Master's in Law and Management

Vinisha Dineshchandra Sauchande

Cryptocurrency and E-commerce: The disappearance of fiat currency?

Internship Report

Miguel Azevedo Moura, Professor at the NOVA School of Law

2022/2023

Vinisha Dineshchandra Sauchande

University NOVA of Lisbon

Supervisor Professor Miguel Azevedo Moura

The Regulation of Cryptocurrency and E-commerce: The disappearance of fiat currency

Internship Report to obtain a Master's in Law and Management

2022/2023

Lisbon

Anti-plagiarism statement

I hereby declare that the work I present is my own work and that all my citations are correctly acknowledged. I am aware that the use of unacknowledged extraneous materials and sources constitutes a serious ethical and disciplinary offence.

Vinisha Dineshchandra Sauchande

Vinisha Dineshchandra Sauchande

Acknowledgements

I would like to express my sincere gratitude to the following people who helped me through my master's degree, internship, and research.

My dear parents, Joyouti and Dineshchandra, as well as my beloved extended family in Lisbon and London, for all the support, care, and love.

All my cherished friends, for the wise counsel and compassionate shoulders they have offered.

My supervisor, Professor Miguel Azevedo Moura, for the unmeasurable assistance and collaboration in the of making this work.

The entire Customer Success team at Profitero for the great opportunity, especially my manager Stevie J. Knapp Wilson and all the executives, for their incredible support.

And last but not least, to Diogo Roovers, without whom this idea would not have existed.

Contents

Introduction

The current banking system drains significant value from society, and its monetary parasitism encourages both the worst and best parts of human endeavour. Some would want to end it by burning dollars, euros, yen and transforming every penny into ones and zeros. *Cryptocurrency* is digital money that has been entrusted to the internet and computers all around the world. *Bitcoin* was invented in secrecy and was given to the world as a gift: it is a currency and programmable money.

This report has two paramount components: firstly, it will present the internship at Profitero as a Customer Success Intern: there will be an overview of the company, as well as its mission and values, followed by a description of the internship and the learning outcomes.

Additionally, it will argue the future of this revolutionary technology: how *cryptocurrency* aims to replace fiat currency. Furthermore, it intends to discuss the evolution of Legal Regulations around this currency and explain what the forthcoming outlook could be.

Part I: The Internship at Profitero

I.I Internship Report

I.I.I Profitero

Profitero is the recognized eCommerce performance analytics tool for the world's leading companies. Profitero allows companies to track digital shelf performance across thousands of retailer websites and mobile apps in fifty countries, providing actionable information to optimize product content, search placement, ratings and reviews, availability, selection, and price. Profitero also allows businesses to measure their Amazon sales and share performance and is the only solution that can link Amazon sales and share performance with changes throughout the digital shelf. Many of the world's largest brand manufacturers rely on Profitero's comprehensive and exact statistics to assess and improve their eCommerce success. Among them are Beiersdorf, iRobot, General Mills, Heineken, Kids II, MillerCoors, and L'Oréal (Profitero, 2020).

Companies having an online retail presence require data in order to obtain insights into client behaviour and improve their experience. In addition, online companies use eCommerce data and eCommerce merchants to analyse their business functions, do competitive analysis, and generate increased online sales.

I.I.II Mission and Values

Profitero has been at the forefront of eCommerce analytics since 2010, with industry-leading technologies. The start-up was founded by data scientists and engineers who worked on Google's ground-breaking search indexing technology and IBM's Watson AI platform. Using this information, they created Profitero, a technological platform capable of analysing half a billion-product data points every day, allowing firms to monitor and improve their eCommerce performance (Profitero, 2020).

Profitero's purpose is to empower customers with actionable eCommerce data and insights that accelerate sales and save time. Its objective, and vision, is improving quality and dependability, providing actionable insights, and expanding category penetration, all of which is

done by giving the client complete control over the data they wish to access, but also by building long-term relationships with its customers.

Profitero is an international firm operating in the UK, the US, and China. They all utilise the same digital workplace (Jira), which helps everyone stay on top of their task and see how other offices are doing. Profitero's international presence allows them to cater to a varied customer. Henkel, Hasbro, Sony, Google, and SEB are just a few examples. Profitero has always been open to any structure or size, but its long-term strategy requires them to start discarding smaller, less well-known businesses in favour of focusing on mid-sized and significant firms.

I.I.III Strengths and Weaknesses

According to Profitero CEO Bryan Wiener, historically, there has not been a straightforward method for agencies to get product performance data because it often resides in-house with the company. However, as retailers build media networks and commerce and media increasingly interact, businesses turn to agencies to optimize their e-commerce investment (Weissbrot, 2020).

Profitero's clear strength is that it is the market pioneer; they have been leading for a few years now and continue to improve to separate themselves from competition.

One of Profitero's drawbacks is the lack of technological advancement, which they are constantly working to rectify. In fact, they recently completed a large migration of all client accounts to Ace, a new, updated, and speedier tool. It took approximately a month to complete the transfer, but the end result was a more user-friendly tool to work with, and almost every employee acknowledged that it made most activities less time-consuming.

Profitero's obvious strength is that it is the market leader; they have been leading for a few years and continue to improve in order to distinguish themselves from the competition.

I.I.IV The role

My role at Profitero consisted of a Customer Success Management Internship which entails assisting clients as they move from sales prospects to active users of the products.

The customer success intern's responsibility is to bring sales and success teams together. The role involves a high-level view of the client lifecycle since they engage in various stages of customer interaction. This viewpoint is applied to provide value to customers and the organization.

Customer success managers (CSMs) are active in numerous stages of the customer's integration within the company, giving them a bird's eye view. CSMs identify issues that affect many clients and estimate what such patterns signify for future churn.

Success managers also have a distinct perspective on future product updates and modifications. They may advocate for their consumers by connecting their requests to the company's more significant objectives.

I.I.V Onboarding

The onboarding process was quite simple: I got to know as many colleagues as I could, whether they were in the Customer Support service team with whom I was working or in any other team, such as sales or technical support. I had used most of the tools within three weeks, and while I was still reporting to my primary manager, I had gained significant job autonomy. I had work to complete, so I spent my time as I saw fit, with the help of Profitero, and then I presented the results to my supervisor on time.

Initially, I was allocated projects in no particular order, but as time passed, I grew more acquainted with some specific customers, which meant that I would ultimately begin working more and more with the account manager of these organisations. The customer care team comprises account managers, customer service managers, customer service executives, and interns. Account managers and customer service managers would be in charge of connecting with

clients and controlling everyone's availability and workload, while executives and interns would be focused on completing assignments.

I.I.VI Daily tasks

During my internship, I was responsible for providing manufacturers with the measurement and data required to optimize their sales and profitability on Amazon and other eCommerce platforms. This process involved analysing customer inputs and adhering to agreed-upon standards, as well as controlling data entry to generate set outputs on time.

I received all my tasks generally from Jira, where they would be assigned to me by my superiors. The requests can range from adding and removing products, to altering their categories and matching them with the given retailers according to the client's needs. This process would require the use of Microsoft Excel, along with the Profitero app and tools, ACE, and Delivery tool. Furthermore, whenever finding any particular situation that would be difficult to manage, I could reach out to my superiors or discuss said issues with the client.

Additionally, I was given the chance to play a vital role within the Customer Success team, which resulted in performing other tasks such as preparing monthly competitor reports for brands such as JDE, followed by reviewing client's feedback and finally making the necessary updated on the Profitero app. These reports are focussed on each market (country) where the client performs its business. I worked on various accounts during this internship, mainly Kimberly Clark, Hasbro, Group SEB, and Henkel.

I.I.VII Learning outcomes

In the span of six months, I have deepened my time management and organization skills. Many times, I was given complex tasks which required me to divide my time wisely in order to prioritize the most urgent tasks, and simultaneously put in time for other tasks. As the business grew since I joined the team, the workload began rising quickly, which gave me the opportunity to become more independent within my tasks, and able to perform more.

I was able to gain better analytical skills alongside mastering Microsoft Excel, Although I am very acquainted with Excel, I have discovered that there is always something new to learn as a result of the tasks. Some of the most unfamiliar tools were required in the Excel assignments I have completed so far. With time, I grasped the necessary skills and became more at ease with substantial amounts of data. Furthermore, I got the opportunity to progress from simply managing requests from my superiors to directly account managers and advocating for their interests. I also had the chance to teach new coming interns and support them on all the necessary queries, which was a positive experience, as it also gave me the opportunity to ask different questions to myself and enjoy different perspectives on solving the same problems.

Part II: The Regulation of Cryptocurrency and E-commerce

II.I Brief history of money

Money has historically been described in economics as anything that is widely regarded as a means of trade. Money serves as both a measure of wealth and a unit of account. Nonetheless, how did it get there in the first place? Its origins were more intriguing than is typically depicted in mainstream economics, and so will be its future.

Governments are not the source of money. Instead, money emerged organically when markets developed, and people with a labour perspective realized that if one has eggs and the other has a cow, there may be a necessity for a means of exchange for the trade to take place.

Bartering dates all the way back to 6000 B.C.. People used to barter to get the commodities and services they needed before the emergence of a means of exchange—that is, money. As a result, two people would get into a trading arrangement if they had certain things that the other desired. For instance, one may exchange bananas for apples and call it an equitable transaction. The barter system's lack of a set exchange rate was a key concern. What if the parties involved could not agree on the value of the items or services being exchanged, or if the person in need of goods and services had nothing that the person who had them wanted? To overcome this dilemma, people devised commodity money. Commodity, a sort of good that serves as a form of currency, was formulated to overcome this issue. Commodity money is long-lasting, divisible, exchangeable, and scarce.

Silver was exchanged in ancient Rome, the Aztecs traded cacao beans, and whale teeth were traded in Fiji. Humanity has a history of relying on money: when there was none, it was invented, and once invented, it was destined to evolve.

However, trust and credibility are vital features that are not emphasized enough when it comes to currency. When exploring the history behind money as we know it, it slowly becomes clear why trust and credibility are the ultimate driving forces of evolution that currency faces. Economic historians have highlighted the legal idea of trust, which establishes fiduciary

obligations and beneficiaries' rights concerning a specific asset, as a powerful instrument (Kim, 2011).

People believe in money's worth, which is why it functions as a means of payment for products and services. Banknotes could formerly be exchanged for gold. However, because the relationship between notes and gold was severed a long time ago, it is now more appropriate to conceive money as a type of IOU (I owe you).

The first metal money dates back to 1000 B.C. China. Afterwards, King Alyattes of Lydia (modern-day Turkey) also minted[1] legal coins around 600 B.C., and goldsmiths subsequently began issuing paper receipts to depositors and borrowers in place of metal coins.

These new coins were oval gold-silver alloy pieces with a simple stamp on one side, such as the head of a lion, which verified the currency. They mix the benefits of commodity money and tokens. Coins were valued in their own right because they were made of precious metals, but unlike commodities, they were easily transportable and did not deteriorate over time. So long as coins retained the seal of the goldsmith, people would be able to determine their value instantly. The system worked because people had trust in the institution. Coins were consequently always exchanged there for a value greater than the cost of their content for else they would have been melted down (Orrel & Chlupatý, 2016).

II.I.I The transition from gold to paper

Another issue comes shortly after the invention of coinage - security. People would have to carry gold with them, making them vulnerable - resulting in a society susceptible to danger. Consequently, the Goldsmiths were brought into the scene to ensure the safekeeping of the gold in the 16th century. Over time, they realized that depositors did not want the same original coin but rather a coin of equivalent worth. So, in actuality, the goldsmiths gained custody of the coin and began issuing certificates to the original owners that allowed them to withdraw the coin on

[1] to produce metal (coins or money)

demand. The technique was flawless if the goldsmith had enough cash to satisfy withdrawal requests on demand. As a result, depositing and safekeeping became distinct.

These receipts could be presented at any moment and be exchanged for silver or gold coins of their face value and to purchase products and services. In this sense, it functioned similarly to cash in today's society (Madise, 2019). Once again, trust was heavily involved in this new type of currency. After a period of time, the goldsmiths came to the conclusion that deposits much-outweighed withdrawals. Given the statistical plausibility and probability distributions involved, a goldsmith would only be asked to withdraw a small percentage of gold coins received at a time rather than all of them. Therefore, the goldsmiths started to lend out the coins that they had on deposit, despite the fact that they did not own them in the first place. As a result, the second most significant function of contemporary banking was established: the lending of money to customers (Juneja, 2015).

Goldsmiths rose to the status of wealthy individuals who loaned money to consumers at a profit. They started making loans in notes rather than coins when it became usual for them to be traded in circulation. As long as not all of the notes were redeemed for gold simultaneously, the goldsmith was free to issue more notes than there was coin in the vault at any given moment (Tomlinson, 2015).

There is no need to withdraw gold if everyone understands that the goldsmith is trustworthy, and if the receipts cannot be easily counterfeited, every time someone wants to acquire something, the receipt may be used as a means of exchange.

These financial ideas also arise in the 15th century from Florence's famed Medici banking dynasty, and they are still used within modern finance (Nicoletti, 2021). The parties did not go through the trouble of transferring and exchanging gold coins when these paper banknotes were created; instead, the paper was exchanged since everyone agreed that it *had* worth. Nevertheless, this only happened because everyone trusted the Medici as solvent intermediaries (Hoffmann & Watchulonis, 2015).

Trust built the system and trust could also easily overthrow it. Suppose a scenario where multiple people decide to withdraw their gold all at once. All it would take is a single person who could not withdraw their gold to spread the news and cause panic. The entire system relies on people rarely ever withdrawing their funds to prevent what came to be known as a bank run.

II.I.II Modern banking

The nominal value of receipts flowing in the economy eventually surpassed the value of gold owned by the Goldsmiths (Frost, 2004). And this is how banks became to be respectable institutions around the 19th century. Except, nowadays, every €20 bill does not equal €20 worth of gold. So, what determines the value of a dollar, pound, or euro? Its value as a currency is entirely contingent on other people's desire to accept it, and two variables ultimately determine that willingness. To begin, the government requires people to retain it in order to pay taxes, and second, it is legal tender (Tomlinson, 2015).

People frequently believe that banks are custodians of their funds when, in reality, the funds are bank's property. Banks have complete control over their balance sheets and may do whatever they want with it (Hoffmann & Watchulonis, 2015). Create new money, for example. Goldsmiths received gold and now bankers receive deposits. These funds are lent multiple times, however, there is no money or gold to back it up, as these loans consist of merely figures on computers. This is brand new money. The practice of paying away significantly more money than a bank has in cash on hand is known as fractional reserve banking.

Fractional banking is a banking system in which banks are only required to keep a fraction of the money placed with them as reserves, as opposed to the whole amount. Banks employ client deposits to originate new loans and pay interest on customer deposits.

The reserves are stored in the form of balances in the bank's account at the central bank or in the form of cash held by the bank. Because of the reserve requirement, commercial banks are able to function as mediators between borrowers and savers, making loans to borrowers while providing immediate liquidity to depositors who choose to withdraw their funds.

The fractional banking system was established as a remedy to the issues that arose during the Great Depression. The stock market in the United States had a historic growth throughout the 1920s. As stock prices reached new highs, investment in the stock market became perceived as a simple method to gain money. By the end of the decade, enormous quantities of stocks were carried on margin, which meant that their purchase price was supported by debts that would be returned with profits created by rising share prices. When prices began to fall in 1929, stockholders panicked and hurried to liquidate their shares. As a result, both consumers and companies experienced deep psychological shock and a loss of trust in the economy. When depositors made large numbers of withdrawals, resulting in bank runs. In order to prevent depositor money from being invested in high-risk ventures, the government-imposed reserve requirements on banks and other financial institutions. Nowadays, if there was an attempt of bank run, the central bank is able to satisfy the customers and guarantee money so as to not cause mass panic. The system evolved to become 'bank runs' proof.

