

A COMPARISON OF CRYPTOCURRENCIES AND TRADITIONAL CURRENCIES

Yousef Jahmani, Savannah State University
Yonpae Park, Savannah State University

ABSTRACT

This research comprehensively compares traditional currency systems and cryptocurrencies, exploring their advantages and disadvantages. Traditional currencies have enjoyed widespread acceptance due to their tangibility, simplicity, stability, and regulatory backing by governments and central banks. However, they are susceptible to inflation, counterfeiting, and high transaction fees. Cryptocurrencies offer decentralized, secure, anonymous transactions without intermediaries. However, they face challenges in cybersecurity, scalability, illicit use, environmental impact, and regulatory oversight. The study further examines cryptocurrencies' potential benefits and risks, such as stability, cost-effectiveness, and financial inclusion, while cautioning against potential cybersecurity threats and illicit activities. It underscores the role of governments and regulatory bodies in addressing these challenges and fostering the coexistence of traditional currencies and cryptocurrencies. The research aims to shed light on the transformative potential of cryptocurrencies, emphasizing the importance of prudent decision-making by investors and policymakers in navigating this dynamic financial landscape. It encourages further exploration of innovative solutions to address the drawbacks while harnessing the advantages of both currency systems for a more inclusive and secure global economy.

JEL: M00, O10

KEYWORDS: Cryptocurrency, Traditional Currency, Blockchain, Decentralization, Advantages, Disadvantages

INTRODUCTION

Traditional currency systems have significantly shaped the global financial landscape, wherein a central authority, like a government or central bank, plays a pivotal role in issuing and regulating the currency. This centralized control ensures careful management of the currency's supply, fostering stability and preserving its value. This well-established system's core lies in a vast network of interconnected banks and financial institutions facilitating seamless transactions. When using the traditional currency for payments, the process involves the sender's bank transmitting a financial message to the recipient's bank, swiftly crediting the recipient's account. This secure and efficient mechanism empowers individuals to conduct transactions with ease, enabling the purchase of goods and services across borders and time zones. Centralized control over the currency supply is a paramount hallmark, ensuring a coordinated approach to monetary policy and inspiring confidence in the currency's stability.

Unlike historical currencies backed by tangible assets like gold or silver, traditional currencies derive value from people's trust in the issuing authority. This fiat nature underscores the critical role of public confidence in sustaining its value and widespread acceptance. Moreover, traditional currency systems operate under government oversight and regulation, protecting the currency's integrity and enhancing trust and stability within the financial ecosystem.

The widespread global acceptance of traditional currencies contributes significantly to their ubiquity as a convenient and efficient medium of exchange. This broad acceptance reinforces international trade and facilitates economic interactions, promoting seamless commerce between regions and nations worldwide. While traditional currency systems have proven reliable in stimulating economic activity, they also face challenges. One significant challenge is their susceptibility to inflationary pressures, which can erode the currency's purchasing power. Additionally, cross-border transactions can pose logistical hurdles for individuals and businesses. Chohan (2022) noted that such dysfunction of the traditional currency systems had led many to desire newer, more democratized, innovative, and participatory elements that can address these severe weaknesses.

In recent years, innovative alternative currency systems, such as cryptocurrencies, have emerged alongside traditional currencies. These digital currencies offer advantages like decentralization and potential cost reduction. However, they also encounter unique obstacles like volatility and a lack of universal acceptance.

The future relationship between traditional currency systems and cryptocurrencies remains uncertain. Some speculate that alternative currencies may replace traditional ones, while others envision a symbiotic coexistence. The disruptive potential of alternative systems has garnered considerable attention, promising to revolutionize our understanding of money and financial transactions.

This paper aims to provide an unbiased analysis of the strengths and weaknesses of the traditional currency system and cryptocurrencies. Examining their underlying mechanisms, adoption trends, and regulatory frameworks aims to equip readers with an informed understanding of how these financial systems interact and influence each other. The paper's structure includes a section on related literature, followed by a discussion of the advantages and disadvantages of traditional currency and cryptocurrency. The final section presents the paper's results and conclusion.

LITERATURE REVIEW

In recent years, cryptocurrencies have garnered attention as an alternative currency. In a study conducted by DeVries (2016), it was suggested that cryptocurrency could become the world's next currency. The study highlighted that South America experienced a significant surge in bitcoin transactions, increasing by 510% from 2014 to 2015. However, he also noted that cryptocurrencies are technological creations that may face numerous challenges before becoming widely used and trusted. Additionally, he criticized the use of cryptocurrencies in illicit activities.

In a study conducted by Nica, Piotrowska, and Schenk-Hoppé (2017), the risks associated with cryptocurrencies were explored in detail. The authors explained how cryptocurrencies are used in the malware trade, cyber ransomware, and even by international terrorist organizations. They also highlighted several examples of convicted cases related to cryptocurrencies.

Bunjaku, Gjorgieva-Trajkovska, and Miteva-Kacarski (2017) discussed various advantages and disadvantages of cryptocurrencies. They reported that people with libertarian views are optimistic and embrace the cryptocurrency system. Still, due to potential risks, authors, economists, and scholars are not interested in using these currencies in financial transactions.

Jafari, Vo-Huu, Jabiyev, Mera, and Farkhani (2018) delved into the illegal activities, money laundering, and government considerations associated with cryptocurrencies. Their research showed that while countries like Canada and the U.K. consider cryptocurrencies a payment method, Germany treats them as "Private Money" and taxed them at 25%. They also confirmed that Japan and Switzerland have legalized cryptocurrencies, but China and Bolivia have banned them.

Zhmai and Mamunenکو (2019) warned that without proper research and regulation, cryptocurrencies may negatively affect the modern financial system by diverting financial flows from existing institutions. On the other hand, they also highlighted two significant advantages of cryptocurrencies: they cannot be falsified, and transactions cannot be disputed. However, a study conducted by Kiruscheva, Kleschenok, Hodkova, and Turcheniuk (2020) concluded that cryptocurrency in its current form is unlikely to become an official currency due to its numerous disadvantages and risks. They argued that the existing strengths of cryptocurrencies do not necessarily meet the needs of users in a traditional currency.

Lastly, the Financial Stability Oversight Council (2020) warned that if the scale or interconnections of crypto-asset activities were to increase without proper regulation, including enforcement of the current regulatory framework, there could be potential risks to the stability of the U.S. financial system.

Overall, while there are some benefits to using cryptocurrencies, there are also numerous risks and challenges associated with them. Thus, more research and regulation are needed to ensure the safe and effective utilization of cryptocurrencies in the modern financial system.

Traditional Currency

The traditional currency system is a well-established and widely used method of exchanging value throughout history. It is based on using physical money, such as coins and banknotes, as a medium of exchange for goods and services.

