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Digital Currencies: An Introduction

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ABSTRACT

Digital currency also known as digital money, electronic money or electronic currency (cybercash) is any currency, money, or money-like asset that is primarily managed, stored or exchanged on digital computer systems, especially over the internet. The various types of digital currencies include cryptocurrency, virtual currency and central bank digital currency. Digital currency is recorded on a "distributed database" on the internet, a centralized electronic computer database owned by a company or bank, within "digital files" or even on a "stored-value card." Digital currency can be used to buy physical goods and services, but may be restricted to certain communities such as for use inside an online game. This paper looks into the benefits, pros and cons, challenges and the prospects in the future use of digital currencies globally.

KEYWORDS: *Digital currency, distributed database, e-gold, bitcoin, cryptocurrency, virtual currency, ethereum*

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HISTORY OF DIGITAL CURRENCY

Precursory ideas for digital currencies were presented in electronic payment methods such as the "Sabre" (travel reservation system) [1]. In 1983, a research paper by David Chaum titled "Blind Signatures for Untraceable Payments" introduced the idea of digital cash [2, 3]. In 1983, he founded DigiCash, an electronic cash company, in Amsterdam so as to commercialize his ideas in his research. It filed for bankruptcy in 1998 [4, 5].

The first widely used internet money was e-gold, which was introduced in 1996, and grew to several million users before it was shut down by the US Government in 2008. However, e-gold has been referenced to as "digital currency" by both the US officials and academia [6, 7].

It was in 1997 that Coca-Cola offered buying from vending machines using mobile payments [8], and while PayPal launched its USD-denominated service in 1998 coupled with that of bitcoin in 2009 – which marked the start of decentralized blockchain-based digital currencies with no central server, and no tangible assets held in reserve; also referred to as cryptocurrencies, blockchain-digital digital proved resistant to attempt by government to regulate them [9].

The origins of digital currencies date back to the 1990s Dot-com bubble [10], and Liberty Reserve founded in 2006. Several digital currency operations were reputed to be used for Ponzi schemes and money laundering, and were prosecuted by the US government for operating without MSB licenses [11]. There is currently a renewed interest in cryptocurrency with the introduction of bitcoin in 2008 becoming the most widely used and accepted digital currency, as shown in Figures 1 and 2.

Another decentralized blockchain is Ethereum with smart contract functionality, as shown in Figure 3. Ether (abbreviation: ETH) is the native cryptocurrency of the platform. Among the cryptocurrencies, ether is second only to bitcoin in market capitalization. Decentralized digital currencies make them more resistant to government interference, censorship, and manipulation, as well as making true control over the digital currency to be spread over a broader range of owners or users [12].

TYPES OF DIGITAL CURRENCY

The various types of digital currencies include cryptocurrency, virtual currency and central bank digital currency. Digital currency is recorded on a "distributed database" on the internet, a centralized electronic computer database owned by a company or bank, within "digital files" or even on a "stored-value card" [13, 14].

Due to the rise of technology, traditional money is no longer the only available option. There is the need to have a deep understanding of digital currency as a result of its different forms and how they differ. The four types of digital currency are [15]: Cryptocurrencies, Central Bank Digital Currencies (CBDCs), Virtual Currencies, and Stablecoins.

1. Cryptocurrencies: this is a type of digital currency that regulates the generation of new units and secures transactions using cryptographic methods. A decentralized ledger known as a blockchain is used by cryptocurrencies to verify transactions and allow them to operate independently of any centralized authority. Examples of cryptocurrencies are Bitcoin and Ethereum The pros of cryptocurrencies are: (a) they have decentralization and anonymity, and (b) high potential for value appreciation; while the cons are: (a) volatility and risk of price manipulation, and (b) lack of regulatory oversight. There are more than 9,000 cryptocurrencies according to CoinMarket [15], as shown in Figures 4 and 5.
2. Central Bank Digital Currencies (CBDCs): CBDCs are digital versions of fiat currency that central banks issue and maintain. They have developed to maintain the reliability and security of traditional currencies while simultaneously providing many benefits of digital currencies, such as quick and secure transactions. The pros of CBDCs are: (a) improved efficiency and security of transactions, (b) greater control and monitoring by governments, and while the cons are: (a) possible threat to privacy and financial freedom, and (b) dependence on central authorities.
3. Virtual Currencies: these are unregulated digital currencies that are used in virtual worlds or online gaming environments to facilitate user transactions. They can also be used to buy virtual goods, such as weapons or clothing for avatars. They are being controlled by developers or a founding organization involved in the process. The pros of virtual currencies are: (a) easy and convenient transactions, (b) accessibility and inclusion, while the cons are: (a) lack of government regulation, and (b) volatility.
4. Stable Coins: these are digital currencies that are designed to have a constant value in comparison to a traditional currency or other asset. Stablecoins are backed by the underlying asset's reserves or by algorithms that modify the stablecoin's supply based on market demand. The pros of Stablecoins are: (a) stability and predictability, (b) faster transaction processing and lower fees, and while the cons are: (a) dependence on the stability of the underlying asset, and (b) potential for regulatory scrutiny and lack of transparency.

