

## **CRYPTO AND DIGITAL CURRENCIES – WILL GOVERNMENTS ALLOW THESE FORMS OF NEW PAYMENTS?**

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### **Abstract**

Since the 2010s cryptocurrencies have started to acquire a popularity never seen before, influencing the way the general population, investors, and governments treat investments. It is no surprise that central banks are pursuing their own digital currency in order to boost the security of transactions and reduce counterfeiting. Throughout this paper, we are going to analyze and compare the market valuation of the ten most valuable cryptocurrencies and explain if it is possible that one of them could become a viable and widely used currency in the future. Additionally, we are going to examine the central banks that will pursue their own digital currency and the reasons as of why they chose to venture into this new uncharted technology.

### **Keywords**

cryptocurrency, digital currencies, market valuation, central banks

### **JEL Classification**

E5, G1, N1

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### **Introduction**

Cryptocurrencies have existed way before the most well-known crypto – the Bitcoin, albeit in a different form than the one known until now. The first ever cryptocurrency was in fact, according to Reiff (2022), eCash developed in 1990 by a company named DigiCash. The concept was created by the cryptographer and the founder of the company, David Chaum. Having published a research paper called "Blind Signatures for Untraceable Payments."

Chaum created a "blinding formula" that is used to encrypt data transmitted between people. Thus, "Blinded Cash"—a form of payment that may be altered without leaving a trace—could be safely moved between people. A few years later, Chaum launched DigiCash to implement his idea by developing the first electronic payment system based on cryptography, named eCash. Despite going out of business in 1998, DigiCash's

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theories, as well as some of its algorithms and encryption tools, had a significant impact on the creation of following digital currencies (Reiff, 2022).

There were other cryptocurrencies after the eCash until the creation of Bitcoin. E-gold, as said by White (2014), was a successful for-profit service offering transferable gold-denominated accounts that, unfortunately, quickly became a hotspot for money laundering. After that, a new cryptocurrency appeared - the Bit Gold. Moskov (2018) says that the goal of Bit Gold was to imitate the economic benefits of gold while enhancing its security. There were many cryptocurrencies after, B-money, Hashcash etc., but none of them caught the public eye's attention like Bitcoin did.

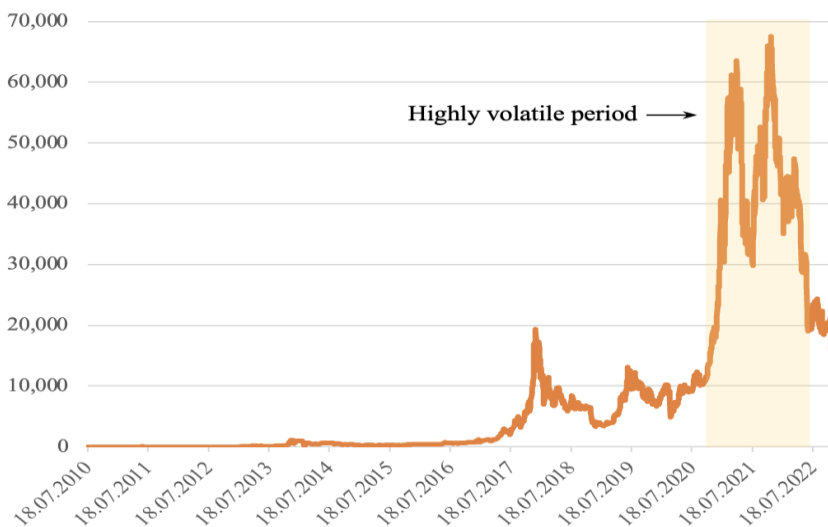
The Bitcoin is by far the most well-know and valuable currency at the time of writing this paper. A group operating anonymously under the name Satoshi Nakamoto published, in 2008, a whitepaper outlining the specifications for the currency (Nakamoto, 2008). Any institution or individual who has access to the open-source software can manage Bitcoin, the first fully decentralized money. This indicates that the currency is essentially a peer-to-peer network where all users are connected to one another and can conduct transactions without the involvement of any third party, such as banks. In order to make transactions computationally difficult to undo, Bitcoin uses public-key cryptography. In principle, this shields users from fraud and prevents double spending. The amount of currency in circulation is determined by a predetermined algorithm, and new currency is created through a process known as "mining," in which some users are rewarded with new currency units in exchange for carrying out computationally demanding tasks that are essential to the Bitcoin system's operation (Nica et al., 2022). As of November 2022, according to Investing.com and CoinMarketCap, there are approximately 8970 cryptocurrencies.