II.I.III From physical fiat currency to digital fiat currency

As all money is destined to evolve in order to become more convenient to carry around, coins and notes ended up having the same fortune as gold, being replaced by credit and debit cards. Money is deposited in banks, and upon ownership of a bank card, it may be accessed through the press of four numbers or just a single tap.

Money now no longer has a physical link with precious metals, or for that matter, with anything else in the universe. The notion of money has grown more abstract, to the point that real coins and notes account for just a minuscule proportion of the total amount of money in circulation. Economists believe that just 8% of the world's currency is in the form of actual cash (Grabianowski, 2003). Money exists as an abstract collection of symbols. Modern capitalism is constructed on the foundation of this virtual, ethereal kind of money, and the pursuit of it controls much of the structure of people's lives (Orrel & Chlupatý, 2016).

As technology has advanced, governments and financial institutions have been able to improve physical fiat money with a credit-based model in which balances and transactions are recorded digitally.

II.I.IV The issue with modern banking

Figures are generated by banks, who earn billions in interest each year by producing and lending 'virtual money'. So, theoretically, this is a form of digital currency. Every time Internet banking or bank cards are used to complete a transaction, so is digital currency. But, in principle, banks, to put it another way, have nothing. All new money is debt: while each euro, pound, crown, rouble, dollar, and yen are, of course, someone's assets, they are also someone's liability (McLeay, Radia, & Thomas, 2014).

Central banks generate money to stimulate the economy and then strive to withdraw it before inflation becomes a problem. The issue is that no one knows how much money banks create in order to raise their profits by making questionable loans. This is where corruption enters the picture: when you give a few people authority over large sums of money, they will take advantage of it (Antonopoulos, 2015).

Every day, there are news reports about this advantage being taken, nevertheless money is still deposited in the same banks that: (1) *allow money laundering that likely funds terror and drugs* (Jamieson, 2012); (2) *launder billions from Mexico's murderous drug gangs* (Vulliamy, 2011); (3) *are involved in Malaysian bribery schemes* (Bogage, 2020); and (4) *assist Japanese banks in laundering money for terrorist states such as Iran, Sudan, and Myanmar* (Dugan, 2014) – just to name a few.

In the current state of affairs, too many banks help and conspire in illegal activity. Moreover, regulators are not adequately enforcing rules to deter people from obtaining stained wealth. According to a report published by Global Witness[2], there are many reasons for this, including the fact that the regulations are seldom implemented, sanctions are rarely carried

2 Banks and Dirty Money
https://www.globalwitness.org/documents/18012/Banks_and_Dirty_Money_Global_Witness.pdf

out, and top executives who have control of violations rarely suffer financial or reputational repercussions of their own. Thus, the breach of rules comes as no surprise.

It is common for banks to escape punishment with penalties that can easily be attributed to the cost of doing business, with the resulting financial burden being passed on to their investors and consumers. Moreover, those in charge of preventing breaches are seldom held accountable. As a result, unscrupulous politicians and bankers may operate freely inside the global financial system, reaping huge financial rewards at the expense of those who do not hold such power, both socially and environmentally (Global Witness, 2015).

Banks are entangled in a system that is entirely designed to take money from the whole global economy and funnel it into the hands of a small group of people (Carry, 2015). The current financial system is parasitic in nature, extracting huge value from society without providing anything in return.

The mechanisms that keep the world spinning are able to do so because people have put their trust in them. Whether it is financial or political. People frequently feel weak and impotent in the face of the world's largest corporations, banks, and governments, but they forget that their power is derived from the people themselves, as Abraham Lincoln famously stated: "*government of the people, by the people, for the people*"[3]

Realizing that fiat money is built chiefly on trust might be unsettling. The public must have faith that the government will not just print additional money when it is compelled to do so. Inflation increases when the government brings in too much money. The currency's worth decreases since it can no longer purchase as much as it once could. When the currency loses its value, hyperinflation emerges. Law and order break down, residents cannot afford food, and savings are emptied out (January, 2021).

What if there existed a currency that did not require a trustee middlemen?

3 The Gettysburg Address, Gettysburg, Pennsylvania November 19, 1863

II.II Cryptocurrency and The Birth of Bitcoin

Few individuals were interested in the 2008 announcement of "*a new electronic cash system that's fully peer-to-peer, with no trusted third party*"[4] made by an anonymous developer. This is no longer the case. "*Ten years later, and against all odds, this upstart autonomous decentralized software offers an unstoppable and globally-accessible hard money alternative to modern central banks*" says Saifedean Ammous, the author of *The Bitcoin Standard* (Ammous, 2008). *Bitcoin* has finally addressed the issues of fiat money.

This is the tale of how a niche technology received worldwide prominence and what happened to the innovators who adopted it and utilized it to further their own goals, whether altruistic or not.

Bitcoin was born out of the upheaval of the Great Recession of 2008, as people's mistrust of banks and their position in the financial system became more intense. Written by a person or group of individuals going by the name Satoshi Nakamoto, *the white paper*, was published in response to the centralized management of money and the need for trust in the handling of citizens' currency (Likos & Hicks, 2022).

According to Nakamoto, who alleged to be a thirty-six-year-old Japanese man, the program was written over the course of more than a year and was motivated in part by his displeasure with the country's handling of the current financial crisis. It was his goal to develop a currency that would be immune to the unpredictable nature of monetary policy, as well as the predatory behaviour of politicians and bankers (Davis, 2003).

To avert a catastrophic economic slump, governments were obliged to spend hundreds of billions to sustain banking institutions in controversial bailouts. A crisis that caused much economic damage to many people seemed to leave the CEOs of said corporations unpunished.

4 Bitcoin: A Peer-to-Peer Electronic Cash System https://bitcoin.org/bitcoin.pdf

The global financial crisis of 2007-2008 destroyed faith in government, organizations, and people throughout society.

The headline of a piece in the *London Times* dated January 3, 2009, *'Chancellor on brink of second bailout for banks'*[5], was cited by Satoshi Nakamoto in the initial block holding the very first fifty *bitcoins*, known as *Genesis Block* or *Block 0*. Nakamoto summarized the difficulties that led to the creation of *bitcoin* with this citation. He did not have to make a case. It was clear, in the wake of the global economic crisis of 2007-2008, many individuals concluded that governments could not be trusted with money (January, 2021).

"There are lots of ways to make money: You can earn it, find it, counterfeit it, steal it. Or, if you're are Satoshi Nakamoto, a preternaturally talented computer coder, you can invent it."[6]

- Joshua Davis, The New Yorker

One of the most perplexing modern puzzles is the true identity of *bitcoin's* founder. What was Satoshi Nakamoto's real name? What is the significance of that name? What happened to Satoshi? Satoshi is popularly thought to own more than a million *bitcoin*, which would be worth tens of billions of euros nowadays, in addition to inventing an entirely new type of money with a market cap of €1 trillion. There are certainly compelling reasons to remain hidden: the U.S. government has a long history of pursuing those who are bold enough to design a currency that is not the dollar (Coinbase, s.d.).

People who experiment with cash often find themselves in danger; thus, Nakamoto had excellent cause to hide. Bernard von NotHaus, a Hawaiian native, began producing silver and

5 https://www.thetimes.co.uk/article/chancellor-alistair-darling-on-brink-of-second-bailout-for-banks-n9l382mn62h

6 Joshua Davis, The Crypto-Currency 2011

gold coins known as Liberty Dollars in 1998 (Davis, 2003). NotHaus was subject of accusation with "*conspiracy against the United States*" by the US government nine years later. "*It is a violation of federal law for individuals (…) to create private coin or currency systems to compete with the official coinage and currency of the United States*" the F.B.I. announced at the end of the trial (Defendant Convicted of Minting His Own Currency, 2011).

II.II.I The White Paper

Whitepapers are documents created by developers that describe the technology and goal of the project they are currently working on and are distributed to the public. Nakamoto's paper claimed that *bitcoin* would be superior to conventional types of electronic money such as credit cards, offering benefits such as decreasing transaction fees and cutting chargebacks to retailers (Elder-Vass, 2018).

The issue Satoshi sought to tackle is defined in the first sentence of the abstract. As the e-commerce age progressed, numerous observers mused about how it is possible to reach electronic "cash": a digital asset that, like a dollar bill, could be traded directly from one person to another without needing an intermediary such as a bank. Transactions must be broadcast over a peer-to-peer network as a public record, which comprises the specifics of each transaction made and received.

The majority of the paper goes on to describe the technology that allows the *bitcoin* to exist and how exactly it can tackle the issues we face with fiat currency today.

II.II.II How does cryptocurrency work?

Cryptocurrency is a digital asset that can be used as a type of payment that may be transmitted anywhere globally without the use of a central monetary authority like a government or bank. Instead, cryptographic techniques create *cryptocurrencies*, allowing users to buy safely, trade, and exchange them. Although *cryptocurrency* may be used to buy and sell goods and services, it is most typically used as an investment instrument (Royal & Voigt, What Is Cryptocurrency? Here's What You Should Know, 2021).

Bitcoin is the most well-known *cryptocurrency*, and its fluctuating value reached an all-time high in 2021, with prices reaching around €60.000 in February, April, and November of the same year.

Bitcoin, however, is not the only contestant in this game. Every other *cryptocurrency* that has been created other than *bitcoin* is called an *altcoin*. They have certain traits in common with *bitcoin*, but they are also distinct in other aspects (Frankenfield, 2021). There must be a backstory behind every alternative currency. There is no use in having an *altcoin* if it does not have a distinguishing feature. An *altcoin* simply alters some of *bitcoin's* pre-existing characteristics in the most basic form. Additionally, features like block size limit, reward schedules, and inflation rate of *cryptocurrency* are included in this list. The *altcoin* may also have more intricate technological distinctions, making it more intriguing. Different types of transactions or security features may be expressed via extensions to the scripting language. Different mining methods and a different consensus algorithm might be used in the future. Occasionally, a new *cryptocurrency* may be founded with a particular theme or community in mind, and those who are a part of this group will be given special privileges or roles inside the altcoin (Narayanan, Bonneau, Felten, Miller, & Goldfeder, 2016).

Ethereum, the world's second-largest cryptocurrency, which was launched in 2015, surged at an exponential rate, reaching an all-time high of above 4.000€ in November 2021. *Ethereum* is expanding on the technology that underpins *Bitcoin* to make it more than simply a currency. It enables people to design apps, known decentralized applications in the *Ethereum* realm, that combine smart contracts into a simple interface.

A smart contract is a contract written in code that is meant to carry out a sequence of commands. The main distinction is that there is no intermediary with smart contracts (Haar, 2022). There is no entity keeping or confirming information. Instead, the *blockchain* validates and stores data. For example, when purchasing a car online, one must find a listing first, followed by communication with the selling party, a payment method, and even the registration of the car.

A smart contract eliminates the need to rely on so many individuals throughout the purchasing process by being autonomous, secure, and transparent. Smart contracts, like conventional contracts, are intended to implement the terms of a contract, be it an exchange of cryptocurrency, or almost anything else. When certain criteria are satisfied, smart contracts will execute automatically (Hussey & Phillips, 2022).

Bitcoin and *ethereum* are often contrasted. However, potential investors should be aware of specific significant differences between the two cryptocurrencies: *ethereum* is dubbed "the world's programmable *blockchain*." On the other hand, the *bitcoin* blockchain was developed just to serve the *bitcoin cryptocurrency*.

XRP is a cryptocurrency that operates on the *XRP Ledger*, a blockchain that was created by Jed McCaleb, Arthur Britto, and David Schwartz to facilitate the transfer of value. McCaleb and Britto would proceed to form *Ripple*, which would utilize the cryptocurrency *XRP* to conduct transactions. On the *blockchain* of *XRP*, things function a little differently. For a transaction to be uploaded to other *cryptocurrencies'* ledgers, a majority of the ledger holders must consent to the verification.

The *XRP Ripple* network, on the other hand, centralizes: However, it preserves a list of individuals who are least likely to defraud it by downloading its validation application. At the moment, it has thirty-five reliable verifiers on board. There are six *Ripple* nodes in the list of validators that *Ripple* authorizes. As an alternative, users may establish their own list of trusted validators to replace the default one. *Ripple* would not even be required to participate in the network in order for transactions to be approved (Rodeck & Schmidt, Meet Ripple & XRP, Cryptocurrency For Banks, 2021).

Though it may be hard to keep track of every altcoin in existence, given that some may have a released white paper, yet no activity or trading, there are around 10.000 altcoins in the

market, according to Statista[7]. Even though many of these *cryptocurrencies* have truly little support or trading activity, several have devoted groups of enthusiasts and investors.

Another *cryptocurrency* that has been growing fast, making its way to the top 10 *cryptocurrencies* by market capitalisation since it was released is *ADA - Cardano*. Like other *cryptocurrencies*, this is a digital token that can be used to hold value as well as transfer and receive funds (Conway, 2021). The *ADA cryptocurrency* is based on the *Cardano blockchain*, a decentralized network built entirely on mathematical and scientific premises and constructed by cryptography and engineering specialists. *Cardano's* blockchain can be used to generate smart contracts, which may then be used to develop decentralized apps and protocols (Rodeck & Powell, 2022).

Bitcoin and *Ethereum* miners use computers to solve complicated mathematical equations and upload new blocks of data to the blockchain, collecting *cryptocurrency* in return for their efforts, which may be time and power-consuming (Narayanan, Bonneau, Felten, Miller, & Goldfeder, 2016). Cardano, on the other hand, employs staking, a mechanism in which network members deposit certain quantities of *cryptocurrency* in order to acquire the ability to participate in the blockchain's functioning, making it more environmentally friendly (Arora, 2022).

Stablecoins are a different kind of cryptocurrency whose values are linked to assets like the fiat currency or gold. They were created in reaction to the price fluctuations of existing cryptocurrencies like *bitcoin*, whose usability as a payment method is restricted by fast market value swings. *Stablecoins* are frequently backed by the precise assets to which they are linked. For instance, when a stablecoin is issued, the organization normally establishes a reserve with an institution that maintains the underlying asset (Benson & Rosen, 2022). As an example, a stablecoin may have €1 million in reserve and produce 1 million coins with a set value of €1 each. If the owner of a *stablecoin* wishes to pay out the coin, the actual money can eventually be withdrawn from the reserve (Royal, 2022).

7 Quantity of cryptocurrencies as of February 3, 2022 - https://www.statista.com/statistics/863917/number-crypto-coins-tokens/

The manner in which each *stablecoin* project keeps the peg varies. *Tether (USDT)* and *Circle's USDC* are collateralized by fiat reserves, which means they hold cash or cash-equivalent assets in their reserves. Decentralized but overcollateralized, *MakerDAO's stablecoin DAI* is backed by ether (*ETH*) placed into its smart contracts.

Nevertheless, algorithmic stablecoins, like *TerraUSD (UST)*, *magic internet money (MIM*), or *neutrino USD*, have appeared in the last year that ranges in their collateralization. They're termed algorithmic as they're backed by an on-chain algorithm that allows for supply and demand adjustments among themselves (the *stablecoin*) and the cryptocurrency that keeps them afloat.

For instance, in the *Terra/Luna* case, the algorithm is performed by *UST*, a *stablecoin*, and *terra* (*LUNA*), *Terra's* native cryptocurrency that backs the stablecoin, on the *Terra* blockchain, which operates the largest algorithmic stablecoin network.