Several vital components underpin the traditional currency system. First and foremost, the creation of a traditional currency begins with a government decree. Through its central bank or monetary authority, the government officially designates a specific form of currency as the legal tender for transactions within the country. The central bank plays an important role in this system, as it is responsible for issuing and controlling the nation's currency supply. Physical banknotes and coins are created through printing and minting, and the central bank oversees their production and distribution.

Moreover, the central bank acts as the monetary authority, regulating the money supply to maintain price stability and support economic growth. It employs various monetary policies to manage interest rates, inflation, and foreign exchange rates (Cecchetti, 2021). Commercial banks also play an essential role in the traditional currency system. They facilitate the storage and transfer of money between individuals and businesses. People hold accounts with these banks, enabling them to deposit money, withdraw cash, and conduct electronic transactions using checks, debit cards, or online banking systems (Hubbard, 2022).

Coins and banknotes are tangible representations of the traditional currency. Coins, usually made of metal, come in different denominations and are used for smaller transactions due to their durability. On the other hand, banknotes are printed on paper or polymer and serve as a more convenient form of currency for larger transactions. They often feature symbols, historical figures, or landmarks representing the issuing country (Cecchetti, 2021). The concept of legal tender is central to such traditional currencies. Specific forms of money, like coins and banknotes, are designated as legal tender, which means that they must be accepted by law to settle a debt or meet a financial obligation. Historically, currencies used to be backed by physical assets like gold or silver. However, most modern fiat currencies are not directly backed by any physical commodity. Instead, they derive their value from the trust and confidence placed in the government and the economy of the issuing country. Such currencies are called "fiat" currencies (Hubbard, 2022).

It is essential to acknowledge that while the traditional currency system has long been the dominant means of currency exchange, digital forms of money, such as cryptocurrencies, have emerged in recent years, offering alternative methods of exchange and storage of value. These digital currencies operate independently of traditional banking systems and often rely on blockchain technology for security and

transparency.

Advantages of Traditional Currency

Traditional currency systems, which have been deeply ingrained in daily life for centuries, are widely recognized and accepted as a medium of exchange. People are well acquainted with the different denominations and values of physical currencies, such as coins and banknotes. The tangibility of physical currencies contributes to their popularity, as people can see, touch, and count their physical money, making it easier to understand than digital forms. Hence, traditional currencies are widely accepted as legal tender within their respective jurisdictions, backed by governments and central banks, thereby instilling trust and confidence in their value. The broad acceptance of traditional currencies ensures seamless transactions, as people do not need to worry about whether the recipient will accept them (Denic, 2021).

The simplicity of transactions within traditional currency systems is designed to facilitate straightforward exchanges. People are accustomed to using physical cash or electronic payment methods like credit cards and checks, which are relatively simple and convenient. Such transactions require only basic arithmetic and counting skills and can be conducted by people who are not familiar with computers or the internet. Traditional currency systems are accessible to a broad range of users, which has helped to facilitate economic activity and promote financial inclusion (Hall, 2021).

The traditional currency system operates within a well-established regulatory framework overseen by governments and central banks to ensure integrity and protect users from counterfeiting and fraud. This regulatory framework provides security and stability, further bolsters people's trust and confidence in the traditional currency system. Governments and central banks are responsible for upholding currency stability and implementing monetary policies to mitigate economic shocks, maintain price stability, and foster economic growth (Hall, 2021; Denic, 2021).

A robust and extensive infrastructure underpins the stability of the traditional currency system. This infrastructure includes banking institutions, strong payment networks, and comprehensive financial regulations. Together, these elements ensure efficient, secure, and transparent transactions, contributing to the overall stability of the traditional currency system (Denic, 2021). On the other hand, traditional currencies issued by major economies are highly recognized and accepted internationally. This is due to their widespread use in international trade and their status as reserve currencies held by central banks worldwide. This global recognition enhances the stability of traditional currencies, as they are widely trusted and easily exchanged in various markets worldwide. As a result, they are less likely to experience sudden fluctuations in value, which can disrupt economic activity.

Disadvantages of Traditional Currency

The traditional currency system is susceptible to the impact of inflation, a gradual increase in the general price level of goods and services over time. Traditional currencies can experience devaluation as prices rise in the economy. Inflation can be triggered by various factors, including an excessive money supply, rising costs of production, excess consumer demand, and global economic fluctuations (Denic 2021). The stability of traditional currencies heavily relies on the monetary policies central banks implement. Expansionary policies, such as increasing or decrease the money supply or lowering interest rates, can lead to inflation when the money supply surpasses economic growth. Other economic factors like labor costs, raw material prices, and geopolitical events also play a role in influencing inflation levels.

The consequences of inflation are significant, particularly in terms of purchasing power. As prices rise, the same amount of traditional currency can purchase fewer goods and services, affecting individuals' standard of living, financial planning, savings, and investments (Denic, 2021). People often seek protection against

the adverse effects of inflation on traditional currencies by diversifying their holdings with alternative assets like stocks, real estate, commodities, or inflation-protected securities, which have the potential to outpace inflation and act as a hedge against the loss of purchasing power. On the contrary, governments and central banks actively manage and control inflation risks within acceptable limits. They utilize tools such as adjusting monetary policies, altering interest rates, and closely monitoring economic indicators to counteract inflationary pressures. Nonetheless, the potential for inflation remains a crucial factor in evaluating the stability of traditional currency systems (Denic, 2021).

The traditional currency system faces significant risks from counterfeiting, especially with physical banknotes and coins as targets. Counterfeiters employ modern technology and sophisticated equipment to produce fake currency that closely resembles genuine notes, making detection challenging. Counterfeiting undermines the value and trust in traditional currencies, leading to financial losses and economic disruptions for individuals, businesses, and governments. Additionally, it erodes consumer confidence in the traditional currency system, affecting its acceptance as a reliable medium of exchange. To deter counterfeiters, governments and central banks actively combat counterfeiting by implementing advanced security measures, such as intricate designs, unique serial numbers, and specialized inks. Collaboration with law enforcement agencies and continuous improvement of currency designs help stay ahead of counterfeiters. Although counterfeiting remains a persistent challenge, evolving security measures work to minimize its impact. Individuals and businesses must stay vigilant and familiarize themselves with their country's currency's security features to reduce the risk.