Moreover, different central banks throughout the world have been venturing in pursuing their own digital currency because of changes in how day-to-day transactions are being done. As the world is heading in the directions of cashless payments central banks, through their respective governments, must find ways in order to boost the ease of such transactions on top of adding an enhanced layer of security and, arguably the most important thing, privacy. One major central bank, which we will talk extensively about in the second chapter about, has set an ambition plan of introducing their own digital currency. Thus, it is very clear that a huge shift in the modalities of payments is happening.

In the following section, "Overview of the market capitalization of cryptocurrencies and their use" we are going to analyze the valuation of the top 10 most used cryptocurrencies and how the market has changed since their creation. We will further explain why exactly some cryptocurrencies have been less volatile than others and if such trend will continue to occur. Additionally, in order to give a more thorough view of the possibility of governments using cryptocurrencies, we will benchmark their performance against the major currencies in the world such as EUR, GBP, JPY, CHF, and CNY. For the section called "Digital currencies of central banks" the author will examine the pursuit and aim of central banks in creating their own digital currencies.

## 1. Overview of the market capitalization of cryptocurrencies and their use

In this section we are going to look at the market capitalization of the 10 most valuable, as of 21 December 2022, cryptocurrencies namely Bitcoin, Ethereum, Tether, USD Coin, BNB, Binance USD, XRP, Dogecoin, Cardano, and Polygon. The market capitalization values were retrieved from Investing.com database. Moreover, we will compare the volatility of cryptocurrencies with national currencies, the ones that are used as a reserve currency internationally, in order to depict a thorough picture.



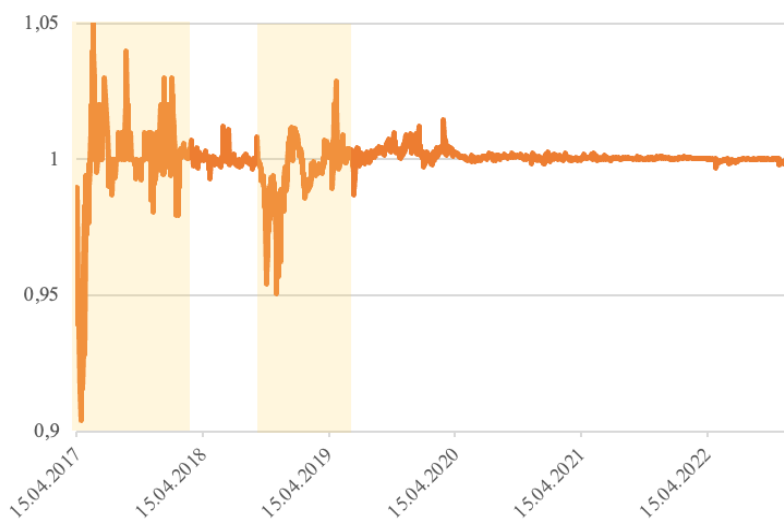
**Figure no. 1: Evolution of the market price in USD of Bitcoin**

