The Digitization of Value

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Abstract

From the earliest of times, methods of wealth transfer and value storage have come and gone, fueling commerce, the growth of early society to modern day and storing and moving value and worth around the World for as long as man has been in existence. From tangible items, tools, animals, unique and precious metals to bank notes and modern coinage, value has been stored, exchanged, and spent to promote life and growth in this world and over the populous. As technology has evolved, so have our methods of exchange. The digital age has ushered in a time where transactions can occur instantaneously and world-wide in the same breath. The struggle to maintain the benefits of tangible currency with the need to digitize and use the same methods of value storage and transfer, over a digital landscape is underway. The struggle in this change of medium has also become a struggle for control, as nation-states and decentralized entities vie for supremacy with their versions of value transfer and storage which could replace the old guard and reinvent the idea of money.

Introduction

Cryptocurrency is the next wave of change coming quickly to our American society and overall Global Economy. Systems for storing and exchanging value have been around since the dawn of time and were as simplistic as an agreement between two parties who bartered with valued items that were often thought to be scarce in availability. Societies have routinely assessed a certain value to items of scarcity, desirability, utility, or vanity and exchanged these items amongst groups who understood and commonly believed in the value of various metals (precious and functional), naturally occurring minerals, or items of use or functionality existed. Coinage has been traced to commerce in early societies as far back as 1250 B.C. and it confirms that societies have always had a need for systems to exchange value for goods and services that are efficient, practical, and secure.

The computer age has brought about new ways of thinking related to interaction and commerce amongst people worldwide. The quickening pace of technology has outpaced long-standing systems that our society has relied on to exchange goods, provide services and ultimately sustain life. This paper is a review of emerging systems of value transfer specific to cryptocurrencies which are not tangible and exist only in the digital world. I will examine how technology in criminality has advanced over time and how the digitization of money will affect our society and shape crime going forward.

Money in all its forms represents work, stored value, control, mobility, relative privacy and ultimately, increased options in modern life. It is necessary for any citizen of the world to have or obtain it to sustain life. With it, a person, group, nation, or society can

effectively solve problems, address issues, aid, enrich lives, exact control, impose will and for the purposes of this research, commit crimes with relative anonymity. Cryptocurrency is the next evolution of a global society's drive to improve social interaction, but it is not without issues. It can be said that any system that exists an operates in the world that involves human beings is susceptible to corruption, manipulation, fraud, and abuse. Addressing and overcoming these obstacles in relation to existing monetary systems and ongoing value exchange in a manner that is even-handed, equitable, secure and provides accessibility for everyone would improve upon this age old idea of money. Much like having large amounts of money, we have seemingly unlimited options in the emerging digital world.

Literature Review

Money's evolution from barter to textiles and livestock

"According to modern historical records, credit thus existed long before the invention of coinage, which evolved in the Mediterranean from the early sixth century BCE onwards" (Peneder, 2021 p.10). Systems of exchange like "bartering" are "as old as the hills" and are in some form… "as old as man himself" (Davies, G., 2010, p.9). Money has always been used as a means to store and transfer value from one person to the next. Tangible mediums of exchange of stored value have been found as early in history as the invention of primitive mediums of exchange between 3000-600 BC (Davies, G., 2010). "One would expect all pre-metallic moneys to be associated with primitive communities and similarly all metallic money to be associated exclusively with more advanced societies, but this is far from the case" (Davies, G, 2010 p.34). The development of banking in Britain followed a thousand years behind the introduction and widespread use of coinage (Davies, G., 2010, p.34). Even in our own days, innovation and progress are not necessarily synonymous terms (Davies, G, 2010, p.35). The use of cowries, which is an ovoid shell of a mollusk and coming in various shapes, sizes, and colors, were widely used, and spread over the shallower regions of the Indian and Pacific Oceans by Nigerian societies.(Davies, G 2010). In Central Africa, cowries were introduced into Uganda towards the end of the 18th century (Davies, G., 2010, p. 36) "It is only with the advent of the Uganda Railway that coins began to replace cowries, and only then for medium and large-sized transactions (Davies, G.,2010 p. 36). In contrast to the large range of the cowrie, two much more geographically limited types of money were the sperm whale's tooth or "tambua" of the Fijian group of islands, and the peculiar stone currency of the island of Yap" (Davies, G. 2010 p.37). "The peculiar stone currency of Yap, a cluster of ten small islands in the Central Pacific was still being used as money as recently as the mid-1960's" (Davies, G, 2010, P.38).

"Wampumpeag" which was usually abbreviated to "Wampum" which meant "white" was the most common color of American Indian's money and "Peag" which was a string of beads which were also used by American Indians was documented as early as 1535 by Jaques Cartier and was noted to have curative properties in stopping nosebleeds. The scarcer "black: or blue-black wampum was typically traded at twice the price of the "white" wampum.(Davies, 2010 p. 40) An average piece of wampum was a cylindrical bead about

a half an inch or so long and between an eight and a quarter inch in diameter, with a hole drilled lengthwise for stringing (Davies, 2010). As an indication of the role wampum played in early colonial days even amongst the white settlers, it (wampum) was declared legal tender in Massachusetts in 1637 (Davies, 2010, p.41) and was rendered no longer legal tender in 1661, but still remained popular in parts of North America for nearly 200 years (Davies, G, 2010). As Wampum faded away, it was still "used and functioned strongly as a store of value" (Davies, 2010, p.41) Although the American example of a more advanced economy incorporating and utilizing primitive forms of money is the best known, it is far from being the only instance in history. The same process occurred in other instances, including the early civilizations of Egypt and China. (Davies, G, 2010, p.42).

Livestock has also played a major part in primitive money from the point of view especially of being a medium of exchange, so cattle have occupied a central role in the long evolution of money as units of account (Davies, G. 2010, p.42). However, once the realization was reached that the use of cattle as value storage and transfer, it was quickly accepted, even with its obviously cumbersome form (Davies, G. 2010) Even in present day, livestock futures are traded on the open market and regarded as a commodity and are seen as a strong and stable medium for the storage of value.

US Legal Tender and the Silver-Gold Standard

The advent of the United States coinage and currency came about after the adoption of the monetary standard based initially on silver and gold in April of 1792 thru 1834 (Elwell, 2011). "A brief history of the gold standard (GS) in the United States began as a "bi-metallic standard" in which both gold and silver were used to define the monetary unit" (Elwell, 2011 p.2). The first coinage act, recommended by Treasury Secretary Alexander Hamilton, defined the dollar as 371.25 grains of pure silver minted with alloy into a coin of 416 grains. Gold coins were authorized in denominations of $10 ("eagle") and 2.50 ("quarter-eagle") The ratio of silver to gold in a given denomination was 15 to 1. These coins were declared legal tender (Elwell, 2011 p. 2). ... at that same time, the Spanish milled dollar of silver was designated as legal tender and set equal to the US Dollar (Elwell, 2011,p.2). This was done under US Code (31 USC 5103) US coins and currency including Federal Reserve notes and circulating notes of Federal Reserve banks and national banks) are legal tender for all debts, public charges, taxes, and dues. Foreign gold or silver coins are not legal tender for debts" (Elwell, 2011 p.2) This forged the centralized idea that " the US monetary system is based on paper money backed by the full faith and credit of the federal government". Not long after the first coinage act was passed, the market price ration of silver to gold moved to around 15 ½ to 1. "As a result, silver being the cheaper metal, gold was used for purchases abroad, and the coins used for domestic purposes became primarily silver. Effectively, the United States found itself on a silver standard for the first 40 years of its existence" (Elwell, 2011 p.3).

In 1834, Congress elected to address the issues caused by the 15 to 1 silver-to-gold ratio and therefore restore gold coins to use in domestic commerce (Elwell, 2011). "The ratio was changed to 16 to 1 by reducing the amount of gold contained in the gold coins, from 246.5 to 232 grains (9/10th fine). The new coins were legal tender and debts incurred before the alteration in the gold content." "This meant that debts from before the

change could be discharged with effectively less money than was borrowed (Elwell, 2011p. 3). “Effectively, a $10 debt could be paid off with 3712.5 grains of silver, worth about 236.465 grains of gold on the world market at the time. After the change in 1834, 232 grains of gold could pay the debt, a reduction of about 2 percent in the debtor’s cost” (Elwell, 2011 p.3)

The beginning of the end of the gold standard

“In 1933, the gold standard was ended for the United States” (Elwell, 2011 p. 9), due primarily to the crash of the stock market, “a wave of bank runs (by depositors) resulted in massive bank failures over the period 1930-1933” (Elwell, 2011 p. 9). “The Federal Reserve failed to provide sufficient liquidity to enable the banks to meet their customer’s demand for cash” (Elwell, 2011, p.9) To keep the US economy from complete economic collapse, the US was taken off the gold standard, all privately held gold was nationalized in the United States making it effectively illegal to own tangible gold. A new measure with gold was set forth by the Federal Reserve and “it amounted to a 40 percent devaluation of the US Dollar overnight and it restricted any and all conversion of US Dollars to actual gold. This reset of parity with the dollar was needed and important for conducting international transactions (Elwell, 2011).