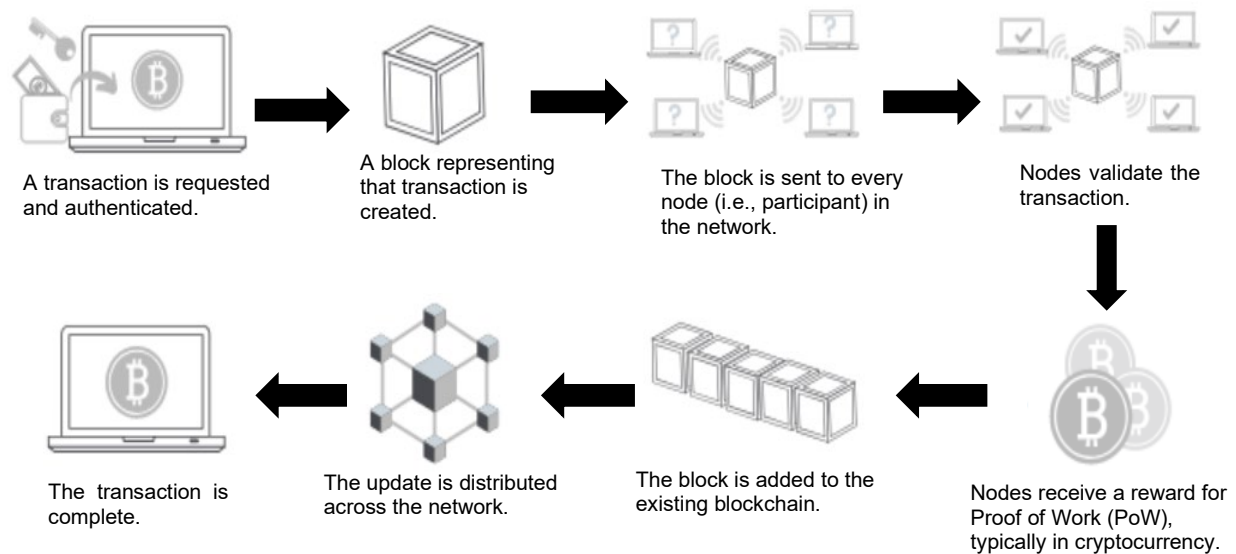
Controlling the supply of traditional currencies poses challenges for governments due to complex economic factors, unpredictable demand, and time lags in policy effects, and external influences. The underground economy and political considerations further complicate regulation efforts. Despite working closely with central banks and utilizing various tools, achieving precise control over the money supply can be difficult, making it challenging to regulate traditional currency systems effectively.

Cryptocurrency

At its core, cryptocurrency is a digital token that is a placeholder representing a monetary unit in a financial transaction. Cryptocurrency uses a blockchain technology that records and validates all transactions in a transparent and immutable way. To assess the pros and cons of cryptocurrency, it is advantageous to first look at its origin. So much can be gleaned from the source and foundations of it to set the stage for determining what and who could benefit or be harmed by its existence. This entire form of cryptocurrency is attributed to a white paper published by an unknown person or group of people that was simply identified by the pseudonym Satoshi Nakamoto. The white paper was published in October 2008, entitled "Bitcoin: A Peer-to-Peer Electronic Cash System" (Martharu, 2019). Four months later, in January 2009, the same author released the first bitcoin, block 0 (zero). This was created using a source that is referred to as a blockchain or a blockchain database.

The blockchain itself is an immutable distributed digital ledger that records transactions. A set of transactions bundled together is the "block," as one block of transactions is added or stacked on top of previous blocks, a chain is formed, producing a blockchain in digital space (See Figure 1).

Figure 1: The Process of a Transaction on the Blockchain



The above figure shows several key steps a transaction should go through when it is added to the blockchain. Source: Euromoney Learning (2020)

This could be visualized by taking a traditional accounting ledger and blocking or boxing it up to contain it, then placing an additional ledger in a block or box and stacking it on top of the previous one. Furthermore, the blockchain is formed through a consensus mechanism that ensures that all computers on the blockchain network (i.e., nodes) agree on the contents of the ledger. In a blockchain network, no central authority controls the data. Instead, every node on the network maintains a copy of the ledger, and the network must validate any changes made to the ledger through a consensus mechanism. This consensus mechanism ensures that the data on the blockchain is immutable, transparent, and secure.

To fully comprehend blockchain technology, knowing who builds the blocks and maintains the records is essential. These individuals are called miners in a proof-of-work (PoW) blockchain or validators in a proof-of-stake (PoS) blockchain. They verify transactions and add blocks to the blockchain. In the PoW blockchain, this is not as simple as it sounds because the verification process is more of a competition between multiple miners unlike in the PoS blockchain, which selects the validator and not just an allocation of a transaction to one specific miner. When a transaction is sent through the network for the cryptocurrency exchange, it must be verified as legitimate; hence, miners are all attempting to complete at the same time for the same transaction. In order to do so, a complex solution must be reached for the computational problem that is presented with each transaction. Only one miner will verify the transaction first and move forward with recording the transaction in the block. Miners do not work for free but rather get rewarded by receiving payment in cryptocurrency. Their function is that of a type of mathematical problem solver that allows senders and receivers to interact without intermediaries brokering their exchange. Miners are needed because the blockchain is a public, accessible to anyone, available digital ledger that relies on cryptographic proof to remove the need for a third-party broker in the transaction.

Cryptography is defined as "the science by which intelligible data or information can be scrambled or concealed by using encryption techniques" (Martharu, 2019). The cryptographic protocols consist of a highly complex code system, and its main purpose is to encrypt the transfer; in the case of cryptocurrency, the transfer is data pertaining to a monetary unit. Therefore, the sender end encrypts data to make it unintelligible, and the receiver end decrypts the data. It sounds simple but it is a very advanced level of

mathematics and computer engineering that forms the foundations of the process that miners are working with to verify transactions. With this broad overview, it is now imperative to discover how cryptocurrency is advantageous as a form of monetary transaction. The global cryptocurrency market capitalization experienced significant volatility but peaked at almost \$3 trillion in 2021 (CoinMarketCap, 2023). This amount represents around 1% of the total global financial assets, which means that it is still relatively small in comparison to the overall scope of the global financial system.

Advantages of Cryptocurrency

The advantages of cryptocurrency encompass various aspects, including its underlying technology, the financial system at large, the users, miners, and other entities affected by it. The areas that will be addressed in this analysis are foundational advantages that support all relevant parties and entities. Specifically, this paper examines cryptocurrency as an alternative to centralized monetary systems, its security and anonymity features, and the elimination of trusted third parties (TTPs) in transactions.

The timing of Bitcoin's creation and release was particularly significant as it coincided with the 2008 Financial Crisis, which profoundly impacted the global economy. This crisis eroded trust in financial institutions, their complex systems and governments, and policies permitting financial institutions to develop such destructive financial mechanisms. Bitcoin is denoted as having "its roots in Libertarian and Cypherpunk values, which aim to create social and political change by circumventing governments and large financial institutions through privacy-enhancing technologies" (Lacity, 2020).

