, like competition among any competing products, cryptos are used in place of traditional currencies for transactions.<sup>375</sup> If speculators choose to convert these cryptos to currency in rapid succession, the threat of serious injury through speculative attack, or serious injury to the economy may occur.<sup>376</sup> Serious injury is defined in the Agreement as an “overall impairment in the position of a domestic industry.”<sup>377</sup> Certainly, the dangers that a speculative attack would pose constitute this threat of serious injury.

Nevertheless, a problem arises when comparing cryptos to actual currency and going before the WTO to resolve the issue of the possibility of speculative attacks through cryptos. Surely the WTO would not likely hear such an argument, because the IMF asserts jurisdiction over the regulation of exchange rates, and issues that affect those rates.<sup>378</sup> Treating the cryptos like a currency could very well lead the IMF to assert jurisdiction and thus lead to the litany of problems previously covered in Part III.<sup>379</sup>

## 2. *Preventing Crypto Movement Through Tax Implications*

A different and more permanent directive available for bringing cryptos under WTO purview would be to treat any preventative measures as a form of tax or regulation affecting the internal sale, purchase, transportation, and distribution of products imported into the country.<sup>380</sup> Once again, the way cryptos are treated depends upon how they are defined.

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<sup>373</sup> Agreement on Safeguards, art. 7 § 1, 1869 U.N.T.S. 154, available at [http://www.wto.org/english/docs\\_e/legal\\_e/25-safeg.pdf](http://www.wto.org/english/docs_e/legal_e/25-safeg.pdf); WTO, *supra* note 333, at 48.

<sup>374</sup> Agreement on Safeguards, *supra* note 373, art. 2.

<sup>375</sup> See discussion *supra* Part I.C.1.

<sup>376</sup> See discussion *supra* Part III.B.

<sup>377</sup> Agreement on Safeguards, *supra* note 373, art. 4 § 1(a).

<sup>378</sup> See Siegel, *supra* note 245, at 563.

<sup>379</sup> See discussion *supra* Part III.C.

<sup>380</sup> See GATT, *supra* note 363, art. III.

For example, say country X exports goods to country Y, and a seller in Y that sells X's goods accepts bitcoin up until Y prevents the use of bitcoin for the purchase of goods. Could X bring an action on this basis? The likely answer would be no, at least initially, because for one country to have a cause of action, these laws would have to be applied to imported products that would serve to benefit domestic production.<sup>381</sup> Country Y could simply point to the fact that the ban is against the purchase of all products with bitcoin, not just imported products.

However, the analysis does not end here. If the seller in Y that is selling goods from X could no longer transact in bitcoin, then this is clearly one less form of payment that the seller in Y could accept. Why shouldn't any seller be allowed to accept whatever they want as a form of payment? Assuming that the only two options for payment were the domestic currency and bitcoin, this action would force the seller to accept the domestic currency of Y, and force the seller or the producer in X to bear a transaction cost to exchange the domestic currency back to either bitcoin—which has now been banned—or the currency of X.<sup>382</sup> In this scenario, payments back to producers of Y's goods, in country Y, would not need to go through this "forced exchange" measure. By banning bitcoin, country Y is subjecting "a charge . . . in excess of those applied . . . to like domestic products."<sup>383</sup>

Again however, when looking at this situation narrowly, cryptos appear to look like currency. Treating cryptos as currency can be damaging because this situation may blur the lines between what is an exchange measure and what is a trade measure. While trade measures fall under the jurisdiction of the WTO, exchange measures, by contrast, fall under the IMF.<sup>384</sup> IMF jurisdiction is triggered when there is a "direct governmental limitation on the availability of or use of exchange as such."<sup>385</sup> This situation is peculiar because there is no limitation on the use of exchange, but rather crypto users are forced to exchange to the detriment of importing nations. While initially the approach above appears to be a tax-like regulation on the movement of bitcoin, and thus within the WTO purview, should this forced exchange approach lead to

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<sup>381</sup> See *id.*, art. III §1.

