

ANALYSIS OF CRYPTOCURRENCIES AS A FINANCIAL ASSET

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Abstract:

The following research paper focuses on the analysis of new decentralized digital assets, cryptocurrencies. As an introduction, the concept of cryptocurrencies and the most outstanding references will be put into context. The main objective of the work is to analyze cryptocurrencies not only as a decentralized tool, but also as a speculative financial asset. Research will be conducted on the functioning of the reference currency, Bitcoin and the main factors affecting to understand how its value fluctuates. Subsequently, it will be compared with the coins that currently belong to the top 5 cryptocurrencies with the largest market capitalization.

KEYWORDS: Cryptocurrencies, Bitcoin, Blockchain, Digital currency, financial assets

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1. introduction

The choice of theme is based on several key points. On the one hand, my interest in the cryptocurrency market, especially Bitcoin and its competitors for their financial analysis, since today they are capitalized for a value greater than two billion euros. To contextualize the importance of this emerging market, Bitcoin has accumulated a total of more than 700 million euros, comfortably surpassing companies such as Samsung (500 million), Visa (450 million) or Pay-pal (270 million). According to the data presented in this paper, the returns of the main cryptocurrencies have been extremely high, reaching in the cases of Bitcoin and Binance coin to exceed the ROI of 250,000%. Being a profitable asset and demanded by investors, even so, it has meant a rejection by governments and financial bodies of the countries, being interesting its analysis also as a tool. These tools produce a new paradigm in financial markets, both as an investment asset and as a decentralized financial system itself. The financial sector may be in a process of change where the advances of new technologies can evolve markets and society.

The arrival of cryptocurrencies in the market has acted as a disruptive force, offering an alternative form of decentralized monetary exchange, in a way unknown to date. Since the birth of bitcoin, a huge number of crypto projects have been developed, many of which have failed in the market. Surely, due to this scarce life, there is still little research on these coins, and most of them are focused on the one that, so far, has been more successful, bitcoin. The following lines address the analysis of the financial reality in the investment field of this new asset, as well as its relationship with other investments of greater tradition. This new technology, with its risks, advantages and questions, have become one of the best market opportunities within today's financial assets. But what factors can determine the success and profitability of a cryptocurrency? In this study, we propose several objectives.

- 1) Understand the concept of cryptocurrencies and what are the projects that are occupying most of the market capitalization. From 2008 to date, the intrinsic characteristics of these assets have been determined, and the bases of each type of cryptocurrency have been developed.
- 2) Another objective is to make an analysis of the main characteristics that can mark the proper functioning of a cryptographic project, differentiating between the variables of the project itself and those that it has as a financial asset within the capital market.
- 3) It is also important to differentiate the different uses that cryptocurrencies have and really see how to classify them according to their potential, in addition to seeing if they are a good form of investment.
- 4) Check how cryptocurrencies have behaved in reference to the financial market, in our case we will use the market for comparison

Because the cryptocurrency industry is still very young and there are factors that impact it every day, not many academic resources can be found with fully updated information. Therefore, almost all the information collected in this work comes directly from synthesis of online sources, pages specialized in the subject or knowledge acquired through the reading of news in the sector. Section 2 introduces the concept of cryptocurrency and the main characteristics that must be met in order for them to fall within the concept of this type of asset. In Section 3, cryptocurrencies are studied from the economic-financial point of view since, at present, their main use is investment with the intention of obtaining high returns on investment. Subsequently, section 4 defines the variable that can affect the profitability of the different cryptocurrencies, focusing on two alternative points of view, that of the project and its financial meters. Section 5 defines the database used and the descriptive study of the variables studied once collected. For a better application in section 6 a comparison of ROI with the shares of the American S&P 500 since the birth of cryptocurrencies is made. Sections 7 and 8 compile the conclusions of the study and the limitations of our study.

2. What is a cryptocurrency?

A cryptocurrency is a virtual currency that is protected by cryptography, which makes it impossible to use it twice. Cryptocurrencies are generally decentralized networks based on blockchain technology, which we could define as a ledger distributed by a disparate network of computers, thus providing a secure and public data structure throughout the network. (Coron, 2006; Liu et al, 2018). Each new block or transaction generated must be verified a certain number of times, depending on the cryptocurrencies. Cryptocurrencies have no central authority, making them theoretically immune to government interference or manipulation(Leet,2019).

Before the 2000s models close to the concept of cryptocurrency were created, such as the digital money service E cash created by David Chaum (Chaum D, 1983) and the DigiCash system that proposed anonymous transactions based on cryptography being this centralized (Lunt P, 1996). According to previous research, the idea of cryptocurrency was born in 2008, where the lines were defined to create new type of decentralized money that used cryptography as a means of control. This definition is usually attributed to Wei Dai (1998), Otiz, O. (2001 and Pauw, C. (2017).

In 2009 Satoshi Nakamoto presents the project of the first cryptocurrency, Bitcoin with the aim of replacing in the long term the physical currency motivated by the financial crisis of 2008 and the reduction of money in circulation in the financial system. Unlike financial systems, where central banks can control the money supply through expansive monetary policies, Bitcoin (Nakamoto S, 2008) offers a decentralized system where no one can control this supply, which is limited. This system remains inviolable and secure thanks to the contribution of the "miners" who carry out the operations in exchange for Bitcoin. In addition, there is no equivalent asset that safeguards the value of Bitcoin. Based on the characteristics of Bitcoin research in recent years (Lansky J, 2018; Houben R and Snyers A, 2018; yuan Y 2018) a cryptocurrency must meet certain characteristics:

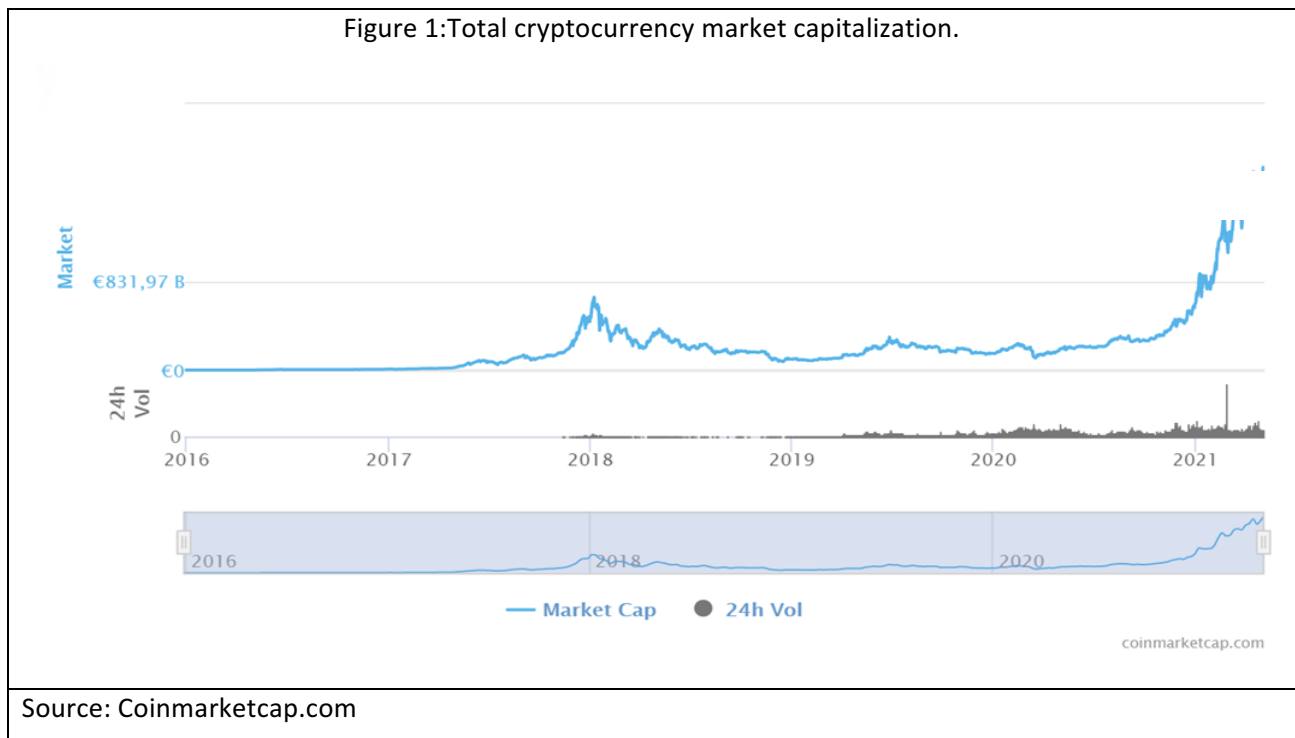
- **Ease of payments** are made transactions instantly at any time, with any amount, unlike other banking services. In addition, it is interchangeable for other currencies.