Going off the gold standard

Due to the executive orders set forth in 1933 by President Roosevelt’s executive order, there was no market in the United States related to gold. The only market for gold that existed was outside the United States and was directly associated with the now inconsistent and fluctuating value of the US Dollar (Elwell, 2011). In 1968, the United States with other countries, orchestrated a gold sell off (known as “gold pool” arrangements)(Elwell, 2011 p.13) in hopes of stabilizing the fluctuating value of the dollar and flooding the open market with a surplus of gold (Elwell, 2011). This effort did not have the desired effect and in September of 1973, the US Dollar was officially taken off the Gold Standard and became a currency of “pure fiat money” (Elwell, 2011 p.13). The US dollar was no longer based on the price of gold, it was on its own as an unbacked currency going forward, with a value all to its own. (Elwell, 2011). The United States move to “fiat money” was not a controlled one. It was essentially something that “occurred by default as links to gold became too heavy to maintain” (Elwell, 2011 p.14)

Money Laundering, Banks, and their role in our monetary system

The earliest documented act of money laundering controls was seen around 443 A.D. “when usury became a crime in the Roman Empire”. Roman usury is defined as the act of lending money at interest rates greater than allowed by the Roman Twelve Table (aka Code of Law) (Pamplin, 2014, p.1) This would be considered present day loansharking, typically associated with more modern facets of organized crime. This practice of cleaning “dirty money” and running these illicit proceed through a legitimate financial institution or business for the purpose of making the money appear legitimate is defined as money laundering (Pamplin, 2014). This process was not made illegal until the

early 20th century when a tax evasion trial of the gangster Alphonse “Al” Capone shed light on it (Pamplin, 2014). Capone’s technique of using laundromats to funnel and combine his ill gotten money from prostitution, gambling and bootlegging with the legitimate money, making it all money appear like legitimate revenue from his laundromats and also, coined the term “Money Laundering” due to the use of several legitimate laundromats (Pamplin, 2014). At the time of this trial, structuring your businesses like this was not a crime, which is why he was charged with tax evasion and received an 11 year federal prison sentence (Pamplin, 2014). Another gangster, Meyer Lansky developed the concept of off-shoring illegal money out of the United States and into Europe (Madinger, 2011,p. 12), using non-existent shell corporations, shell banks, legitimate and illegitimate casinos to launder illicit money and avoid taxation issues the illegal money would normally trigger.(Pamplin, 2014).

“Beginning in 1970, the US Congress passed the Bank Secrecy Act (BSA), which was the first regulation directed towards controlling money laundering activity” (Pamplin, 2014, p.2). While the BSA failed to make money laundering illegal, it did require strict record keeping, retention and reporting standards for banks and the financial industry as a whole to the US Treasury Department. The mandate set forth identification mandates and transactional thresholds that required documentation and full disclosure to the Federal Government for any transaction in excess of $10,000 US Dollars. The BSA also defined “financial Institutions” specifically to positively identify who is required to report these transactions. These Financial Institutions were identified as:

- Depositor Banks (retail and commercial)
- Agencies or branches of a foreign bank operating in the US.
- Credit Unions
- Brokers or dealers registered with the Securities and Exchange Commission
- Investment companies
- Operators of credit card systems
- Insurance companies
- Dealers in precious metals, stones, or jewelry, to include pawn brokers
- Loan or finance companies
- Money Service Bureaus (typically any licensed sender of money or engages in the transmission of funds, to include an informal money transfer system (Hawala) who engage in the transfer of money domestically or internationally.
- Casinos
- Dealers of transportation - Car dealers, Aircraft & boat dealers (Pamplin, pp.2-3).

The 1986 Money Laundering Control Act, (MLCA) was passed by Congress in response to the increase in large Drug Trafficking Organizations (DTO) who dealt almost exclusively with immense amounts of cash. These DTOs routinely cleaned these proceeds from their drug trafficking as a necessity. The MLCA made money laundering illegal and made it a federal crime, to include prohibiting the structuring of cash transactions within the banking systems to avoid BSA Currency Transaction Reports (CTR) and added scrutiny from financial institutions. (Pamplin, 2014).

The end of the 1980s brought in the Internet age. Computers were now connected and able to exchange information at a faster pace over the internet and were creating a "global economy" (Pamplin, 2014, p.4). Russian and Chinese hacking groups began using the internet to defraud unsuspecting individuals in other countries from their new-found anonymous and relative safety of their home countries thanks to the internet. (Pamplin, 2014, p.4).

This evolution of new internet enabled crime brought about the Annunzio-Wylie Anti-Money Laundering Act of 1993 (AWAML). It made BSA reporting even more specific and required Suspicious Activity Reports (SAR), which were to be filed with FinCEN, an agency of the US Dept. of Treasury which monitors, and archives financial information related to money transfers, banking and BSA, MLCA and AWAML violations to include wire transfers and the record keeping associated with all wire transfers in the US (Pamplin, 2014 p.5).

The Money Laundering Suppression Act of 1998 (MLSA) was also passed by Congress. This was an additional effort directed at Money Service Bureaus (MSBs) such as (i.e., Western Union, MoneyGram or Amscot). These businesses are not banks, but have the ability to loan money, cash checks, wire transfer and receive money. After the passing of the MLSA, MSBs were now required to be registered as a licensed MSB with FinCEN and also requires "MSBs to maintain a list of businesses that are authorized to act as agents in connection with the financial services offered by the MSB" (Pamplin, 2014, p.5).

After the events of September 11th, 2001, the Patriot Act was passed specifically to close financial regulation loopholes that helped fund the terror attacks. On October 25th, 2001, The USA Patriot Act changed financial regulation forever by:

- Criminalizing the financing of Terrorism
- Strengthened the customer identification program (CIP) requirement for financial institutions by requiring a documented customer provide positive identification and verification.
- Prohibited financial institutions from transacting with foreign shell banks (banks that exist only on paper)
- Required financial institutions to have customer due diligence (CDD) and enhanced due diligence procedures (EDD)
- Increase civil and criminal penalties for money laundering. (Pamplin, 2014 p.6)

The desirability of conventional (paper) US Dollar

"The Federal Reserve estimates that household currency usage by U.S. residents is less than 10 percent of the of the nation's currency supply. Businesses admitted to holding less than 5 percent. It seems that 85 percent of the nation's currency supply is unknown" (Feige, 2011 p. 240). "If a large portion of America's currency is held abroad (overseas), US citizens derive considerable benefit from seigniorage (share of the profit), since the US Government effectively obtains an interest free loan from foreign citizens holding US Dollars"(Feige, 2011, p.240)

What is Seigniorage you ask? "The Federal Reserve supplies currency on demand to both domestic and foreign customers willing to hold the non-interest bearing obligations

of the U.S. central bank. The Federal Reserve earns seigniorage income when it uses these interest free proceeds to acquire interest bearing assets. After subtracting the costs of operating the currency system, the Federal Reserve remits the bulk of its annual interest earnings to the U.S. Treasury" (Feige, 2011 p.252). "1964 cumulative seigniorage earnings amounted to $916 billion of which $287 billion represents the windfall accruing to U.S. taxpayers resulting from the overseas holdings of foreigners" (Feige, 2011, p. 254).

The US Dollar has typically had a number of attractive properties that would make someone either foreign or domestic want to invest and retain the US Dollar. The US Dollar "is a relatively stable currency and provides a safe and portable storage of value" (Feige, 2011, p.241). "Financial innovation has created many substitutes for cash. Credit and Debit cards, electronic payments, EZ Pass transponders on toll roads and pre-paid phone cards" are just a few (Feige, 2011p. 242), "Yet all predictions of a "cashless" society have proven false as evidenced by the evolution of US Currency held by the public between 1964 and 2010" (Feige, 2011 p.242). Why does are cash wind up overseas? "One possible explanation is the "dollarization" hypothesis, [17, 20] suggesting that U.S. currency, and particularly $100 bills are widely demanded as a second currency in foreign countries experiencing banking crises, political instability and/or hyperinflations" (Feige, 2011, p. 243). While this interest is definitely a plus, the overseas appeal of US Dollars can also bring about troubling issues. For instance, "The widespread circulation of U.S. banknotes abroad and their near universal acceptance as a medium of exchange makes America's currency an attractive target for counterfeiting" (Feige, 2011, p.254). The desirable nature of the US Dollar to individuals outside the US is a testament to the stability of the currency and its view as a possible safe haven from lesser financial systems. The question remains, does the US have plans to digitize the US Dollar? Would a cryptocurrency version of the US Dollar look like?

Crypto-currency basics, just what is it, exactly

Crypto-currency has emerged in many forms, and it would appear the reception continues to be mixed at best. "U.S. Treasury Secretary Janet Yellen, at a New York Times conference, said that Bitcoin is "an extremely inefficient way of conducting transactions." New York Attorney General Letitia James squeezed $18.5 million in fines out of a couple of cryptocurrency firms, Tether and Bitinex. Meanwhile, Twitter chief Jack Dorsey's side hustle, Square, poured another $170 million into Bitcoin (Gilman, 2021, p.1). A recent (Oct 2021) interview with Daniel Roberts, Editor in chief of cryptocurrency website Decrypt, explains just what crypto-currency is and isn't. "I like to simply say that these are digital assets, as opposed to currencies per se. You can't touch and hold bitcoins, but when you log into your online banking, you see your balance and trust that it's there. You can own some gold without ever seeing and touching the actual gold bars. We are entering a world in which a growing portion of the things we value can be digital-only and still hold value. Some of the appeals of crypto assets: speed, privacy, reduced friction. Traditional money transfers can take days to settle, and in 2021 that's unacceptable. Crypto transactions get recorded on a public, immutable ledger for all to see, and you cut out a middleman like a bank taking a cut and/or slowing the process. That's increasingly appealing for people" (Gillman, 2021, p.1). "With the rise of Dark Web

marketplaces and online black markets, there has been a demand for secure, discreet, online payment instruments using untraceable digital currencies disassociated from true user identities. The most commonly used financial instrument adopted for this purpose is cryptocurrency" (Desmond, Lacey, & Salmon, 2019, pp.480-481).