<sup>382</sup> To exchange currency to bitcoin or bitcoin to currency, there is normally a charge for this exchange when bitcoins are traded for cash. THE BITCOINERS, <http://www.thebitoiners.com/bitcoin-resources/bitcoin-exchanges/> (last visited Feb. 2, 2015); *Transaction Fees*, BITCOIN WIKI (Jan. 30, 2014), [https://en.bitcoin.it/wiki/Transaction\\_fees](https://en.bitcoin.it/wiki/Transaction_fees).

<sup>383</sup> GATT, *supra* note 363, art. III, § 2.

<sup>384</sup> See Siegel, *supra* note 245, at 563.

<sup>385</sup> *Id.* at 566.

balance-of-payment issues between nations, such an issue could again come before the IMF.<sup>386</sup>

### 3. *Barter Transactions*

One simpler measure would be for the WTO to essentially define cryptos as goods and treat their exchange like a barter transaction.<sup>387</sup> A barter is when trade flows with no involvement in foreign exchange.<sup>388</sup> In the past, the WTO has looked unfavorably upon bilateral agreements that constituted countertrade agreements because they were likely to be discriminatory against other WTO members,<sup>389</sup> which in turn flies in the face of that most central tenet of the WTO: the “most favored nation” clause.<sup>390</sup> Thus, as long as member nations apply any restrictions on the inflow of cryptos in a uniform manner, no country would be able to legitimately assert an action before the WTO based on the grounds that one country is prohibiting trade against another by banning cryptos from all nations.<sup>391</sup>

Treating bitcoin like a good and like a barter transaction should be easily implemented. If a country chose to place restrictions on the inflow of cryptos, it would be nonsensical to allow them to come in from one country and not from another. Because cryptos are so easily exchanged across borders, theoretically, if one country outlawed their inflow from an exchange in one country, users in another, could seamlessly move their funds to another exchange located in a different country as a way to circumvent controls.<sup>392</sup>

While many arguments have been put forth about how regulating cryptos is an exercise in futility, there are legitimate reasons why a country would want to regulate cryptos. Cryptos’ money-like characteristics cannot be ignored and as cryptos become ever more popular, the threat of a speculative attack will increase.<sup>393</sup> While larger economies generally have the ability to withstand

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<sup>386</sup> See *id.* at 563.

<sup>387</sup> Howse, *supra* note 102, at 289; see *Barter Definition*, *supra* note 102.

<sup>388</sup> *Id.*

<sup>389</sup> Howse, *supra* note 102, at 307.

<sup>390</sup> See *Understanding the WTO: Principles of the Trading System*, WORLD TRADE ORGANIZATION (2014), [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/fact2\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm).

<sup>391</sup> GATT, *supra* note 363, art. I; Howse, *supra* note 102, at 307.

<sup>392</sup> *Markets*, BITCOIN CHARTS, <http://bitcoincharts.com/markets/> (last visited Jan. 17, 2015); *How to Buy Bitcoins info*, HOW TO BUY BITCOINS, <http://howtobuybitcoins.info> (last visited Jan. 17, 2015) (explaining how to purchase bitcoin in various countries).

<sup>393</sup> See discussion *supra* Part III.B.

such an attack, smaller ones will become more susceptible.<sup>394</sup> This threat will likely become more pervasive as cryptos become more widely used.<sup>395</sup> Additionally, the governments of smaller nations may not have the means to enforce the criminal aspects such as fraud and other illegal activities that can come with cryptos. Even developed countries have trouble regulating fraud and other illegal activities conducted over the web.<sup>396</sup>

#### *E. How Would the WTO Regulate?*

The goal of this analysis is to provide the ways a country may assert a cause of action for unwanted importation of cryptos through the WTO. To do so, the first issue that needs to be addressed is determining the origin of the crypto currency because if an issue arises, a country must be named an origin country for one to be able to assert an action against that country.<sup>397</sup> Unfortunately, there is not one customary standard for determining the origin of a good.<sup>398</sup> Some countries apply a change of tariff classification, others, the criterion of manufacturing or process operation.<sup>399</sup> GATT does not offer any guidance, noting that it is within the province of each importing country to determine origin in accordance with the provisions of its law.<sup>400</sup> A harmonization program implemented by the WTO to make origin rules predictable and objective has failed to yield a specific agreed upon standard.<sup>401</sup> However, members expect other contracting parties to have their own rules as transparent, consistent, and uniform as possible.<sup>402</sup> As far as the fickle beast of cryptos is concerned, an official categorization may be needed.