Stablecoin algorithm traders used an arbitrage mechanism between the values of *Terra* and *Luna* to keep *TerraUSD* at $1. Traders would exchange *TerraUSD* for $1 worth of new *Luna* units if Terra dropped below the peg. *TerraUSD's* supply was decreased, and its price rose as a result. Traders could burn *Luna* and generate new *TerraUSD* when *TerraUSD's* value increased over $1, boosting the stablecoin's supply and bringing its price back (Mirza, 2022).

II.II.III The science behind it all

Prior to establishing the *Bitcoin blockchain*, the only way to obtain an agreement on virtual asset ownership was through centralization. In centralized systems, an institution has sole record-keeping rights and handles safeguarding and maintaining property rights. For example, our present financial infrastructure is based on centrally managed accounting systems.

In finance, centralisation may express itself in the influence that financial institutions have over the overall amount of capital in circulation in an economy. For example, centralisation indicates that central banks have the ability to conduct and oversee all of a nation's financial activities, therefore exercising power over other independent banks, regardless of the physical location in the country (Neuberger, 1959).

The central bank's capacity to establish currencies and maintain price and financial stability is a vital feature of centralisation. Moreover, because of the financial system's centralised structure, revenues and losses have been privatised and socialised, respectively (Rejeb, Rejeb, & Keogh, 2021).

Consequently, centralized records are simple to manipulate, and since they play such a significant function, they become systemically relevant rapidly. Furthermore, people can be excluded from participation in centralized systems, and their assets can be simply confiscated. However, because of its decentralized structure, *bitcoin* is resistant to many of these issues (Schar & Berentsen, 2020).

Bitcoin does not belong to a single person or corporation, and it is not under the control of a single entity. Instead, *bitcoin* is a self-contained system shaped by diverse stakeholders through complex interactions and incentive structures. For the first time in history, this independence allows the technology to establish virtual property without the need for a central authority.

The so-called *blockchain* technology was used to achieve this accomplishment, which is a technical milestone.

Blockchain is a secure, decentralized data ledger. Its technology enables a limited group of individuals to share data. *Blockchain* cloud services enable the collection, integration, and sharing of transactional data from various sources.

It functions as a public ledger that is built on the internet in a decentralised way by an indefinite number of participants and it is also a collection of files that contain whatever information is required to be permanently archived. Essential *blockchains* are used to join files together in order to construct a simple string of chain. A more advanced *blockchain* joins data to build a network-like structure similar to that of the internet (Yano, Dai, Masuda, & Kishimoto, 2020). Recently, distributed computing has emerged as a means of constructing computer networks. *Blockchain* is a technique that creates a decentralised ledger-based on distributed

computing in a distributed computing environment. It is required to develop a whole new algorithm in order to construct a decentralised ledger, and this is what resulted in the invention of *bitcoin*.

It is not enough to just employ a security tool to construct and maintain a safe, decentralised ledger since skilled hackers may readily circumvent such security measures. Even if a large number of independent computers work together to maintain a ledger with the best of intentions, they are still subject to assaults by machines with evil purposes. In particular, if the ledger keeps data that serve as money or virtual currency, where perfect precision and permanence are essential, this is particularly true.

The first *blockchain*, the *Bitcoin blockchain*, solved this issue. A considerable number of computers share a typical data store, which is called a database. The whole *blockchain* record is stored on each server, and each server performs comparable tasks simultaneously. These computers are referred to as *blockchain* full nodes. Any server may download the appropriate software and duplicate the *blockchain* record to join a *blockchain* network. One record is created for each participating server at least once a month. Malevolent computers cannot attack ledger's *blockchains* since the number of copies of the *blockchains* ledger throughout the globe grows (Yano, Dai, Masuda, & Kishimoto, 2020).

A large part of *blockchain's* reputation for security stems from the process through which new blocks are generated. Before a new block can be added to the ledger, it must be verified and confirmed by most nodes that the new data is legitimate. As an example, these may include verifying the validity of new transactions in a block, as well as making sure the same coin has not been spent twice (Rodeck & Schmidt, What Is Blockchain?, 2022).

Data cannot be modified without the permission of a quorum of the participants. Hence fraud and data tampering are eliminated in a *blockchain* system. A *blockchain* ledger's contents can be shared, but they cannot be changed. All participants will be alerted if someone attempts to alter data, and the culprit will be identified, leading to more efficient and secure transfers.

While the *blockchain* has many benefits, it also has drawbacks. For example, data cannot be modified once it is formed, and there may be a human mistake or malicious intent in the original data entry. Thus, *blockchain* data is not perfect information and may be fake. For example, *blockchain* technology may help identify the step in the supply chain when the container was loaded with rocks, but it will not stop the fake data from entering the *blockchain*.

On the other hand, *blockchain* implementation might be expensive, especially in the beginning. Furthermore, hiring *blockchain* developers comes at a price since their specialised knowledge makes them more expensive than standard developers (Wang & Wegrzyn, 2021). In any case, if the *blockchain* is designed to be well-tailored to the targeted supply chain, it can easily prevent itself from being disadvantageous.

In more accessible terms, when one makes a purchase using a bank card, the store checks with the bank to see whether there is enough money to make the payment. The bank verifies its records, approves the payment, and deducts the appropriate amount from the bank account. It then keeps its records up to date and charges a fee for its services.

Who would be trusted to maintain the records straight if the banks were eliminated from the system? No one would put their faith in a single individual with so much authority, but this trust could be put in a group of people, even millions. The primary concept is that instead of having a centralized record of transactions, numerous copies of the same transaction data are spread worldwide. The owner of each copy records each transaction.

Instead of checking with the bank, the shop now checks with everyone's records to determine if there is enough money. All the record keeper's data are updated when a purchase is made. If a transaction is fraudulent, it is denied because it does not match the rest of the records. This extensive collection of individuals checking the transactions is, in fact, a network of computers. It is referred to be a decentralized system since it does away with the requirement for third parties.

II.II.IV Mining

Bitcoin mining consists of producing new *bitcoins* through the resolution of exceedingly tricky mathematical problems that verify *bitcoin* transactions. The miner receives a predefined amount of *bitcoin* when a *bitcoin* is successfully mined (Baker, 2022).

Precisely as with traditional money, when cryptocurrencies are spent, the digital ledger should be revised by deducting one account and crediting the other, just as it would be with fiat money. On the other hand, a virtual currency presents a problem since digital platforms may be readily manipulated. As a result, the digital ledger maintained by *Bitcoin's* distributed ledger can only be updated by miners who have been validated. Success is determined via the use of the proof-of-work consensus process. Each block of transactions in a proof-of-work *cryptocurrency* has a unique hash. Therefore, *cryptocurrency* miners must produce a hash that is less than or equal to the block to be accepted as valid (Daly, 2022). For the decentralised *blockchain* ledger to update, blocks of transactions must be verified by solving sophisticated cryptographic hash problems. These riddles need the use of powerful computers and high-tech equipment (Arora, 2022). In order to prevent double-spending, miners are given the additional task of protecting the network.

Miners are rewarded for their efforts in safeguarding the network with new currencies. The mining process is essential to verifying transactions in distributed ledgers since there is no centralised authority. By participating in the transaction validation process, miners are rewarded with a greater chance of earning newly-minted coins.

Ethereum, on the other hand, was built specifically to be ASIC– (specialized mining hardware) resilient, allowing only effective mining utilizing graphics processing units (GPUs) and rejecting AISC hashes. This is in sharp contrast to *Bitcoin*, which is currently almost entirely mined with ASICs. The aim of incorporating such a constraint into *Ethereum's* design was to minimize the concentration of hash power seen in the Bitcoin network (Arora, 2022).

Ethereum was created with the intention of becoming an inflationary currency with no set supply, unlike *Bitcoin*. Every year, the supply of *ether* would grow according to block rewards given

to miners. A steady stream of new ether entering circulation, on the other hand, would gradually push the price down. As a result, some investors were apprehensive that *ether* may follow the path of fiat money, which is periodically inflated and lose purchasing power over time (Walton, 2022).

II.II.V Disadvantages of cryptocurrency

Bitcoin has elemental weaknesses that make it unsuitable for financial transactions despite its technological flash and gloss.

According to some scholars, *bitcoin* is doubtful to dethrone the dollar or other major central bank-issued currencies, but its technology will change the way we conduct payments, banking, and other financial transactions.

Among many of the disadvantages, the most important are that *bitcoin* transactions are slow and costly, and its network cannot tolerate high numbers of transactions. Instable value is an influential issue for an aspiring medium of exchange. *Bitcoin's* volatile price variations from month to month, and even day to day, making it untrustworthy for daily transactions (Prasad, 2021). Volatility is a given when one invests in risky assets. As a result, the investment price is susceptible to changes in investor expectations or perceptions, no matter how minor such changes may be (Lapin, 2021). For example, Elon Musk - mediatic entrepreneur, investor, and business magnate - is well known for moving *cryptocurrency* prices just by using Twitter – which he now owns. Despite the fact that Musk may or may not be doing it for personal gain, his *tweets* have the potential to deliver a significant impact on *cryptocurrency* investors (Molla, 2021).

Another example are the so-called *pump* and *dump* schemes - a specific sort of consumer abuse or price manipulation in which the price and value of a crypto-asset are methodically boosted by a community purchasing of that crypto-asset, followed by a sudden selling of that crypto-asset at a higher price (Jovanic, 2021).

Stablecoins, as stated above, were created in part to combat this weakness of *cryptocurrencies*. Nevertheless, they too can be susceptible to volatility. For example, at the beginning of May 2022, the algorithmic balance that was held between *TerraUSD* and *Luna* shattered. The Anchor

Protocol, a savings, lending, and borrowing platform designed on the *Terra* Blockchain that pays 20% interest on *TerraUSD*, was the most important reason why most individuals owned the coin (Nieva & Sethi, 2022). Anchor, on the other hand, approved a resolution in March this year to substitute the 20% rate with a floating rate. Subsequently, traders were alarmed causing traders to sell their *TerraUSD* and *Luna* tokens. People started fleeing by exchanging *TerraUSD* for *Luna*. *Luna's* supply exploded, leading the price to drop. Because more people started to sell *TerraUSD*, the balancing process failed, and *TerraUSD* and *Luna* both plummeted. They are worth less than a penny as of May 17th, 2022. This resulted in huge losses in both money and trust. Like all financial systems, the *cryptocurrency* market is intertwined and thus, the losses in *TerraUSD* rippled into other cryptocurrencies. One thing is clear - volatility in the realms of the crypto world is not easily avoidable.

Moreover, *bitcoin* has a dubious image for enabling illegal trade in its early days. Hackers have reportedly demanded bitcoin ransomware payments, although criminals have moved mainly to other *cryptocurrencies* that provide greater anonymity than *bitcoin*. On the other hand, governments are wary of any *cryptocurrencies*, fearing that they would promote unlawful activities like money laundering, drug trafficking, and terrorism funding.

Notwithstanding, according to *bitcoin* research firm *Chainalysis*, criminal conduct accounted for 2.1% of total *bitcoin* transaction volume (about €21.4 billion in transfers). The illegal proportion of total *bitcoin* activities declined to 0.34% (€10.0 billion in transaction volume) in 2020. Moreover, according to the UN, money laundering and illegal activity account for between 2% and 5% of global GDP (€1.6 to €4 trillion) per year[8]. This indicates that criminal behaviour involving *bitcoin* transactions is significantly lower than that using fiat cash, and its use is decreasing year after year (Lennon, 2021).

8 Money Laundering https://www.unodc.org/unodc/en/money-laundering/overview.html

Additionally, because a centralized body does not manage *bitcoin*, transactions cannot be undone, and errors cannot be corrected. If users forget or misplace their passwords, their *bitcoin* balances in digital wallets might be lost permanently.

According to *bitcoin* research firm *Chainalysis*, roughly 20% of the existing 18.5 million Bitcoin — presently valued at around $140 billion — seems to be in lost or otherwise stranded wallets (Chainalysis, 2021). Wallet Recovery Services, a company that aids in the recovery of stolen digital keys, claimed it receives around seventy inquiries per day from consumers seeking assistance in regaining their funds (Popper, 2021).

Aside from that, there is a further concern with *bitcoin*: its mining. *Crypto* mining consumes a critical amount of energy due to the nature of the process. Excessive energy use has a negative impact on the environment.

Bitcoin mining, according to Digiconomist, emits around ninety-six million tons of carbon dioxide per year, which is equivalent to the emissions produced by several smaller nations[9]. Each year, mining for *ethereum* emits more than forty-seven million tons of carbon dioxide (Digiconomist, 2020). Nonetheless, new data from Cambridge reveals that mining location has shifted dramatically in the previous six months, and experts say that this will reduce *bitcoin's* carbon impact (Cambridge, 2021).

II.II.VI Currency or 'commodity'?

Distinguishing between money and financial assets may be tricky. Money is a highly liquid financial instrument that pays little or no interest in reality. Other financial assets are not as liquid, yet they provide dividends. For example, people invest in stocks and bonds with the hopes of earning interest, receiving dividends, or eventually selling the asset for a more significant profit. Although *bitcoin* was created as a medium of exchange, there has been a surge in demand from people looking to purchase *bitcoin* as a speculative investment.

9 Bitcoin Energy Consumption Index https://digiconomist.net/bitcoin-energy-consumption/

Bitcoin prices have risen so quickly due to investor speculation that some financial professionals have termed it a "*financial bubble*." A financial bubble happens when increased demand for an item leads its price to soar much above its underlying worth. As a result, current investors benefit from increased asset values and may be motivated to acquire more (Fontinelle, 2020).

Others, fearful of losing out on a chance, may see the increasing trend and decide to invest, expecting to continue. *Bitcoin's* features as a financial asset have captivated many people's attention while also posing a risk of monetary loss.

While the distinction between money and a financial asset is blurry, people's behaviours frequently show the asset's importance in the economy. As a result, the enthusiasm around *bitcoin* recently has centred on purchasing it as a financial investment rather than utilizing it to purchase goods and services. (Wolla, 2018).

Former Federal Reserve Chair Janet Yellen weighed in on the topic, saying that *bitcoin* is "*not a stable source of a store of value, and it does not constitute legal tender";* in her opinion, Bitcoin *"is a highly speculative asset*" (Yellen, 2017).

Nevertheless, according to Ryan Haar, the volatility of *bitcoin* is just another incentive for investors to play a consistent long game. If one is looking for long-term development potential, there is no need to worry about short-term volatility. Investors' emotional responses to market changes might cause them to act impulsively and make decisions that incur losses on their financial investments. (Haar, 2022).