Source: Investing.com database



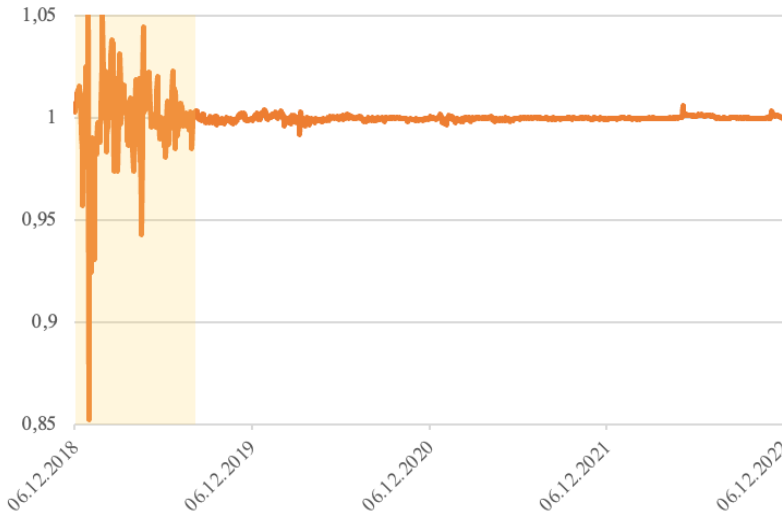
**Figure no. 2: Evolution of the market price in USD of Ethereum**

Source: Investing.com database



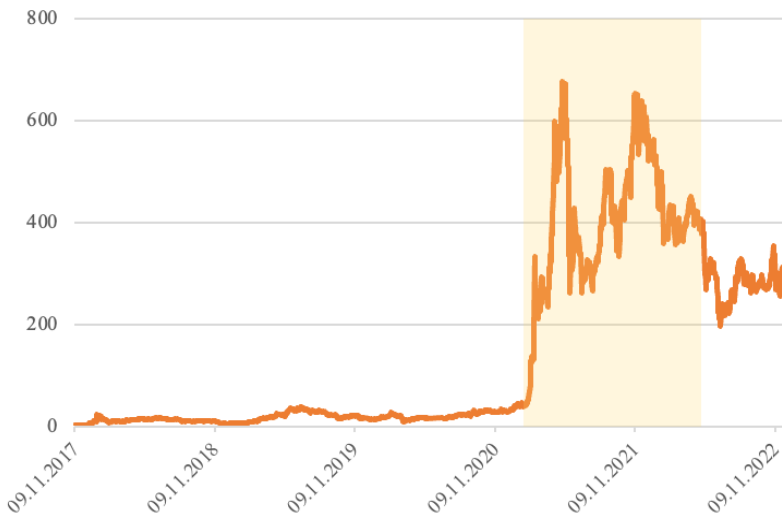
**Figure no. 3: Evolution of the market price in USD of Tether**

Source: Investing.com database



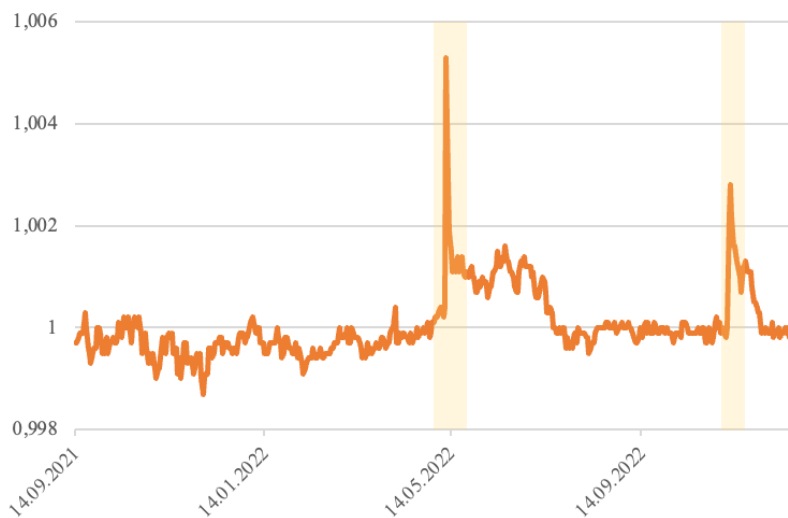
**Figure no. 4: Evolution of the market price in USD of USD Coin**