A simple measure to determine a crypto's country of origin would be to identify the origin country as that country from which the crypto was last sent. This avoids getting into issues of the country that created the currency, which would add unnecessary complexities. For one, the biggest and most well

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<sup>394</sup> See discussion *supra* Part III.B.

<sup>395</sup> See discussion *supra* Part III.B.

<sup>396</sup> See generally Stephen Mihm, *Are Bitcoins the Criminal's Best Friend?*, BLOOMBERG OPINION (Nov. 18, 2013, 1:29 PM), <http://www.bloomberg.com/news/2013-11-18/are-bitcoins-the-criminal-s-best-friend.html>.

<sup>397</sup> See *Rules of Origin: Technical Information on Rules of Origin*, WORLD TRADE ORGANIZATION, [http://www.wto.org/english/tratop\\_e/roi\\_e/roi\\_info\\_e.htm](http://www.wto.org/english/tratop_e/roi_e/roi_info_e.htm) (last visited Jan. 17, 2015).

<sup>398</sup> See *id.*

<sup>399</sup> *Id.*

<sup>400</sup> *Id.*

<sup>401</sup> *Id.*

<sup>402</sup> See *id.*



known crypto, bitcoin, has murky origins with an unknown creator.<sup>403</sup> Even if a crypto has a disclosed creator, issues could arise in determining origin that would require determining where the creative work took place, and even where the software or hardware on which the crypto was created. Determining the country of origin to be that from which the country that allowed for entrance into the “importing” country would be the most appropriate measure because it would avoid investigating all of the above issues. Additionally, the onus would be on those nations to enforce measures that prevent the outflow of crypto into countries that forbid their inflow. Since it has generally been the more wealthy nations that have been more accepting of bitcoin and other cryptos, they would theoretically be better able to handle the expense of monitoring outflows.<sup>404</sup>

Countries must still regulate bitcoin and other cryptos with care. Any regulation that impinges on the crypto’s anonymity, ease of transfer, and low fees,<sup>405</sup> could very possibly reduce demand. Implementing regulation that is too stringent will leave customers looking elsewhere and developers looking for other measures to circumvent regulation.<sup>406</sup>

#### *F. What Can Countries Do?*

The WTO’s member nations might look to both the U.S. and Canada in determining a method for controlling inter-country flow of cryptos. Since July 2011, the U.S. Financial Crimes Enforcement Network (FinCEN) has required every company that deals with bitcoin to register as a money services business (MSB) with the Treasury Department and the proper state agency if that state regulates money services businesses.<sup>407</sup> These requirements have since been amended to include only those companies that actually distribute bitcoin, not those that mine for their own profit.<sup>408</sup> As an MSB, firms are required to keep records and file reports of transactions exceeding \$10,000 (and in some cases \$3000)<sup>409</sup> and report any suspicious activity to authorities.<sup>410</sup> Reporting from

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<sup>403</sup> John Biggs, *Who is the Real Satoshi Nakamoto? One Researcher May Have Found the Answer*, TECHCRUNCH (Dec. 5, 2013), <http://techcrunch.com/2013/12/05/who-is-the-real-satoshi-nakamoto-one-researcher-may-have-found-the-answer/>.

<sup>404</sup> See discussion *supra* Parts I.C.1, I.C.3.

<sup>405</sup> See discussion *supra* Part I.B.

<sup>406</sup> See Calomiris, *supra* note 32, at 65.

<sup>407</sup> Jason M. Tyra, *FinCEN Issues Money Service Business Clarification*, BITCOIN MAGAZINE (Dec. 29, 2013), <http://bitcoinmagazine.com/9203/fincen-issues-money-service-business-clarification/>.