- **Low transaction fees** Users can include a fee on their transactions to receive priority and perform it more quickly in exchange for larger transactions, but also make trades with lower commissions and lower priority. Person-to-person transactions, there are no intermediaries, so transaction fees are low. Fees at the present time are much lower and with fewer limitations than other alternative services, allowing users to avoid the high fees charged by banks and financial institutions for wire transfers.
- **Secure and private transactions** Transactions are irreversible once carried out, and are also recorded in a freely accessible register that offers transparency to the movement of capital. Given its architecture, it is impossible to counterfeit or reproduce cryptographic currencies. In addition, each fraction of currency can only belong to one owner-and can make anonymous transactions if it so chooses. In modern cryptocurrency systems, a user's "wallet" or account address has a public key, while the private key is only known to the owner and used to sign transactions. Funds transfers are completed with minimal processing fees.
- **Decentralisation** They must be decentralised, so they must not be controlled by any institution.
- **Neutral and transparent** All information is recorded on the blockchain for anyone who wants to check how demand is moving. No organization can control them by being a highly neutral, transparent and reliable system.

3. Cryptocurrencies as a financial asset

Given this data, Bitcoin can be understood as a reliable payment method in the near future, where a greater number of companies accept your payment (although currently more than 2000 companies accept it as payment among them 150 multinationals, such as BMW, MICROSOFT, PayPal, RAKUTEN, DESTINIA, WIKIPEDIA, PLAYSTATION, G2A ...),

but currently mainly as an investment financial asset , purely speculative. Its decentralization and limited supply have caused its prices to have increased very prominently, attracting the attention of investors, in which we can differentiate two profiles. On the one hand, the "holders" or people who trust in the viability of the project in the future and its potential by maintaining positions of this asset in their long-term investment portfolio. On the other hand, short-term investors who move large volumes of capital in the short term taking advantage of the high volatility of this asset to profit indifferently from its future application. Currently according to the portal specialized in cryptocurrencies CoinMarketcap (2020) we find how the capitalization of the global cryptocurrency market has exceeded that of trillion and a half euros. You can see the exponential growth in Figure 1.¹

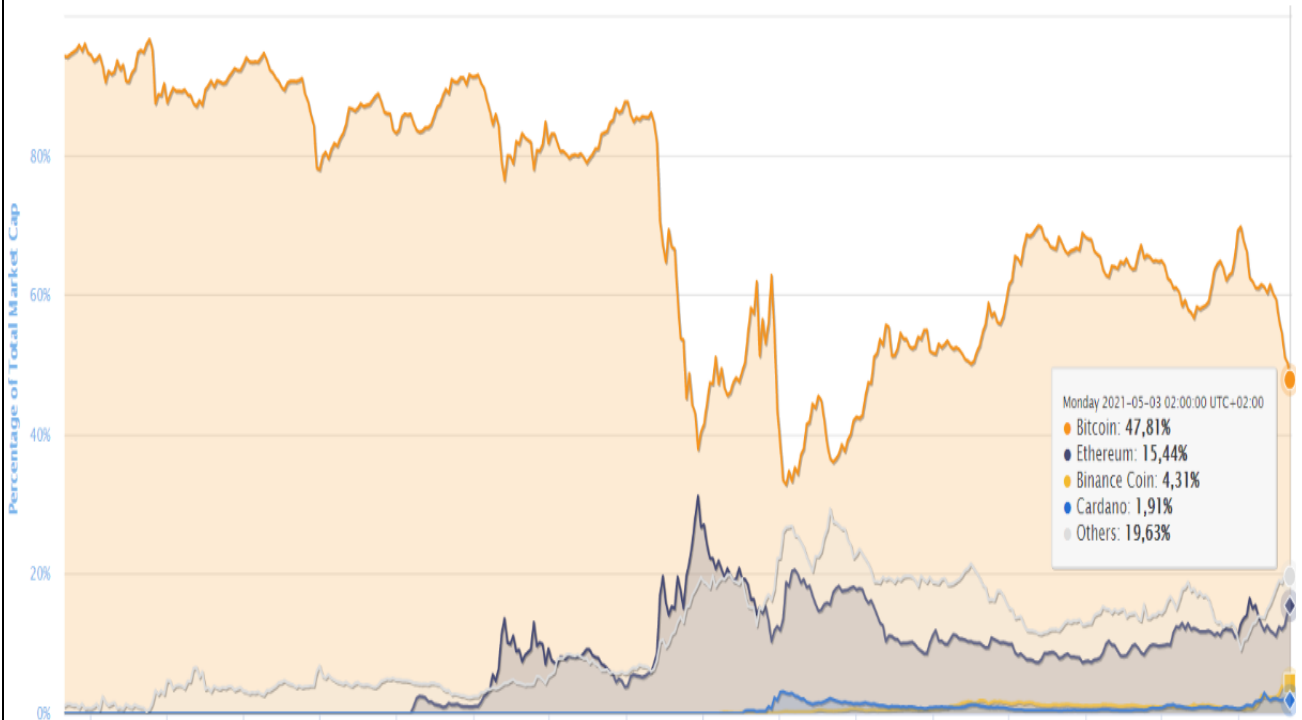


Although Bitcoin remains the most well-known and eye-catching project as a potential investment, there are other projects in the cryptocurrency market that have grown in

¹ visit <https://spendmenot.com/blog/who-accepts-bitcoin/> for more information on multinational companies that accept bitcoin fully as a payment method.

recent years reducing Bitcoin's dominance as a cryptocurrency. In Figure 2, it is observed how in other projects they have divided this total capitalization into different projects.

Figure 2:D Bitcoin :D



Source: Made with data and software from Coinmarketcap.com

It is observed how the dominance of Bitcoin has decreased in recent years from practically 100% of the cryptocurrency market to only 47.81%. This shows how market investors are diversifying into other decentralized products is that they could offer better returns or reduce the risk associated with investing in only one market product. These projects that make up the top5 market cap are Ethereum (ETH), Binance Coin (BNB), Dogecoin (DOGE) and Cardano (ADA). Given this data, and the interest of cryptocurrencies as a potential investment, a study of the factors that determine can determine and affect Bitcoin's price will be made and a comparison will be made with the rest of the most important cryptocurrencies today. These factors that can influence

the price of cryptocurrencies will be divided into two groups based on the studies of Hayes (2017), Bouoiyour and Selmi (2014) and Polasik (2014).