Enter Bitcoin

Cryptocurrency can be centralized, with Government oversight or backed by a commodity or security to secure its value (i.e., Central Bank Digital Currency- a.k.a "CBDC") or Decentralized (No Government intervention). It functions as a unit of account, however, "Crypto-currency does not have legal tender status….. is unregulated and is issued and most often managed by its creators" (Stuhlmiller, 2013). "The decentralization is what creates the greatest barrier to enforcement of U.S. anti-money laundering regulations. The decentralization also increases the threat that Bitcoin poses to U.S. anti-money laundering regulations because law enforcement cannot shut down the currency for violating the regulations" (Pamplin, 2014, p.34). virtual currency can be used both inside and outside the virtual worlds of video games or on the internet. The most popular and well know virtual currency is Bitcoin. It was designed by an unknown individual, believed to be using the pseudonym Satoshi Nakamoto, who wrote and released a 9 page white paper to a website on October 31st, 2008 (Keller, A, 2021 pg. 42). In this white paper, Nakamoto wrote that "he'd been working on a new electronic cash system that's fully peer to peer, with no trusted third party for securing and verifying transactions" (Keller, 2021). When a banking transaction is initiated between two parties (A sends B $10), The bank (third party) is the actual verifier of the transaction, ensuring all facets of the transaction for validity and security. Bitcoin's use of peer to peer verification, means the bank is no longer in the transaction, making Bitcoin truly decentralized and not subject to transfer fees or third party interference. "Nakamoto stated that his digital currency, called bitcoin, "wasn't really a coin at all. It was essentially just a string of digits and letters (computer code) generated by an open-sourced software running on a random network of private computers in cyberspace" (Keller, 2021) Nakamoto also said that his currency required no mint, or banks, and individuals could transact directly with each other in a pseudo-anonymous venue to prevent fraud through peer to peer transaction verification (Keller, 2021). Nakomoto also proposed that anyone who wanted to assist in the processing of transaction verification by having their own computers solve complex mathematical equations, would be rewarded with new coins of their own, which would be forever known as Bitcoin mining (Keller, 2021) He stated the supply of Bitcoin was fixed and the total circulation of bitcoins would be 21 million in total (Keller, 2021 p.). Nakamoto detailed that there were incremental parts of a bitcoin, so that people could purchase fractional denominations of a bitcoin if they desired, the breakdown was laid out as follows (smallest to largest).

"Bitcoin has a metric system of denominations used as units of Bitcoin. The main goal of the bitcoin currency, abbreviated BTC, is to make it work with other worldwide currencies. Bitcoin has accomplished this function by being divisible down to the 8 decimal place. This is an important detail, since the actual high price of 1 Bitcoin (approx.60,000.00 USD per BTC) The smallest denomination in a Bitcoin is called 'Satoshi', named after its creator. Below is a list of the named denominations and their

value in BTC world. This is important because by having such minute denominations, it makes Bitcoin more accessible to all and improves functionality and fluidity.

UNIT	Abbr.	Formal name	Unit of measure
Satoshi	SAT	Satoshi	0.00000001 BTC
Microbit	µBTC	(uBTC) Microbitcoin or Bit	0.000001 BTC
Millibit	mBTC	Millibitcoin	0.001 BTC
Centibit	cBTC	Centibitcoin	0.01 BTC
Decibit	dBTC	Decibitcoin	0.1 BTC
Bitcoin	BTC	Bitcoin	1 BTC
DecaBit	daBTC	Decabitcoin	10 BTC
Hectobit	hBTC	Hectobitcoin	100 BTC
Kilobit	kBTC	Kilobitcoin	1000 BTC
Megabit	MBTC	Megabitcoin	1000000 BTC

Virtual Currency exchanges, virtual wallets and beyond

Bitcoin and all other virtual or cryptocurrencies are purchased at online exchanges. These exchanges require identification of the user and verification to create an account and a virtual wallet, where purchased virtual currency is stored online, along with all associated information on transactions, transfers and running balances. Some of these wallets are firewalled from the internet until use and other times kept offline, to ensure the highest security. There are Custodial wallets, where a third party oversees and ensures the security of the cryptocurrency being offered. Presently popular exchanges include Coinbase, Binance, Kraken or Crypto.com offer virtual wallets when you sign up for an account and provide access to the markets where one can purchase cryptocurrency of all types and in all amounts, with a key to the cryptocurrency purchased. In the last few years, financial and investment apps have begun allowing limited access to purchase selected cryptocurrency. Apps such as CashApp, PayPal, Venmo and investment apps like Robinhood and Stash have started giving verified members access to a virtual wallet with the ability to buy and sell cryptocurrency with secured funds within their application. However, only a public key is provided to the cryptocurrency, so it would be considered a “custodial” wallet, to be used during any transfer of the cryptocurrency. MasterCard has released information that it will begin offering “crypto cards” It released the following statement on its world access website: “To be clear, this data is not of any individuals — it's anonymized and in aggregate — but the trend is unmistakable. We are preparing right now for the future of crypto and payments, announcing that this year Mastercard will start supporting select cryptocurrencies directly on our network. This is a big change that will require a lot of work. We will be very thoughtful about which assets we support based on our principles for digital currencies, which focus on consumer protections and compliance. Our philosophy on cryptocurrencies is straightforward: It’s about choice. Mastercard isn’t here to recommend you start using cryptocurrencies. But we are here to enable customers, merchants, and businesses to move digital value – traditional or crypto – however they want. It should be your choice, it’s your money. Doing this work will create a lot more possibilities for shoppers and merchants, allowing them to transact in an entirely new form of payment. This change may open merchants up to new customers

who are already flocking to digital assets, and help sellers build loyalty with existing customers who want this additional option. And customers will be able to save, store and send money in new ways." - Raj Dhamodharan, Feb 10, 2021.

An anonymous wallet is being marketed for use specifically on the Dark Web. "Dark Wallet is designed to eliminate law enforcement's ability to trace transactions through Bitcoin's public ledger called the blockchain. This is achieved by taking multiple users' transactions that are scheduled to occur at the same time so that when the transaction is recorded on the Bitcoin public ledger, the blockchain, it will give the transaction the appearance of only one Bitcoin addresses sending Bitcoins and one Bitcoin address receiving Bitcoins. In reality there may be several transactions involved. The process effectively erases any traceability in transactions. When a Bitcoin transaction occurs outside of Dark Wallet the blockchain will contain a linear record of "address a" sending Bitcoins to "address b". The developers Amir Taaki and Cody Wilson state about Dark Wallet, "when a coin passes through either a CoinJoin transaction or a stealth address, it becomes vastly more difficult to track, making taxation, regulation, and prosecution virtually impossible." The stealth address feature of Dark Wallet allows users to receive bitcoins to an encrypted bitcoin address that only the intended recipient can retrieve by using a private key" (Pamplin, 2014, pp.17 &18).

In the article "Trading in Code: Florida is becoming a center for the cryptocurrency industry", the author details the most up to date list of most used virtual or cryptocurrencies used today. This is important because it shows the level of involvement and the sheer size, market share and popularity each has separate of one another.

- BITCOIN: While there are thousands of virtual coins in circulation today, 11-year-old bitcoin remains the leader. Market cap: $644 billion.
- ETHEREUM: Also based on blockchain, Ethereum is known for its smart contract functionality, which allows for futures trading, puts, options and calls. ETH trades for about $2,000. Market cap: $251 billion
- TETHER: The world's third biggest cryptocurrency is tied to the U.S. dollar. While its value hovers at around $1, it's not without risk. Critics contend that the digital token has inadequate cash reserves, and some worry a drop in confidence could trigger the crypto equivalent of a bank run. U.S. Treasury Secretary Janet Yellen and others in Washington have signaled interest in regulating what they believe is simply a shadow banking system. Market cap: $61.8 billion
- BIANCE COIN: BNB is a so-called "utility token" that consumers can use to pay transaction fees on the cryptocurrency exchange platform Binance. Developers can also use the token to power applications on the Binance Smart Chain, a blockchain network built to run self-executing contracts (smart contracts) created with computer code. Some traders soured on Binance exchange last May when the cryptocurrency exchange froze in midst of a bitcoin price dip and they lost money. The crypto platform has attracted regulatory scrutiny from around the world. Market cap: $50.1 billion
- CARDANO: This third generation cryptocurrency, created by Ethereum co-founder Charles Hoskinson, is another smart contract platform. Its differentiator is a

blockchain protocol called Ouroboros that Cardano contends is up to 4 million times more energy efficient than bitcoin and faster, too, validating thousands of transactions per second, compared to bitcoin's average of seven per second. Market cap: $38.5 billion (Keller, 2021, p.5).

Existing efforts to regulate cryptocurrencies

"After FinCEN released its guidance on virtual currencies several types of virtual currency users are now classified as MSBs, which subjects them to the requirements of the BSA, MLCA, AWAML, MLSA, and the USA PATRIOT Act. The definition of MSB has been expanded to include administrators or exchangers of virtual currencies." (Pamplin, 2014 pp.34-35) "Crypto-currencies do not have a centralized administrator or any authoritative body to enforce these requirements upon. Instead, the United States Government has been enforcing the requirements upon virtual currency exchange businesses that deal in Bitcoin" (Pamplin, 2014, p.35).