CHARACTERISTICS OF VIRTUAL CURRENCIES (VIRTUAL MONEY)

Some of the characteristics are [12]:

- Virtual currencies are digital representations of value whose transactions occur in online networks or the internet.
- All virtual currencies are digital currencies, but the opposite is not true.
- Virtual currencies are issued by private organizations or groups of developers and are mostly unregulated.
- Some virtual currencies strive to increase transaction speeds by removing intermediaries from the process.
- There are two types of virtual currencies: closed and open, which can be centralized or decentralized.

THE BENEFITS OF DIGITAL CURRENCY

Some of the benefits of digital currency are [15]:

1. Faster payments: payments can be completed much faster than by ACH or Wire transfers, which could take days for financial institutions to confirm a transaction.
2. Cheaper international transfers: moving funds from one country to another by individuals are expensive, especially when it involves currency conversions. Digital assets could disrupt this market by making it faster and cheaper.
3. 24/7 access: during weekends and outside normal working hours, money transfers take longer time to confirm transactions. However, with digital currency, this barrier would be removed as services would be for 24 hours a day and 7 days a week.
4. Support for the unbanked and underbanked: In America alone, more than 7 million households do not have a bank account, according to the FDIC in a 2019 survey. Globally, this number would be astronomical. If countries can launch

CBDCs, unbanked individuals could access their money and pay their bills without extra charges.

5. More efficient government payments.

However, some of the disadvantages of digital currency are:

1. Too many options: there are so many digital currencies being created across different blockchains that all have their own limitations. It will take to determine which digital currencies may be appropriate for certain use cases, including whether some are designed to scale for mass adoption according to Tessler.
2. Steep learning curve: in this case, the user must learn how to perform some fundamental tasks on how to open a digital wallet and properly store digital assets securely. For it to be widely adopted, the system must be simplified.
3. Expensive transaction.
4. Price volatility, and
5. Slow progress.

LAW

Since 2001, the European Union has implemented the E-Money Directive "on the taking up, pursuit and prudential supervision of the business of electronic money institutions" last amended in 2009 [16]. In the United States, electronic money is governed by Article 4A of the Uniform Commercial Code for wholesale transactions and the Electronic Fund Transfer Act for consumer transactions. Provider's responsibility and consumer's liability are regulated under Regulation E [17, 18].

REGULATION

Virtual currencies pose challenges for central banks, financial regulators, departments or ministries of finance, as well as fiscal authorities and statistical authorities [9].

HARD vs. SOFT DIGITAL CURRENCIES

Hard electronic currency does not have the ability to be disputed or reversed when used. It is nearly impossible to reverse a transaction, justified or not. It is very similar to cash. Contrarily, soft electronic currency payments can be reversed. Usually, when a payment is reversed there is a "clearing time." A hard currency can be "softened" with a third party service [9, 19].

CONCLUSION

Digital currency which is also called digital money, electronic money, electronic currency or cybercash has no physical form, and therefore cannot be handled, stored, or manipulated. Consumers and businesses can use digital currencies to execute transactions and trades, but may not be used by all countries and communities. They can be exchanged for regular money or other assets. The most popular digital currencies are cryptocurrencies like bitcoin, and while many national governments are considering issuing their own centralized digital currencies.