On the one hand, financial factors (which are based on meters on the characteristics of the financial asset) and the characteristics of the project (which influence investor confidence for its future potential as a cryptocurrency).

4. Study variables

This section lists the variables that can influence the determination of the prices of Bitcoin and other cryptocurrencies studied, both at the project and financial level. As a financial asset, the objective is to obtain a greater profitability, our objective is to observe how the different variables influence either their implicit characteristics of the project and their financial variables in the profitability obtained by each cryptocurrency. Therefore, our variable dependent on the rest will be the ROI accumulated by each cryptocurrency since its launch. That the cryptocurrency is more used, has a better project or has a larger market capitalization does not necessarily indicate that it performs better as a financial asset. In this study it is observed how the rest of the variables can have a direct influence on the ROI obtained since the beginning of the project, and which can be a good indicator to make investments in other cryptocurrencies.

For this study, the five most important cryptocurrencies have been chosen by popularity and use eliminating the "Stablecoins" or coins linked to values of fiat currencies (such as the dollar) and the "MEMEcoins" or coins that do not meet all the necessary characteristics to be considered "cryptocurrency" but that are traded as one. These cryptocurrencies are highly volatile and behave in a different way due to their characteristics, therefore, they can be a problem to compare with the rest.

4.1 Characteristics of the project

4.1.1 Whitepaper (Cryptocurrency Goals)

A Whitepaper is a document that acts as a guide to explaining a specific concept, clearly explaining and including project information that improves the understanding of the project. For cryptocurrencies, the Whitepaper has an importance of capital, since it has the mission of defining the project and attracting potential investors by explaining the characteristics of the blockchain, functionalities and objectives. Each project can offer different solutions and call on greater investors with its functionalities. In the case of Bitcoin it was designed with the purpose of offering a decentralized network of value transfer, Ethereum, wanted to generate a platform on which people could develop digital contracts, build tokens and applications in a decentralized way. Shortly after Bitcoin began to gain great popularity, exchanges (or exchange houses) also began to create their cryptocurrencies to offer faster financial products (as is the case with Binance coin, BNB). As a result, all digital assets - seemingly the same - are different. Each one is based on a project with functionalities, pretensions and objectives completely different from each other. Therefore, in our comparison we will take into account the type of project as an influential variable in the price.

4.1.2 Competitors

The cryptocurrency rush has led large teams of developers to enter the sector, creating new participants that offer similar and even improved services compared to other cryptocurrencies with more travel. Competition can be a definite factor for the price of these assets, since as has been exposed in this work, cryptocurrencies are based on the confidence of crypto-investors.

A greater supply of cryptocurrencies with projects that promise to improve weak points of (processing time in transactions, energy consumption levels, operating cost to keep alive the blockchain or blockchain of this digital currency. In this study, an investigation will be conducted on how competition from other large projects affects Bitcoin, and whether these may mean lower profitability for Bitcoin or simply increase the total capitalization of the crypto market.






To measure the level of competition, we will take into account the number of current projects on the market depending on the type of project. Although currently in the crypto market there are at the moment almost 10000 different cryptocurrencies not all

are direct competition for Bitcoin or other cryptocurrencies. To define the competitors of each currency we will differentiate its general purpose represented by the Whitepaper (value reserve, smart contracts, financial services ...) and through the web Coingreko.com (2020) we will observe that projects of more than 100 million capitalization could obtain part of the market capitalization of the cryptocurrencies studied (top 5).

4.1.3 Listed markets

Cryptocurrencies are decentralized products therefore they have no trading restrictions in any market. The usual option to trade cryptocurrencies with sufficient level of liquidity are the Exchange or exchange houses. A cryptocurrency exchange is the place where cryptocurrency transactions are carried out (in exchange for fiat money or other cryptocurrencies). These Exchanges are very important for the crypto ecosystem since here the market price that marks the value of cryptocurrencies is generated based on supply and demand. Currently, the three reference Exchanges where liquidity and users are higher can be seen represented in Figure 3, with data from Coinmarketcap.com (2020):

Figure 3: Main Crypto Exchanges

#	Nombre	Puntaje del exchange ⁱ	Volumen (24h)	Liquidez prom.	Visitas semanales ⁱ	# Mercados	# Monedas	Compatible con fiat
1	 Binance	9.8	\$65,508,938,467 ▼ 10.86%	652	34,690,815	1214	358	AED, ARS, AUD and +43 more ⁱ
2	 Coinbase Pro	8.8	\$8,837,440,126 ▲ 9.13%	490	5,263,535	192	59	USD, EUR, GBP
3	 Huobi Global	8.5	\$20,966,279,060 ▼ 12.59%	617	1,883,132	962	325	ALL, AUD, BRL and +47 more ⁱ
4	 Kraken	8.5	\$3,920,131,554 ▼ 14.86%	514	5,372,402	285	62	USD, EUR, GBP and +4 more ⁱ
5	 KuCoin	8.2	\$2,865,521,669 ▼ 6.92%	412	1,268,622	735	318	TOKEN

Source: Coinmarketcap.com

The importance of cryptocurrencies being present in large Exchanges is enormous since, if they belong only to local exchange houses or with little visibility, their price will be greatly affected. If at any time they are listed in these, their price and capitalization will increase abruptly, since it supposes an increase in liquidity, weekly visits and turnover. Consequently, we include it as a representative variable that affects its price and therefore its ROI.

4.1.4 Community

Investor sentiment is an important factor behind the price movements of digital currencies. The news, the attitude of the community of a certain cryptocurrency (fear or euphoria), expectations, evolution and the level of users largely determine the market. After all, investors seek to analyze which events may affect the market and the sentiment of others to predict price movements. This speculative act by investors, which creates pressure and sales, can cause fluctuations in the prices of digital currencies. We

will use two fundamental factors to measure community support on the one hand the number of individual users who own the cryptocurrency as a measure of adoption and also the number of users who follow the project on Twitter. To obtain this data, we have collected the information from the ICOholder website (2020) that collects individualized information from each cryptographic project.

4.1.5 Investment of Large enterprises

In recent months, an increase in institutional demand for Bitcoin has been interpreted as a strong sign of strengthening in the market. The incorporation of renowned players such as banks and financial institutions into the crypto space has cultivated an optimistic narrative around digital assets. For example, in addition to Bitcoin and Ethereum - leading by capitalization, adoption and popularity - some companies invested in currencies such as Cardano, thus reaching the prices of both tokens at new highs this We will study how they affect the accumulation levels of large companies in the price of bitcoin through the free Bigdata page *Bitcoin Treasuries* (2020). The reference company in cryptocurrency investment is Microstrategy who makes investment funds and serves as a reference for large companies to select the cryptocurrencies in which to invest. Currently in bitcoin alone it has about 92000, equivalent to more than 2 billion dollars. To study the effect of large companies investing in each cryptocurrency, we will look at the Microstrategy (2020) website to check which cryptocurrencies are accumulated.