Cryptocurrency operates outside the realm of government-issued currencies. It is a new form of digital currency that presents itself as an alternative in an open-source community. It utilizes open-source codes with monetary policies programmed into software, relying on algorithms rather than corruptible governments and financial institutions. It is worth noting that the world's 180 currencies recognized in ISO 4217, published by International Organization for Standardization, are mostly fiat or backed by governments, which have the power to trigger inflation by simply printing more paper money. In contrast, cryptocurrency is finite, deflationary, and has a predetermined final release date.

The most appealing feature of cryptocurrency is that it operates in a decentralized system that permits peer-to-peer (P2P) transactions, giving users a higher sense of control. The borderless aspect of cryptocurrency can also reduce the costs associated with international payments compared to fiat currencies. Furthermore, cryptocurrency promotes financial inclusion by eliminating the need for a bank account and offering unbanked or underbanked communities a P2P mechanism for making direct financial transactions on a blockchain (U.S. Department of Treasury, 2022). Cryptocurrency also incorporates a democratic process within the open network, enabling all users to vote for or against any block that is attempting to be added to the blockchain. Its value is derived from the consensus-based verification mechanism based on an incentive structure and from the users who believe in it, empowering them to influence its success (Sharif and Ghodoosi, 2022; Lacity, 2020)

The strength of the cryptocurrency system resides in blockchain technology. Blockchain serves as a vehicle for cryptocurrency exchange and provides security just as a Brink's truck, its security officers, and the company's processes and procedures secure physical currency. The cryptographic function embedded in the transfer process and its construction of interconnected blocks ensure the security of cryptocurrency. The cryptographic hash of each block in the blockchain is derived from the data in the block and the preceding block's hash, serving as a digital fingerprint. This digital fingerprint secures the distributed ledger containing the transaction records in each block. It makes the data in the block resistant to modification, thereby solidifying the authenticity of the transactions on record. The unalterable records of transactions confer integrity to the entire chain of linked blocks.

Moreover, the involvement of users worldwide in the validation of transactions before their inclusion

in a block enhances security. There is also a single distributed ledger, eliminating the need to reconcile different versions of the records and ensuring data consistency and security among multiple parties. Satoshi Nakamoto envisioned a world where people could safely, securely, and anonymously transfer value directly with each other (Lacity, 2020).

Anonymity on the blockchain can be attained through the use of pseudonymous addresses. These addresses are unique strings of characters that are generated using cryptographic methods and are used to conceal a user's real-world identity, thereby ensuring user privacy within the blockchain. Since the distributed ledger is also a public record of all transactions on the blockchain, anyone can view the contents of the entire blockchain, but user identities are pseudonymous and secure. This helps protect user privacy, while allowing for the transparent and secure recording of transactions.

Nakamoto's blockchain design makes it computationally and financially impractical for hackers to attack (Lacity, 2020). This is because an attacker would need to control more than fifty percent of the blockchain network's computers, which is extremely difficult and expensive to do. Even if an attacker were able to do this "51% attack", they would still need to restructure the historical data in each block, which would be a very time-consuming and difficult task. Additionally, any currency that the rest of the network would devalue the attacker obtained in this process to the point where it would not be worth anything because users would no longer trust the blockchain if they knew that it could be attacked.

Furthermore, cryptocurrency offers the advantage of eliminating trusted third parties (TTPs) involved in brokering monetary transactions pertaining to fiat currencies. TTPs are banks, firms issuing credit, money transmitters, and notaries. TTPs traditionally mitigate risks because they attest to the truth in what is being presented by all parties involved in a monetary exchange. This attestation has verified and validated ownership, identity, signatures, and asset authenticity. In addition, the primary function of TTPs has also been to ensure that projects are properly funded, that there is no double funding, and that agreements are executed properly. The downside to all they do is that high fees are associated with each transaction. TTPs are primarily focused on generating profits, and providing their services to low-income individuals is not a high-profit activity. This can lead to low-income individuals being denied access to basic financial services, which may have a negative impact on their creditworthiness and financial well-being.

Cryptocurrency revolutionizes financial access by providing a cost-effective, equitable, and open system. Cryptocurrency eliminates the need for TTPs by using computers on the decentralized network to store data and verify transactions. The cryptographic element of blockchain with the anonymity aspect through the usage of the private-public key verification validates ownership. At the same time, miners in the network community are rewarded for validating the transactions. Combining these factors makes cryptocurrency a promising alternative to traditional financial systems. Cryptocurrency could help reduce the cost of financial services, making them available to people excluded from the traditional financial system.

In summary, cryptocurrency offers a number of benefits over traditional fiat currencies. It is cost-effective, secure, anonymous, and equitable and does not require the use of TTPs. These features make it an attractive option for individuals and businesses who need to conduct transactions in a secure and efficient way.

Disadvantages of Cryptocurrency

Cryptocurrencies offer a range of advantages, including protection against inflation, self-governance, enhanced security and privacy, swift and low-cost payment transactions, currency exchanges, and decentralization. The scarcity of cryptocurrency would protect its value during times of rising inflation, like gold, because it is limited in supply, such as in the case of Bitcoin, with only 21 million units available, the increasing demand for cryptocurrency contributes to its value appreciation, which can serve as an effective hedge against inflation. The self-governance aspect of cryptocurrencies is a crucial factor in their

development, as they rely on users' hardware for storage and offer transaction fees as rewards for maintaining transaction records. This decentralized approach ensures the integrity and security of the system. However, it is essential to acknowledge that cryptocurrency faces certain disadvantages and challenges.

Cryptocurrency security and privacy have been persistent concerns, although implementing complex mathematical puzzles in blockchain technology ensures high cryptographic security. Nonetheless, the decentralized nature of cryptocurrencies also presents a disadvantage in their potential misuse for illicit transactions, as the high security and privacy measures make it challenging for governments to trace and regulate such activities. The absence of regulation and oversight makes cryptocurrency exchanges vulnerable to hacking and fraud. In recent years, there have been a number of high-profile security breaches at cryptocurrency exchanges with billions of dollars' worth of cryptocurrencies stolen. According to the Crypto Crime Report published by Chainalysis (2023), exchanges and other platforms lost over \$3 billion worth of cryptocurrencies to hackers in 2022. The rising value of cryptocurrency has made it an attractive target for hackers. In addition, the decentralized nature of cryptocurrency makes it difficult to track and recover stolen funds.

While the blockchain itself is secure, it becomes vulnerable if the private key, which represents ownership and control of cryptocurrencies, is compromised. Cryptocurrency is often considered less safe than traditional assets because users are responsible for safeguarding their private keys, which are essential for accessing their cryptocurrencies. If hackers are able to obtain a user's private key, they can steal those cryptocurrencies (Roohparvar, 2022). Many users opt to store their private keys on their computers. Hackers typically attempt to gain access to their computers, stealing private keys and using them to log in to users' digital accounts or wallets. Some hackers exploit private keys through phishing campaigns. They'll pose as the official trading platform to trick investors into handing over their private keys or cryptocurrencies. Phishing attacks can also occur through emails containing links leading investors to a malicious website. Spear phishing, DNS hacking, phishing bots, and fake browser extensions are examples of common phishing attacks to take advantage of cryptocurrency investors (Ngrave, 2021).