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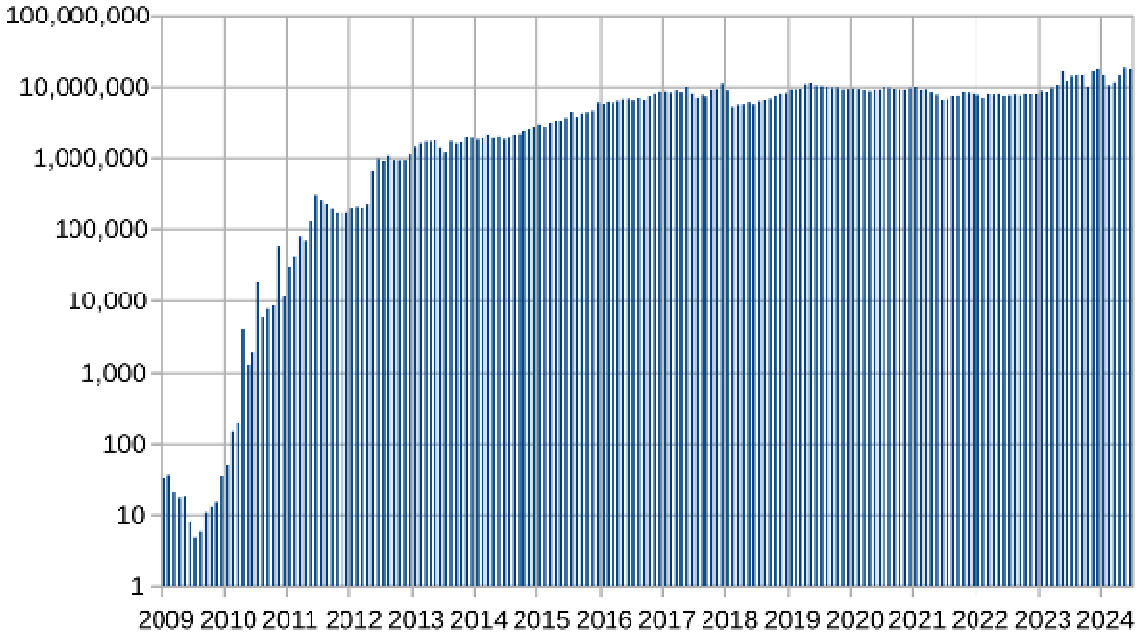

Figure 1. History of bitcoin

Source:https://www.google.com/search?sca_esv=50094aa3d5842932&sxsrf=ADLYWIKTOoXybrFOzaJ3a6NOozFVybvqgw:1724327870513&q=images+on+digital+currency+by+wikipedia&tbm=isch&source=lnms&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkW9NAzhPVmkAfB2zK1tnQfJ7YXLTPLGowL1aB4gvrdKmu70zzTP2_sQ159Xok78I2QMeoWwolxGOk_e6RaRltc3S-Ab9q8946LdQg4VISRnt7VgZDWk3P2jmx6V7FE8qpBPnLhG0oLnqapH-lRWnxeq9mOd2Y&sa=X&ved=2ahUKEwjlzcrxxYiIAxVkSUEAHflPHIkQ0pQJegQIEhAB&biw=1366&bih=580&dpr=1#imgrc=yv6_rCJhQ-MV0M