Figure 4: Accumulation of Bitcoin Large Enterprises

BitcoinTreasuries.org	Symbol	Market Cap	% BTC	Purchases/Filings	Cost Basis USD	Today's Value	NgU	Bitcoin	/21M
MicroStrategy inc.	US NADQ:MSTR	\$6,148,688,738	86%	250M Aug. 175M Sep 2020. Learn	√\$2,226,000,000	\$5,268,375,028	2.4X	฿ 91,579	436%
Tesla, Inc.	US NADQ:TSLA	\$757,554,688,042	0.3%	Ann (estimate 48k btc)	√\$1,500,000,000	\$2,485,218,240	1.7X	฿ 43,200	206%
Square inc.	US NADQ:SQ	\$107,147,032,939	0.4%	50M Bitcoin Investment Whitepaper	√\$220,000,000	\$461,778,861	2.1X	฿ 8,027	038%
Marathon Digital Holdings	US NADQ:MARA	\$3,377,141,941	9%	Jan25th Ann	√\$161,539,500	\$312,076,678	1.9X	฿ 5,425	026%
Coinbase Global, Inc.	US NADQ:COIN	\$56,276,938,350	1%	S1 filling	? \$312,076,678	\$312,076,678		฿ 4,487	021%
Galaxy Digital Holdings	CA TSE:GLXY	\$3,276,840,874	7%	\$134M on Jun-30-2020	? \$230,112,800	\$230,112,800		฿ 4,000	019%
Bitcoin Group SE	DE ADE.DE	Not on G.F. ▼	-	Fin report	? \$230,112,800	\$230,112,800		฿ 4,000	019%
Hut 8 Mining Corp	CA TSX:Hut-8	\$760,105,239	24%	Q2 2020	√\$39,303,111	\$185,988,671	4.7X	฿ 3,233	015%
NEXON Co. Ltd	US TYO:3659	Not on G.F. ▼	-	100M Apr 2021	√\$100,000,000	\$98,775,919	1.0X	฿ 1,717	008%
Voyager Digital LTD	CA CSE:VYGR	\$162,985,744	44%	March 31 2020	√\$7,927,182	\$71,277,440	9.0X	฿ 1,239	006%
Riot Blockchain, Inc.	US NADQ:RIOT	\$3,178,146,868	2.1%	\$7.2M on Jun-30-2020	√\$7,200,000	\$67,595,635	9.4X	฿ 1,175	006%
Seetee AS	NO AKER:NO	Not on G.F. ▼	-	March 2021	√\$58,599,450	\$67,307,994	1.1X	฿ 1,170	006%
Meitu	HK SEHK:1357	Not on G.F. ▼	-	Statement	√\$49,500,000	\$54,128,249	1.1X	฿ 941	004%
Argo Blockchain PLC	US OTCPK:ARBKF	\$706,258,220	6.2%	December 2020	? \$43,951,545	\$43,951,545		฿ 764	004%

Source: Bitcoin Treasure

4.2 Financial Meters

4.2.1 Cumulative ROI

If we analyze cryptocurrencies as an investment financial asset, the most important point and the reference variable should be the ROI obtained by them over time. ROI is formally defined as the Return on an Investment. It is a financial ratio that compares the profit obtained with respect to the investment made at a given point in time. The calculation is used to check if a given investment project is yielding the expected benefits. The formula for its calculation is as follows [1]:

$$\text{ROI} = [(\text{Final Price} - \text{Starting Price}) / \text{Starting Price}] \times 100 \quad [1]$$

In this study, ROI is considered as the defining variable of the capacity of each cryptocurrency as an investment asset, since outside of its project or the implicit characteristics of each one, the objective of a good financial investment is that it is as profitable as possible in the shortest possible time. The ROI data of each cryptocurrency from the time they were listed for purchase to the current moment have been collected from the Exchange Coinbase (2020) page where this data can be obtained from its API.

4.2.2 Market capitalization

In the cryptocurrency market, the current price of the asset is represented through the division of the total market capitalization by the number of coins in circulation at any given time [2].

$$\text{Current cryptocurrency price} = \frac{\text{Current market capitalization}}{\text{Number of current coins}} \quad [2]$$

Within the blockchain technology sector, market capitalization is a concept relative to the size of the cryptocurrency at a given time. Market capitalization does not provide an accurate measure of project size and performance. Following the formula above, it can be estimated by multiplying the circulating supply of a crypto-asset by the price of an individual unit. In the end, the market capitalization is simply a number that represents its value determined moment in time.

On the other hand, we must also take into account for our comparison another very important financial meter in the cryptocurrency market the totally diluted market capitalization. It is about multiplying the value of cryptocurrencies in circulation by the amount of cryptocurrencies by adding future coins that are not on the market, but are

known to be. This measure is more recommended to compare cryptocurrencies so we will use it for our comparison.

4.2.3 Volume and Liquidity

The analysis of volume and liquidity, as with other indicators, can be important when making more informed investment decisions. Bitcoin volume is the monetary value at which an asset has been traded over a given period of time. Volume is a key indicator of market activity as it monetarily shows a measure of trading interest between buyers and sellers for the cryptocurrency. Volume is a bald indicator for cryptocurrencies since its value is based on many people staying active in the use and control of a certain cryptocurrency. The volume in cryptocurrencies is usually represented in the last 24 hours, given the volatility of the general market. While volume relates to the amount of assets traded within a given period, liquidity is basically the degree to which the asset is available for purchase or sale, quickly without causing too much variation in prices. This meter is broadly linked to the number and quality of Exchange in which the cryptocurrency is listed. Liquidity is important for all marketable assets, including cryptocurrencies. Low levels of liquidity often indicate that there is volatility in the market, which causes spikes in cryptocurrency prices and mistrust.

Simply put, a liquid and high volume market cannot be easily manipulated because there are many orders in the order book and possibly a large volume of trades within the different price ranges. This results in a less volatile market, meaning that large investors would need amounts too large to significantly manipulate the price. The rationale is similar to those in traditional markets where larger companies are very difficult to manipulate. We will use the 24-hour volume variable of each cryptocurrency that represents the average euro transaction volume of the last 3 months.

4.2.4 Total number of coins or tokens and Coins or tokens in circulation

In the case of cryptocurrencies, not all of them agree on the amount of supply, time and cost of token generation. A limited supply makes cryptocurrencies a scarce resource. In

addition, it also affects the pace of generation of new currencies, which delimit the level of limitation of the offer of each cryptocurrency. Some cryptocurrency on the market has an unlimited supply, but its creation is totally delimited with a stable and known supply. We will focus on two key concepts, offer in circulation and maximum offer.

- The Outstanding Offering is the best approximation to the amount of assets that are circulating in the market and in the hands of the general public.
- The Maximum Bid is an approximation of the maximum amount of coins that will exist in the life of the cryptocurrency. This is also known as the theoretical maximum number of coins to be minted.

This means that cryptocurrencies can have different prices depending on the number of coins in circulation and the maximum possible they are in the future. Mining costs are also different for each. Cryptocurrencies are usually differentiated into two groups. Inflationary (there is a limited number of cryptocurrencies, when the maximum number is reached they will not be issued anymore) and deflationary (there is no maximum number and a new offer can be issued if it is stated in your Whitepaper). In this study we will look at the values of both the offer in circulation and the maximum offer of each token.

5. Analysis of the variables and comparison of Bitcoin with the cryptocurrencies of the top 5

5.1 Data base

For the study of the 5 cryptocurrencies we will use data discussed in the previous section to obtain a descriptive environment of each of the most important cryptocurrencies today.

The data have been obtained from different databases. On the onehand, for financial variables the CoinMarketcap API has been used, being able to download the data of the cryptocurrencies, in this case those of the top 5. ²Coingreko's database has also been used to know the direct competitors of each cryptocurrency, also Icoholder's data for the number of followers on Twitter and the individual holders of each cryptocurrency.