"The IRS has issued its own guidance for investors, miners, exchanges, and users of virtual currency as a method of payment" (Pamplin, 2014, p.36) "The guidance applies the U.S. tax principles to virtual currencies in several ways but most importantly "the receipt of virtual currency in exchange for goods or services is payment in property, with the fair market value of the virtual currency included in income on receipt and such value becoming the recipient's tax basis in the virtual currency (Greenberg, Langhirt, & Plewa, 2014)." The Internal Revenue service has set forth to treat virtual or cryptocurrency holders as property owners and appears to punish those who accept Bitcoin as a form of payment. "….the IRS has staked out in the Notice, merchants and dealers who accept virtual currencies as a form of payment and who do not immediately convert such currencies into US dollars may themselves be whipsawed. For instance, assume a small business that accepts bitcoins charges a customer US$100 for a widget and the customer pays in the equivalent value in bitcoin. If the value of the bitcoin drops to US$50 in between the time of the merchant's receipt and disposition of the bitcoin, the merchant will have an economic loss of US$50. However, the US$50 economic loss would be a capital loss and would not offset the US$100 ordinary income on the receipt of the bitcoin (unless the bitcoin, in the merchant's hands, was also an ordinary asset). If the merchant cannot use the capital loss to offset other capital gain in the same year, such loss will be suspended, and the merchant will suffer a character mismatch. If the merchant has entered into some form of hedging agreement whereby it has downside protection against declines in the value of bitcoin, it is not exactly clear whether such transactions would be treated as ordinary or capital transactions for US federal income tax purposes – thus, a second potential for mismatch occurs (see "Hedging and notional principal contract considerations" below) (Greenberg, Langhirt, & Plewa, 2014). Quantifying value of any cryptocurrency has proven problematic, often due to differing opinions over how these assets should be viewed in court and volatile and fluctuating market prices. "Cryptocurrencies are just over a decade old, but their growing importance in the global market and the current lack of inter-agency regulatory consensus around characterizing them has led many to call for comprehensive and uniform regulations to address these intangible assets. The Securities and Exchange Commission (SEC), Internal Revenue Service (IRS), and Commodity Futures Trading Commission (CFTC) have each

attempted to regulate cryptocurrency. Significantly, the general novelty of cryptocurrencies and lack of consensus as to their legal status pose complex challenges for bankruptcy courts, especially in the context of asset valuation" (Shawver, 2021 pp.2016-2017).

Central Bank Digital Currencies- "CBDC's"

In this article, the author lays out the arguments for and against the issuance of a digital currency with Central Bank backing. Currently, the United States has stated that they are researching the issue of digitizing the US Dollar. This article discusses some of the roadblocks at play. Most central banks issue both bank notes (cash) and reserve deposits, in short, they provide the tangible cash and backing to the world's banks.. "it is vital to recognize the role cash plays in the modern financial system. The greatest attribute of cash is that it carries only the information of value, protecting purchaser privacy. Cash is the only established payment system that scored "full anonymity" in the International Monetary Fund's ("IMF") survey on CBDC; cash protects privacy because no account is required, and there is no record of transactions" (Thrasher, 2021, p.403). "A Central Bank Digital Currencies (CBDC) does not yet have a precise definition because of the wide variation in form that the instrument can take. Despite the lack of a specific definition, a CBDC has been proposed by several sources as a "widely accessible digital form of fiat money that could be legal tender." There are four key factors in distinguishing a CBDC: issuer, accessibility, form, and technology used." (Thrasher, 2021 p.406).

This article discusses the types of clearing systems currently at work in our monetary system which safeguard all financial transactions from start to finish. "There are two basic potential systems: a token-based currency, or an account-based currency. A token-based currency is characterized by a few key distinctions that allow for the provision of anonymity. First, a token-based currency would likely utilize a cryptographic scheme that does not require user identification. Second, the token-based currency would likely use some form of distributed ledger technology ("DLT"). DLT's important contribution in the formation of currency is the provision of a system that allows for trust among anonymous participants without any need for trust across institutions" (Thrasher, 2021, pp..406-407). The account based system is what most of us use in banking today. "An account-based CBDC requires a central party—the central bank. The account-based system involves a transfer of a claim on an account. In this system, the user would request a transfer of funds between accounts held at the central bank. The central bank would then ensure settlement, but only after verification of authority to use the account, and authenticity of the recipient's account (Thrasher, 2021, p.407).

"World-wide acceptance?" -EL SALVADOR

Passing the "Bitcoin Law", the Salvadorian Government made El Salvador the first country in the world to accept Bitcoin as legal tender. In September of 2021, "All "economic agents" were required to accept bitcoin….." in addition to the US Dollar (since 2001) when conducting business in El Salvador. (Alvarez, 2022, pg.1) El Salvador used an application ("App") to encourage access this digital currency (Bitcoin) calling it a "Chivo Wallet". This digital wallet allows for payment of Governmental Taxes by citizens and

requires acceptance by ALL Businesses in El Salvador. “The “Chivo Wallet” App is a digital exchange that allows for Bitcoin transactions without paying any transactional fees and upon sign-up, gives registered Salvadorian citizens a bonus of $30 in Bitcoin from the Salvadorian Government.” (Alvarez, 2022, pg.1). This “Chivo Wallet” does not provide users with a “Key” (Digital Location), which makes the App a “custodial” wallet and tracks and archives all transactions to the name of the owner of the “Chivo Wallet”. (Alvarez, 2022, pg.7). The “Chivo Wallet” App also offers users a $0.30 discount per gallon of gas purchased with the App, as well as cash withdrawals at “Chivo” ATMs, which do not charge fees for withdrawing cash (Alvarez, 2022, p.8).

In February of 2022, a survey was conducted of Salvadorean households to measure the acceptance of the “Chivo Wallet” App and the overall usage of Bitcoin in El Salvador. The survey revealed that “68 percent of potential users (Registered Citizens) had knowledge of the “Chivo” App and that most found out through social media, TV, radio and news sources” (Alvarez, 2022, pg.11). Further, the survey revealed that 78 percent of the 68 percent aware of “Chivo” tried to download it” (Alvarez, 2022, pg.11). “21 percent of those aware of “Chivo” but did not attempt to download it cited a preference for cash followed by trust issues….they did not trust the system or bitcoin itself. (Alvarez, 2022, pg. 15). Additionally, Salvadoreans cited lack of access to a phone or an internet connection (Alvarez, 2022, pg. 15-16), both of which are required to utilize the “Chivo Wallet” app and to purchase Bitcoin. Despite all the efforts and the incentive to use contactless payments……Bitcoin is not widely accepted as a medium of exchange” (Alvarez, 2022, pg. 26).

Crackdown to Outright Ban on Cryptocurrency- CHINA

“China‘s position of cryptocurrency has hardened over the years and has crystalized into a May 21 2021 “crackdown on bitcoin mining and trading behavior” and an outright outlaw of cryptocurrency. In 2013, “a marked interest in bitcoin mining began to take hold due to an event involving a southwestern Sichuan provincial earthquake, donations which flowed into charities in the aftermath…..large gifts of bitcoin given to the Chinese action star, Jet Li’s foundation set up to assist in the recovery of the earthquake” (Areddy, J., 2021). Shortly thereafter, Bitcoin mining operations began to spring up and “the amount of electricity needed to power vast numbers of computers used to create (electronically mine) new Bitcoin are at odds with China’s recent climate goals. China forbade the country’s banks form handling cryptocurrency” (Areddy, J. 2021) . “The 24/7 number crunching required to create, of “mine” bitcoin relies on ample supplies of cheap electricity and equipment, some of the same elements China harnessed to become the world’s manufacturing hub” (Areddy, J., 2021) In a race to gain “…market share, China’s Bitcoin miners took advantage of an underregulated and overbuilt electricity generating sector and set up mining operations adjacent to hydropower producers…..where turbines churn snowmelt and seasonal downpours into electricity” (Areddy, J., 2021). “The bitcoin industry alone is on track to rank among China’s 10 biggest power users…that would make China’s Bitcoin producers bigger consumers of energy than the entire nation of Italy” (Areddy, J., 2021) This “ravenous appetite” places Bitcoin mining in direct conflict with Chinese Governmental political priorities to “recast China as a climate champion” (Areddy, J., 2021). “On May 21 (2021), China’s Government vowed to “crackdown on