Source: Investing.com database



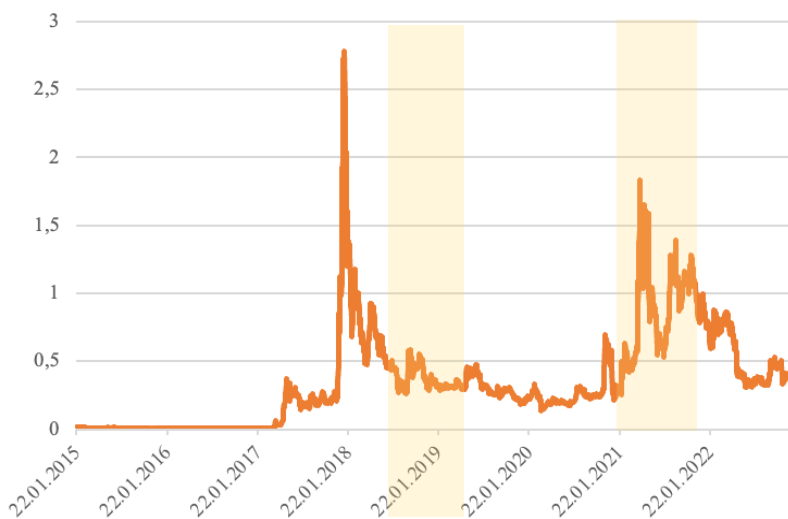
**Figure no. 5: Evolution of the market price in USD of BNP**

Source: Investing.com database



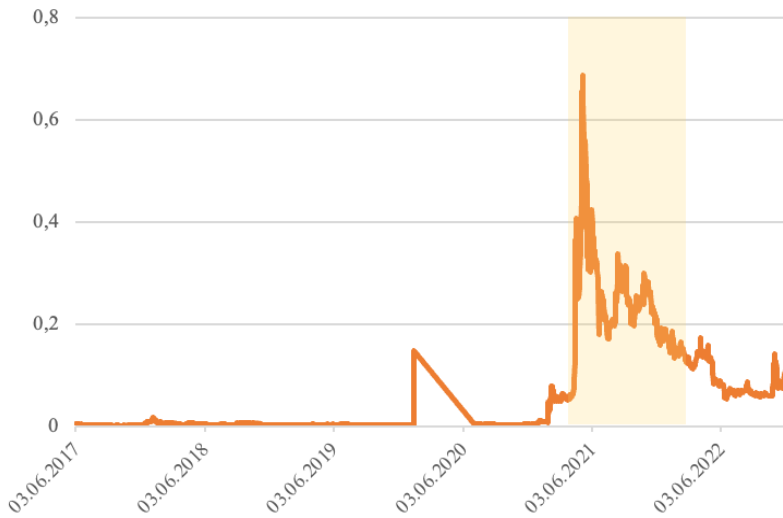
**Figure no. 6: Evolution of the market price in USD of Binance USD**