5.2 Descriptive analysis of the variables

Table 1 shows all the variables defined above for the five most important cryptocurrency projects today. A descriptive study of each of the projects will be made to try to define how the different variables can affect the ROI of the cryptocurrency

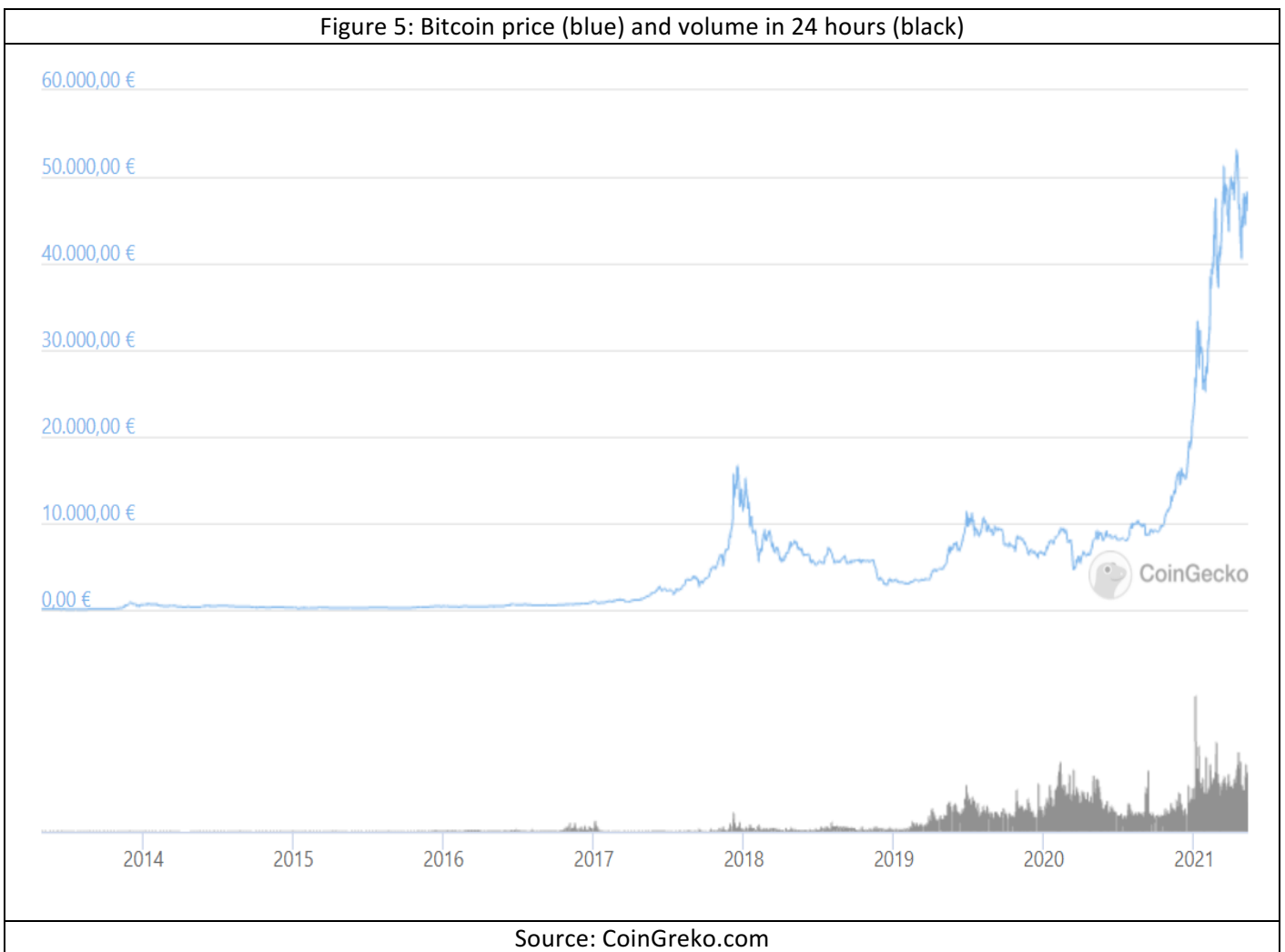
² <https://coinmarketcap.com/api/>

Table 1: Descriptive analysis of Top 5 cryptocurrencies

variable	description	Bitcoin	Ethereum	Binance Coin	Cardano	Polkadot
Roi	Return on Investment (100 euros at the time of placing on the market)	262.631.1%	134.384.5%	272,703%	9.960.6%	1.506%
price	Current coin price	49.904,04 €	3.937,28 €	603,88 €	1,90 €	36,51 €
Offer in circulation	Number of admnishes or tokens currently in circulation	18.708.593,00	115.850.785,94	153.432.897,00	31.948.309.440,75	937.403.399,53
Total offer	Number of maximum coins or tokens	21.000.000,00	115.850.785,94	169.432.897,00	45.000.000.000,00	1.072.927.514,38
Volume 24 hours (average)	Number of euros traded in 24 hours on average in the last 3 months	90.466.097.487,54 €	79.249.955.600,50 €	5.627.030.665,05 €	16.179.211.647,16 €	4.326.922.600,93 €
Market capitalization	Number of euros invested in cryptocurrency	933.634.464.276,39 €	456.137.318.313,26 €	92.655.529.863,74 €	60.963.257.145,07 €	34.220.732.565,31 €
fully diluted market capitalization	Number of euros that the market capitalization would have with all the shares outstanding	1.047.984.941.989 €	456.137.318.313,26 €	102.317.659.086,39 €	85.293.990.000,00 €	39.168.159.140,60 €
ranking	Popularity ranking according to CoinMarketcap	1,00	2,00	3,00	6,00	9,00
Active years	Number of years that cryptocurrency is active in the market as a tradable asset	8,00	6,00	4,00	4,00	1,00
Number of exchanges listed	Number of markets where you can buy cryptocurrency	9549,00	5487,00	593,00	260,00	194,00
adoption	Number of individual users who own the cryptocurrency	200. 000. 000,00	130. 000. 000,00	200. 000. 000,00	43. 000. 000,00	43. 000. 000,00
popularity	Number of users following the project on Twitter	2. 341. 000,00	1. 092.840	3. 600. 000,00	527. 700,00	387. 900,00
Competitors	Number of similar competitors with more than 100 million market capitalization	35,00	49,00	34,00	49,00	49,00
Whitepaper	Project type	Blockchain	Smart contracts	financial services	Smart contracts	Smart contracts
Great fortunes	Microstrategy Investment Fund	Yes	Yes	Yes	No	No
Own realization with data from Coinbase, Icoholder, Coingreko, Coinmarketcap, BitcoinTreasure as of May 13, 2021						

5.2.1 Bitcoin

Bitcoin is currently the reference cryptocurrency today, being the number 1 cryptocurrency in the ranking by market capitalization with more than 930 billion euros. Its main purpose according to whether Whitepaper is to become a store of value with the ability to carry out decentralized transactions without the need for the cooperation of other financial intermediaries. As of 14-05-2021, bitcoin trades at €49,904.04 with a total of 18,708,593 bitcoins on the market. In Figure 5 we can see the evolution of Bitcoin with respect to its price and volume every 24 hours since its departure.