Bitcoin mining and trading behavior…..In response, Electricity producers are ejecting miners from (power) grids and Chinese dealers are unloading computers designed to create bitcoin onto the secondhand market at huge discounts" (Areddy, J. 2021). "On September 21st, 2021, the People's Bank of China, China's Central Bank, posted on its official website a legally binding "Notice on Further Preventing and Disposing of the Risks of Speculative Trading in Virtual Currencies (Notice 2021), in effect declaring all cryptocurrency transactions illegal" (Xi, C. 2022, p. 2-3). " China became the first major economy to unreservedly embrace a blanket ban on cryptocurrencies…..and that the emergence of rival Central Bank Digital Currencies (CBDC), (i.e., China's Digital Yuan) urges a reimagination of the global financial infrastructure in the new technological age" (Xi, C., 2022, p.4). "Naming Bitcoin, Ethereum and Tether as examples, the Notice (Notice 21) regards cryptocurrencies as having certain defining characteristics that set them far apart from fiat currencies (Xi, C., 2022, pgs. 5-6). Notice 21 holds that "Cryptocurrencies are issued by nonmonetary authorities, use encryption technologies and de-centralized leger or similar technologies, and exist in digital form….. Notice 21's verdict that cryptocurrencies are not legal tender also echoes the Basel Committee on Banking Supervision's (BCBS) position that crypto-assets are not legal tender and are not backed by any government or public authority" Xi, C., 2022, p. 6). "….the 2021 Notice further makes it clear that crypto asset activities and service may constitute criminal offense, with those who conduct prohibited cryptocurrency activities or operations potentially being held criminally liable" (Xi, C. 2022, p. 9). At the same time, "China has taken the lead among the world's major economies in respect of Central Bank Digital Currencies (CBDC), Pilot testing for the digital Yuan, officially known as the e-CNY, kicked off in early 2020 in four large Chinese cities" (Xi, C. 2022, p.20). "By early November of 2021, the number of individuals with digital yuan accounts has reached 140 million, together with 10 million corporate accounts generating transactions that reached $9.7 Billion USD in total" (Xi, C. 2022, p.20). Recent history "shows that China has waged an all-out war on cryptocurrencies, banning almost all forms of crypto transactions and investments, as well as the crypto exchanges and platforms that facilitate them" (Xi, C. 2022, p. 22). At the same time, China's CBDC in the digital Yuan "is also anticipated to help to reduce China's dependence on the dominant global (US) dollar payment system and to internationalize the Yuan" (Xi, C. 2022, p. 21). "The digital Yuan (is) in a fight with Cryptocurrencies….." (Xi, C., 2022, p.21).

What does Uncle Sam think? - United States

"For a nation's economy to function effectively, its citizens must have confidence in its money and payment services" (Board of Governors, 2022, January p.1). The United States Federal Reserve has begun a dialogue with the general public to discuss, define and gain feedback on Central Bank Digital Currencies (CBDC). This is a comprehensive look and study of Governmentally backed Digital Currency which was ordered by the Biden Administration who are "putting its support behind the research and development of a "U.S. Central Bank Digital Currency," (Abbruzzese, 2022, March 9) or CBDC" to examine all potential effects of the digitizing of the US Dollar and the effect of Cryptocurrency on the US economy. To date, "Cryptocurrencies have not been widely adopted as a means of payment in the United States" (Board of Governors, 2022, January

p.11) “they have remained the subject of extreme price volatility and are difficult to use without service providers” (i.e., exchanges)……Many cryptocurrencies come with a significant energy footprint and make consumers vulnerable to loss, theft, or fraud” (Board of Governors, 2022, January p.11). Initially, the US has studied “stablecoins” as a means of facilitating trading into other digital assets. “….well-designed and appropriately regulated stable coins could potentially support faster, mor efficient and more inclusive payment options” (Board of Governors, 2022, January pgs.11 &12). The President’s Working Group on Financial Markets (PWG) “recommends that Congress act promptly to enact legislation that would ensure payment stable coins and payment stable coin arrangements are subject to consistent and comprehensive federal regulatory framework” (Board of Governors, 2022, January p.12). “The Federal Reserve is considering how a CBDC might fit into the U.S. money and payments landscape. A crucial test for a potential CBDC is whether it would prove superior to other methods that might address issues of concern outlined in this paper. While no decisions have been made on whether to pursue a CBDC, analysis to date suggests that a potential U.S. CBDC, if one were created, would best serve the needs of the United States by being privacy-protected, intermediated, widely transferable, and identity-verified” (Board of Governors, 2022, January p. 13). “A CBDC could potentially serve as a new foundation for the payment system and a bridge between different payment services, both legacy and new. It could also maintain the centrality of safe and trusted central bank money in a rapidly digitizing economy” (Board of Governors, 2022, January p.14).

Methods

The goal of this specific survey research was to get a clear idea of Florida Police agencies awareness of cryptocurrency, its uses and wide availability, in routine Law Enforcement situations. I was attempting to gauge Florida’s Law Enforcement Officers’ and Detectives demonstrated levels of awareness of the existence of cryptocurrency in day to day dealings and interactions with the public and if so, how frequently they were encountering and dealing with this new technology in relation to the crimes and cases they came across or were charged with investigating. The technological speed, use of mobile computers (i.e., smartphones) and overall digitization of our society has made the possibility of digital value transfer an absolute certainty in varying types of criminality and overall movement of money amongst citizens in all walks of life. I also desired to get a baseline of the training awareness of these Florida Police agencies and if they were taking measures to get information out to their front-line operations about this shift in money transfer and overall money movement.

Therefore, I created three surveys and sent them to medium to large metropolitan police agencies within some of Florida’s largest metro areas, in the hopes of an increased chance of obtaining responses on some day to day or case based level. I also was interested in finding out how these agencies were dealing with the documentation, tracking and overall investigation of cryptocurrency and the included blockchain leger system attached to it. Also included in the surveys was a specific question to gauge topic interest level amongst parties surveyed and allude to those participating in the survey gaining access to the results and possible future training on the overall topic of

cryptocurrency as a way to motivate participation. Some weaknesses in my survey process were related to candor or lack of trust related in this survey, and of course, the willingness to participate in the survey due to it being a topic that some may find boring or uninteresting.

Survey #1:

"Front-line Police Patrol Officers and Sheriff's Office Patrol Deputies in Major Florida Metros".

This 10 question survey was drafted to attempt to document and understand the level of situational awareness of cryptocurrency as a form of value transfer as it related to Patrol and Street Level Police encounters. It touched upon the Officer/Deputy's basic level of knowledge on cryptocurrency, interaction with cryptocurrency to include if they had ever owned or purchased any form of digital value. The survey inquired if any complaints of victims related to the loss of cryptocurrency, asked specifically if the Officer/Deputy had received any training related to cryptocurrency or the handling of digital money. Also include was a question which asked if the Officer/Deputy was interested in future training related specifically to cryptocurrency and if the Officer/Deputy felt that digitized money could pose future difficulties for Law Enforcement going forward.

Survey #2:

"Large Metropolitan Police Departments/Sheriff's Offices Training/Intelligence Bureaus"

This 8 question survey was directed specifically at the information being pushed out with any regularity as it related to cryptocurrency and its potential uses in the commission of crimes. This survey spoke directly to the reader's level of awareness of the uses of cryptocurrencies using simple (Yes/No) and Likert scale responses to specifically gauge and define potential levels of understanding to include their own involvement with the purchase of cryptocurrency. This survey asked specifically about the number of known cases that their Department has handled related to the loss or use of cryptocurrency. Survey recipients were asked if their employing agencies was either attempting to provide and specific training related to the investigation, tracking and tracing, seizure/impound of cryptocurrency. Also, the survey recipients were asked if they were aware of any agency policies written or in place specifically for the handling of cryptocurrency and if they believed that cryptocurrency could become and issue or create difficulties for Law Enforcement going forward.

Survey #3:

"Economic Crime and Detective Bureaus involved in financial investigations."

This 12 question survey asked specifically about Detectives who had investigated financial crimes and their awareness level of issues dealing specifically with cryptocurrency. I inquired if Detectives polled had received any training (agency or occupational) related to cryptocurrency and/or blockchain technology. I inquired about

potential cases encountered by Detectives related to cryptocurrency and their level of involvement to include the potential seizure or impounding of cryptocurrency. I inquired about Detective's awareness and if they had noticed any change in the way money moves digitally in our society and if they thought it could pose problems in the future for Law Enforcement. I inquired if they felt that their agency was "keeping up" with a requisite level of training and/or awareness related to cryptocurrency and asked if they were interested in training specific to the investigation of cryptocurrency as a way to gain "buy-in" into this particular survey.

Results

The survey was sent to 2176 uniformed law enforcement officers, economic crime detectives and training or intel bureau personnel from 5 medium to large Sheriff's Offices. Sheriff's Offices in Florida interface with the largest number of citizens in the most jurisdictions and are the reason why they were selected. These Florida Police agencies were the Okaloosa County Sheriff's Office, Jacksonville Sheriff's Office, Marion County Sheriff's Office, Hillsborough County Sheriff's Office, and the Miami-Dade Police Dept. A total of 605 responses were received, for a response rate of 28%. Of those 605 responses, some respondents chose to skip some of the survey questions.