Source: Investing.com database



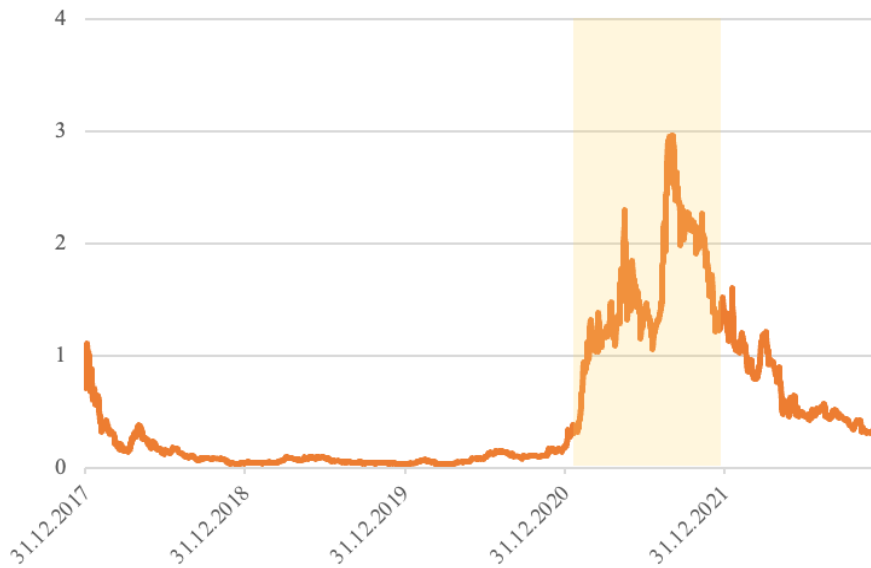
**Figure no. 7: Evolution of the market price in USD of XRP**

Source: Investing.com database



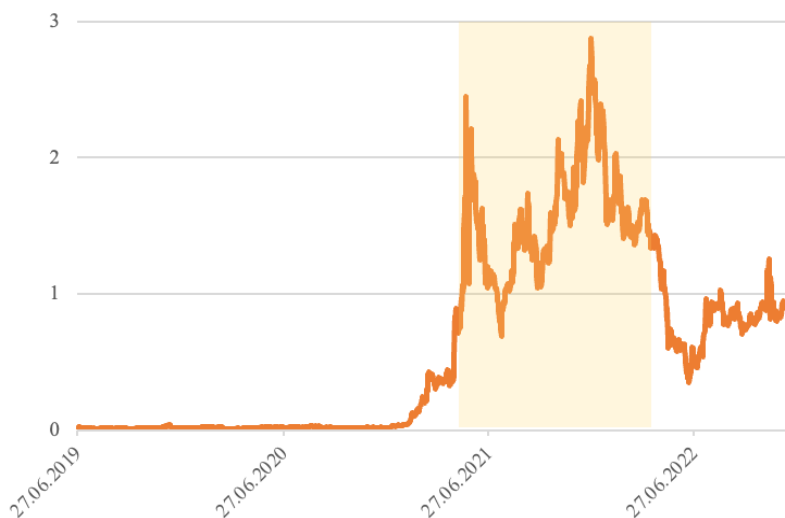
**Figure no. 8: Evolution of the market price in USD of Dodge Coin**

Source: Investing.com database



**Figure no. 9: Evolution of the market price in USD of Cardano**

Source: Investing.com database



**Figure no. 10: Evolution of the market price in USD of Polygon**

*Source: Investing.com database*

If we examine the performance of these 10 cryptocurrencies, we can clearly see that they have been very volatile, especially from 2021 until 2022, increasing and decreasing in value at rates that do not inspire stability, which is desperately needed in order to have a currency that will be used extensively and will keep prices stable (Deutsche Bundesbank, 2019). If we examine the figures, we can pin-point the exact month when the cryptocurrencies studied picked off in popularity, in that period extensive media coverage happened as well. In May 2021, all, with a few exceptions, cryptos have seen a tremendous increase in market value. After that, the so-called ‘Crypto crush of 2021’ ensued, spooking investors away from the currencies that were said to be the best against inflation (Chaturvedi, 2022).

In the case of the Bitcoin, its valuation reached a high, on the 8<sup>th</sup> of November 2021, of approximately 67.528 dollars per one coin. Afterwards, it dropped sharply reaching the lowest value, since the second half of 2021, at roughly 15.776 dollars on the 21<sup>st</sup> of November 2022. Ethereum had a similar trajectory as Bitcoin did, reaching its maximum valuation of about 4.808 dollars on the 8<sup>th</sup> of November 2021. The vast majority of the important cryptocurrencies did undergo a period of a ‘bull’ - ‘bear’ - ‘bull’ - and, finally, they are currently in a ‘bear’ market at the time of writing this paper. Subsequently, reaching a low of more or less 995 dollars per one coin on the 18<sup>th</sup> of June 2022. There are other cryptocurrencies that mirror the evolution of the Bitcoin and Ethereum, such as BNP, XRP, Dodge Coin, Cardano, and Polygon. Nevertheless, there are currencies such as Tether, USD Coin, and Binance USD that had a much stable evolution of their market capitalization, albeit they are backed by a 1:1 ratio of dollars per token, thus providing a more stable asset that fares better against the volatile nature of the cryptocurrency industry (Reiff, 2021). The reasons of the volatility of the