As you can see the price increase of Bitcoin has had an exponential price increase in recent years. The price of Bitcoin at the time of being listed for the first time was 21,30 € in 2013 assuming today an ROI of 272,631.1%. This means that an initial investment

of 100 euros at the time of listing will have obtained a return of 72,631.1 euros. In the case of Bitcoin, it has been listed in 9549 exchanges being the cryptocurrency that is possible to buy in more markets and platforms. Although it is not the most profitable cryptocurrency that we are going to study, it is the best known being the cryptocurrency with the most followers on social networks and the most used with more than 200 million people who have it in their investment portfolio.

One of the advantages of bitcoin when it comes to investing is its purpose of being a store of value. Unlike other cryptocurrencies, it only has 21 million total supply, being in circulation already more than 18 million. This for many investors is a fundamental advantage over other cryptocurrencies as other cryptocurrencies can issue more tokens once their maximum offer is met and market capitalization increases.

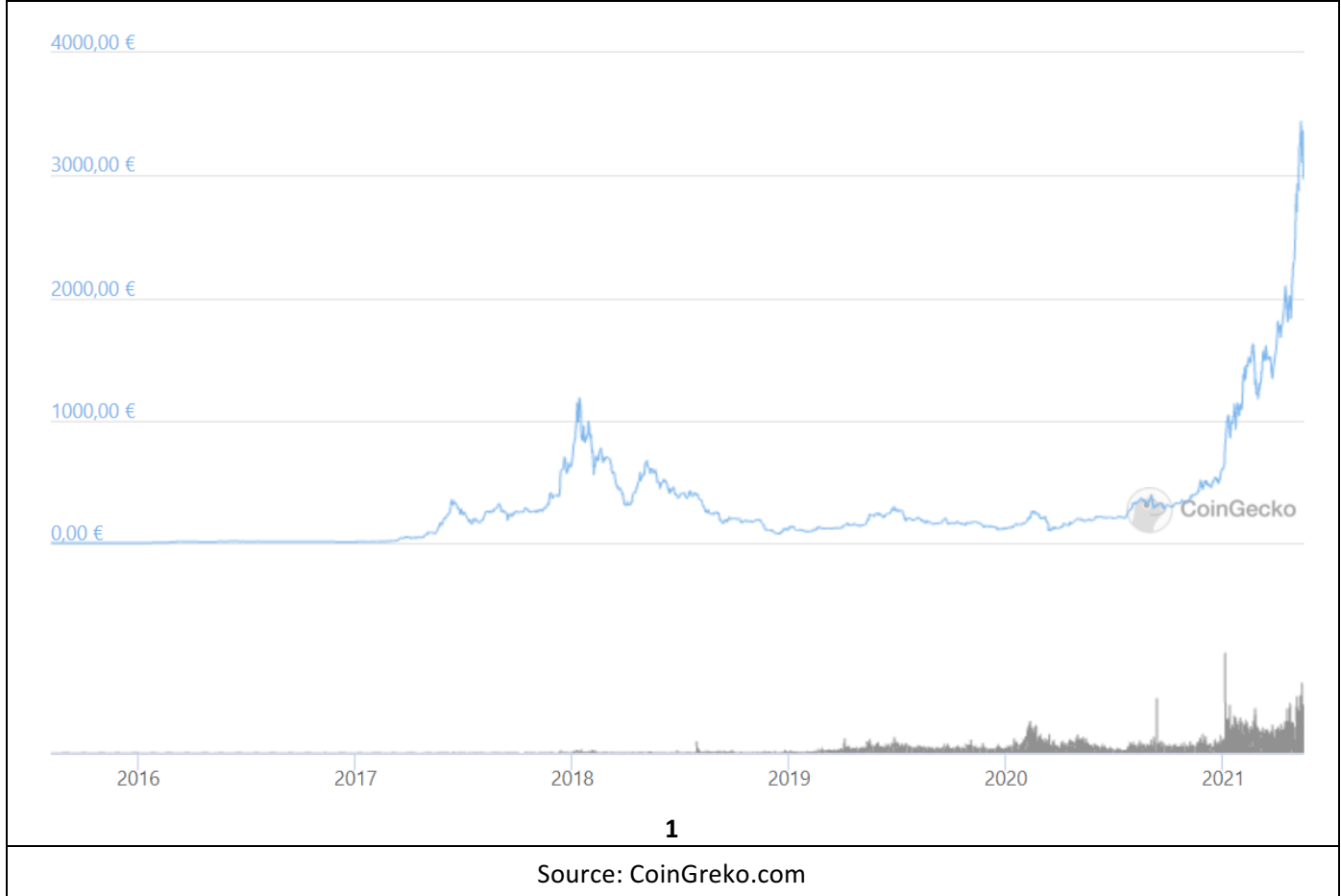
5.2.2 Ethereum

Ethereum is another safe value of the cryptocurrency market, occupying the number 2 in the ranking by market capitalization with more than 450 billion euros. Ethereum belongs to the cryptocurrency group that has the ability to make smart contracts and host platforms that offer different types of services, which the Bitcoin blockchain cannot do. This caught the attention of investors from the year 2017, arriving on June 8, 2021 at 3,937.26 euros with a total of 115,850,785.94 tokens in circulation. In Figure 6 we can see its evolution with respect to its price and volume every 24 hours since its departure. At the time of its launch Ethereum could be purchased at a price of 2.1 euros, obtaining today an ROI of 134,384.5%, being of all the cryptocurrencies studied the second best financial performance of all those studied. This high profitability can be given by different factors.

First ethereum's goal makes it more functional compared to Bitcoin today as it can develop smart contracts since 2017. In addition, it is a better known cryptocurrency, having 1,092,840 followers on Twitter and an approximate adoption of 130,000,000 individuals. Its profitability can also be explained by belonging to the Microstrategy

investment portfolio and project age (6 years). Its energy consumption is much lower than Bitcoin.

Figure 6: Ethereum price (blue) and volume in 24 hours (black)



One of the features of Ethereum is that its maximum offer can be expanded by vote of the holders, in order to expand its market capitalization. It currently has 115,850,785.94 in circulation and moves more than €79,249,955,600.50 € day very close to Bitcoin.