Survey #1 – Cryptocurrency Survey- Law Enforcement Patrol

S1-Q1. **Cryptocurrency is a form of digital money/value transfer that only exists in the computer world. What is your level of familiarity with Cryptocurrency? (Bitcoin, Ethereum, Litecoin, Cardano etc.)**
Extremely Familiar -19 (5%)
Very Familiar – 34 (8%)
Somewhat Familiar – 150 (37%)
Not so familiar – 107 (26%)
Not at all familiar – 95 (24%)
(Answered Question- 405, Skipped Question- 1)

S1-Q2. **Have you purchased/invested, or do you own any cryptocurrency?**
YES- 123 (35%)
NO- 233 (65%)
(Answered Question- 356, Skipped Question- 50)

S1-Q3. **Is there an agency policy that dictates how to handle cryptocurrency when it is encountered in the course of your duties as a Law Enforcement Officer? (Documentation, seizure, evidence etc.)**
YES- 32 (9%)
NO- 315 (91%)
(Answered Question -347, Skipped Question – 59)

S1-Q4. **Have you received any training (agency or occupational) in understanding, identifying and/or encountering cryptocurrency?**
YES- 10 (3%)
NO- 339 (97%)
(Answered Question- 349, Skipped Question- 57)

S1-Q5. **Have you encountered any situation while working as a Law Enforcement Officer involving cryptocurrency? (Theft, fraud, loss, or possession during arrest etc.)**
YES- 23 (7%)
NO- 327 (93%)
(Answered question- 350, Skipped Question- 56)

S1-Q6. **Have you encountered any issues when dealing with arresting persons or taking complaints from victims related to the loss of cryptocurrency?**
YES- 10 (3%)
NO- 340 (97%)
(Answered Question- 350, Skipped Question- 56

S1-Q7. **Does your agency have a point of contact, agency designees, specialty unit or protocol in place for handling ANY issues or cases that you receive with complaint involving cryptocurrency?**
NO- 287 (83%)
YES- 29 (7%)
If yes, describe – 31 (9%) - Mostly referred to CID/ Investigation Bureau/ Agency Subject Matter Expert
(Answered Question 347, Skipped Question 59)

S1-Q8. **Are you interested in training specifically for the recognition, handling, documentation and seizure/impound of cryptocurrency?**
YES- 227 (65%)
NO- 123 (35%)
(Answered Question- 350, Skipped Question- 56)

S1-Q9. **Do you agree or disagree that the evolution of money to a digitized form could create difficulties or problems for Law Enforcement in the future?**
Strongly Agree- 152 (44%)
Agree- 127 (36%)
Neither agree nor disagree- 50 (14%)
Disagree- 11 (3%)
Strongly Disagree – 9 (2.5%)
(Answered Question- 349, Skipped Question- 57)

Survey #2 (S2) – Cryptocurrency Survey- Law Enforcement Investigations/Economic Crime Detectives

S2-Q1. **Cryptocurrency is a form of digital money/value transfer that only exists in the computer world. What is your level of familiarity with Cryptocurrency? (Bitcoin, Ethereum, Litecoin, Cardano etc.)**
Extremely Familiar -4 (2 %)
Very Familiar – 9 (5.5%)
Somewhat Familiar – 79 (46.5%)
Not so familiar – 45 (26.5%)
Not at all familiar – 33 (19.5%)

S2-Q2. **Have you purchased/invested, or do you own any cryptocurrency?**
YES – 47 (28.5%)
NO- 118 (71.5%)
(Answered Question – 165, Skipped Question – 5)

S2-Q3. **Have you received any training (agency or occupational) in understanding, Identifying and/or tracing, tracking, seizing, or investigating cryptocurrency and/or blockchain technology?**
YES- 29 (17.5%)
NO- 137 (82.5%)
(Answered Question- 166, Skipped Question- 4)

S2-Q4. **Over the last two years, have you encountered any situation while working as a Detective/Investigator specifically involving the use or transfer of money to cryptocurrency? (Theft, fraud, loss, or possession during arrest etc.)**
A great deal +51 - 2 (1 %)
Many cases 21-50 – 2 (1 %)
A moderate amount of cases 6-20 – 9 (5.5%)
A few cases involving crypto 1-5 -21 (13%)
No cases at all – 132 (79.5%)
(Answered Question- 166, Skipped Question – 4)

S2-Q5. **Have you ever worked a case that required you to seize or impound a suspect/criminal organization's cryptocurrency?**
YES- 1 (1%)
NO- 165 (99%)
(Answered Question- 166, Skipped Question – 4)

S2-Q6. **Do you agree or disagree that the evolution of money to a digitized form could create difficulties or problems for Law Enforcement in the future?**
Strongly agree- 94 (57%)
Agree – 61 (36%)
Neither agree nor disagree – 10 (6%)

Disagree- 0
Strongly Disagree- 1 (1%)
(Answered Question – 166, Skipped Question- 4)

S2-Q7. **Have you noticed any change in the way money moves in our society or within criminal elements or criminal organizations?**
A great deal- 23 (14%)
A lot- 18 (11%)
A moderate amount- 45 (27%)
A little- 39 (24)
None at all- 39 (24)
(Answered Question – 164, Skipped Question- 6)

S2-Q8. **Have you encountered any issues when dealing with arresting persons or taking complaints from victims related to the loss of cryptocurrency?**
YES- 10- (6 %)
NO- 155 (94%)
(Answered Question- 165, Skipped Question – 5)

S2-Q9. **Are you interested in training specifically for the recognition, handling, documentation and seizure/impound of cryptocurrency?**
YES- 130 (78%)
NO- 36 (22%)
(Answered Question- 166, Skipped Question- 4)

Survey #3- Cryptocurrency Survey- Law Enforcement Training/Intelligence Bureaus

S3Q1. **Cryptocurrency is a form of digital money/value transfer that only exists in the computer world. What is your level of familiarity with Cryptocurrency? (Bitcoin, Ethereum, Litecoin, Cardano etc)**
29 Responses from Training/Intelligence Bureaus
Extremely Familiar 1 (3.5%)
Very Familiar 0
Somewhat familiar 10 (34.5%)
Not so familiar 7 (24 %)
Not at all familiar 11 (38%)
(Answered Question- 29, Skipped Question- 0)

S3-Q2. **Have you purchased / invested, or do you own any cryptocurrency?**
Yes – 6 (21.5%)
No- 22 (78.5%)
(Answered Question- 28, Skipped Question- 1)

S3-Q3. **Over the last two years, has your agency encountered any situation while handling a case (Patrol or Investigations) involving cryptocurrency? (Theft, fraud, loss, or possession during arrest etc.)**
A great deal of cases- 51+ - 0
Many (21-50) -1 (4 %)
A moderate amount 3 (12.5%)
A few cases – 3 (12.5%)
No cases – 17 (71)

S3-Q4. **Has your agency training bureau started reviewing and identifying training for Patrol Officers related to the recognition, identification, documentation, and seizure of cryptocurrency?**
YES- 3 (11%)
NO- 24 (89%)
Answered Question- 27, Skipped Question - 2

S3-Q5. **Is your Agency interested or is your training bureau trying to provide training specifically for the recognition, handling, documentation, Investigation, tracking and tracing and seizure/impound of cryptocurrency?**
YES- 14 (52%)
NO- 13- (48%)

S3-Q6. **Does your Agency have any policies in place related to the specific handling, seizure, documentation, investigation, tracking or tracing of cryptocurrency or the analysis of blockchain technology?**
YES- 3 (11%)
NO- 24 (89%)
(Answered Question- 27. Skipped Question- 0)

S3-Q7**. Do you agree that the evolution of money from a tangible asset to a decentralized, non-governmental based, digitized commodity could create difficulties or problems for Law Enforcement in the future?**
Strongly Agree- 11 (39%)
Agree- 13 (46.5%)
Neither agree nor disagree- 3 (11%)
Disagree- 0
Strongly Disagree- 1 (3.5%)
(Answered Question- 28, Skipped Question- 1)

Discussion

In all, 3 surveys were conducted to establish a base line in Florida Law Enforcement with crypto-currency. These surveys were designed specifically to document the awareness, interaction and overall direction of law enforcement involvement and handling with the emergence of crypto-currency in our monetary system. This slow societal shift from the tangible exchange of government backed paper money into the electronic transfer of stored value through computer based, decentralized digital or virtual assets is an emerging trend that may harbor serious implications for law enforcement when conducting investigations involving the legal AND illegal transfer, trace, track and seizure of illicit funds, ill-gotten gains and the financial instruments lost by unsuspecting Americans every day. My goal is to understand how frequent crime involving crypto-currency is occurring, if it is being reported, if Florida Law Enforcement is aware and staying current or ahead of the quickly changing environment as it pertains to the transfer of value in the American Digital age.

Survey # 1

Patrol Officers from medium to large Sheriff's Office's in North, Central and South Florida were surveyed about their familiarity related to crypto-currency. It was revealed that half (50%) of Patrol Officer's surveyed revealed that they were Somewhat, Very, or extremely familiar with crypto-currency. Further, 34.5 percent of these officers admitted that they had purchased or invested in crypto currency personally, demonstrating a deeper level of involvement and understanding in its use. Conversely, half (50%) of Patrol Officers surveyed reported being "not so familiar" or "not at all familiar" with crypto-currency and a large portion of these same officers stated that the had not purchase and do not own crypto currency. Clearly, the vast majority of those surveyed were not ready to commit to ownership of crypto-currency, quite possibly due to lack of an acceptable level of understanding related to its acquisition.

Patrol Officers were also polled about crypto-currency and how it is encountered on the job. The vast majority of those officers surveyed (91%) revealed that their medium to large Sheriff's Office did not have a formal policy in place to dictate the handling of cases specific to crypto-currency. Further, an even larger percentage of those officers who responded (97%) revealed that they have not received any training (agency or occupational) in understanding, identifying and/or encountering cryptocurrency as it relates to their job as a Police Officer. While officers responding to the survey indicated that for the most part they are not having an abundance of issues in their day to day duties taking reports from citizens relating specifically to cryptocurrency (93.5 percent- said "No" when asked), These responding officers also admitted that 83 percent of them do not have any point of contact, specialty unit or protocol in place within their agency to handle specific cryptocurrency related cases or issues they encounter. This information is bolstered by a high level of confirmed interest in training specific to the recognition, handling, documentation, and seizure of cryptocurrency, as 65 percent of Officers who were surveyed responded "YES" to this question, expressing a desire for more training on the topic. When asked if these officers thought that the evolution of money into a digitized medium could pose problems or 'create difficulties" for Law Enforcement going

forward, 80 percent of officers survey responses either “strongly agreed” (43.5%) or “agreed” (36.5%) that it could.