<sup>408</sup> *Id.*

<sup>409</sup> Courtney J. Linn, *Redefining the Bank Secrecy Act: Currency Reporting and the Crime of Structuring*, 50 SANTA CLARA L. REV. 407, 412 (2010).

banks allow authorities to follow a paper trail to detect criminal activity.<sup>411</sup> However, the growing number of transactions and the volume of reports being filed by financial institutions are making enforcement untenable.<sup>412</sup>

The Financial Transactions and Reports Analysis Centre of Canada (FINTRAC) collects reports related to cross-border electronic funds transfers that total \$10,000 (CAN) or greater.<sup>413</sup> FINTRAC has established a system that allows institutions to find the best way to report the needed data.<sup>414</sup> This is perhaps one option that could work. Governments are generally inefficient and allowing MSBs to choose their own methods for reporting would allow for the greatest efficiency and reduction of costs. Governments, on the other hand, would be responsible for notifying the crypto exchanges of locations where they cannot transfer money and, hopefully, in return would not send transfers to customers in those locations. No more information is needed and anonymity could be preserved. All that would be required of exchanges is to acquire the location of the end user.

There is little empirical analysis to weigh the effects of these regulations. Bitcoin exchanges are not currently regulated by FINTRAC in Canada and it is thought that this lack of regulation has paved the way for such novel innovations as a bitcoin ATM.<sup>415</sup> Coinbase, a San Francisco startup and one of the most popular methods for U.S. users to buy and sell bitcoin, has managed to stay out of FinCEN's control so far.<sup>416</sup> Since the firm currently only buys and sells cryptographic tokens and not financial instruments, Coinbase remains out of the U.S. government's purview.<sup>417</sup> MSBs are required by most states—currently—47 to register in each state in which they do business at a cost that

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<sup>410</sup> *FinCEN's Mandate From Congress*, FIN. CRIMES AND ENFORCEMENT NETWORK, [http://www.fincen.gov/statutes\\_regs/bsa/](http://www.fincen.gov/statutes_regs/bsa/) (last visited Jan. 24, 2015).

<sup>411</sup> *Id.*

<sup>412</sup> Linn, *supra* note 409, at 510.

<sup>413</sup> U.S. Dep't of the Treasury, *Appendix E—Cross-Border Funds Transfer Reporting in Canada and Australia*, FIN. CRIMES ENF'T NETWORK 71, available at [http://www.fincen.gov/news\\_room/rp/files/Appendix\\_E.pdf](http://www.fincen.gov/news_room/rp/files/Appendix_E.pdf).

<sup>414</sup> *Id.*

<sup>415</sup> See Matthew Burgoyne, *Does Canada View Bitcoin as Currency?*, COINDESK (Nov. 22, 2013), <http://www.coindesk.com/canada-view-bitcoin-currency/>.

<sup>416</sup> Enid Burns, *Bitcoin Wallet Coinbase Raises \$25 Million in Funding*, REDORBIT (Dec. 12, 2013), <http://www.redorbit.com/news/technology/1113026920/coinbase-raises-25-million-in-funding-121213/>; Jon Matonis, *Coinbase: Swapping Bitcoin Privacy for Banking Convenience*, THE MONETARY FUTURE BLOG (Feb. 24, 2013), <http://themonetaryfuture.blogspot.com/2013/02/coinbase-swapping-bitcoin-privacy-for.html>.

<sup>417</sup> Matonis, *supra* note 416.

runs between \$5 and \$10 million.<sup>418</sup> This costly regulation is the regulation that any governing authority should try to avoid. Increasing costs of business because of high regulation could lead to innovation to circumvent the regulation, thus making such regulation ineffective.<sup>419</sup>

The WTO and its members must establish a middle ground. Mirroring the United States will hurt international commerce and only pave the way for a new crypto to circumvent the regulations.<sup>420</sup> Canada's approach, while it works for modern economies, will not prevent the export of cryptos to other parts of the world. However, Canada is on to something by taxing bitcoin as a good and treating it as a barter transaction. The international economy will benefit should the WTO take note.

### G. Pursuing an Action

Disputes arise in the WTO when one country feels that another is adopting a trade policy conflicting with one of the WTO agreements.<sup>421</sup> Before the Uruguay Round agreement, there was no fixed timetable for settling a case.<sup>422</sup> Now, under the Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU), a case normally does not take longer than a year or, at the most, fifteen months, if the case is appealable.<sup>423</sup> The proceedings are accelerated as much as possible in urgent cases.<sup>424</sup>

Once a member nation brings a dispute before the Dispute Settlement Body (DSB), they must consult with the counterparty before moving forward.<sup>425</sup> Even before the first stage has ended and the parties decide that they cannot reach an agreement, the parties may call on the WTO director-general to mediate or to help stem any damages arising out of the disagreement.<sup>426</sup>

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<sup>418</sup> Adrienne Jeffries, *Dark Money: Only 35 Bitcoin Dealers are Compliant With US Law*, THE VERGE (Dec. 12, 2013), <http://www.theverge.com/2013/12/12/5201636/without-legal-clarity-many-bitcoin-companies-go-unregistered>.