crypto market were, according to Chow (2022), that regulations started to be imposed on the cryptocurrency market such as China's complete ban on mining and use of cryptocurrency, in mid-2021, on its territory, and regulatory measures by the governments of the USA, India, and Germany. Furthermore, Tesla's announcement that will not accept Bitcoin as a form of payment for its cars in May 2021 further spooked investors causing a sell of these assets which caused the crypto crash of 2021. Moreover, not all cryptocurrencies experienced the same high volatility periods. As said by Lopatto (2021), in the case of Tether which experienced a tumultuous period for its market value from mid-2017 until mid-2018, its volatility was caused by the leak of the Paradise Papers, while in mid-2019 New York's state Attorney General found that Bitfinex, Tether's owners, covered-up the fact that they had losses of 850 million \$. In addition to that, Tether's lawyers admitted that Tether was only 74 percent backed by other traditional currencies or other cash equivalents. In the case of the USD Coin which experienced a tense period of volatility from the end of 2018 until early 2019 its market valuation volatility was because it was newly put out on the market and its supply and demand did not reach a point of equilibrium which was subsequently reached in the mid 2019 and ever since it had a very stable journey. Additionally, regarding the XRP value in 2018, as stated by Farrer (2018), it coincided with the first major cryptocurrency bubble that burst due to rumors that South Korea might ban trading in cryptocurrency, later followed by Coincheck's hack which resulted in the loss of 530 million \$. For the other currencies such as BNP, Dodge Coin, Cardano, and Polygon their market valuation followed the market trend of both Bitcoin and Ethereum, increasing immensely in early 2021 until the market burst.

**Table no. 1: Market share of selected cryptocurrencies as % of total market capitalization of the entire industry**

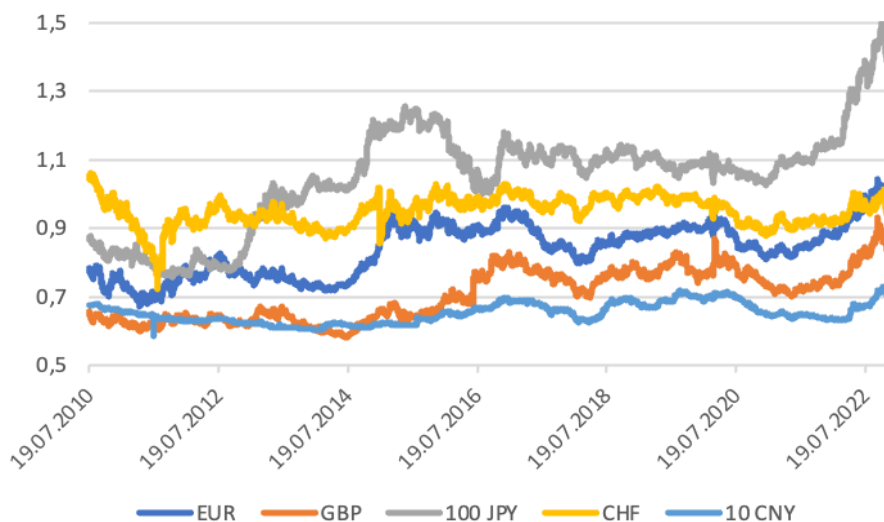
Market share as % of total industry	
Bitcoin	39,96%
Ethereum	18,23%
Tether	8,24%
USD Coin	5,50%
BNP	4,84%
Binance USD	2,23%
XRP	2,16%
Dodge Coin	1,24%
Cardano	1,08%
Polygon	0,85%
The rest	15,67%