Bitcoin was primarily founded to be a currency such as the euro and dollar, although it can also be used as an investment vehicle. According to a paper published in 2014[10], *bitcoin's* return characteristics are incredibly different from those of conventional investments, and as a result, it

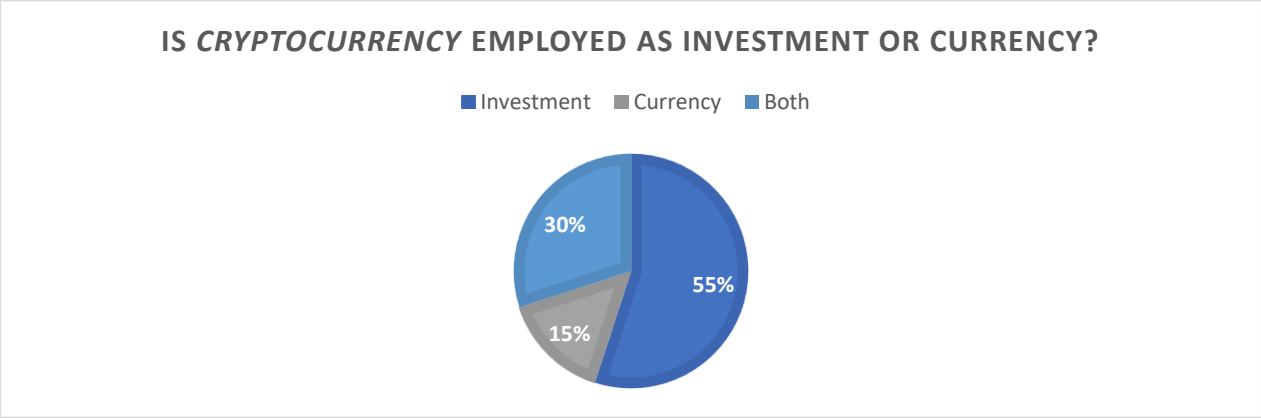
10 Bitcoin: Currency or Investment? https://www.planet-fintech.com/file/166239/#:~:text=The%20analysis%20of%20transaction%20data,monetary%2C%20financial%20or%20economic%20stability.

provides excellent diversification advantages. It was discovered, after an investigation, that one-third of *bitcoins* are kept by investors.

These investors are especially prevalent among users who only receive *bitcoin* and never transmit it to anybody else. On the other hand, a minority of users seem to be using *bitcoin* as a means of exchange. This shows that *bitcoin* is now being retained for investment rather than being utilized for transactions (Kühne, Hong, & Lee, 2014).

Although *cryptocurrency* has clearly seen significant changes from 2014 to 2022, it may still be far from being used as a currency. Over three hundred million people throughout the globe are expected to hold 3.9% of all *crypto* assets.[11] *Cryptocurrency* has grown plenty from 2014 to 2022, and for such purposes, a poll was conducted on Telegram, an online messaging app.

The reasoning behind this choice was due to the fact that, in addition to features like channels and groups, Telegram has many other valuable capabilities for sharing information about an ICO[12] or future ICOs. This app harbours plenty of channels and groups joined by *cryptocurrency* enthusiasts. Aside from being a great way to disseminate information about a new coin, it is also frequently used to promote existing coins to boost prices.



Source: Telegram – various groups and channels related to cryptocurrency. 143 people participated.

April 2022

11 Global crypto adoption - https://triple-a.io/crypto-ownership/
12 Initial Coin Offering - a method of raising funds for new cryptocurrencies

The chart above demonstrates that, although cryptocurrency is mainly employed as an investment, the number of people who employ it as a currency is growing. The question was simple: "*Do you use bitcoin and/or other cryptocurrencies as investment or as currency*?."

This growth is due to the popularity of *crypto*, mainly *bitcoin*. After a rough year in 2018 and a sluggish start to 2019, *bitcoin* began to recover in 2020. The pandemic was an ideal storm for *bitcoin* to resurgence as investors were more concerned about the value of their conventional investments (India Today, 2021). Additionally, the other reason, and perhaps the one that directly affects its use as currency, is the fact that *bitcoin* has gained widespread acceptance as a valid source of money by a large number of businesses (Sophy, 2022). Companies like Starbucks, Amazon, and Microsoft (to name a few) are all adhering to the modern currency.

II.III E-commerce

Electronic commerce has emerged as one of the most significant Internet development components. It enables individuals to trade products and services quickly and without regard to the passage of time or the distance between them. As a result, it has had a significant impact on the macro-economic and social environment in which we live. Significant ramifications have been felt throughout a wide range of economic sectors, namely communications, banking, and retail commerce (Satterlee, 2001).

The concept encompasses a wide range of transactions and is thus applicable to not just websites such as Amazon but also other online transactions such as online banking and remote service providers, amongst other things. The employment of the letter "e" is the most common way to designate a specific process/action or circumstance that has made the transition to the internet format (Tofan & Bostan, 2022).

Because of its early style of specialized, sophisticated, and costly transactions, which posed significant obstacles to entry for smaller rivals, e-commerce has always been the territory of significant corporations. However, with the Internet, anybody may now become an online trader for a little cost, with the capability to reach millions of consumers all over the globe

(Jorgensen & Jorgensen, 2003). As a result of this democratization of the Internet, the primary emphasis of e-commerce has shifted from primarily business-to-business transactions among known parties to a complicated network of commercial operations involving large numbers of customers who have never met before (Satterlee, 2001).

According to Jörg Binding and Kai Purnhagen[13], there are certain characteristics that distinguish online trading from traditional trading manifest themselves in three ways: information flow, cash flow and commodity flow: the flow of information symbolizes the methods of trading, the flow of currency represents the circumstances for trading, and the flow of commodities reflects the outcome of the trading process (Binding & Purnhagen, 2011).

II.III.I Payment Methods

The growth of technology has allowed the creation of multiple types of payment, both online and offline. As a result, businesses that want to reap the benefits of a worldwide customer base must provide a diverse choice of payment alternatives. According to the payment platform PPRO[14], 42% of customers could abandon their purchase if they do not have their preferred payment method.

Payments can be made by credit and debit cards, which continue to be the most widely utilised method of payment throughout the world.[15] However, because each country has its own issuers, making overseas transactions can be challenging at times because not all cards are accepted in all countries or locations. Furthermore, customers can pay for products or services electronically using digital wallets associated with a credit card or bank account. Google Pay, Apple Pay, and Venmo are just a few examples of well-known companies that provide e-wallets widely utilised worldwide. Moreover, payment gateways such as Paypal, a trustworthy third-party company that meets the payment processing needs, generally results in greater security, speed,

13 Regulations on E-Commerce Consumer Protection Rules in China and Europe Compared – Same Same but Different? https://www.jipitec.eu/issues/jipitec-2-3-2011/3173/binding_purnhagen.pdf

14Retailers risk losing 42% of US customers if they don't offer preferred payment methods https://www.ppro.com/news/retailers-risk-losing-customers/

15 Popular Payment Methods Worldwide https://jumpseller.com/learn/payment-methods/

and efficacy. Additionally, buy-now, pay-later payment options are on the rise, allowing consumers to make online purchases instantly and pay overtime in predetermined instalments (Stripe, 2021).

Finally, *cryptocurrencies* are also starting to be accommodated by businesses. Coinbase and Bitpay, for example, are specialised platforms that operate in conjunction with e-commerce enterprises to provide clients with the option of making purchases using *cryptocurrencies*. As previously stated, many companies have started to accept *cryptocurrency* as payment. However, there as some that instead use a *Cryptocurrency* Payment Gateway. Similar to payment processors, gateways and acquiring bank credit cards, this is a digital currency payment processor. It allows companies to take digital payments and convert them into fiat currency instantaneously. Decentralisation and anonymity are built-in to the *bitcoin* model from the ground up. Making a transaction between two parties is simplified thanks to the technology. Nevertheless, merchants may be reluctant to accept digital currency payment as they do not understand how it works or have scepticism about the system, given that its use as a payment method is still in its initial stages from a global perspective (Seth, 2022).

II.III.II The Regulation of E-Commerce in the EU

The Member States of the European Union operate under the Directive 2000/31/EC of the European Parliament and of the Council which is concerned with ensuring that information society services – activities including a broad variety of commercial transactions conducted online - may be freely moved between member states in order to aid in the smooth functioning of the internal market.

All European Union Member States have the authority to define the framework for the development of information society services delivered on their territory. Moreover, they have the authority to regulate and penalize misfunctions that are later shown to be active and significant in this sector. Furthermore, it should be highlighted that the Member States may not impose restrictions on the free movement of information society services in the other Member States.

The act of electronic commerce is the selling of products or services, or interposition in the circulation of commodities, for profit. Since the e-commerce directive's provisions impact other normative acts, both suppliers and users of information society services may be people or legal organizations. Although e-commerce regulation does not include additional players, e-commerce involves not just the provider and the consumer but also a host of other actors who help facilitate the transaction. Of the many service providers that can legitimately be included in this list: public regulators and public control authorities; postal and delivery service providers; transport service providers; payment solution providers; support service providers, as well as logistics outsourcing companies (Tofan & Bostan, 2022).

In addition, the Directive sought to harmonize minimal levels of liability for internet intermediaries throughout the European Union (EU). The legislation established the "safe harbour" principle, according to which online intermediaries who host or transmit content provided by a third party are exempt from liability unless they are aware of the illegality of the content and do not take adequate steps to prevent it from being distributed. The removal of unlawful internet material is subject to "duty of care" and "notice and takedown" responsibilities on the part of the service provider (Madiega, 2020). However, the internet has evolved dramatically during the last 20 years toward a more active community. User-generated content has grown exponentially as a consequence. On the other side, government pressure on firms to develop voluntary safeguards against purportedly unlawful or "harmful" information is increasing. Due to the two concurrent developments, there has been an increase in erroneous deletions and the banning of legitimate speech (Fiedler, 2019). According to Piedade Costa de Oliveira, online intermediaries' obligations of care and responsibilities, as well as how far they should be obliged to take aggressive action, are perennially controversial issues in a variety of industries (Oliveira, 2019).

Accordingly, both the Digital Markets Act and the Digital Services Act have been proposed by the European Commission to modernize EU regulations covering digital services

(DMA), in order to tackle the issues brought by the evolution of the internet. As a result, a single set of new EU rules will be implemented across the continent in order to create a more secure and open digital environment. In accordance with the European Commission, society and the economy stand to lose a great deal due to this revolution's challenges. The illicit sale and exchange of products, services, and material over the Internet is a significant problem. Online services are also being abused by algorithmic manipulators to propagate misinformation and do other terrible deeds. The way platforms respond to these new issues greatly influences online fundamental rights.

The Commission proposed the legislation in December 2020, and a political agreement was obtained on the Digital Markets Act on March 25, 2022, and the Digital Services Act on April 23, 2022.

In July 2022, the European Parliament adopted the Digital Services Package in its first reading, a monumental step in the regulation of online platforms and search engines. Fast forward to February 2023, both the Digital Services Act and Digital Markets Act have been adopted by the Council of the European Union, signed by the Presidents of both institutions, and published in the Official Journal.

The Digital Services Act officially went into effect on 16th November 2022 after being published in the Official Journal on 27th October 2022. This means that online platforms and search engines operating in the European Union will be held to a higher standard when it comes to the protection of users and content moderation. The Digital Services Act is a powerful tool for regulators, but it also places new responsibilities on online platforms and search engines. As of 17th February 2023, online platforms must disclose their number of active users. Those with more than 45 million users, will be designated as *very large* online platforms or search engines by the European Commission. These services will have four months to comply with the obligations of the DSA, including providing the Commission with their first annual risk assessment.

Additionally, EU Member States will need to appoint Digital Services Coordinators to ensure compliance with the Digital Services Act. This is also the deadline for platforms with less than 45 million active users to comply with all the rules in the Act. This landmark legislation is a critical step in ensuring the safety and security of online services, and will undoubtedly shape the future of online regulation in Europe and beyond. (European Commission, 2023)

II.III.III The contractual stages of E-commerce

Contracting online and offline are almost identical processes. The same conditions must be met in order for the contract to be enforceable. Both parties must wish to engage in a legally binding agreement and have agreed on a set of conditions. To understand how contracts are formed online, it's essential to know the three-stage analysis: invitation to treat, offer, and acceptance. First, there is a good chance that websites will be seen in the same way as a shop window is and that the marketing of an item for sale on a website will be interpreted as an invitation to treat the visitor. If this is the case, an offer will only be made when a buyer expresses his or her desire to purchase an item from the site by, for instance, putting an order, and then the seller will still have the option to accept or reject the offer (Pinsent Masons, 2008).

- Offer and Invitation to treat

Offering a contract is a statement of readiness to enter into a contract that is made with the purpose (real or apparent) that it will become legally binding on the person who makes it when it is accepted by the person to whom it is directed. There must be an offer, an acceptance, and an exchange of consideration for a contract to be legal. Offers are made by the "*offerer*," and the person who accepts them is known as the "*offeree*." An offer must have explicit conditions and be made with the goal of becoming binding. So, if someone makes a promise but does not intend to fulfil it, they are making an "*invitation to trade*" or "*invitation to treat*", not an offer. A contract discussion would only include words expressing a readiness to accept proposals (Nuth, 2008). In electronic means, an offer would equal to goods or services posted on websites with the intention to sell.

- Communication

To communicate, one must use one of the following: voice, writing, gestures, behaviour, or digital communication. It is the act of conveying a concept to someone else's mind. The offeree must be informed of the offer before it takes effect. The timing of the offer's notification is critical in determining when the offeree is able to accept it. Regardless, there are certain exceptions to this rule, such as when a deadline has passed for acceptance, and the offer is received, and the offeree is unable to accept the offer because of this. In the same way, if the transmission of the offer is delayed and the offer has already expired, it cannot be accepted (Nuth, 2008). For electronic contract purposes, an offer would equal to the act of placing an order. According to *Article 11,* Member States must take into consideration that (1) *the service provider has to acknowledge the receipt of the recipient's order without undue delay and by electronic means* (2) *the order and the acknowledgement of receipt are deemed to be received when the parties to whom they are addressed are able to access them.*[16] When a website is nothing more than an invitation to treat, a customer's order is really an offer to acquire the products or services being offered. An order placed by the customer will be regarded as an acceptance of the offer if a website is considered to be an offer made to the customer by the website.

- Acceptance

To constitute a legally binding agreement, an offer must be accepted. There is no contract if the offeror makes an offer, and the offeree rejects it. To accept a contract, both parties must come to an agreement on its terms (Lee & Bookseller, 2021). In the same way, that intent to make an offer is evaluated by an objective standard, intent to accept an offer is evaluated by objective criteria. The distinction is that in order for a contract to be formed, the offeree must objectively express a present intent to enter into a contract on the conditions of the offer. A contract can only be formed if both parties act in accordance with the terms of the offer, which

16 Electronic Commerce Directive 2000 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32000L0031&from=EN

can be specified in great detail by the offeror. If the offeror does so, the offeree must typically comply with all of the terms of the offer before a contract can be formed between the two parties. When the offeree fills out the form in order to confirm the purchase, the final *click* would equal to the acceptance. The acknowledgement is provided via an automated email sent by the service provider's system, and the contract is regarded as ended only once the receiver has been able to have access to the acknowledgement.

When it comes to paying directly with cryptocurrency, it is important to notice how this can change the nature of a contract. Depending on the jurisdiction where the contract takes place, cryptocurrency may or may not be recognized as actual currency. If it is, a regular purchase contract takes place. If not, it ceases to be a purchase given that the payment is not legally recognized and turns into an exchange of goods.

A barter deal is a legal contract that spells out the conditions of exchange between parties. A transaction of goods, services, products, or something similar could be involved. Barter agreements are frequently utilized to replace cash or monetary payments. The transaction is completed by trading a digital asset - virtual currency - for a physical asset for example.

II.IV Regulation on Cryptocurrency

The argument over how *crypto* assets should or should not be classified under law, also known as legal taxonomy, has contributed significantly to the development of an infrastructure for *crypto* finance and its regulation. The absence of agreement on the nature of *crypto*-assets - what should be regulated - inhibits the creation of a unified regulatory strategy. Consequently, the issue of whom to regulate becomes an important one. Because of the decentralized nature of the *blockchain*, it is not easy to pinpoint a specific entity to whom legislation should be applied (Jovanic, 2021). *Crypto* assets are defined in law by legal taxonomy so that players in this emerging system may understand how to use them to catalyse socio-economic growth, monetise them, limit risks, and manage how the system is used (Lee J. , 2022).