Survey #2

The second survey had questions tailored specifically for Detectives and Economic Crime Detectives. These are law enforcement personnel with a more focused look at aspects of law enforcement investigation as it relates to money and the tracking, documentation, and overall flow of money. The large majority of the violations, crimes, cases and fraud schemes that Detectives and Investigators see revolve around money or involve money as the end goal or result. Therefore, learning the natural and unnatural movements of money as it flows from person to person, entity to entity and represents a direct relation to the crimes Florida Detectives investigate make it very important to keep up with the everchanging forms of value exchange. In short, the goal of most property crimes is money. The goal of most drug crimes is money. The goal of most fraud schemes is money and most people involved in these endeavors are usually motivated by of course, money. As cash disappears off our streets and out of our bank accounts, it most certainly has to go somewhere. Detectives and Investigation Bureaus have a special interest in this particular movement because it provides a way to legitimize otherwise illegitimate means of ill gotten gains or dirty money. With this information in mind, I asked Detectives about their awareness and familiarity with cryptocurrency. It was revealed that 54 percent of Detectives surveyed responded being “extremely familiar” to “somewhat familiar” with the advent of cryptocurrency and its existence in Bitcoin, Ethereum and other decentralized stored value mediums. Only 19.5 percent of Detectives surveyed responded that they were “Not at all familiar” with cryptocurrency, so at least 80 percent of Florida Detectives surveyed, responded that they had some requisite knowledge of cryptocurrency, almost 20 percent more awareness than the Patrol Officers we surveyed. This fact alone further supports the working hypothesis that cryptocurrency is being used and utilized in criminal schemes and as a way to launder ‘dirty money” and garner a level of untraceability or anonymity. Numbers of Detectives who have purchase or invested in cryptocurrency were found to be lower than that of their uniformed counterparts. Only 28.5 percent of Detectives surveyed, responded “Yes” to purchasing or owning cryptocurrency. This information could indicate a level of skeptical caution, or maybe a need to know more about cryptocurrency.

Nonetheless, it would also appear that while Detectives know the basics about cryptocurrency, they also lack training in its understanding, identifying, tracing, tracking, and investigating. 17.5 percent of Detectives surveyed, responded “No” that they had not received any training in cryptocurrency. Further, when asked, “Over the last two years” had they encountered cryptocurrency related theft, fraud or loss, 79.5 percent of Detectives surveyed responded that they had “No cases at all”. The rest of those responding to the survey (20.5 percent) indicated a “few cases” to “A great deal” of cases, indicating that there is slightly over a 1 in 5 chance that Detectives surveyed have received at minimum, a case that involves cryptocurrency. Conversely, 93 percent of all Detectives surveyed responded that they believed that the evolution of money to a digitized form could create difficulties for Law Enforcement. 76 percent of these Detectives have also noticed “a little” to “a great deal” of change “in the way money moves

in our society or within criminal elements or organizations." This information would hint at a clear shift in money movement in the State of Florida, if not the US. These Detectives surveyed expressed a large interest 78 percent, expressing "Yes" when asked if they were interested in training specifically related to the recognition, handling, documentation, and seizure of cryptocurrency assets. Once again, the survey reveals a trend in Florida Law Enforcement that shows that they want more information and options when it comes to handling cryptocurrency effectively. These answers also indicate a clear sign of things to come in the future related to cryptocurrency. This naturally poses the next and final question. What are training and intelligence bureaus doing to recognize and address this need as it emerges?

Survey #3

Law Enforcement intelligence bureaus and training bureaus are uniquely positioned to see these emerging trends in some cases earlier than they show up as cases for Patrol Officers/Deputies or Detectives to work. Law Enforcement Intelligence is forward leaning information about trends and issues that are actively being dealt with by Law Enforcement as well as noticing and providing information about societal changes and issues that could potentially affect Law Enforcement. Law Enforcement Training Bureaus are also forward thinking and leaning and often compare notes with other agencies as to identify tactics, ideas, training and overall information for Law Enforcement to address emerging trends and changes in society that can affect the way the police goes about their jobs. If training and/or intel falls behind, so goes the Police Dept. or Sheriff's Office. Therefore, by definition, these entities within a Law Enforcement organization must be looking out to the edges of the future to see exactly just what threats, changes and challenges are on the horizon and where they can provide information, value and support for the Officers, Deputies and Detectives of Florida Law Enforcement. Question one of the third survey revealed that a large number of intel and training bureaus are at least "somewhat familiar" as stated by 34.5 percent of those members of the LE Intel and Training worlds in Florida. Overall, 62 percent of those who answered question one in this survey revealed at least a minimal knowledge of cryptocurrency. In short, the awareness is there, and growing. 71 percent of those Intel and Training Bureau members revealed that they were aware of "No cases" involving cryptocurrency at all, this information juxtaposed against the information for Patrol Officers (6.5%) and Detectives (20%) referencing a small amount of cryptocurrency related cases. This may reveal a slight disconnect between the interdependent groups, as certainly there are some cases. Even more concerning is the Intel and Training representatives surveyed, responded that only 11 percent are aware of their training bureau beginning the process of reviewing and identifying training for Patrol Officers, whom are most certainly the first line of defense against new issues being encountered first. However, according to Question 5, there is hope. 52 percent of those Intel and Training personnel that answered this question has an interest or is trying to provide training specifically related to cryptocurrency as it relates to recognition, handling, documentation, investigation, tracking and tracing or seizure of these digital assets. One thing has been made clear, there will be some lag time in getting Patrol Officers/Deputies and Detectives "schooled up" on all issues cryptocurrency. Question 6 show that only 11 percent of Intel/Training personnel are focused on the

identification of any policies already in place or being implemented related to “the handling, seizure, documentation, investigation, tracking or tracing of cryptocurrency or the analysis of blockchain technology”. Thankfully, question seven shows that the overall understanding is there. Question 7 revealed that once again, 86 percent of LE intel/training surveyed that they are in lockstep with Patrol Officer/Deputies and Detectives on one issue. They agree that “the evolution of money from a tangible asset to a decentralized, non-governmental base, digitized commodity will most likely create difficulties for Law Enforcement” as we move into tomorrow.

Recommendations

Based on my research and surveys conducted of “front line” Florida Law Enforcement with their supporting entities, I would recommend that we establish a clear definition of what cryptocurrency is and isn’t. We need to address this immediately with legislation changes and updates that way Florida statute does not get outpaced by technology. We need a training program that is specific to law enforcement and defines and shows the actual potential of cryptocurrency, good and bad. We need to start looking at this immediately because as of March 9th, 2022, US President Biden has signed an executive order requiring governmental studies to be conducted on cryptocurrency and assess the risks associated with it for the US economy. I believe that Florida should be looking at it as well and taking it seriously so as not to fall behind the proverbial “eight ball”.

As a state, Florida needs to set forth guidelines for Law Enforcement when it comes to decentralized currencies and the personal, organizational, and financial risks and issues associated with it being in our society. Florida needs to create a roadmap of how to traverse this new world of decentralized digital currency. How do we properly prepare to address the wave of digital crime that is sure to follow? How will we keep up with criminals who continually use technology to outpace the court system and the police? I believe the best way is a three pronged attack of modernization of police functions and technology, comprehensive education and training related to enforcement and awareness and specific training to understand this new technology and just how different it is compared to tangible assets. Hence, if we learn to speak the language early, one won’t have to rush to learn and will be ready for the challenges ahead. Florida needs to mandate across the board upgrades to all Law Enforcement computer infrastructure. This will help with the access to and hosting of very large databases to track, analyze, search, and store the copious amounts of information that is associated with cryptocurrency. Blockchain technology is excellent for traceability and linking transactions to humans quickly, but only if you are trained to do so and have the technology and storage to do so. Efficient tracking and tracing only come with sound technology and infrastructure and the constant training needed to stay at the forefront. Florida needs to get serious about this, or very quickly we will collectively miss the boat and be forever chasing the technology curve, trying to keep pace with the private sector and vertically integrated criminals who keep evolving to get the next big thing. We need to take ownership of our role as the first and last line of defense for the good citizens of Florida. We need to do this soon; time is running out as this technology evolves and may soon become the norm.

Lieutenant Jason Velazco is in his 20th year in Law Enforcement, currently with the Florida Dept. Of Agriculture and Consumer Services, Office of Agricultural Law Enforcement. He started his law enforcement career with the Florida Department of Corrections as a Correctional Officer in Central Florida in 2002. In August of 2006, he was hired as a Law Enforcement Officer with the Florida Department of Agriculture and Consumer Services- Office of Agricultural Law Enforcement. After 14 months of service in the Office of Agricultural Law Enforcement- Bureau of Uniform Services, he was promoted into the Office of Agricultural Law Enforcement- Bureau of Investigative Services as a Conservation and Recreational Lands (C.A.R.L) Officer based in Tallahassee, Florida in October of 2007 assigned to patrol all Florida Forest Service managed lands. In 2010, he was promoted to the rank of Investigator with the OALE/ Bureau of Investigative Services based in the Tampa Bay Area, Investigating a litany of white-collar fraud, licensing fraud, organized crime, and wildland fire related cases. In 2012, Lieutenant Velazco began instructing in the FI-210 Wildland Fire Origin and Cause Investigation cadre and in 2014, became the Cadre Lead Instructor in this discipline, instructing students in methods and techniques of Wildfire Origin and Cause Investigation from across the United States and Canada. In 2018, Lieutenant Velazco was promoted to the rank of Lieutenant with the OALE Bureau of Investigative Services and was first assigned as the Orlando Regional supervisor based in Kissimmee, Florida, before transferring back to the Tampa Bay Region, which he oversees today.