*Source: data retrieved from CoinMarketCap database*

Looking at table no.1, we can see that Bitcoin clearly dominates the crypto industry. Having about 40% of the total market, it stands uncontested as the most valuable cryptocurrency in use in 2022. It is worth mentioning that while Bitcoin has the highest market share, it is also the oldest out of all cryptocurrencies. Other notable mentions are Ethereum, at 18,23%, Tether, 8,24%, USD coin, and BNP having 5,5% and 4,84% respectively. ‘The rest’ category comprises the remainder 8960 cryptocurrencies that have 15,67% of the market share.

Given the data collected, it is highly unlikely that countries will allow the use cryptocurrencies as they are, as seen in the figures above, highly volatile. Highly volatile currencies are undesirable because they lead to a lower GDP growth (Holland, Vieira, Silva and Bottecchia, 2011). Despite this, there is one country in the world that allows one cryptocurrency, the Bitcoin, to be used as a legal tender i.e., this form of payment must be accepted if offered (PwC, 2021). Nonetheless, not every country is as keen as El Salvador, according to the U.S. Law Library of Congress (2021) there are 9 countries that ban the use of cryptocurrencies: China, Nepal, Morocco, Tunisia, Algeria, Egypt, Oman, Qatar, and Iraq.

In order to give an even clearer picture of the various cryptocurrencies and their performance both against themselves and other financial indicators we must see how the exchange rates of USD against other major currencies are. The other major currencies that we are going to compare the USD to are the EUR, GBP, JPY, CHF, and CHY. In order to better represent graphically the changes in the valuation we took in consideration 100 JPY and 10 CHY. The time frame used for this analysis is 19.07.2010 – 21.12.2022.



**Figure no. 11: Exchange rate of USD for other major currencies**

Source: Yahoo finance database

By analyzing the above graph, we can clearly see that the volatility of the exchange rate of USD for other major currencies is, relatively low, or at least not as worrying as the price volatility for the cryptocurrencies shown in Figure no.1 until Figure no.10. A period of tumultuous exchange rates is seen starting from the middle of 2021 when governments have started to pick up the spending in order to jump-start their economies after the effects of the Covid-19 pandemic. Because the USD is the world's dominant reserve currency sitting at approximately 60%, according to IMF (2023), it has been able to enjoy a very privileged status, thus even if the United States of America has spent enormously to kick-off their economy it was able to keep the demand high for the USD. Because of this, other currencies have started to devalue against the USD but still have not reached the level of uncertainty, due to volatility, as have the cryptocurrencies examined. It is safe to assume that because national currencies are backed and supported by countries and their governments, they have a much higher probability of not being in a down fall if the macroeconomic context is uncertain.

To conclude this chapter, it is the opinion of the author that cryptocurrencies will not be accepted by any major economy as a legal tender due to their feeble structure and their susceptible nature. Cryptocurrencies are not backed by any country; thus, there is an enormous risk associated with them. If they suddenly lose most of their market value, no governmental body will step in to save it.

## **2. Digital currencies of central banks**

Many central banks have started to venture into having their own digital currency. According to the World Economic Forum (2022) digital currencies are, put simply, just money that are digital rather than physical. Therefore, for example, a ten-euro digital currency will be worth just the same as a regular ten euro note that we all have and know. There are many reasons why central banks are pursuing their own digital currency. One of them is because, as said by the European Central Bank (2022), it is a much safer way to use money.