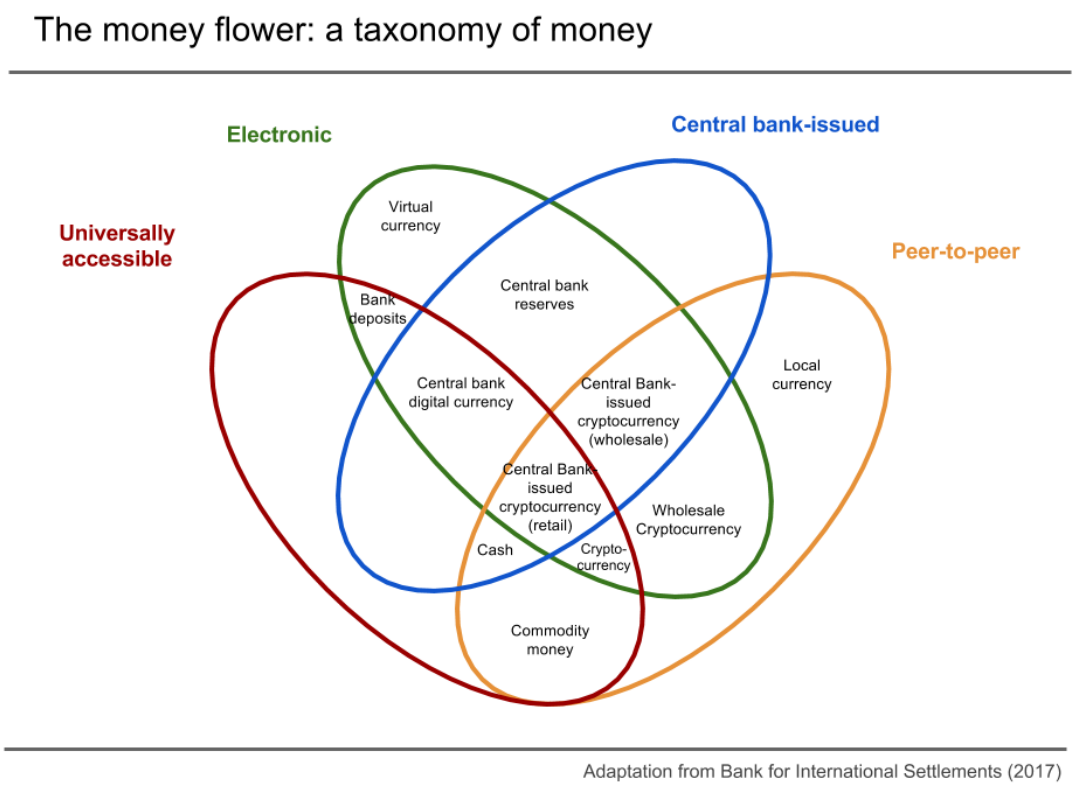

Figure 2. Digital currency

Source:https://www.google.com/search?sca_esv=50094aa3d5842932&sxsrf=ADLYWIKTOoXybrFOzaJ3a6NOozFVybvqgw:1724327870513&q=images+on+digital+currency+by+wikipedia&tbm=isch&source=lnms&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkW9NAzhPVmkAfB2zK1tnQfJ7YXLTPLGowL1aB4gvrdKmu70zzTP2_sQ159Xok78I2QMeoWwolxGOk_e6RaRltc3S-Ab9q8946LdQg4VISRnt7VgZDWk3P2jmx6V7FE8qpBPnLhG0oLnqapH-lRWnxeq9mOd2Y&sa=X&ved=2ahUKEwjlzcrxxYiIAxVkSUEAHflPHIAb9q8946LdQg4VISRnt7VgZDWk3P2jmx6V7FE8qpBPnLhG0oLnqapH-lRWnxeq9mOd2Y&sa=X&ved=2ahUKEwjlzcrxxYiIAxVkSUEAHflPHIkQ0pQJegQIEhAB&biw=

Figure 3. Ethereum

Source:https://www.google.com/search?sca_esv=50094aa3d5842932&sxsrf=ADLYWIKTOoXybrFOzaJ3a6NOozFVybvqgw:1724327870513&q=images+on+digital+currency+by+wikipedia&tbm=isch&source=lnms&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkW9NAzhPVmkAfB2zK1tnQfJ7YXLTPLGowL1aB4gvrdKmu70zzTP2_sQ159Xok78I2QMeoWwolxGOk_e6RaRltc3S-Ab9q8946LdQg4VISRnt7VgZDWk3P2jmx6V7FE8qpBPnLhG0oLnqapH-lRWnxeq9mOd2Y&sa=X&ved=2ahUKEwjlzcrxxYiIAxVkSUEAHflPHIkQ0pQJegQIEhAB&biw=1366&bih=580&dpr=1#imgrc=wKsIIuXye99XpM

Figure 4. Cryptocurrency logos.jpg

Source:https://www.google.com/search?sca_esv=50094aa3d5842932&sxsrf=ADLYWIKTOoXybrFOzaJ3a6NOozFVybvqgw:1724327870513&q=images+on+digital+currency+by+wikipedia&tbm=isch&source=lnms&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkW9NAzhPVmkAfB2zK1tnQfJ7YXLTPLGowL1aB4gvrdKmu70zzTP2_sQ159Xok78I2QMeoWwolxGOk_e6RaRltc3S-Ab9q8946LdQg4VISRnt7VgZDWk3P2jmx6V7FE8qpBPnLhG0oLnqapH-lRWnxeq9mOd2Y&sa=X&ved=2ahUKEwjlzcrxxYiIAxVkSUEAHflPHIkQ0pQJegQIEhAB&biw=1366&bih=580&dpr=1#imgrc=b2U_1VPqyqjI8M

Figure 5. Cryptocurrency

Source:https://www.google.com/search?sca_esv=50094aa3d5842932&sxsrf=ADLYWIKTOoXybrFOzaJ3a6NOozFVybvqgw:1724327870513&q=images+on+digital+currency+by+wikipedia&tbm=isch&source=lnms&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkW9NAzhPVmkAfB2zK1tnQfJ7YXLTPLGowL1aB4gvrdKmu70zzTP2_sQ159Xok78I2QMeoWwolxGOk_e6RaRltc3S-Ab9q8946LdQg4VISRnt7VgZDWk3P2jmx6V7FE8qpBPnLhG0oLnqapH-lRWnxeq9mOd2Y&sa=X&ved=2ahUKEwjlzcrxxYiIAxVkSUEAHflPHIkQ0pQJegQIEhAB&biw=1366&bih=580&dpr=1#imgrc=3K5eFNQ4ocL2QM