<sup>419</sup> See *id.*; see Calomiris, *supra* note 32, at 65.

<sup>420</sup> See Calomiris, *supra* note 32, at 65.

<sup>421</sup> *Understanding the WTO: Settling Disputes—A Unique Contribution*, WORLD TRADE ORG. (2014), [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/disp1\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/tif_e/disp1_e.htm).

<sup>422</sup> *Id.*

<sup>423</sup> *Id.*

<sup>424</sup> *Id.*

<sup>425</sup> *Id.*

<sup>426</sup> *Id.*

In the event that these consultations fail, the complaining country asks for the appointment of a panel to hear the dispute.<sup>427</sup> The panel, in its official capacity, helps the DSB make rulings or decisions, but because their conclusion can only be rejected by consensus in the DSB, its decisions are very difficult to overturn.<sup>428</sup> Any findings laid out in a panel report can be issued as fast as three months although it generally takes six months.<sup>429</sup>

Once a case is before a panel, each side presents a case in writing to the panel, then all parties are called before the panel, including those interested parties, to make their case.<sup>430</sup> After the case the panel submits reports to both sides, the parties may comment on the panel's findings.<sup>431</sup> Approximately three weeks after the ruling, a report is circulated to all WTO members suggesting measures for resolving the conflict.<sup>432</sup> This report becomes a ruling or recommendation within two months after the issuance of the report, unless the WTO by consensus rejects the measure.<sup>433</sup> Parties may appeal a panel's ruling, but the appeals have to be based on points of law.<sup>434</sup> The Appellate Body is made up of seven permanent members, three of which hear the appeal.<sup>435</sup> The appeal must be completed ninety days after filing, and if the DSB refuses to accept the appeal report, a consensus of the DSB must make the decision.<sup>436</sup>

Member nations are required to follow WTO decisions.<sup>437</sup> In the event that a country cannot comply with the decision immediately, they are given what is considered "a reasonable amount of time" to do so.<sup>438</sup> If a member nation refuses to implement the required changes, or it is not effective in doing so, then sanctions may be imposed.<sup>439</sup> Sanctions are generally imposed in the industry in which the offense took place.<sup>440</sup> If this is not practical, then sanctions may be imposed in other areas.<sup>441</sup>

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427 *Id.*

428 *Id.*

429 *Id.*

430 *Id.*

431 *Id.*

432 *Id.*

433 *Id.*

434 *Id.*

435 *Id.*

436 *Id.*

437 *See id.*

438 GATT, *supra* note 363, annex 2, art. 21 § 3.

439 *Understanding the WTO: Settling Disputes—A Unique Contribution*, *supra* note 421.

440 *Id.*

441 *Id.*

### H. *Why the WTO Could Work Better than the IMF*

Because the technology is young, cryptos and the programming behind them is expanding rapidly.<sup>442</sup> Bitcoin is the major player at the moment and much discussion in the media is directed at bitcoin, but several flaws have arisen that highlight some of the concerns within the system.<sup>443</sup> Bitcoin has only been in existence since 2009.<sup>444</sup> As with any new technology, over time, changes are made to the technology and measures are taken to get this machinery to operate more efficiently.

A possible analogy to the current crypto phenomenon might be that of the home video industry. Format wars in the 1970s and 1980s involved strong competition between Betamax and VHS formats.<sup>445</sup> Betamax, an arguably superior technology to VHS,<sup>446</sup> eventually lost out to VHS because providers of VHS were able to meet the specific demands of the consumer—longer recording time—at a lower price.<sup>447</sup> Even though Sony established itself as the first mover in home video by supporting Betamax,<sup>448</sup> once it became clear the VHS would be the dominant technology, Sony had to switch to VHS amidst an already competitive market.<sup>449</sup> Those companies that pushed VHS reaped the rewards.<sup>450</sup> But even so, after a time, technology developed and along came the DVD, which eventually replaced VHS.<sup>451</sup> Now there is a transition away from DVDs to streaming movies.<sup>452</sup>

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<sup>442</sup> See generally Kirby, *supra* note 37 (discussing the types of cryptocurrencies beyond bitcoin).