A lack of legal certainty or regulatory interference can cause the downfall of a mature or emerging sector (Mandjee, 2016). The majority of regulations governing financial intermediation were drafted prior to the emergence of new fintech advances. As a result, rules may be in contradiction with the new setup of creative ways, and certain fintech may not fall within the categories that were previously defined by relevant legislation. Furthermore, certain advances have resulted in structural changes, and regulators should first examine the risks associated with these changes and determine whether or not they are covered by the present framework. In addition, the sooner regulators are exposed to innovation, the better they will be able to spot hazards, while financial innovators will have the chance to alter their service whilst compliance costs remain affordable (Jovanic, 2021). As a result of the absence of a regulatory framework, it is challenging to execute official government policy. Virtual currencies may be used as tax havens for tax evasion since it is impossible to trace and identify the participants in transactions.

The volatility of fluctuating coin markets, such as the *bitcoin* market, shows that a stable market structure needs legal certainty and government intervention (Chiu, 2019). To bring the asset inside its regulatory scope, the regulator applies existing laws or creates new ones. As new notions of law and regulation arise in this field, software engineers have begun to collaborate with attorneys to develop intelligent solutions that connect the many roles (Bolotaeva, Stepanova, & Alekseeva, 2019).

As *bitcoin* continues to evolve from speculative investment to a balanced portfolio stablemate, governments worldwide remain divided on regulating the growing asset class.

Effective regulation is a vital element for the flourishing of the crypto universe. It serves as a protective shield for investors by curbing any fraudulent activities and providing a secure platform for all to thrive. With the right regulatory framework, the wild west of *crypto* can be tamed, and investors can rest easy knowing they are not being taken for a ride by dubious operators. Furthermore, financial regulators can keep a hawk's eye on the market and prevent investors from falling prey to scams and other fraudulent schemes. A robust regulatory

environment can also facilitate partnerships between crypto firms and governments, leading to the eradication of illegal money activities (Docherty, 2023).

In short, effective regulation is the key to unlock the true potential of the *crypto* landscape, where investors can trust the system, and businesses can prosper in a transparent and stable market.

II.IV.I European Blockchain Regulatory Sandbox

A regulatory sandbox serves as a virtual playground to explore the impact of cutting-edge technologies in a controlled environment. The UK's Financial Conduct Authority has spearheaded this movement through its *Project Innovate* initiative, dubbing sandboxes as a safe haven where businesses can test out innovative products, services, business models, and delivery methods without immediately incurring regulatory consequences (Arner, Barberis, & Buckley, 2017). Regulatory sandboxes are not about loosening safety and protection standards. In fact, there are many grey areas where proper legislation is yet to be formulated. The beauty of regulatory sandboxes is that they can facilitate the development of an appropriate legal framework without compromising vital standards.

In February 2023, the European Commission launched a regulatory sandbox that "*establishes a pan-European framework for regulatory dialogues to increase legal certainty for innovative blockchain solutions*"[17]. The European Blockchain Sandbox was established to serve as a catalyst for fruitful conversations between regulators and innovators in both the private and public sectors. This secured and confidential environment will provide legal advice and regulatory guidance, encouraging cross-industry and cross-border collaboration to identify and share best practices for the benefit of the wider EU/EEA blockchain community. The sandbox welcomes blockchain use cases from any infrastructure and will select 20 of the most promising ones annually, based on their maturity, regulatory relevance, and alignment with the EU's policy priorities. Matched

17 European Commission - Launch of the European Blockchain Regulatory Sandbox https://digital-strategy.ec.europa.eu/en/news/launch-european-blockchain-regulatory-sandbox

with relevant national and EU regulators, use case developers will engage in a constructive dialogue to tackle the most critical regulatory challenges.

II.IV.II Around the World

Cryptocurrencies are classed and taxed differently throughout the world because of the patchwork of regulations in various countries (Smith, 2021).

Algeria, Bangladesh, China, Egypt, Iraq, Morocco, Nepal, Qatar, and Tunisia are among the nations that have explicitly banned *cryptocurrencies*, according to a report issued by the Law Library of Congress in November 2021[18]. Bangladesh, for instance, has issued a warning on how cryptocurrency trading "*may violate the Money Laundering Prevention Act, 2012*" (Taylor, 2021). *Bitcoin* may be used to perform transactions between any account holders anywhere globally in an anonymous manner. For governments, this has resulted in some worries about the value of their currency.

Thus, because of the fact that certain lawmakers and authorities oppose its usage due to a lack of control and illegal connections, several countries have enacted limitations under their anti-money laundering and counter financing of terrorism legislation in an effort to minimize its use for these objectives (Bajpai, 2021).

- **China**

In China, according to a joint release by the central bank and nine other government ministries, all '*cryptocurrency*-related commercial operations are "*illegal financial activity*" that is absolutely forbidden. Illegal financial operations include overseas *crypto* exchanges that provide services to Chinese domestic citizens over the internet. In addition, financial and non-bank payment institutions are prohibited from providing cryptocurrency-related services (Xin, 2021).

18 Regulation of Cryptocurrency Around the World: November 2021 Update - https://tile.loc.gov/storage-services/service/ll/llglrd/2021687419/2021687419.pdf

Between 2019 and 2020, over €46 billion worth of *cryptocurrencies* departed East Asian accounts for non-regional destinations, according to Chainalysis[19]. Because China has a significant presence in East Asian *cryptocurrency* exchanges, Chainalysis believes that most of this net bitcoin outflow was really capital flight[20]. Capital fleeing China between 2019 and 2020 is unknown to Chainalysis, however it is predicted to be around €46 billion (Chainalysis, 2020). As part of its existing stringent capital restrictions, China imposes an annual limit of around €46,000 on the acquisition of foreign currency (Reuters, 2017). As a result, the capital flight enabled by *cryptocurrency* is particularly noteworthy. Chinese billionaires previously got past capital regulations by buying overseas real estate, inventing new ways to bill for international commerce, and even forcing their workers to deposit money abroad. With *bitcoin*, Chinese citizens may readily purchase overseas assets without the inspection of the Chinese government. Overall, there is substantial evidence that the cryptocurrency ban was a reaction to the recurrent issue of Chinese capital flight. The People's Bank of China was aware that *bitcoin* was compounding China's chronic problem of capital flight, given the amount of wealth already leaving through cryptocurrency exchanges (Shin, 2022). Overall, it is clear that China is taking a tough stance on cryptocurrency, with a focus on minimizing financial risks and illegal activities.

Other nations have chosen an implicit prohibition, which means that their governments, among other measures, do not let financial institutions accept *crypto* businesses or holders as customers and even forbid *cryptocurrency* exchanges from operating. Some of these nations are part of economic zones where *cryptocurrency* is not accepted. For example, this is the situation with Benin and Burkina Faso, both Central Bank of West African States members, which do not accept cryptocurrency within their economic zone. (Benson J. , 2022).

19 East Asia: Pro Traders and Stablecoins Drive World's Biggest Cryptocurrency Market - https://blog.chainalysis.com/reports/east-asia-cryptocurrency-market-2020/

20 Happens when assets or money rapidly flow out of a country

- **United Kingdom**

Cryptocurrencies are neither prohibited nor banned in the United Kingdom, although they are not regarded as legal tender. Although investors must still pay capital gains tax on crypto trading income, taxability is more widely determined by the crypto activities done and the parties involved in the transaction.

Since Brexit, the United Kingdom has taken a different regulatory course, and it is now striving to ensure that the sector is adequately regulated and registered. Among some of the actions taken by the government, the Financial Conduct Authority communicated that it has fifty active investigations into unregistered *cryptocurrency* companies after the initiation of more than three hundred complaints involving unregistered *cryptocurrency* enterprises. Furthermore, to protect existing payment systems from a potential threat from *stablecoins*, the Treasury has announced preparations for regulation (Choo & Pimentel, 2022). In the future, the UK may deviate from EU cryptocurrency legislation. In January 2021, Her Majesty's Treasury announced guidelines indicating the UK's intention to comment on placing some *cryptocurrencies* under 'financial promotions regulation' and to continue to investigate a 'broader regulatory framework'. In addition, with the help of a new law, the government addressed deceptive *crypto*-asset pitches and brought *cryptocurrency* ads in line with conventional financial advertising in January 2022 (Comply Advantage, 2022).

On February 2023, the UK government announced plans to robustly regulate *crypto* asset activities, including strengthening rules for *crypto* trading platforms and introducing a world-first regime for *crypto* lending. The proposals aim to enhance consumer protection and operational resilience of firms, while seeking views on improving market integrity. This announcement delivers on the Prime Minister Rishi Sunak's plan to embrace technological change and innovation for growing the economy (HM Treasury, 2023). The UK's approach to *cryptocurrency* regulation is seen as relatively balanced, seeking to strike a balance between protecting consumers

and investors, while also fostering innovation and supporting the growth of the cryptocurrency industry.

- **India**

India, similarly, to the United Kingdom, declares that *cryptocurrencies* are not a legal tender. Despite this, the nation's Central Board of Direct Taxation requires investors to pay taxes on *cryptocurrency* trading gains. The Reserve Bank of India (RBI) banned financial institutions from trading in virtual currencies in 2018, nevertheless the Supreme Court overturned that ruling in March 2020. Nonetheless, rules in the nation remain ambiguous. For instance, in early 2021, India proposed a regulation that would make it illegal to issue, retain, mine, and trade *cryptocurrencies* other than state-backed digital assets (Smith, 2021).

The Indian market expanded 641% between July 2020 and June 2021, with a total transaction value of €527,43 billion, or 14% of the world total, Central and Southern Asia was the fourth-largest *crypto* market analysed. During that time period, 42% of transfers sent from Indian addresses were valued at more than $10 million, compared to 28% for Pakistan and 29% for Vietnam (Rodrigues & Ghosh, 2022).

In an effort to regulate *crypto* income, India imposed a 30% flat tax effective April 2022 and introduced a 1% tax deducted at source (TDS) on transactions above 10,000 Indian rupees (€113) from July of the same year. However, the implementation of the 1% TDS had the most "*distortionary impact*" leading to a capital flight of about €3.27 billion moved from India's centralized *crypto* exchanges to foreign exchanges between February and October 2022, in an attempt to avoid the taxes (Mukherjee, 2023).

The country has chosen to maintain its strict *crypto* tax regulations from the previous year and has even added the possibility of a fine or imprisonment for non-compliance with TDS. This development was confirmed by three attorneys speaking to CoinDesk, highlighting the continued government crackdown on *crypto* in India (Singh, 2023).

- **United States**

In the United States, federal regulatory authorities have published various regulations in recent years regarding their handling of *cryptocurrency* transactions, investment profits, payment services, and other activities involving digital assets.

The Securities and Exchange Commission (SEC) has communicated that it considers *cryptocurrencies* securities and would apply current securities regulations to digital assets, which happen to be strict (Choo & Pimentel, 2022). This is significant for retail investors because it implies they must record realized profits and losses from *cryptocurrency* assets on their annual tax returns. Failure to do so will bring the Internal Revenue Service's attention, which has threatened to crack down on *crypto* tax evaders. (Hyatt, 2021).

One example for this is the mediatic case of SEC vs. Ripple Labs, a US technology firm that created the *Ripple* payment protocol and exchange network and developed the currency known as *XRP*. The lawsuit, filed by SEC, claims Ripple raised over €1.2 billion illegally, and it holds Ripple co-founder Christian Larsen and current CEO Bradley Garlinghouse liable, claiming considerable gains earned in the process. If SEC wins the lawsuit, *XRP* (the cryptocurrency of the Ripple Blockchain) becomes a security in the US. This might create a legal precedent for other *cryptos* to be categorized as securities. Thus, the lawsuit against Ripple is vital for all crypto players, including investors, blockchain developers, and policymakers worldwide (Carson, 2022).

Notwithstanding, it is important to note that there is an uneven regulatory environment that differs greatly between states and creates the possibility of state and federal laws conflicting (Hansen, 2021). As a result of the country's fragmented financial regulatory scheme, which includes multiple agencies scrambling for a role in *cryptocurrency* and 50 states exercising some level of financial oversight, the United States is deemed the "*most complex*" and "*most difficult*" place for business for *cryptocurrency* companies, according to Michael Philipp, partner at Morgan, Lewis & Bockius (Choo & Pimentel, 2022).

Furthermore, there are nations where despite *cryptocurrency* regulations, which may differ or be ambiguous at times, they all have one characteristic in common: they are tax havens.

The rise of the *cryptocurrency* business has forced numerous nations to regulate it, most notably by placing capital gains taxes on *cryptocurrencies*. Despite this, certain nations have emerged as crypto tax-havens because of their governments' comparatively liberal crypto tax legislation. Legislators' objectives vary, but they may be motivated in part by a desire to attract *crypto* investors and enterprises (Vermaak, 2021).

The beginning of year 2023 turned into a fierce battleground as regulators launched a full-blown assault on digital assets. In January, state and federal regulators set their sights on two high-profile crypto companies, leaving them reeling under the intense pressure by imposing fines and penalties. The Securities and Exchange Commission also took action against *crypto* lending firms, while federal banking officials released policy statements aimed at impending *crypto* firms to access mainstream finance.

The crackdown comes in response to the damage wreaked by the *crypto* market in 2022, which saw prominent companies file for bankruptcy and investors lose billions of dollars. With enforcement on the rise, the industry is bracing for a lengthy period of legal battles. It's clear that regulators are growing increasingly urgent in their efforts to address the threat posed by *cryptocurrencies*, which enable new forms of financial speculation and experimentation (Yaffe-Bellany, 2023).

According to Hinesh Shah, a legal expert at Multinational Law Firm Pinsent Masons, the recent crackdown by the SEC on some of the biggest players in the *crypto* industry demonstrates the regulators' "*proactive*" approach in restraining non-compliant digital asset firms. However, Shah also cautioned that the repercussions of such enforcement actions may extend beyond the *crypto* space, potentially causing harm to conventional financial institutions that process payments for *crypto* companies (Hamilton & Shah, 2023).

- **Belarus**

For instance, Belarus adopted an unusual approach to *cryptocurrency* in 2018. Rather than enacting *crypto* tax regulations, as many other nations have done, the Eastern European state-approved *crypto* operations in March 2018 and exempted all individuals and enterprises from *crypto* tax until 2023. A report from Chainalysis[21], ranked Belarus third in Eastern Europe behind Ukraine and Russia in its cryptocurrency adoption index, noting a high level of peer-to-peer activity.

As a result, all *crypto* activities, including mining and day trading, are regarded as personal investments, exempting them from income tax and capital gain tax.

This unusual law was enacted to boost Belarus's digital economy and will be reviewed in 2023. So, while Belarus is now a *crypto* tax haven, this may change in the future (Koinly, 2022).

- **El Salvador**

On the other hand, El Salvador made news throughout the world when it became the first government to declare *bitcoin* legal tender in June 2021. The nation hopes that it could draw more investment into its economy. So, the country now exempts overseas investors from paying any tax on *bitcoin* profits or income to encourage this (Koinly, 2022). At the time of the initial announcement of the *bitcoin* legislation, President Nayib Bukele made a magnificent pledge to his nation. He claimed that adopting *bitcoin* would help digitize the economy, reduce reliance on the U.S. currency, minimize remittance costs — which account for almost 20% of the country's gross domestic product — and spur economic growth by encouraging investment (Brigida & Schwartz, 2022).