The advantages of cryptocurrency include its primary use for cross-border transactions, which reduces or eliminates transaction fees typically associated with third-party intermediaries like Visa, Mastercard, or PayPal. Nevertheless, the irreversible nature of cryptocurrency transactions can be a drawback, as they cannot be reserved, tracked, or refunded once initiated. The verification requirements for cryptocurrency transactions are relatively minimal, allowing for easy accessibility. However, this also means that once a cryptocurrency transaction is recorded on a blockchain, it cannot be reversed because a distributed ledger cannot be changed. There is no third-party institution such as bank or government that protects users' cryptocurrencies. This makes getting users' money back if they are scammed or make a mistake difficult. Such irreversibility of cryptocurrency transactions can expose users to risks. Consequently, these potential risks highlight the importance of using strong security measures when users manage cryptocurrencies.

Scalability measures how well a system can handle increasing users or transactions without sacrificing performance. Regarding of cryptocurrency, scalability refers to the measure of how well a blockchain network can process a large number of transactions without slowing down or becoming too expensive. There are a number of challenges to scaling blockchain networks. One challenge is blockchains are typically based on a proof-of-work (PoW) consensus mechanism. In PoW, miners compete to solve complex mathematical problems using powerful computers. The first miner to solve the problem is rewarded with a cryptocurrency, and their block is added to the blockchain. This process secures the blockchain and incentivizes miners to participate in the network. However, this process can be very time consuming and energy intensive. Hence, the current cryptocurrency system is not scalable to handle a large volume of transactions required for widespread adoption (Nasir, Arshad, Khan, Fatima, Salah, and Jayaraman,

2022). As a result, cryptocurrencies need to impose solutions like staking, sharding, and lighting networks to overcome the scalability issue (Boukhalfa, 2019). Nonetheless, it is important to be aware of the risks associated with these technologies before using them because there are also some security risks associated with using those solutions.

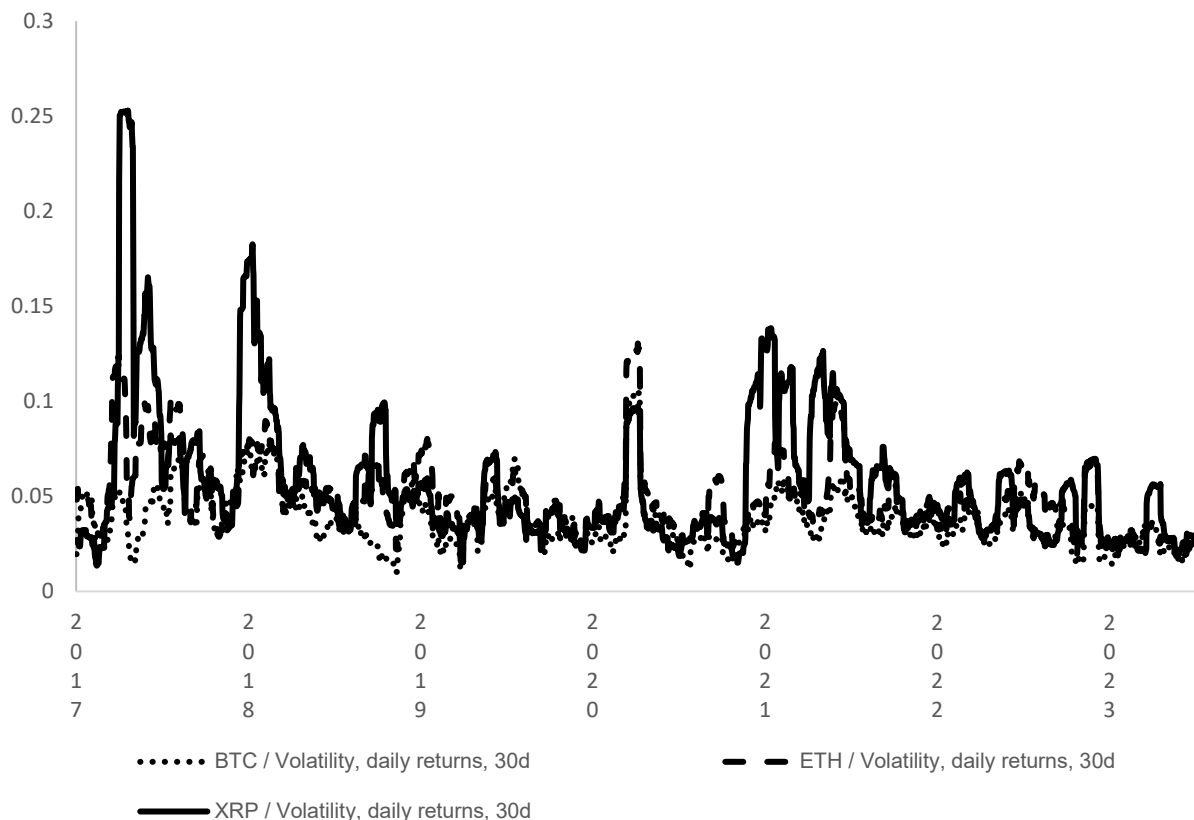
Furthermore, cryptocurrency can be used for illegal transactions because of its high level of privacy and security, which makes it difficult for governments to oversee the creation, movement, and management of cryptocurrencies and to track down abusers. For example, Bitcoin has been used by drug dealers to conduct transactions on the dark web. Additionally, cryptocurrencies can be used to launder money by converting "dirty" money into "clean" money, which makes it difficult for law enforcement to trace the source of the funds. The U.S. Government Accountability Office (GAO) report emphasizes that policymakers, regulators, and law enforcement agencies have recognized cryptocurrency, human trafficking, and drug trafficking as significant areas of concern. However, it also cautions that federal agencies may face challenges in obtaining comprehensive data for evaluating and reporting on the use of cryptocurrency in various illicit activities (Knutson, 2022).

In financial markets, liquidity is a measure of how easily an asset can be bought or sold without significantly impacting its price. Liquidity is important because it supports asset values. If an asset is illiquid, selling it for a fair price may be difficult. Cryptocurrencies are illiquid because there are fewer buyers and sellers than traditional financial markets, and the cryptocurrency market is poorly regulated. According to Singapore-based blockchain firm, TripleA, it is estimated that as of 2023, the global crypto ownership rate is around 5.2%, with about 420 million crypto users worldwide.