<sup>443</sup> See *supra* Part I.B.2.

<sup>444</sup> See *supra* text accompanying note 443.

<sup>445</sup> See generally Michael A Cusumano et al., *Strategic Maneuvering and Mass-Market Dynamics: The Triumph of VHS over Beta*, 66 BUS. HISTORY REV. 51, 51 (1992) (discussing the history of the rivalry between Betamax and VHS developers).

<sup>446</sup> Dave Owen, *The Betamax vs VHS Format War*, MEDIACOLLEGE (Jan. 8, 2008), <http://www.mediacollege.com/video/format/compare/betamax-vhs.html>.

<sup>447</sup> Alan R. Dennis & Bryan A. Reinicke, *Beta versus VHS and the Acceptance of Electronic Brainstorming Technology*, 28 MIS Q. 1, 2 (Mar. 2004).

<sup>448</sup> Cusumano, *supra* note 445, at 68.

<sup>449</sup> See Al Fasoldt, *How Sony Killed Betamax*, TECHNOFILE (1988), <http://www.technofileonline.com/texts/howbetadied.htm>.

<sup>450</sup> See *id.*; Owen, *supra* note 446. See generally Julian P. Christ & Andre P. Slowak, *Why Blu-ray vs. HD-DVD is not VHS vs. Betamax: The Co-evolution of Standard-setting Consortia* (Univ. of Hohenheim, Center for Research on Innovation and Services, Discussion Paper No. 05-2009), available at <https://www.econstor.eu/dspace/bitstream/10419/27761/1/605284490.PDF>.

<sup>451</sup> See *DVD Sales Top VHS Sales for First Time*, SILICON VALLEY BUS. J. (Jan. 9, 2002), <http://www.bizjournals.com/sanjose/stories/2002/01/07/daily34.html>.

<sup>452</sup> See Rick Burgess, *Online movie streaming will overtake DVD sales this year in U.S.*, TECHSPOT (Mar. 23, 2012), <http://www.techspot.com/news/47927-online-movie-streaming-will-overtake-dvd-sales-this-year-in-us.html>.

Like the home video industry in the 1970's and 1980's, the crypto industry is also in its early stages and likely to undergo changes.<sup>453</sup> Although bitcoin may now stand as the market leader, it does not necessarily follow that bitcoin will always stay as such. Innovations are currently happening within the industry, as it did with the home video market. Suggested IMF regulation will only prove feasible if both the industry stagnates and the regulation does not spur innovation.<sup>454</sup> Empirical data suggests that neither of these situations is likely, let alone both of them.<sup>455</sup>

In a best-case scenario bitcoin will end up like VHS; worst case would be that it ends up like Betamax. IMF regulation and the effects of IMF regulation would force countries to essentially back VHS or Betamax. But at what cost? Forcing countries to contribute reserves to an industry that is growing and rapidly developing could turn out to be highly problematic, especially if another crypto supersedes bitcoin. Under the IMF solution to speculative attacks, countries would have to expend more money to build up extra reserves of this new crypto and continue this process for each new emerging crypto that could be designated as posing a speculative attack threat. This outcome is grossly inefficient.

Under WTO regulation, there would be no need for forced purchase or adoption of any crypto.<sup>456</sup> Additionally, if a country wishes to prevent the flow of a crypto within its borders, assuming that the WTO will agree to hear such an action, then a member nation will have an outlet to pursue a course of action against the offending nation through the DSB.<sup>457</sup> For this regulation to work, the DSB must be agreeable to hear such case. The issue could be classified as the illegal importation of such cryptos into a country.

In the event that a complainant state wins an action against a counter-party, the losing state can amend the situation, maintain the offending measure and provide compensation, or refuse and suffer retaliation.<sup>458</sup> Empirical evidence shows that, shortly after the WTO came into effect, member nations pursuing an action found the DSB resolution process to be effective and were generally

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<sup>453</sup> See *supra* Part I.A–C.2.