Additionally, the ECB states that because of the declining use of cash for payments, and because of the ever increase of e-commerce which, obviously, cannot use physical banknotes in order to process payments. A greater need of safe and secure online measures must be taken – including a new digital currency and better and more thorough regulations. Moreover, ECB (2022) says that in the digital age, a digital euro produced by the Eurosystem would act as a monetary anchor and as a public benefit. It might encourage innovation, improve payment efficiency, and promote the European Union's overall economic efficiency. By utilizing synergies with the business sector, it would support the ongoing digital shift. For example, it would be easier for payment systems to be quickly scaled up to span the entire euro area and for smaller businesses to offer more technologically advanced services at affordable costs if intermediaries were permitted to offer innovative services based on the digital euro.

The European Central Bank started this procedure on July 2021 where the Governing Council voted to launch an investigation phase that is expected to end in the Q3 of

2023. At the end of that period, after many consultations, distribution models, design options to control take-up, and thinking thoroughly about the access to a digital euro ecosystem, and the services that possibly will add value, the European Central Bank will decide if they will embark on this journey.

There are other central banks that are even keener than the European Central Bank. The People's Bank of China, the central bank of China, has made pioneering progress nationally toward implementing the world's first digital currency: the e-CNY (digital yuan). Jiang and Lucero (2021) state that the e-CNY was in 2014 in its very early stage of experimentation when researchers have put into question the possibility of creating a Central Bank Digital Currency (CBDC).

In January 2017, the Digital Currency Research Institute was created by the People's Bank of China, in that exact year, thanks to the approval of the State Council, the PBOC has formally started their work towards the e-CNY. Three years later, in April 2020, e-CNY experiments were started in four cities in China: Shenzhen, Suzhou, Chengdu, and Xiong'an. The PBOC was negotiating with private businesses in May to extend its test run. Many significant companies, including the largest ride-hailing business in China, Didi Chuxing, China's equivalent of Uber or Lyft, and the largest company in the food delivery industry, Meituan and Dianping, are contenders to roll out E-CNY on a broad scale through their extensive platforms.

The extensive push for the e-CNY is not a surprise at all. According to Fullerton and Morgan (2022) a PBOC survey in 2019 that evaluates the number and value of the transactions done by payment type found interesting results. Mobile payments therefore surpassed cash and cards, which accounted for 23% and 7% of total transactions, accounting for 66% of the total. By value, mobile payments made up 59% of all transactions, compared to 16% and 23% for cash and cards, respectively. Because of these results, China is set to continue their pursuit of introduction of their e-CNY as it will be able to make transactions more secure and reliable.

## **Conclusions**

As seen in this paper, the cryptocurrency market is highly unstable and volatile. The major players, the top 10 crypto currencies, have seen a big change in their market valuation. It is very unlikely that such a cryptocurrency will be used, in this current state, throughout the world or even in any major economy. While crypto still might be a hot topic as of right now, the future holds no certainty that this newfound obsession for a new type of investment will last. Governments, through their regulatory bodies, must be very careful in handling cryptocurrencies, as their valuation are very easily and strongly influenced by statements from political and public figures. The future of cryptocurrencies becoming widely used as a legal tender is extremely unlikely, on the contrary countries have started to ramp up both limitations of their use or a flat out ban on them.

In the case of digital currencies, the likelihood of them starting to be widely used is very high. Central banks such as the European Central Bank (ECB) have started the process

of feasibility of such technology, and The People's Bank of China takes this new innovation much further. PBOC has started test trials and it is expected that they will take things even further in the near future. China has set itself on a very ambitious plan to revolutionize and change how its people and firms conduct transactions. The world is in a constant and rapid change, and how we use money will continue to be a pressing issue for individuals, corporations, and governments.

The limitation of this research comes from the fact that we have not taken into consideration all the cryptocurrencies that are on the market, thus we were not able to analyze their market valuation and volatility in order to give a more thorough picture. Furthermore, we have compared the exchange rate of the USD to only the EUR, GBP, JPY, CHF, and the CNY. In consequence, we have not considered other major currencies such as the CAD, AUD, and the HKD. As a further research aim, the author should consider using for its analysis all the cryptocurrencies and national currencies mentioned above.

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