According to a report published by PwC[22], the reasons behind El Salvador's interest in cryptocurrency comes from the fact that it increases the effectiveness of overseas remittances, as

21 The 2020 Geography of Cryptocurrency Report - https://redeeem-cdn.sfo2.digitaloceanspaces.com/public/2020_chainalysis_geography_of_crypto_report.pdf

22 El Salvador's law: a meaningful test for Bitcoin - https://www.pwc.com/gx/en/financial-services/pdf/el-salvadors-law-a-meaningful-test-for-bitcoin.pdf

remittances account for more than 20% of El Salvador's GDP (World Bank, 2020), implying that a sizable portion of the population is reliant on money transfers from outside the nation. Additionally, in El Salvador, nearly 70% of the population does not have a bank account. *Bitcoin* technology may make financial services more accessible to a broader public segment (Arslanian, Donovan, Blumenfeld, & Zamore, 2021).

However, the execution of making the Salvadoran economy up and running on *bitcoin* did not go as well as expected. Officials from the Salvadorean administration said on several occasions that accepting *bitcoin* would be wholly voluntary and on several others that it would be obligatory. Ultimately, Article 7 of the *bitcoin* Law, which renders *bitcoin* adoption obligatory, has remained in effect for the time being. Bukele named the network "Chivo", but Chivo was not formed until August 24, two weeks before the debut. Because Chivo is a private corporation, it is not subject to the same freedom of information regulations as a government agency. Carolina Recinos, the president's chief of staff, is a Chivo SA de CV director and is on the US State Department's Engel List of corrupt officials (Gerard, 2021).

When it came to accepting *bitcoin* as payment, merchants were hesitant. People refused to believe in money they could not touch. Some street vendors even lack mobile phones and knowledge of their usage, and literacy is an issue for many of their clients. In addition, the reliability of Chivo transfers to bank accounts was questionable due to glitches experienced in the app and issues with ATM withdrawals. This resulted in many violent protests against the government's utter lack of openness, the faulty Chivo payment system, and the coerced system adoption (Bateman, 2021).

Bukele's enthusiasm for promoting *bitcoin* adoption among Salvadorans is waning as he focuses more on fixing the country's economic problems and enhancing his public image (Brigida & Schwartz, 2022).

In January 2023, El Salvador approved a law that regulates the issuance of digital assets. This new law, known as the Digital Assets Issuance bill, enables the country to issue volcano bonds (*bitcoin* backed bonds) to tackle foreign debt and boost the development of *'Bitcoin* City,' a hub for digital asset investment. El Salvador's Congress gave the green light for this bill to pass, marking an important milestone for the country's economy (Golubova, 2023).

- **Portugal**

In Europe, Portugal has announced various incentives over the years: earnings from *cryptocurrencies* are free from VAT in the country, and *cryptocurrency* enterprises have reduced legal and regulatory burdens.

While adhering to EU norms on digital currency regulation, Portuguese officials have stated that *cryptocurrency* would be recognized as a currency but not an asset. The Ministry of Finance published a notification in 2016 declaring that retail transactions of *cryptocurrencies* would be exempt from taxation, with only trades or revenue earned from a professional activity subject to taxation (Galea, 2021).

A "Digital Transitional Action Plan" was authorized by the Portuguese government in April 2020 to boost digitization. The government said it would support firms' innovation and digital transformation by implementing this strategy. "Technological Free Zones" are to be established to promote experimentation in blockchain and other sectors as part of the plan (Madeira, 2020).

In May 2022, a property was 'purchased' for the very first-time using bitcoin, in Braga. Following this, a platform was launched to 'buy and sell' houses exclusively with cryptocurrency. As mentioned earlier, however, cryptocurrency is not recognized as currency in Portugal, which makes this an exchange deal between the digital asset and the house (idealista, 2022). It is important to remember that with the new regulation of the Portuguese Bar Association of Notaries launched in April 2022, it became possible to carry out a real estate business entirely in cryptocurrencies through an exchange, that is, there is an exchange of digital money for the right

to the property. Before this regulation, this was not possible, and the houses were only partially sold in cryptocurrencies because prior to carrying out the business it was necessary to convert the virtual currencies to euros.

- **Switzerland**

Still in Europe, Switzerland is one of the most well-known worldwide tax havens due to its loose tax and privacy rules, which have resulted in criticism from authorities in both the United States and the European Union. The landlocked European country has historically let affluent individuals pay modest taxes and, for example, collects taxes solely on households, not individuals.

In terms of *crypto* assets, Switzerland has a favourable and appealing legal environment in place, even if the country does not have a distinct legal framework for them (Favre, Houdrouge, & Tribolet, 2021). Individuals' crypto exchange profits and losses are treated the same as those of regular exchanges by the Swiss authorities, who consider all of their *crypto* exchange earnings and losses to be tax-free. On the other hand, *Crypto* firms must record and pay taxes on their profits (Vermaak, 2021). In Switzerland, the *crypto* industry is subject to the same regulations as traditional financial institutions. Crypto companies must comply with anti-money laundering and consumer protection laws and obtain a FINMA license to operate. While embracing the potential of *blockchain*, the Swiss financial authorities keep a watchful eye on market participants to prevent fraud, especially in the context of ICOs (Docherty, 2023).

II.IV.III Markets in Crypto-Assets Regulation

On a broader level, the EU Commission published a proposal for the regulation of *crypto* assets: the "Markets in Crypto-Assets Regulation" (MiCA), on September 24th, 2020. The regulation proposal is an example of the most thorough, detailed standardization of laws on issuance, trading in *crypto*-assets, and investor protection that has been developed to date (Jovanic, 2021).

Even though the concept of a *stablecoin* has been around for several years in various forms, the entry of a prominent technology player such as Facebook - and the introduction of its *stablecoin Libra* - into the market has awoken regulators around the world to the possibility of a *stablecoin* achieving global reach[23]. The relatively modest total market capitalization of all *crypto*-assets enabled authorities to maintain the notion that *crypto*-assets were a niche concern. In this way, *Libra* pushed *crypto*-assets into the mainstream of financial regulation.

The MiCA Regulation has the power to establish worldwide rules for the governance digital, *blockchain*-based assets. As a result, the EU can welcome *crypto* talent, firms, start-ups, and investments worldwide by imposing clear standards, economic and legal stability. On the other side, critical voices are concerned that portions of the law would go too far, imposing insurmountable limits on enterprises and putting a halt to several creative *crypto* use cases in the EU.

New uses for *blockchain* technology may be hindered by too much regulation since the technology is still in its early stages. For this market to thrive and innovate, it must be allowed to freely experiment with new technologies before strict licensing, or regulatory systems are implemented. Simultaneously, there is a risk that individuals who wish to use the technology may find themselves in a murky area since there are no restrictions in place (Jovanic, 2021). According to Patrick Hansen, a RegTrax Contributor for the European Union, this proposal is the consequence of three significant changes in recent years.

Firstly, between the end of 2017 and the beginning of 2018, the EU Commission instructed the European financial supervisory authorities (EBA, EIOPA, ESMA) to study the applicability of EU financial legislation to these new kinds of crypto-assets. In early 2019, the European Banking Authority (EBA) issued its Report with Advice to the European

23 Investigating the impact of global stablecoins https://www.bis.org/cpmi/publ/d187.pdf

Commission[24]. According to the study, *crypto*-assets are not subject to EU regulation to a considerable extent, although posing serious consumer protection and money laundering risks. It was stressed that although certain sections of European law may have a detrimental impact on financial engineering, in the majority of circumstances, consumer and investor protection requirements do not apply to transactions involving specific kinds of virtual assets (Jovanic, 2021). Furthermore, the members are obligated by the 5th Anti-Money Laundering Directive to act by early 2020 at the latest. However, this results in a chaotic mess of initiatives. Countries like Germany, France, Lithuania, and Malta have enacted significantly diverse rules, while others have done nothing. Supposedly, the still-young *crypto* industry has become increasingly fragmented, posing a significant locational disadvantage for the EU.

According to EBA, there must be an agreement at EU level on participants associated professionally in virtual currencies being legal entities and fully accountable for the integrity of central ledger exchanges, policies, procedures, and other components in digital money schemes (Jovanic, 2021).

Thus, the awareness among EU regulators was clear: a fully harmonized, comprehensive, and binding legal framework was required to avoid regulatory loopholes and market fragmentation (Hansen, 2021). Because *cryptocurrencies* are based on decentralized distributed ledger technology, no one command or compromise them. So naturally, this attracts people to *cryptocurrencies*, especially those who believe in the original *bitcoin* ideas of decentralized monetary exchange and governance (Cengiz, 2021).

If the MiCA plan is implemented, it would effectively put all *crypto*-assets into the EU's regulatory framework for financial services. The goal of the proposed law is to include all *crypto*-assets that are now not covered by EU financial services regulations. Companies that wish to run and/or promote a *cryptocurrency* project in the EU or offer services concerning crypto-assets would

24 Report with advice for the European Commission - https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1

likely face a considerable upheaval as a consequence of the proposal (Casanova, Ng, & Feehily, 2020). The legislation does not include the *blockchain* or distributed ledger technology underpinning *cryptocurrencies*, nor does it include digital currencies issued by governments and/or controlled by central banks. The rule applies to all other *cryptocurrencies*, not financial assets, such as utility tokens and payment tokens.

Listed below are the kinds of crypto-assets that MiCA recognizes along with the given definitions:

- *'asset-referenced token' means a type of crypto-asset that purports to maintain a stable value by referring to the value of several fiat currencies that are legal tender, one or several commodities or one or several crypto-assets, or a combination of such assets*
- *'crypto-asset' means a digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology;*
- *'asset-referenced token' means a type of crypto-asset that purports to maintain a stable value by referring to the value of several fiat currencies that are legal tender, one or several commodities or one or several crypto-assets, or a combination of such assets;*
- *'utility token' means a type of crypto-asset which is intended to provide digital access to a good or service, available on DLT, and is only accepted by the issuer of that token.*[25]

The regulation employs unusual wording unfamiliar to the *cryptocurrency* sector, categorising *stablecoins* as 'e-money tokens' and asset referenced tokens. *Stablecoins* (also known as 'asset-referenced' tokens) are subject to stringent regulatory transparency, operation, and governance rules. *Stablecoins*, unlike other *cryptocurrencies*, must be authorised by regulatory organisations before they may be traded within the EU, and this need extends to *stablecoins* that are currently in circulation. As a result, when the legislation goes into effect, current *stablecoins* will

25 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Markets in Crypto-assets, and amending Directive (EU) 2019/1937) https://eur-lex.europa.eu/resource.html?uri=cellar:f69f89bb-fe54-11ea-b44f-01aa75ed71a1.0001.02/DOC_1&format=PDF

be required to obtain regulatory approval to trade in the EU. The regulation, most crucially, prevents the issuing of interest on e-money tokens (Cengiz, 2021). According to Firat Cengiz, Senior Lecturer in Law at the University of Liverpool, the interest prohibition appears to be an attempt by the EU legislature to disincentivize the investing of *crypto* earnings in stablecoins, and therefore to safeguard the interests of the European banking industry. This comes as a benefit for national tax authorities, by making it easier to trace *crypto* gains should they convert to fiat money rather than held in stablecoins.

Nonetheless, decentralization implies that *crypto* adopters cannot appeal to authorities in times of fraud, cyber-attack, or unintentional pecuniary loss, a disadvantage addressed earlier. Thus, to some extent, the proposed EU law tackles this concern by subjecting *cryptocurrency* exchanges (which the regulation refers to as "crypto-asset services") to consumer protection, transparency, and governance norms (Dion-Schwarz, Manheim, & Johnston, 2019).

These modifications will protect consumer funds against cyber-attacks, theft, or failures that are the responsibility of *bitcoin* exchanges. However, the policy ignores some *crypto*-specific dangers. For example, although the rule holds *cryptocurrency* exchanges liable for customer asset losses caused by fraud, cyber-attack, or carelessness, it does not extend the necessity of mandatory insurance to these circumstances or accidental loss (Cengiz, 2021).

Furthermore, the proposed regulation requires a "white paper" before a general *crypto*-asset is to be issued to the public in the EU or allowed to a *crypto*-asset trading platform. If a *crypto*-asset is to be promoted or allowed to trade on a *crypto*-asset trading platform, the white paper must be registered with an EU authority and published on the issuer's website. For example, MiCA stipulates that the white paper must contain full explanations of the project, rights and duties associated with the *crypto*-asset, information on the underlying technology, and a discussion of the risks. In addition, MiCA mandates fair, unambiguous, and non-misleading disclosures. Notably, the proposed regulation holds the issuer liable for damages if it fails to achieve this criterion and compels issuers to form a legal corporation, giving investors a named

party to litigate (Casanova, Ng, & Feehily, 2020). Additionally, MiCA will allow non-EU issuers to sell a broad *crypto*-asset throughout the EU from a single point of entry, removing fragmented national regimes. However, e-money and asset-referenced tokens' issuers must be based in the EU and licensed under the EMD or MiCA. For non-EU *stablecoin* issuers, this implies establishing a sizeable local presence before selling to EU clients.

Moreover, the Commission has proposed an amendment to the Directive on Administrative Cooperation, which would expand information exchange between EU tax authorities regarding revenues generated by investments in or payments with crypto-assets and e-money. This is in addition to MiCA's tax law provisions. The acceptance of MiCA's definition of *crypto*-assets legal status will offer the legal clarity needed to establish the taxation laws applicable to *crypto*-assets in member states. There are still many aspects to be worked out before MiCA can be fully implemented. Thus, each jurisdiction will have to define its own taxation policies for *crypto*-assets (Broumas, 2021).

From an international outlook, the EU is undeniably taking the lead with the introduction of this proposal, notably in light of the inconsistent regulatory environment in the United States - which varies significantly between states and offers the potential for state and federal laws to conflict - or the restrictive attitude toward *cryptocurrencies* of many Asian countries such as China, as mentioned above. Valdis Dombrovskis (former EU-Commission Vice President for Financial Services) openly revealed the EU's intention to lead the way in worldwide *crypto*-regulation in June 2020. As a result, the MiCA might be a vital factor in attracting *crypto* talent, firms, and investments worldwide (Hansen, 2021).

Although the prospect of a liberal license for *crypto* asset service providers seems appealing to major *crypto* businesses eager to establish themselves in the area, industry participants are also concerned about how MiCA could affect the digital asset market in the EU in other ways.

For example, Martin Erhold, a regulatory specialist at Bitpanda, stated that although legal clarity is likely to attract institutional investment, overregulation may drown out innovation and entrepreneurs. In addition to rigorous requirements for *crypto* issuers, MiCA would require enterprises to register in the EU and shoulder compliance expenses or face being blacklisted, he added (Handagama, 2021).

The European Parliament endorsed its negotiating position on MiCA on March 14th.

Parliament left out specific wording that would have outlawed Proof-of-Work (PoW) based digital currencies due to energy consumption concerns in this latest iteration of the legislation text. As the most well-known use of the PoW consensus technique, this might also signal a tacit adoption of *Bitcoin*. This approach is particularly favourable for the *crypto* business, as many had predicted that the first rules would be ineffective and harmful to the EU's crypto economy. Nevertheless, *crypto* advocates, on the other hand, are sceptical, because the draft language proposes an option in which *crypto-assets* are still subject to basic environmental sustainability criteria. Ultimately, the draft law distinguishes among *crypto*-assets generally, asset referenced tokens, also known as *stablecoins*, and e-money tokens, which are mainly used for payments. The European Securities and Markets Authority will now oversee the issuing of asset referenced tokens, while the European Banking Authority will oversee electronic money tokens (Deloitte, 2022).

As of 2023, according to Scorechain[26] The fate of the MiCA bill in the European Parliament remains in limbo, as its vote has been postponed until February 2023. Assuming it's given the green light by the Council of the EU, it'll be published in the EU Official Journal, with implementation set to commence 20 days later. That said, before businesses and institutions are subject to the regulations set forth in MiCA, there will be an 18-month interim period. During

26 Scorechain - MiCA set to be voted into law in 2023 https://www.scorechain.com/blog/mica-set-to-be-voted-into-law-2023

this time, the European Securities and Markets Authority will provide guidance on how to classify digital assets, which could differ from the MiCA's stipulations.