<sup>454</sup> See *supra* Part I.B–C.

<sup>455</sup> See *supra* Part I.B–C.

<sup>456</sup> See *supra* Part IV.D.

<sup>457</sup> See *supra* Part IV.G.

<sup>458</sup> Judith Hippler Bello, *The WTO Dispute Settlement Understanding: Less is More*, 90 AM. J. INT'L L. 416, 417 (1996).

satisfied with the outcome.<sup>459</sup> Even if a case was not resolved by the DSB, the option to bring an action prompted countries to enter into negotiations and bring about an equitable outcome.<sup>460</sup>

However, some smaller and developing countries—i.e., those that are the most susceptible to speculative attacks—have not found the same success in the WTO.<sup>461</sup> A recent example occurred in 2013 when Antigua and Barbuda filed a complaint against the United States and were awarded the right to impose sanctions against the United States for blocking online gambling.<sup>462</sup> Antigua and Barbuda claimed that they had lost billions of dollars and thousands of jobs because of the United States' actions; the United States claimed that these rules were imposed for health and safety reasons.<sup>463</sup>

Even though Antigua and Barbuda were given the right to cross-retaliate against the United States, there is little that these developing countries can do without further imposing harm to themselves.<sup>464</sup> The common thought when the WTO was implemented was that countries would choose to implement WTO decisions or risk losing international credibility, become subject to inflicted damages through retaliation, or jeopardize international cooperation on various other important issues.<sup>465</sup> At least as far as the United States is concerned, this has not served as any sort of deterrent. This now leaves countries to decide what measures they can take to have DSB decisions enforced. Developing countries are at a tremendous disadvantage in bringing complaints because of the legal expense involved.<sup>466</sup> If such countries know that even if they win a judgment that the judgment will not be upheld or the aggravating country will ignore it, then it will be all the more likely that the developing country will not bring an action before the WTO in the first place.<sup>467</sup> For retaliation to serve as an effective instrument, it must both be large enough to induce compliance by the offending country and the marginal

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<sup>459</sup> Keisuke Ida, *Is the WTO Dispute Settlement Effective*, GLOBAL GOVERNANCE 211, 211–12 (2010).

<sup>460</sup> *See id.* at 214.

<sup>461</sup> *See generally id.* (discussing the effectiveness of the DSB resolution process for developing countries).

<sup>462</sup> William New, *WTO: Antigua to Retaliate Against US by Suspending IP Rights Protection*, INTELLECTUAL PROPERTY WATCH (Jan. 28, 2013), <http://www.ip-watch.org/2013/01/28/wto-antigua-to-retaliate-against-us-by-suspending-ip-rights-protection/>.

<sup>463</sup> *Id.*

<sup>464</sup> *Id.*

<sup>465</sup> *See Bello, supra* note 458, at 417.

<sup>466</sup> Mark Phoon, *Developing Countries and "Cross-Retaliation" in the WTO*, E-INTERNATIONAL STUDENT RELATIONS (Aug. 28, 2013), <http://www.e-ir.info/2013/08/28/developing-countries-and-cross-retaliation-in-the-wto/>.

<sup>467</sup> *See id.*; Ida, *supra* note 459, at 216.

effect of such action should be positive.<sup>468</sup> Because developing countries rarely face these scenarios, especially when trying to settle a dispute, they very rarely ask the DSB for permission to pursue such an action.<sup>469</sup>

The WTO will need to find a way to protect smaller nations and developing countries against the importation of cryptos. Currently, developing countries such as Thailand and China have instituted regulations preventing their use and have not raised any concerns about other countries permitting the inflow of the cryptos.<sup>470</sup> While the WTO might not be perfect and it certainly has issues to address in holding its more powerful members accountable, it does provide a forum for discussion. Its goal is to liberalize trade and development. By starting a discussion in the WTO about issues surrounding cryptos, more concrete policy could develop, decisions will become predictable, businesses will be able to safely conduct transactions in such a medium without fear of sudden shifts of regulation, international trade will flourish, and, quite possibly, living standards across the globe will rise.