Bitcoin is a particularly illiquid cryptocurrency. A large portion of all Bitcoin in circulation is not available for purchase or sale. Some of this Bitcoin is held by investors who will never sell regardless of the price and other Bitcoin is stranded in wallets for which the private keys have been lost. Furthermore, only 21 million Bitcoin will ever be mined. Such illiquidity of cryptocurrency could lead to more volatile price movements, as even small changes in supply or demand could significantly impact the price (See Figure 2). Therefore, investors should be aware of the illiquidity of cryptocurrency before investing because illiquid cryptocurrency can be more difficult to sell, and it may be more volatile than other liquid assets.

In the "proof-of-work" consensus mechanism used by 64% of cryptocurrencies such as Bitcoin, Litecoin, Monero, etc., a network of computers competes to solve complex mathematical problems.

Figure 2: 30 Day Volatility of Cryptocurrencies

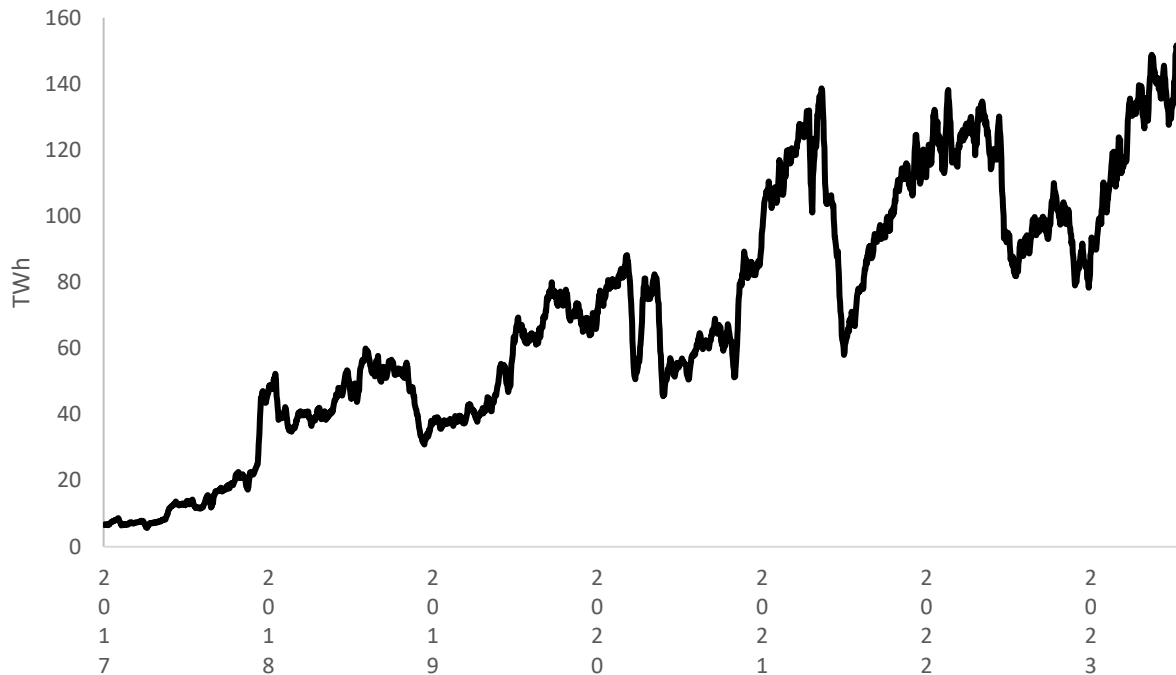


The above graph shows the 30-day volatility of major cryptocurrencies, measured as the standard deviation of the natural log of daily returns over the past 30 days. The illiquidity of cryptocurrency could lead to more volatile price movements, as even small changes in supply or demand could significantly impact the price. Source: CoinMetrics (2023)

The computer which solves a problem first is rewarded with new cryptocurrency and is given the right to add the next block of transactions to the blockchain. The more computing power a computer has, the more likely it is to solve a problem first and be rewarded. This has led to the creation of massive server farms dedicated to mining cryptocurrency, which in turn consume a large amount of energy. A 2023 study by the University of Cambridge estimated that Bitcoin mining consumed 118 terawatt-hours of electricity in 2022, more than the entire country of Argentina (See Figure 3). The environmental impact of cryptocurrency mining is particularly concerning given the fact that the vast majority of the energy used to mine cryptocurrency is derived from fossil fuels. This means that cryptocurrency mining is a major contributor to climate change.

In recent years, there have been a number of efforts to address the environmental impact of cryptocurrency mining. Some cryptocurrency developers have begun to adopt more energy-efficient mining algorithms. For example, the second-largest cryptocurrency, Ethereum, switched to a different method of creating its tokens in September 2022, called "proof-of-stake," which uses significantly less computing power. Others have begun to use renewable energy sources to power their mining operations. However, these efforts have not been enough to offset the overall environmental impact of cryptocurrency mining because Bitcoin seems to continue to use the energy-consuming "proof-of-work" algorithm. Within the decentralized Bitcoin network, no governing body could decide to switch to the energy-efficient "proof-of-stake" algorithm. If the cryptocurrency industry is to continue to grow, it must find ways to reduce its environmental impact.

Figure 3: Bitcoin Annualized Electricity Consumption, Terawatt-hours (TWh)



The above graph shows the estimate of Bitcoin's electricity consumption over the period of one year in terawatt-hours (TWh). In 2022, Bitcoin mining consumed an estimated 118 terawatt-hours of electricity, which is more than the entire country of Argentina. Source: Cambridge Bitcoin Electricity Consumption Index (2023)

In addition, policymakers are still trying to understand how cryptocurrencies work and how to regulate them effectively because cryptocurrency was first introduced in 2009, and it has only been in the mainstream for a few years. One of the key benefits of cryptocurrency is its decentralization, which means that any central authority does not control cryptocurrency. This also makes it difficult for policymakers to regulate cryptocurrencies and prevent criminal activities, as they do not have a single entity to target, and transactions can be made across borders anonymously. Such the nature of cryptocurrencies makes it difficult for uncoordinated regulatory approaches among countries to be effective. Some countries have taken a more laissez-faire approach, while others have imposed strict regulations. In fact, gaps exist where cryptocurrencies are issued, exchanged, transferred, or stored by nonbank entities and where a jurisdiction's regulatory framework does not capture cryptocurrencies based on current legal interpretations of financial services and products (Bains, Ismail, Melo, and Sugimoto, 2022).