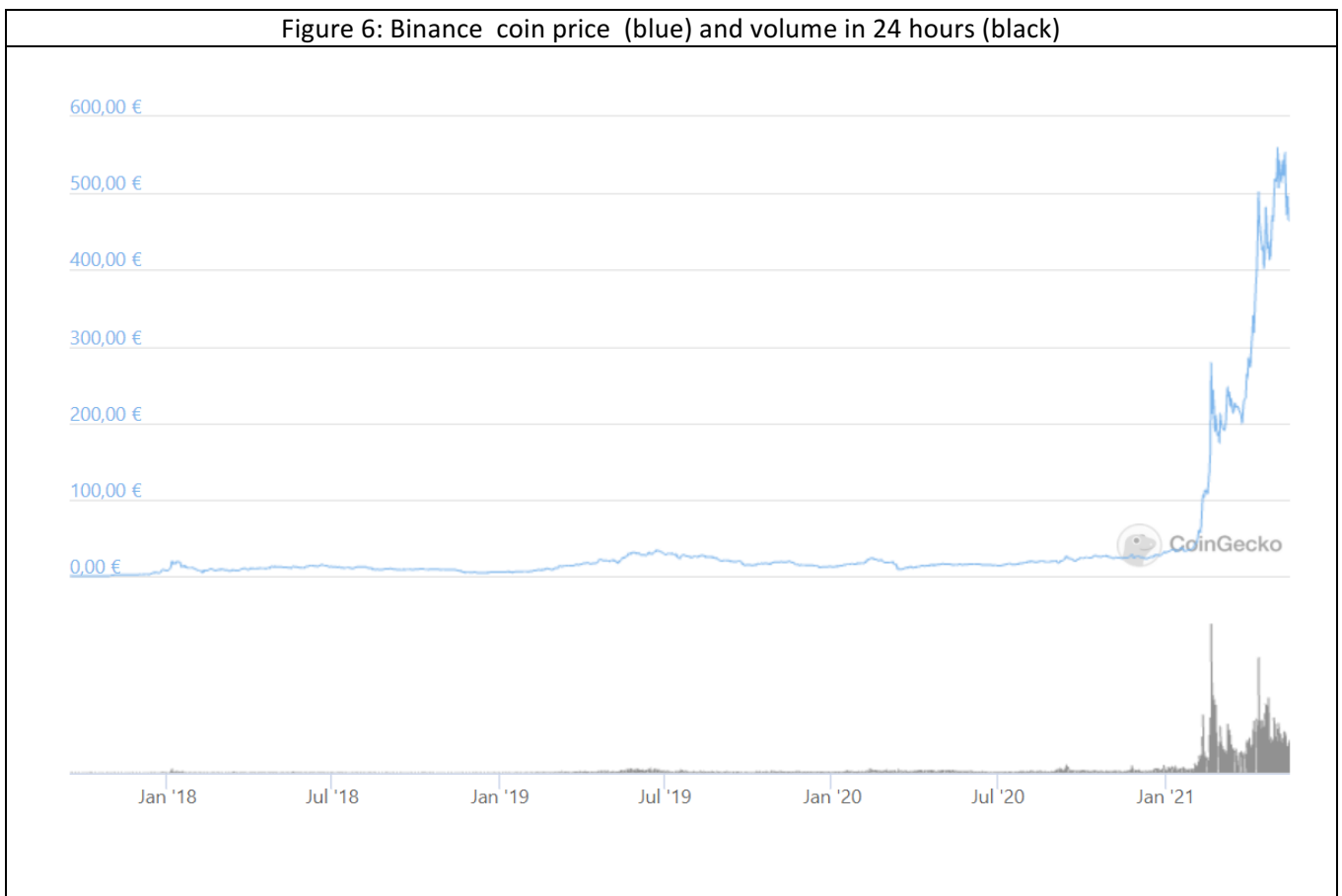
5.2.3 Binance Coin

Binance coin is a cryptocurrency focused on offering financial services to users of the Binance trading platform, which only offers cryptocurrencies. It is currently the

reference financial services cryptocurrency at present, with an accumulated ROI of 272,703% which means that if a person bought at its launch 100 euros of this cryptocurrency currently trades at 272,703 euros. Today, Binance Coin trades at close to €600 with a total of €153,432,897.00 in circulation. In Figure 7 we can see the evolution with respect to its price and volume every 24 hours since its departure. Binance coin has suffered in the last year a very marked growth by several improvements in its network, offering the possibility of obtaining other cryptocurrencies only by keeping binance coin in its portfolio and saving commissions on its platform using its cryptocurrency.

It was also included in Microstrategy at the beginning of the year, coinciding with one of its biggest price increases. In less than 4 years of life, it has managed to be present in 593 exchanges, which may also have affected its price. Another factor that attracts a lot of attention is that it has managed to become the cryptocurrency with more adoption in equal number than bitcoin (200 million individual users).

Figure 6: Binance coin price (blue) and volume in 24 hours (black)



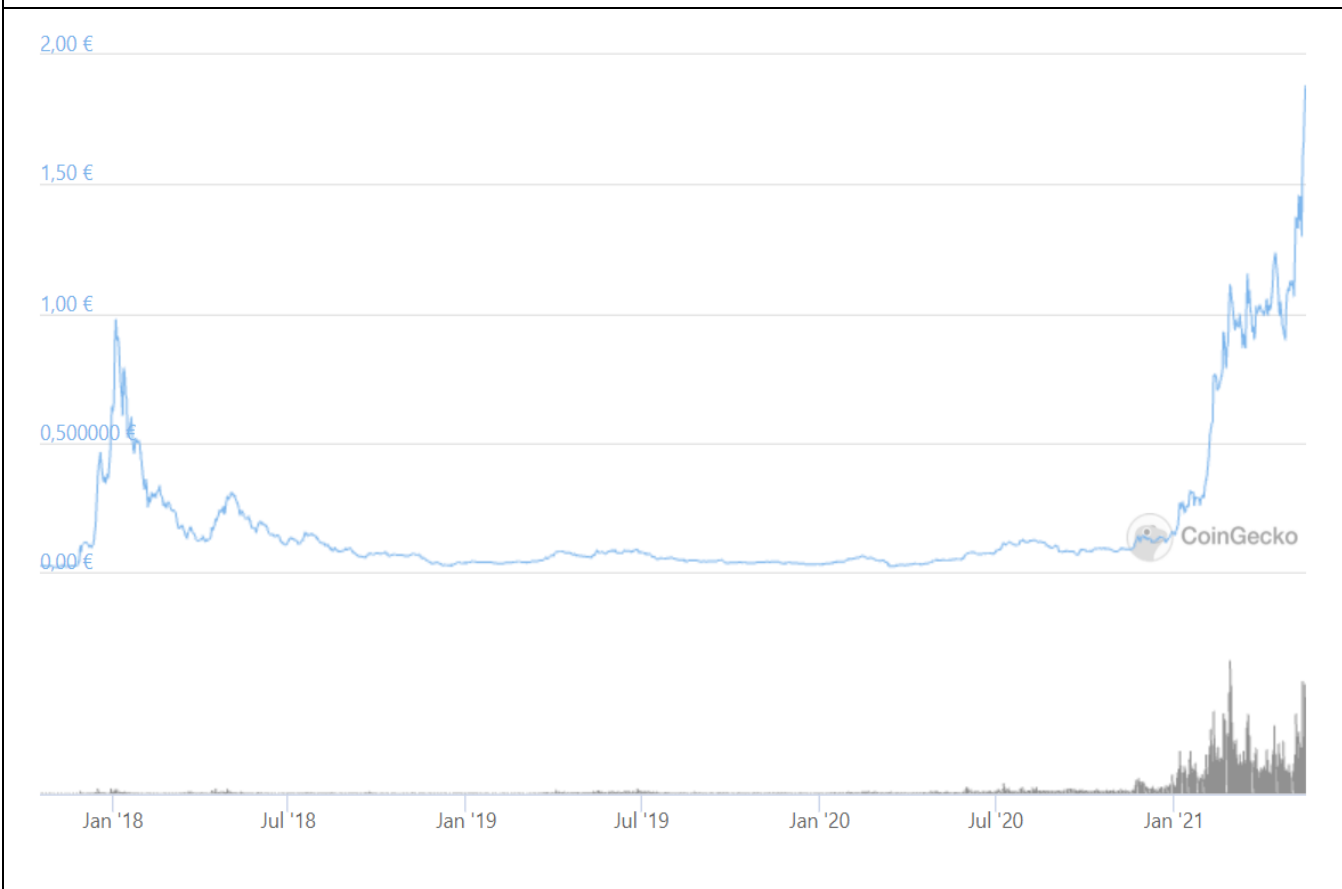
Its popularity surpasses Bitcoin being striking, since its ROI has also surpassed Bitcoin in parallel, it has already obtained about 3 and a half million followers on Twitter. It also belongs to the investment fund Microstrategy, therefore, it seems that the most profitable assets are supported by large fortunes that invest massively in these cryptocurrencies.