#### CONCLUSION

Cryptos' popularity and development have only recently come into the mainstream. Regulators are beginning to feel their hands forced in having to decide what should be done with cryptos. Most of the discussion thus far has centered on bitcoin. While bitcoin is certainly the largest crypto by market capitalization and becoming more mainstream, this does not mean that it will always be so. Flaws such as the fifty percent attack, whereby a miner or mining group that controls more than fifty percent of the mining processing power within the network can control the entire system and negate transactions, have been exposed. Transaction malleability is another problem that has surfaced, whereby users are able to adjust the transaction identification to make it appear that a transaction did not process even though it effectively did.<sup>471</sup> Additionally, the costs associated with confirming these transactions, i.e. mining, has increased so much that only a relative few entities can acquire the skills and machinery to conduct mining operations effectively.<sup>472</sup> Eventually, all bitcoin will be distributed into the system, which will result in

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<sup>468</sup> Phoon, *supra* note 466.

<sup>469</sup> *Id.*

<sup>470</sup> See *supra* Part I.C.3.

<sup>471</sup> See Danny Bradbury, *What the 'Bitcoin Bug' Means: A Guide to Transaction Malleability*, COINDESK (Feb. 12, 2014), <http://www.coindesk.com/bitcoin-bug-guide-transaction-malleability/>.

<sup>472</sup> See *supra* Part I.C.2.



miners only being able to recoup rewards through transaction fees, rather than newly minted bitcoin. Whether this is sustainable and whether bitcoin can last is anybody's guess.

Other cryptos such as NXT, which centers on a proof-of-stake algorithm that does not require mining but rewards users based on how many NXT one holds, eMunie which builds a mesh between proof-of-stake and proof-of-work algorithm, and Ethereum which will build a new and different protocol to allow for the creation of various contracts and derivatives, are all beginning to enter the market.<sup>473</sup> Will any of these cryptos, or some other coin replace Bitcoin? It is impossible to tell. What can be said is that the crypto-currency market could look very different ten years from now.

Heavy-handed regulation or regulation that forces countries essentially to become investors in one or multiple cryptos is shortsighted and could very well shift the market and leave those businesses and individuals that have invested in such cryptos without any valuable asset.<sup>474</sup>

There are legitimate concerns relating to cryptos and their ability to launch a speculative attack. Addressing these concerns is needed but must be conducted in a forum where all countries can have a say and workable solutions can be reached. Currently the best organization to handle such disputes is the WTO. While many countries have not thought to treat cryptos as anything but a currency, at least two countries have: Canada and China.<sup>475</sup> While their handling of cryptos could not have been more different, their responses, both through their treatment and through their words, are similar.<sup>476</sup> Cryptos are not a currency, while it may have money characteristics, it should not just be treated as such. It is something different, and to label it simply as a currency and bring it within the IMF purview could have disastrous consequences.

While there is far from any custom concerning cryptos, Canada and China's actions could be the birth of custom. The WTO could be the place to foster this growing custom until the point where an actual definition for cryptos could become customary international law.

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<sup>473</sup> See *supra* note 15.

<sup>474</sup> See *supra* Part III.C.

<sup>475</sup> See *supra* Part I.C.1, I.C.2.

<sup>476</sup> See *supra* Part I.C.1, I.C.2.

Nations and international organizations do not have to go it alone. Self-regulating bodies such as the Digital Asset Transfer Authority (DATA), as well as several publications covering the crypto market are emerging as authorities on the industry.<sup>477</sup> Communicating with organizations such as DATA and employing their expertise could allow for any such regulation to be as flexible and efficient as possible. National and international organizations could enact such legislation and methods for regulation that would not be cumbersome and not work to stymie innovation or to counteract developments and harm industry.

As the popularity among bitcoin and its other counterpart cryptos become ever more enmeshed in the global market, the wider the net that any regulation on such bitcoin will cast. Therefore, it is imperative to be cautious with regulation moving forward, and not make too much haste by enacting regulation that could be considered over burdensome and detrimental to the global economy.

ED HOWDEN\*

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<sup>477</sup> See *supra* Part II.D.; see generally COINDESK, <http://www.coindesk.com> (last visited Feb. 22, 2014) (providing articles on the bitcoin market); BITCOIN MAGAZINE, <http://bitcoinmagazine.com> (last visited Feb. 22, 2014) (providing articles on the bitcoin market).

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