References

Abbruzzese, J., & Collier, K. (2022, March 9). Biden takes big step towards government backed digital currency. NBC News. https://Www.Nbcnews.Com/Tech/Crypto/Us-Government-Digital-Currency-Rcna19248. Retrieved May 5, 2022, from https://www.nbcnews.com/tech/crypto/us-government-digital-currency-rcna19248

Alvarez, F.E., Argente, D & Van Patten, D. (2022, April). Are Cryptocurrencies currencies? BITCOIN as legal tender in El Salvador. *National Bureau of Economic Research*, pgs. 1, 8 15-16, 26. NBER. https://www.nber.org/papers/w29968

Ammous, S. (2015). Economics beyond financial intermediation: Digital currencies' potential for growth, poverty alleviation, and international development. *The Journal of Private Enterprise, 30*(3), 19-50.

Anthony, N., (2022). Decoding Biden's executive order on cryptocurrency. *Cato Institute*. https://policycommons.net/artifacts/2276662/decoding-bidens-executive-order-on-cryptocurrency/3036625/

.

Areddy, J. T. (2021, June 6). China reconsiders its central role in Bitcoin Mining. *The Wall Street Journal.* Retrieved May 12, 2022, from https://www.wsj.com/articles/china-reconsiders-its-central-role-in-bitcoin-mining-11622865618

Bielefeld, S. (2018). Cashless welfare transfers for 'vulnerable' welfare recipients: Law, ethics, and vulnerability. *Feminist Legal Studies, 26*(1), 1-23.

Bray, J.D. (2016). Anonymity, cybercrime, and the connection to cryptocurrency (Doctoral dissertation, Eastern Kentucky University).

Chu, D. (2018). Broker-dealers for virtual currency: regulating cryptocurrency wallets and exchanges. *Columbia Law Review, 118*(8), 2323.

Davies, G. (2010). *History of money.* University of Wales Press.

Desmond, D. B., Lacey, D., & Salmon, P. (2019). Evaluating cryptocurrency laundering as a complex socio-technical system: A systematic literature review. *Journal of Money Laundering Control, 22*(3), 480-497.

Dhamodhran, R. (2021, February 10). *Why Mastercard is bringing crypto onto its network.* Mastercard.com https://www.mastercard.com/news/perspectives/2021/why-mastercard-is-bringing-crypto-onto-our-network/

Dyntu, V., & Dykyi, O. (2018). Cryptocurrency in the system of money laundering*. Baltic Journal of Economic Studies, 4*(5), 75-81. https://doi.org/10.30525/2256-0742/2018-4-5-75-81

Elwell, C. K. (2011**).** *Brief history of the gold standard (GS) in the United States.* Congressional Research Service, CRS Report for Congress.

Feige, E. L. (2012). New estimates of US currency abroad, the domestic money supply and the unreported economy. *Crime, Law and Social Change, 57*(3), 239-263.

Franco, P. (2014). *Understanding Bitcoin: Cryptography, engineering, and economics.* John Wiley & Sons.

Gilman, H. (2021, February 28). Confused about Bitcoin as I am? Some answers to your questions | Opinion. Newsweek, 176(10) Gale OneFile: Criminal Justice, link.gale.com/apps/doc/A656434876/PPCJ?u=21260_lclcp&sid=bookmark-PPCJ&xid=c0f3c5b8

Greenberg, M., Langhirt, J. H., & Plewa, D. (2014). Bitcoin is property, not currency, IRS says –Notice leaves many open questions about convertible virtual currencies. *DLA Piper*. http://www.dlapiper.com/en-us/us/insights/publications/2014/04/bitcoin-is-property-not-currency/

Hanson, A.R. (2017). Follow the money: Transparency, risk, and financial regulation in the age of terror. (Doctoral dissertation, Northwestern University).

Kethineni, S., & Cao, Y. (2020). The rise in popularity of cryptocurrency and associated criminal activity**.** *International Criminal Justice Review, 30*(3), 325-344.

Keller, A. (2021 September). Trading in Code: Florida is becoming a center for the cryptocurrency industry. Florida's bid for bitcoin. *Floridatrend.com*. https://www.floridatrend.com/article/32093/floridas-bid-for-bitcoin

Madinger, J. (2011). *Money laundering: A guide for criminal investigators*. CRC Press.

Naheem, M. A. (2019). Exploring the links between AML, digital currencies and blockchain technology. *Journal of Money Laundering Control, 22*(3), 515-526.

Peneder, M. (2021). Digitization and the evolution of money as a social technology of account. *Journal of Evolutionary Economics, 32*(1), 1-29.

Pamplin, B. A. (2014). Virtual currencies and the implications for US anti-money laundering regulations (Doctoral dissertation, Utica College).

Soudijn, M., & Reuter, P. (2016). Cash and carry: The high cost of currency smuggling in the drug trade. Crime, Law and Social Change, 66(3), 271-290.

Stuhlmiller, L. (2013). Mitigating virtual money laundering: An analysis of virtual worlds and virtual currencies (Doctoral dissertation, Utica College).

Swan, M. (2015). *Blockchain: Blueprint for a new economy.* O'Reilly Media, Inc.

The Board of Governors of the Federal Reserve System. (2022, January). *Money and payments: The US dollar in the age of digital transformation*. Retrieved May 10, 2022, from https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf

Thrasher, K. (2020). The Privacy Cost of Currency. *Michigan Journal of International Law, 42*(2), 403-427.

White, L. H. (2018). The curse of the war on cash. *Cato Journal, 38*(2), 477.

Xi, Chao. (2022). The end of the war or the commencement of battle? Cryptocurrency regulation in China. *37 Banking & Finance Law Review, 339. The Chinese University of Hong Kong Faculty of Law Research Paper.* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4087467

Appendix

Survey #1 – Cryptocurrency Survey- Law Enforcement Patrol

1. Cryptocurrency is a form of digital money/value transfer that only exists in the computer world. What is your level of familiarity with Cryptocurrency? (Bitcoin, Ethereum, LiteCoin, Cardano etc.)

2. Have you purchased/invested, or do you own any cryptocurrency?

3. Is there an agency policy that dictates how to handle cryptocurrency when it is encountered in the course of your duties as a Law Enforcement Officer? (Documentation, seizure, evidence etc.)

4. Have you received any training (agency or occupational) in understanding, identifying and/or encountering cryptocurrency?

5. Have you encountered any situation while working as a Law Enforcement Officer involving cryptocurrency? (Theft, fraud, loss, or possession during arrest etc.)

6. Have you encountered any issues when dealing with arresting persons or taking complaints from victims related to the loss of cryptocurrency?

7. Are you interested in training specifically for the recognition, handling, documentation and seizure/impound of cryptocurrency?

8. Do you agree or disagree that the evolution of money to a digitized form could create difficulties or problems for Law Enforcement in the future?

Survey # 2 – Cryptocurrency Survey- Law Enforcement Investigations/Economic Crime Detectives

1. Cryptocurrency is a form of digital money/value transfer that only exists in the computer world. What is your level of familiarity with Cryptocurrency? (Bitcoin, Ethereum, LiteCoin, Cardano etc.)

2. Have you purchased/invested, or do you own any cryptocurrency?

3. Have you received any training (agency or occupational) in understanding, identifying and/or tracing, tracking, seizing, or investigating cryptocurrency and/or blockchain technology?

4. Over the last two years, have you encountered any situation while working as a Detective/Investigator specifically involving the use or transfer of money to cryptocurrency? (Theft, fraud, loss, or possession during arrest etc.)

5. Have you ever worked a case that required you to seize or impound a suspect/criminal organization's cryptocurrency?

6. Do you agree or disagree that the evolution of money to a digitized form could create difficulties or problems for Law Enforcement in the future?

7. Have you noticed any change in the way money moves in our society or within criminal elements or criminal organizations?

8. Have you encountered any issues when dealing with arresting persons or taking complaints from victims related to the loss of cryptocurrency?

9. Are you interested in training specifically for the recognition, handling, documentation and seizure/impound of cryptocurrency?

Survey #3- Cryptocurrency Survey- Law Enforcement Training/Intelligence Bureaus

1. Cryptocurrency is a form of digital money/value transfer that only exists in the computer world. What is your level of familiarity with Cryptocurrency? (Bitcoin, Ethereum, LiteCoin, Cardano etc.)

2. Have you purchased/invested, or do you own any cryptocurrency?

3. Over the last two years, has your agency encountered any situation while handling a case (Patrol or Investigations) involving cryptocurrency? (Theft, fraud, loss, or possession during arrest etc.)

4. Has your agency training bureau started reviewing and identifying training for Patrol Officers related to the recognition, identification, documentation, and seizure of cryptocurrency?

5. Is your Agency interested or is your training bureau trying to provide training specifically for the recognition, handling, documentation, Investigation, tracking and tracing and seizure/impound of cryptocurrency?

6. Does your Agency have any policies in place related to the specific handling, seizure, documentation, investigation, tracking or tracing of cryptocurrency or the analysis of blockchain technology?

7. Do you agree that the evolution of money from a tangible asset to a decentralized, non-governmental based, digitized commodity could create difficulties or problems for Law Enforcement in the future?