II.V Analysis

Cryptocurrency, which was initially only known by a small group of anti-establishment investors, is swiftly becoming a household word. Analysts predict that the global *cryptocurrency* market would more than treble by 2030, reaching roughly €5 billion in value (Allied Market Research, 2022). Investors, businesses, and brands cannot ignore the swelling wave of *cryptocurrency* for long, whether they want to or not (Gorman, 2022).

To get anything you must always give something back. And, so, what you give in order to obtain something has evolved from pretty much anything to complex systems of currencies that define our society within a lining of trust. Evolution always ought to bring more safety, transparency, trust, and a solid base for the economy to grow.

Cryptocurrency, in its own way, has also evolved and adapted since its birth in 2009. *Bitcoin*, the first-born, brought an idea which was optimized and developed time and time again with the multiple *cryptocurrencies* that exist nowadays. *Stablecoins* were invented in order to avoid the volatility issue, for which crypto is so infamous.

Although, as mentioned earlier, the disadvantages surrounding *cryptocurrency* are far from defeated, the numerous concepts that are invented every day are a sign of how promising the technology is going to be for the economy, more than it already is.

Even though *cryptocurrency* has established itself in our economy, it still has plenty of developments to go through to become a currency of its own. With digital asset disruption rapidly fragmenting the industry, global financial services are striving to reinvent themselves, forming organisations to replace income streams that are dwindling. Because regulatory duties for the numerous aspects of digital assets do not yet demand a response, the sector has been slow to address the issue (Pawczuk, Walker, & Tanco, 2021).

The unification and solidification of the regulatory regime in an international level would be one of said barriers. As of now, it is hard to find a consensus between countries given that some major economies – such as China – are adopting a ban on *cryptocurrency*. However, in the beginning of 2022, a Chinese state-backed blockchain firm, revealed that it intends to build an infrastructure that will allow people and companies in China to create, sell, and acquire NFTs. Thus, it is clear how inevitable it is to disregard digital assets as a whole. Major economies tend to influence other nations, notwithstanding, even if there are some countries positioning themselves against *cryptocurrency*, plenty of other countries have embraced it and adapt their regulations, or even create new ones, to welcome *cryptocurrency*.

Regulation is very much needed in the dawn of this new tech world. A delicate balance is needed to harmonize both the innovation ahead and secure the financial system. Steps are already being taken to create rules on an international level, such as the MiCA Regulation, and it is expected that other nations follow the EU's lead. As expressed by Stefan Berger, a Member of the European Parliament, "*By adopting the MiCA report, the European Parliament has paved the way for an innovation-friendly crypto-regulation that can set standards worldwide. (...) Many countries around the world will now take a close look at MiCA*".[27]

Notwithstanding, the MiCA and most regulations worldwide are still a work in progress, as is the technology and - most importantly - its use. It was discussed how its main use shifted from currency to investment and, notably, how the economy is allowing a slow - but steady - shift to currency.

27 Cryptocurrencies in the EU: new rules to boost benefits and curb threats Press Release https://www.europarl.europa.eu/news/pt/press-room/20220309IPR25162/cryptocurrencies-in-the-eu-new-rules-to-boost-benefits-and-curb-threats

II.V.I Conclusion

According to a Deloitte's blockchain survey report[28], most financial analysts believe digital assets will either replace or provide a viable alternative to government-issued currencies within a decade. More and more institutions and investors are becoming interested in digital assets as a store of wealth, according to the report. There has been a significant increase in the number of innovative business models based on *cryptocurrency*, indicating a shift in the financial industry (Pawczuk, Walker, & Tanco, 2021). Companies must consider how to adapt their traditional goods to meet the wants of their consumers in the future.

Digital assets bring new views and opportunities to the business world, which every organisation should study or risk falling behind. It is impossible to say when *bitcoin* and digital asset transactions will become the norm. However, the technology adoption curve shows that the period between introduction and popular acceptance is shortening, so it might be less than ten years until old leather wallets are retired and money is safely secured on a blockchain ledger (Foo, 2022). Every economy is dependent on the government's control over its currency. The government may then decide how much money to print in response to external and internal influences. That authority is lost when *cryptocurrencies* replace euros and dollars (Tiwari, 2021).

Thus, is it possible for *cryptocurrencies* to completely replace our present fiat money system? Absolutely. It will, however, take years, if not decades, to even begin to achieve that shift. A number of crucial phases would need to be fulfilled. This means that *crypto* must greatly increase consumer acceptability and confidence before it can compete with fiat currency in terms of purchasing power or reliability. Of course, if those primary barriers to adoption are conquered and build the required infrastructure, it would be possible to reap all the benefits that such a system would provide.

28 Deloitte's 2021 Global Blockchain Survey - https://www2.deloitte.com/ie/en/pages/audit/articles/deloitte-2021-global-blockchain-survey-deloitte-ireland.html

Even though *cryptocurrency* is still largely perceived and used as a store of value rather than currency itself, slowly but surely businesses all across the world are reinventing themselves to offer hospitality to the idea of using digital assets as currency. Participation in the digital asset age is not an option; it is an absolute need. Leaders must only decide how and when their organisations will begin, as well as how to effectively use digital assets and the world's economic service infrastructure to their own benefit (Pawczuk, Walker, & Tanco, 2021).

Bibliography

Allied Market Research. (2022). *Cryptocurrency Market By Offering (Hardware [ASIC, GPU, FPGA, and Others] and Software), Process (Mining and Transaction), Type (Bitcoin [BTC], Ethereum [ETH], Tether [USDT], Binance Coin [BNB], Cardano [ADA], Ripple [XRP], and Others), and End User (Trad.* Oregon: Allied Market Research.

Ammous, S. (2008). *The Bitcoin Standard: The Decentralized Alternative to Central Banking.* Wiley.

Antonopoulos, A. M. (2015). Bitcoin - The End of Money As We Know It. (T. Hoffmann, Interviewer)

Arner, D., Barberis, J., & Buckley, R. (2017). *Fintech and RegTech in a nutshell, and the future in a sansbox.* CFA Institute Research Foundation. Retrieved 02 23, 2023, from https://www.cfainstitute.org/-/media/documents/article/rf-brief/rfbr-v3-n4-1.pdf

Arora, S. (2022, 03 01). *What Is Bitcoin Mining: How Does it Work, Proof of Work, Mining Hardware and More*. Retrieved from simplilearn: https://www.simplilearn.com/bitcoin-mining-explained-article

Arslanian, H., Donovan, R., Blumenfeld, M., & Zamore, A. (2021). *El Salvador's law: a meaningful test for Bitcoin.* PwC.

Bajpai, P. (2021, 12 14). *Countries Where Bitcoin Is Legal and Illegal*. Retrieved from Investopedia: https://www.investopedia.com/articles/forex/041515/countries-where-bitcoin-legal-illegal.asp

Baker, B. (2022). What is Bitcoin mining and how does it work? *Bankrate*, 1.

Bateman, T. (2021, 09 16). *Bitcoin ATMs burn as El Salvador protesters march against President Nayib Bukele*. Retrieved from euronews.next: https://www.euronews.com/next/2021/09/16/bitcoin-atms-burn-as-el-salvador-protesters-march-against-president-nayib-bukele

Benson, A., & Rosen, A. (2022, 05 06). *Stablecoin Definition: What Are They and How Do They Work?* Retrieved from nerdwallet: https://www.nerdwallet.com/article/investing/stablecoin

Benson, J. (2022, 01 22). *Bank of Russia Wants a Bitcoin Ban. Here's How That's Gone in Other Countries*. Retrieved from Decrypt: https://decrypt.co/90886/bank-russia-wants-bitcoin-ban-how-other-countries

Binding, J., & Purnhagen, K. (2011). Regulations on E-Commerce Consumer Protection Rules in China and Europe Compared – Same Same but Different? *Jipitec*, 9. Retrieved from https://www.jipitec.eu/issues/jipitec-2-3-2011/3173/binding_purnhagen.pdf

Bogage, J. (2020, 10 22). Goldman Sachs fined record $2.9 billion to resolve 1MDB bribery scheme. *The Washington Post*, p. 1.

Bolotaeva, O. S., Stepanova, A., & Alekseeva, S. (2019). The Legal Nature of Cryptocurrency. *IOP Conference Series: Earth and Environmental Science.*

Brigida, A.-C., & Schwartz, L. (2022, 03 10). *Six months in, El Salvador's bitcoin gamble is crumbling*. Retrieved from Rest of the World: https://restofworld.org/2022/el-salvador-bitcoin/

Broumas, A. (2021, 10 19). *Impact of the MiCA proposal on the taxation of crypto-assets within the EU*. Retrieved from International Tax Review:

https://www.internationaltaxreview.com/article/b1v26088yfnd4t/impact-of-the-mica-proposal-on-the-taxation-of-crypto-assets-within-the-eu

Cambridge. (2021). *Cambridge Bitcoin Electricity Consuption Index.* Cambridge: University of Cambridge.

Carry, N. (2015). Bitcoin - The End of Money As We Know It. (T. Hoffmann, Interviewer)

Carson, H. D. (2022, 01 04). *The SEC v. Ripple Lawsuit – Where Are We Now?* Retrieved from HDC: https://www.hartdavidcarson.com/news/sec-ripple-lawsuit/#:~:text=On%20December%2022%2C%202020%2C%20the,is%20biased%20in%20its%20assessment.

Casanova, J. M., Ng, L., & Feehily, M. (2020, 11 12). *Analysis of the Proposed EU Markets in Crypto-Assets Regulation*. Retrieved from Sidley: https://www.sidley.com/en/insights/newsupdates/2020/11/analysis-of-the-proposed-eu-markets-in-cryptoassets-regulation

Cengiz, F. (2021, 06 05). *What the EU's new MiCA regulation could mean for cryptocurrencies*. Retrieved from lse: https://blogs.lse.ac.uk/europpblog/2021/07/05/what-the-eus-new-mica-regulation-could-mean-for-cryptocurrencies/

Chainalysis. (2020). *https://blog.chainalysis.com/reports/east-asia-cryptocurrency-market-2020/.* Chainalysis. Retrieved from https://blog.chainalysis.com/reports/east-asia-cryptocurrency-market-2020/

Chainalysis. (2021). Chainalysis.

Chiu, I. H.-Y. (2019). *Pathways to European Policy and Regulation in the Crypto-economy.* Cambridge University Press.

Choo, L., & Pimentel, B. (2022, 03 01). *Crypto's European win is just the beginning of a global regulatory fight*. Retrieved from Protocol: https://www.protocol.com/fintech/global-crypto-regulation

Coinbase. (n.d.). *Who is Satoshi Nakamoto?* Retrieved from Coinbase: https://www.coinbase.com/pt-PT/learn/crypto-basics/who-is-satoshi-nakamoto#why-satoshi-might-want-to-remain-anonymous

Committee on Payments and Market Infrastructures. (2019). *Investigating the impact.* Committee on Payments and Market Infrastructures.

Comply Advantage. (2022). *Cryptocurrency Regulation UK - Is Crypto Legal?* Retrieved from Comply Advantage: https://complyadvantage.com/insights/crypto-regulations/cryptocurrency-regulations-uk-united-kingdom/

Conway, L. (2021, 08 27). *Cardano (ADA)*. Retrieved from Investopedia: https://www.investopedia.com/cardano-definition-4683961

Daly, L. (2022, 01 21). *What Is Proof of Work (PoW) in Crypto?* Retrieved from The Motley Fool: https://www.fool.com/investing/stock-market/market-sectors/financials/cryptocurrency-stocks/proof-of-work/

Davis, J. (2003, 10 3). *The Crypto-Currency*. Retrieved from The New Yorker: https://www.newyorker.com/magazine/2011/10/10/the-crypto-currency

Defendant Convicted of Minting His Own Currency, (704) 344-6222 (Western District of North Carolina 3 18, 2011).

Deloitte. (2022, 03 17). *Digital Finance: European Parliament adopts MiCA Regulation, paving the way for an innovation-friendly crypto regulation*. Retrieved from Deloitte: https://www2.deloitte.com/lu/en/pages/financial-services/articles/digital-finance-european-parliament-adopts-mica-regulation-innovation-friendly-crypto-regulation.html

Digiconomist. (2020). *Bitcoin Energy Consumption Index*. Retrieved from Digiconomist.

Dion-Schwarz, C., Manheim, D., & Johnston, P. B. (2019). *Terrorist Use of Cryptocurrencies.* Santa Monica: RAND Corporation. Retrieved from https://www.rand.org/content/dam/rand/pubs/research_reports/RR3000/RR3026/RAND_RR3026.pdf

Docherty, P. (2023, 02 16). *All there is to know about Crypto Regulations in Switzerland*. Retrieved from EuroWeekly News: https://euroweeklynews.com/2023/02/16/all-there-is-to-know-about-crypto-regulations-in-switzerland/

Dugan, K. (2014, 08 18). PwC fined $25 million for role in terrorist-state money-laundering. *New York Post*, p. 1.

Elder-Vass, D. (2018, 8 18). *A history of Bitcoin – told through the five different groups who bought it*. Retrieved from The Conversation: https://theconversation.com/a-history-of-bitcoin-told-through-the-five-different-groups-who-bought-it-98359

European Commission. (2023, 02 21). *The Digital Services Act package*. Retrieved from European Commission: https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package

Favre, O., Houdrouge, T., & Tribolet, G. (2021, 09 02). The Virtual Currency Regulation Review: Switzerland. *Law Reviews*. Retrieved from https://thelawreviews.co.uk/title/the-virtual-currency-regulation-review/switzerland

Fiedler, K. (2019, 06 20). *E-Commerce review: Opening Pandora's box?* Retrieved from EDRi: https://edri.org/our-work/e-commerce-review-1-pandoras-box/

Fontinelle, A. (2020, 12 01). *What Causes Bubbles?* Retrieved from Investopedia: https://www.investopedia.com/financial-edge/0911/what-causes-bubbles.aspx

Foo, J. (2022, 01 12). *When Will Crypto Replace Fiat?* Retrieved from built in: https://builtin.com/blockchain/fiat-crypto

Frankenfield, J. (2021, 11 14). *What Investors Need to Know About Altcoins*. Retrieved from Investopedia: https://www.investopedia.com/terms/a/altcoin.asp

Frost, S. M. (2004). *The Bank Analyst's Handbook: Money, Risk and Conjuring Tricks .* West Sussex: John Wiley & Sons, Ltd.

Galea, J. (2021, 12 19). *Portugal – The Most Crypto-Friendly Nation in Europe*. Retrieved from Jean Galea: https://jeangalea.com/portugal-crypto-bitcoin/

Gerard, D. (2021, 09 17). *El Salvador's Bitcoin Law Is a Farce*. Retrieved from Foreign Policy: https://foreignpolicy.com/2021/09/17/el-salvador-bitcoin-law-farce/

Global Witness. (2015). *Banks and Dirty Money.* London: Global Witness. Retrieved from https://www.globalwitness.org/documents/18012/Banks_and_Dirty_Money_Global_Witness.pdf

Golubova, A. (2023, 02 13). *IMF warns El Salvador: government should reconsider plans to increase Bitcoin exposure*. Retrieved from kitco: https://www.kitco.com/news/2023-02-13/IMF-warns-El-Salvador-government-should-reconsider-plans-to-increase-Bitcoin-exposure.html

Gorman, D. (2022). *future of cryptocurrency*. Retrieved from GWI Connecting the dots: https://www.gwi.com/connecting-the-dots/future-of-cryptocurrency#:~:text=name%20%E2%80%93%20and%20quickly.-,Analysts%20estimate%20that%20the%20global%20cryptocurrency%20market%20will%20more%20than,tide%20of%20crypto%20for%20long.