In recent years, interlinkages between cryptocurrencies and the regulated financial system have grown, and policymakers are starting to take steps to regulate cryptocurrencies. The European Parliament ratified the Markets in Crypto-Assets (MiCA) in April 2023 and thus became the world's first regulatory framework for cryptocurrencies. MiCA aims to create a single market for cryptocurrencies in the European Union (E.U.) while ensuring that they are subject to appropriate regulation and supervision and requiring cryptocurrency service providers, such as exchanges and custodians, to be licensed and regulated by national authorities (Council of the European Union, 2023). Following the collapse of FTX in November 2022, the U.S. Securities and Exchange Commission (SEC) has taken enforcement action against many cryptocurrency companies such as Thor Tokens, CoinDeal, Gemini Earn, Nexo, Kraken, and Tron by classifying those cryptocurrencies as securities (SEC, 2023). This means that cryptocurrencies that are classified as securities will be subject to the same regulations as traditional securities. It is still too early to say how effective government regulation of cryptocurrencies will be.

However, regulation is necessary to protect investors and prevent criminals from using cryptocurrencies illegally.

RESULTS

The traditional currency system has garnered widespread use and acceptance over the centuries due to its inherent advantages. As a widely recognized medium of exchange, traditional currency benefits from its tangible nature, providing ease of understanding. Furthermore, governments and central banks' backing of traditional currencies instills trust and confidence, enabling seamless transactions without concerns about recipient acceptance. The simplicity of transactions within this system also serves a broad range of users, including those with basic arithmetic and counting skills. Additionally, the traditional currency system operates within a well-established regulatory framework overseen by governments and central banks, ensuring financial integrity, price stability, and protection against counterfeiting and fraud. Moreover, significant economies' global recognition and acceptance of traditional currencies enhance their stability and trustworthiness in international markets.

The traditional currency system is not without its drawbacks. Vulnerability to inflation poses a significant risk, impacting purchasing power and individuals' standard of living. The risk of counterfeiting also undermines the value and trust in traditional currencies. Additionally, challenges in precisely controlling the money supply due to complex economic factors, unpredictable demand, and political considerations can make it difficult for governments to regulate the traditional currency system effectively.

In contrast, cryptocurrencies present various appealing advantages to different stakeholders. Operating independently from government-issued currencies, cryptocurrencies offer a decentralized, open-source community. They mitigate inflation risks and promote financial inclusion. Utilizing cryptographic functions in blockchain ensures high security, and pseudonymous addresses protect user privacy. Furthermore, cryptocurrencies eliminate the need for trusted third parties, enabling cost-effective and equitable peer-to-peer transactions. Nonetheless, cryptocurrencies face challenges and drawbacks, such as cybersecurity risks, vulnerability to illicit activities, and scalability issues with proof-of-work consensus mechanisms. Additionally, the lack of comprehensive regulation poses challenges in managing and preventing criminal activities, and concerns arise regarding the environmental impact of certain cryptocurrencies' energy-intensive mining processes.

Both the traditional currency and cryptocurrency exhibit their respective strengths and weaknesses. While traditional currencies benefit from widespread acceptance and trust, they are vulnerable to inflation and counterfeiting risks. On the other hand, cryptocurrencies offer innovative features such as security, anonymity, and elimination of trusted third parties, but face challenges related to cybersecurity, scalability, illicit use, lack of regulation, and environmental impact. The coexistence of both systems may depend on ongoing developments and regulatory efforts in the financial landscape.

Path Forward

To capitalize on the strengths of traditional currency and cryptocurrency, pursuing a hybrid financial system is recommended. This path forward entails integrating digital payment systems with traditional banking infrastructure to facilitate faster, more secure, and cost-effective transactions. Governments and financial institutions should also collaborate to develop regulatory frameworks that accommodate cryptocurrencies while safeguarding consumer interests and mitigating illicit activities. Additionally, exploring advancements in blockchain technology can help address scalability and environmental concerns associated with certain cryptocurrencies. This approach would foster financial inclusion, stimulate innovation, and bolster the overall stability of the financial landscape.

CONCLUSION

The comparison between traditional currency and cryptocurrency in this paper reveals diverse advantages and disadvantages for each system. Traditional currencies have widespread acceptance, trust, and regulatory framework, providing a stable foundation. However, they remain vulnerable to inflation and counterfeiting risks. On the other hand, cryptocurrencies offer innovative features such as security, anonymity, and disintermediation but face challenges in cybersecurity, scalability, and regulation.

This study suggests that the coexistence of both systems holds the potential to create a more robust and inclusive financial ecosystem. Embracing technological advancements while addressing the limitations of cryptocurrencies can lead to enhanced financial accessibility and efficiency. Stakeholders, including policymakers, financial institutions, and technology developers, should collaborate to strike a balance that optimizes the strengths of each system and mitigates its weaknesses. This approach would provide individuals and businesses diverse financial transaction options while maintaining stability and security.

There are some limitations to this study. For example, comparing traditional currency and cryptocurrency is based on the information available up to 2023. The dynamic nature of the financial landscape, rapid technological advancements, and regulatory changes may influence the interplay between these currencies beyond the provided analysis. The other limitation concerns that the discussion primarily focuses on major cryptocurrencies like Bitcoin and Ethereum, and the advantages and disadvantages may vary for different cryptocurrencies with distinct features and use cases.

The impact of cryptocurrencies on the global economy, financial stability, and potential implications on the traditional currency system may necessitate ongoing research and analysis. As the adoption of cryptocurrencies continues to evolve, new challenges and opportunities will emerge, necessitating further evaluation and adaptation of regulatory measures.

REFERENCES

Bains, P., Ismail, A., Melo, F., and Sugimoto N. (2022), "Regulating the Crypto Ecosystem - The Case of Unbacked Crypto Assets," *International Monetary Fund*, Accessed at <https://www.imf.org/-/media/Files/Publications/FTN063/2022/English/FTNEA2022007.ashx> on June 20, 2023.

Boukhalfa, S. (2019), "What are the Disadvantages of Cryptocurrency?," *Prescouter*, Accessed at <https://www.prescouter.com/2019/11/disadvantages-of-cryptocurrencies/06/20/2023> on June 20, 2023.

Bunjaku, F., Gjorgieva-Trajkovska, O., and Miteva-Kacarski, E. (2017), "Cryptocurrencies – advantages and disadvantages," *Journal of Economics*, Vol. 2(1), p. 31-39.

Cambridge Centre for Alternative Finance (2023), "The Cambridge Bitcoin Electricity Consumption Index," University of Cambridge, Accessed at <https://ccaf.io/cbnsi/cbeci> on June 20, 2023.

Chainalysis (2023), "Crypto Crime Report 2023," Accessed at <https://go.chainalysis.com/2023-crypto-crime-report.html> on June 20, 2023.

Chohan, U. W. (2022), "A History of Bitcoin," Discussion Paper Series: Notes on the 21st Century, Accessed at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3047875 on July 25, 2023.

Chow, A. R. (2022), "Fact-Checking 8 Claims About Crypto's Climate Impact," *Time*, Accessed at <https://time.com/6193004/crypto-climate-impact-facts/> on June 20, 2023.

CoinMarketCap (2023), "Global Cryptocurrency Charts," Accessed at <https://coinmarketcap.com/charts/> on July 25, 2023.

CoinMetrics (2023), "30 Day Volatility Chart," Accessed at <https://charts.coinmetrics.io/crypto-data/> on July 25, 2023.

Council of the European Union (2023), "Digital finance: Council adopts new rules on markets in crypto-assets (MiCA)," *Press Release*, Accessed at <https://www.consilium.europa.eu/en/press/press-releases/2023/05/16/digital-finance-council-adopts-new-rules-on-markets-in-crypto-assets-mica/> on June 20, 2023.

Denic, B. (2021), "Cryptocurrencies vs. Traditional Currencies: Pros & Cons," Accessed at <https://demotix.com/cryptocurrencies-vs-traditional-currencies-pros-cons/> on July 23, 2023.

DeVries, P. D. (2016), "An Analysis of Cryptocurrency, Bitcoin, and the Future," *International Journal of Business Management and Commerce*, Vol. 1(2), p. 1-9, Accessed at <https://ijbmcnet.com/images/Vol1No2/1.pdf> on June 20, 2023.

Euromoney Learning (2020), "How does a transaction get into the blockchain," Accessed at <https://www.euromoney.com/learning/blockchain-explained/how-transactions-get-into-the-blockchain> on June 20, 2023.

Hall, M. (2021), "Barter System vs. Currency System: Definition and How They Work," *Investopedia*, Accessed at <https://www.investopedia.com/ask/answers/061615/what-difference-between-barter-and-currency-systems.asp> on July 22, 2023.

Hubbard, G. and O'Brien, A. P. (2022), *Money, Banking, and the Financial System*, Pearson Publishing, London, UK.

International Organization for Standardization (ISO), "Tables of Codes for the Representation of Currencies and Funds: ISO 4217" Accessed at <https://www.iso.org/iso-4217-currency-codes.html> on June 20, 2023.

Jafari, S., Vo-Huu, T., Jabiyev, B., Mera, A., and Farkhani, R. M. (2018), "Cryptocurrency: A Challenge to Legal System," Accessed at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3172489 on June 20, 2023.

Kiruscheva, A, Kleschenok, V., Hodkova, M., and Turcheniuk, M. (2020), "Cryptocurrency," Accessed at <https://rep.bntu.by/bitstream/handle/data/95248/334-337.pdf?sequence=1> on June 20, 2023.

Knutson, T. (2022), "Crypto Increasingly Used In Human/Drug Trafficking Says GAO," *Forbes*, Accessed at <https://www.forbes.com/sites/tedknutson/2022/01/10/crypto-increasingly-used-in-humandrug-trafficking-says-gao/?sh=79093cd6637e> on June 20, 2023.

Lacity, M. (2020), "Crypto and Blockchain Fundamentals," *Arkansas Law Review*, Vol. 73(2), p. 363–395.

Matharu, A. (2019), *Understanding Cryptocurrencies: The Money of the Future*, Business Expert Press, New York, NY.

Nasir, M. H., Arshad, J., Khan, M. M., Fatima, M., Salah, K., and Jayaraman, R. (2022), "Scalable

blockchains — A systematic review," *Future Generation Computer Systems*, Vol. 126, p. 136-162.

Ngrave (2021), "4 Common Crypto Phishing Attacks & How to Avoid Them," *Medium*, Accessed at <https://medium.com/ngrave/4-common-crypto-phishing-attacks-how-to-avoid-them-e47510970c1> on June 20, 2023.

Nica, O., Piotrowska, K., and Schenk-Hoppé, K. P. (2017), "Cryptocurrencies: Economic Benefits and Risks," Accessed at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3059856 on June 20, 2023.

Roohparvar, R. (2022), "The Cybersecurity Risks of Cryptocurrency," *Infoguard Cyber Security*, Accessed at <https://www.infoguardsecurity.com/the-cybersecurity-risks-of-cryptocurrency/> on July 25, 2023.

Sharif, M. M. and Ghodoosi, F. (2022), "Ethics of Blockchain in Organizations," *Journal of Business Ethics*, p. 1009–1025.

Stephen Cecchetti, S. and Schoenholtz, K. (2021), *Money, Banking and Financial Markets*, 6th ed., McGraw-Hill, New York, NY.

The Financial Stability Oversight Council (2022), "Report on Digital Asset Stability Risks and Regulation" Accessed at <https://home.treasury.gov/system/files/261/FSOC-Digital-Assets-Report-2022.pdf> on June 20, 2023.

TradeStation (2023), "How Does Crypto Compare to Traditional Currency?" Accessed at <https://www.tradestation.com/learn/market-basics/cryptocurrencies/the-basics/how-does-crypto-compare-to-traditional-currency/> on July 24, 2023.

TripleA (2023), "Cryptocurrency Ownership Data - Cryptocurrency across the world," Accessed at <https://triple-a.io/crypto-ownership-data/> on June 20, 2023.

U.S. Department of Treasury (2022), "Crypto-Assets: Implications for Consumers, Investors, and Businesses," Accessed at https://home.treasury.gov/system/files/136/CryptoAsset_EO5.pdf on June 20, 2023.

U.S. Securities and Exchange Commission (2023), "Crypto Assets and Cyber Enforcement Actions," Accessed at <https://www.sec.gov/spotlight/cybersecurity-enforcement-actions> on June 20, 2023.

Velasquez, F. (2023), "Crypto Crime Hit All-Time High of \$20.6B in 2022: Chainalysis," *CoinDesk*, Accessed at <https://www.coindesk.com/business/2023/02/27/crypto-crime-hit-all-time-high-of-206b-in-2022-chainalysis/> on June 20, 2023.

Zhmai, A. and Mamunenka, M. (2019), "The Advantages and Disadvantages of Cryptocurrencies in the Conditions of Modern Market Economy," Accessed at <http://dspace.onu.edu.ua:8080/bitstream/123456789/27924/1/50-51.pdf> on June 20, 2023.

BIOGRAPHY

Yousef Jahmani (Ph.D., CPA) is a professor of accounting and finance at the College of Business Administration/ Savannah State University. He served as a department chair for over five years. His research appears in journals that include *Issues in Contemporary Accounting Journal*, *Special Issues in Finance and Accounting*, *Academy of Accounting and Financial Studies Journal*, and *Accounting and*

Taxation.

Yonpae Park (Ph.D., Accounting) is a professor of accounting at the College of Business Administration/Savannah State University. His research appears in journals that include Issues in the International Journal of Strategic Management, International Journal of Business Strategy, International Journal of Information and Decision Sciences, and International Journal of Accounting and Finance.