Grabianowski, E. (2003, 09 02). *How Currency Works*. Retrieved from howstuffworks: https://money.howstuffworks.com/currency.htm#pt10

Haar, R. (2022, 01 12). *The Future of Cryptocurrency: 5 Experts' Predictions After a 'Breakthrough' 2021*. Retrieved from NextAdvisor: https://time.com/nextadvisor/investing/cryptocurrency/future-of-cryptocurrency/

Hamilton, D., & Shah, H. (2023, 02 21). *US crypto crackdown could impact on wider banking industry*. Retrieved from Pinsent Masons: https://www.pinsentmasons.com/out-law/news/us-crypto-crackdown-impact-banking-industry

Handagama, S. (2021, 11 02). *Europe's MiCA Crypto Rules Are Coming Soon. Here's Why They Matter*. Retrieved from CoinDesk: https://www.coindesk.com/policy/2021/11/02/unpacking-europes-looming-mica-crypto-regulation/

Hansen, P. (2021, 01 12). *New Crypto Rules in the European Union – Gateway for Mass Adoption, or Excessive Regulation?* Retrieved from SLS: https://law.stanford.edu/2021/01/12/new-crypto-rules-in-the-eu-gateway-for-mass-adoption-or-excessive-regulation/

HM Treasury. (2023, 02 01). *UK sets out plans to regulate crypto and protect consumers*. Retrieved from GOV.UK: https://www.gov.uk/government/news/uk-sets-out-plans-to-regulate-crypto-and-protect-consumers

Hoffmann, T., & Watchulonis, M. (Directors). (2015). *Bitcoin: The End of Money as We Know It* [Motion Picture].

Hussey, M., & Phillips, D. (2022, 04 28). *What Are Smart Contracts and How Do They Work?* Retrieved from Decrypt: https://decrypt.co/resources/smart-contracts

Hyatt, J. (2021, 08 19). *Decoding Crypto: Are There Regulations in the U.S. For Cryptocurrency?* Retrieved from Nasdaq: https://www.nasdaq.com/articles/decoding-crypto%3A-are-there-regulations-in-the-u.s.-for-cryptocurrency

idealista. (2022, 05 17). *Comprar casa em bitcoins: 1ª plataforma digital nasce em Portugal*. Retrieved from idealista: https://www.idealista.pt/news/imobiliario/habitacao/2022/05/17/52317-comprar-casa-em-bitcoins-1a-plataforma-digital-nasce-em-portugal

India Today. (2021, 01 05). *Key reasons why Bitcoin's popularity is growing among global investors*. Retrieved from India Today: https://www.indiatoday.in/business/story/key-reasons-why-bitcoin-s-popularity-is-growing-among-global-investors-1756005-2021-01-05

Jamieson, A. (2012, 07 12). Report: HSBC allowed money laundering that likely funded terror, drugs. *NBC News*, p. 1.

January, B. (2021). *Cryptocurrencies and the Blockchain Revolution.* Minneapolis: Twenty-First Century Books.

Jorgensen, J., & Jorgensen, R. (2003). *It's Never Too Late To Get Rich.* Fireside.

Jovanic, T. (2021). An Overview of Regulatory Strategies on Crypto-Asset Regulation - Challenges for Financial Regulators in the Western Balkans. *EU Financial Regulation and Markets: Beyond Fragmentation and Differentiation.* Zagreb: University of Zagreb Faculty of Law.

Juneja, P. (2015). History of Modern Banking. *Management Study Guide Content Team*.

Kim, J. (2011). *How modern banking originated: The London goldsmith-bankers' institutionalisation of trust.* Seoul.

Koinly. (2022, 01 05). *Top 10 Crypto Tax Free Countries 2022*. Retrieved from Koinly Blog: https://koinly.io/blog/crypto-tax-free-countries/

Kuan, L. H., & Ooi, V. (2021, 11 20). *Making money from cryptocurrency? The taxman may call on you*. Retrieved from The Straits Times: https://www.straitstimes.com/opinion/making-money-from-cryptocurrency-the-taxman-may-call-on-you

Kühne, D., Hong, K., & Lee, A. (2014). Bitcoin: Currency or Investment? 13.

Lapin, N. (2021, 12 23). *Explaining Crypto's Volatility*. Retrieved from Forbes: https://www.forbes.com/sites/nicolelapin/2021/12/23/explaining-cryptos-volatility/?sh=662934e27b54

Lee, I., & Bookseller, N. (2021, 09 22). *Contract Law – Acceptance*. Retrieved from Chamberlains: https://chamberlains.com.au/contract-law-acceptance/

Lee, J. (2022). *Crypto-Finance, Law and Regulation - Governing an Emerging Ecosystem.* Abingdon: Routledge.

Lennon, H. (2021, 01 19). *The False Narrative Of Bitcoin's Role In Illicit Activity*. Retrieved from Forbes: https://www.forbes.com/sites/haileylennon/2021/01/19/the-false-narrative-of-bitcoins-role-in-illicit-activity/?sh=111f7a8e3432

Likos, P., & Hicks, C. (2022, 02 04). The History of Bitcoin, the First Cryptocurrency. *U.S. News*. Retrieved from https://money.usnews.com/investing/articles/the-history-of-bitcoin

Madeira, A. (2020, 04 30). *Portugal Chases Crypto-Friendly Status With New 'Free Zones' for Tech*. Retrieved from invesBrain: https://invesbrain.com/portugal-chases-crypto-friendly-status-with-new-free-zones-for-tech/

Madiega, T. (2020). *Reform of the EU liability regime for online intermediaries.* Brussels: EPRS | European Parliamentary Research Service.

Madise, S. (2019). *The Regulation of Mobile Money: Law and Practice in Sub-Saharan Africa (Palgrave Macmillan Studies in Banking and Financial Institutions) .* London: Palgrave Macmillan.

Mandjee, T. (2016). *Bitcoin, Its Legal Classificaion and its Regulatory Frameworks.* Journal of Business and Securities Law.

McLeay, M., Radia, A., & Thomas, R. (2014, 03 14). *Money creation in the modern.* Retrieved from Bank of England: https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy.pdf?la=en&hash=9A8788FD44A62D8BB927123544205CE476E01654

Mirza, J. (2022, 05 16). *Luna Crypto Crash: What Happened To Terra Luna?* Retrieved from Planet Crypto: https://www.gfinityesports.com/cryptocurrency/luna-crypto-crash/

Molla, R. (2021, 06 14). *When Elon Musk tweets, crypto prices move*. Retrieved from Vox: https://www.vox.com/recode/2021/5/18/22441831/elon-musk-bitcoin-dogecoin-crypto-prices-tesla

Mukherjee, P. (2023, 01 24). *India's CoinDCX exchange says crypto tax rules are reducing government revenue*. Retrieved from forkast: https://forkast.news/coindcx-crypto-tax-reducing-government-revenue/

Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). *Bitcoin and Cryptocurrency Technologies.* Oxfordshire: Princeton University Press.

Neuberger, E. (1959). Centralization vs. Decentralization: The Case of Yugoslav Banking. *Association for Slavic, East European, and Eurasian Studies*, 13.

Nicoletti, B. (2021). *Banking 5.0: How Fintech Will Change Traditional Banks in the 'New Normal' Post Pandemic (Palgrave Studies in Financial Services Technology).* London: Palgrave Macmillan.

Nieva, R., & Sethi, A. (2022, 05 14). *Why Crypto Cratered: 5 Things You Need To Know*. Retrieved from BuzzFeed News: https://www.buzzfeednews.com/article/richardnieva/crypto-terra-luna-stablecoin-explainer

Nuth, M. S. (2008). *ELECTRONIC CONTRACTING IN EUROPE.* Retrieved from https://www.jus.uio.no/ifp/forskning/om/publikasjoner/complex/2006-2011/complex-2008-02.pdf

Oliveira, P. C. (2019). Digital Single Market: electronic commerce and collaborative economy . *UNIO EU Law Journal*, 11.

Orrel, D., & Chlupatý, R. (2016). *The Evolution of Money.* New York: Columbia University Press.

Pawczuk, L., Walker, R., & Tanco, C. C. (2021). *Deloitte's 2021 Global Blockchain Survey - A new age of digital assets.* Deloitte.

Pinsent Masons. (2008, 02 01). *Online Contract Formation*. Retrieved from Pinsent Masons: https://www.pinsentmasons.com/out-law/guides/online-contract-formation

Popper, N. (2021). Lost Passwords Lock Millionaires Out of Their Bitcoin Fortunes. *The New York Times*, 1.

Prasad, E. (2021). The Future of Crypto Is Bright, But Governments Must Help Manage the Risks. *TIME*, 1.

Profitero. (2020). *Accelerate your eCommerce sales*. Retrieved from Profitero: https://www.profitero.com/?hsLang=en

Rejeb, A., Rejeb, K., & Keogh, J. (2021). Centralized vs. decentralized ledgers in the money supply process: a SWOT analysis.

Reuters. (2017, 01 02). *China's new rules on yuan transfers are not capital controls: Xinhua*. Retrieved from Reuters: https://www.reuters.com/article/us-china-yuan-idUSKBN14M032

Rodeck, D., & Powell, F. (2022, 05 02). *What Is Cardano (ADA)?* Retrieved from Forbes: https://www.forbes.com/advisor/investing/cryptocurrency/cardano-ada/

Rodeck, D., & Schmidt, J. (2021, 05 06). *Meet Ripple & XRP, Cryptocurrency For Banks*. Retrieved from Forbes Advisor: https://www.forbes.com/advisor/investing/what-is-ripple-xrp/

Rodeck, D., & Schmidt, J. (2022, 02 10). What Is Blockchain? *Forbes*. Retrieved from https://www.forbes.com/advisor/investing/cryptocurrency/what-is-blockchain/

Rodrigues, J., & Ghosh, S. (2022, 02 02). *Now that India has pulled back from banning crypto, here's how it plans to develop digital currency on its own terms*. Retrieved from Fortune: https://fortune.com/2022/02/02/india-crypto-ban-plans-develop-digital-currency-taxes-regulation-bitcoin/

Royal, J. (2022, 05 12). Retrieved from https://www.bankrate.com/investing/stablecoin-cryptocurrency/

Royal, J., & Voigt, K. (2021, 12 23). *What Is Cryptocurrency? Here's What You Should Know*. Retrieved from nerdwallet: https://www.nerdwallet.com/article/investing/cryptocurrency-7-things-to-know

Satterlee, B. C. (2001). *E-Commerce.* New York: Writers Club Press.

Schar, F., & Berentsen, A. (2020). *Bitcoin, Blockchain, and Cryptoassets: A Comprehensive Introduction.* London: The MIT Press.

Seth, S. (2022, 01 15). *What Is a Cryptocurrency Payment Gateway?* Retrieved from Investopedia: https://www.investopedia.com/tech/bitcoin-payment-services-introduction/#:~:text=Your%20customer%20opts%20to%20make,into%20the%20currency%20you%20choose.

Shin, F. (2022, 01 31). *What's behind China's cryptocurrency ban?* Retrieved from World Economic Forum: https://www.weforum.org/agenda/2022/01/what-s-behind-china-s-cryptocurrency-ban/

Singh, A. (2023, 02 01). *India's Crypto Tax Amendment Could Punish Evaders With Jail Time, Attorneys Say*. Retrieved from CoinDesk: https://www.coindesk.com/policy/2023/02/01/india-keeps-restrictive-crypto-tax-rules-in-2023-budget/

Smith, T. (2021, 01 21). *Cryptocurrency Regulations Around the World*. Retrieved from Investopedia: https://www.investopedia.com/cryptocurrency-regulations-around-the-world-5202122

Sophy, J. (2022, 03 03). *Who Accepts Bitcoin as Payment?* Retrieved from Small Business Trends: https://smallbiztrends.com/2021/12/who-accepts-bitcoin.html

Stim, R. (2021). *Consideration: Every Contract Needs It*. Retrieved from NOLO: https://www.nolo.com/legal-encyclopedia/consideration-every-contract-needs-33361.html

Stripe. (2021). *Introduction to online payments.* Retrieved from Stripe: https://b.stripecdn.com/site-srv/assets/files/payments/introduction_to_online_payments-40388278757a58113a47da3304918747209e3bf1c151ea9f8f30744ff6799eed.pdf

Taylor, S. (2021). *Regulation of Cryptocurrency Around the.* Washington: The Law Library of Congress.

Tiwari, M. (2021, 05 21). *Will Bitcoin and cryptocurrency replace Rupees and Dollars in future? It's complicated*. Retrieved from India Today: https://www.indiatoday.in/technology/talking-points/story/will-bitcoin-and-cryptocurrency-replace-rupees-and-dollars-in-future-it-s-complicated-1805414-2021-05-21

Tofan, M., & Bostan, I. (2022). Some Implications of the Development of E-Commerce on EU Tax Regulations. *Laws*, 26.

Tomlinson, S. (2015). *How Goldsmiths Created Money.* Retrieved from https://www.cengage.com/economics/tomlinson/transcripts/8519.pdf

Vermaak, W. (2021, 07). *Where Are the World's Crypto Tax Havens in 2021?* Retrieved from Alexandria: https://coinmarketcap.com/alexandria/article/where-are-the-worlds-crypto-tax-havens-in-2021

Vulliamy, E. (2011, 04 3). How a big US bank laundered billions from Mexico's murderous drug gangs. *The Guardian*, p. 1.

Walton, J. (2022, 02 02). *How to Mine Ethereum: NiceHash, Mining Pools, Optimal Settings*. Retrieved from tom's Hardware: https://www.tomshardware.com/how-to/mine-ethereum-nicehash-mining-pools-optimal-settings

Wang, E., & Wegrzyn, K. (2021, 08 26). *The Pros and Cons of Blockchain in Supply Chain*. Retrieved from JDSUPRA: https://www.jdsupra.com/legalnews/the-pros-and-cons-of-blockchain-in-8158255/

Weissbrot, A. (2020, 09 02). *Profitero Arms Agencies With Its Ecommerce Data*. Retrieved from AD Exchanger: https://www.adexchanger.com/agencies/profitero-arms-agencies-with-its-ecommerce-data/

Wolla, S. A. (2018). Bitcoin: Money or Financial Investment? *Economic Research - Federal Reserve Bank of St. Louis*, 1.

World Bank. (2020). *Personal remittances, received (% of GDP) - El Salvador*. Retrieved from The World Bank: https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?locations=SV

Xin, L. (2021, 10 08). *China regulators to ban crypto trading and speculation*. Retrieved from Pinsent Masons: https://www.pinsentmasons.com/out-law/news/china-regulators-to-ban-crypto-trading-and-speculation#:~:text=All%20'cryptocurrency'%20related%20business%20activities,and%20nine%20other%20government%20departments.&text=Financial%20and%20non%2Dbank%20payment,p

Yaffe-Bellany, D. (2023, 02 18). *Government Cracks Down on Crypto Industry With Flurry of Actions*. Retrieved from The New York Times: https://www.nytimes.com/2023/02/18/business/crypto-crackdown-regulation.html

Yano, M., Dai, C., Masuda, K., & Kishimoto, Y. (2020). *Blockchain and Crypto Currency.* Tokyo: Springer Open.

Yellen, C. (2017). Transcript of Chair Yellen's Press Conference . *Chair Yellen's Press Conference* , (p. 27).