5.2.4 Cardano

Cardano is a project that has caught the attention of investors with only 4 years of development. Its purpose is the same as Ethereum, a blockchain where smart contracts and decentralized applications can be made for different types of services. Its advantages over Ethereum are remarkable, as it offers lower commissions and faster transactions and application of smart contracts. Although the project has a lot of potential, it has not yet been added to the investments of Microstrategy or other large companies, and its follow-up by the general public is still very small compared to the Top3 cryptocurrencies.

He currently has 527 thousand followers on social networks, and they have achieved a remarkable number of unique users of 43 million.

Figure 8: Cardano price (blue) and volume in 24 hours (black)



Source: CoinGreko.com

Cardano has an outstanding offer of 32 billion tokens and has currently managed to reach the price of € 1.90, which means an ROI of 9,960.6%. It has been listed in a smaller number of Exchanges than the top 3 cryptocurrencies. On the other hand, cardano has proposed to reach a maximum offer without more emissions of 45 billion, which can also cause a price increase when the maximum amount is reached.

5.2.5 Polkadot

Polkadot is the cryptocurrency that closes the Top5 of cryptocurrencies being another blockchain project of smart contracts with the possibility of making more advanced and faster applications than Ethereum. Both Polkadot and Cardano have been named "Ethereum Killer" for their greater long-term potential in decentralized applications. It

is still a young project that needs development, only being 1 year old. Even so, it has already achieved a market capitalization close to one trillion euros. In its token distribution we find 937,403,399.53 following Ethereum's philosophy of being able to increase this maximum offer if polkadot token holders so decide by vote. The ROI of this investment is much lower than the previous ones, even so, with a price in its output of 0.3 euros it has obtained a 1.506% of accumulated ROI.

Currently 43,000,000 people have Polkadot in their portfolio. In social networks so far they have only managed to unite a community on Twitter of 387,900.00. Microstrategy has not included investments in Polkadot because it is considered to be a project still in development, and that it still has too much risk for investors. Finally, we find that it is the cryptocurrency that has been listed in the lowest number of Exchanges, it seems that all these factors are somehow related to ROI, since, the lower the following and popularity, the lower the ROI.

Also important is the amount of volume in 24 hours of Polkadot that resembles that of Binance coin, 4.326.922.600,93 € in 24 hours. This reflects that investors are interested in this asset, but it does not end up maintaining it in the long term.

Figure 9: Cardano price (blue) and volume in 24 hours (black)



Source: CoinGecko.com

6. Are cryptocurrencies a profitable and reliable financial asset? A comparison of the Return between the American Stock Exchange and the Crypto Market.

In order to compare the performance of cryptocurrencies as a financial asset, we will take as a reference the index of the American industry, the S&P 500. Created in 1923, it is composed of the 500 largest companies in the United States and its weighting is based on market capitalization which suits us given that we have used the same data as a benchmark of performance in the cryptocurrency market. This index better expresses the real situation of the stock and bond markets making it more sensitive than the Dow Jones Industrial Average and the Nasdaq 100.

This index includes the largest companies, as we can see in Figure 10, of all sectors. For example, the index includes companies such as JP Morgan, Apple, Microsoft, Google or Amazon. This index has been considered by many the benchmark index of the world economy, marking the direction of financial markets.

Figure 10: Composition of companies of the S&P 500



Composition of the S&P500 by Finviz

Given this, our goal after checking what performance cryptocurrencies can offer in relation to the most representative index of companies of the American stock exchange. To make this comparison we will use the performance index calculated in the previous point with the performance that has been obtained by the S&P 500 index.

Figure 11 shows a graphical comparison of the performance per dollar of the S&P 500 index and the two cryptocurrencies with the most market capitalization. As you can see visually, it seems that cryptocurrencies do not have a relationship in their return with American companies, as other previous studies have proven, such as the Forbes studies.³ This for many financial experts is what makes Bitcoin an interesting asset to invest since its decentralization

³ <https://www.forbes.com/sites/benjaminpirus/2020/>

Figure 11: Performance per dollar of S&P, Bitcoin and Ethereum from 2010 to 2020



Source: Google Finance

it causes a non-existent correlation with other financial products. Many experts have defended the position that cryptocurrencies are not a correlated asset, invalidating for them the calculation of the classical theories of the CAPM model. As Pompliano express "Bitcoin is definitely an uncorrelated asset, if you look at the correlation between the digital asset and the S&P 500 over the last 180 days, it's at zero. If you look at it compared to the dollar index, it's close to zero." Also Cointelegraph (2020) "The most important part of bitcoin, when it comes to global coverage, is the fact that it's an uncorrelated asset, which means that as stocks go up or down, bitcoin has no correlation with that." ⁴If we

⁴ <https://www.youtube.com/watch?v=PUpw9r4H4XI>

look at table 12, we see how the ROI of Cryptocurrencies does not usually have the same sign as the performance of the S&P 500 index, nor do the ROI levels coincide.

Figure 12: Anua Performance of S&P 500 vs Cryptocurrencies

Anual performance of S&P 500 vs Cryptocurrencies						
year	S&P 500	Bitcoin	Ethereum	BNB	Cardano	Polkadot
2009	15%	-	-	-	-	-
2010	-2%	4%	-	-	-	-
2011	16%	1473%	-	-	-	-
2012	32%	186%	-	-	-	-
2013	14%	5507%	5%	-	-	-
2014	1%	-80%	-1%	-	-	-
2015	12%	33%	15%	-	-	-
2016	22%	125%	95%	-	-	-
2017	-4%	1325%	3212%	500%	1300%	-
2018	31%	-80%	-83%	-75%	-500%	-
2019	15%	88%	-9%	200%	40%	500%
2020	25%	302%	664%	500%	900%	100%

Source: Coingreko's own data

While it is true that the high levels of ROI may be due to the irruption in the market of new blockchain technologies, it can be observed how cryptocurrencies obtain high levels of ROI compared to the S&P 500 index. In the absence of a more in-depth study, it does not seem to have a correlation between cryptocurrencies and S&P 500, but as we have

seen, cryptocurrencies do correlate with each other, with Bitcoin being the dominant one that usually guides the movements of others. While it is true that these data are an indicator of a great investment opportunity, it takes time to observe how cryptocurrencies are integrated into the market and if their usefulness becomes real, causing higher rates of return or simply a generalized collapse in their prices, by pure speculation. It is undeniable that crypto currencies currently have rates of return with a lot of volatility, but having an upward trend since their birth, with small corrections.

7. Conclusions

Throughout this work we have seen the characteristics and capabilities of cryptocurrencies, each with a project behind and different objectives. While it is true

that these projects seek to establish themselves as payment methods, financial products or smart contract applications, currently a large part of their investors seek a purely speculative return as with any financial asset. As has been shown, these assets have achieved great returns, much higher than the ROI offered by products such as the S&P 500, although it is true that with higher volatilities. The decentralization of cryptocurrencies is an issue that generates great controversy and concern in the financial markets, since this feature makes it totally independent of central bodies, banks and institutional interests. While it is true that there has always been an emphasis on the negative events of cryptocurrencies and unrealistic arguments have been used about why they should be banned (that their privacy causes them to be used in transactions of illegal products, which are a scam, which have no value), the reality is that they have managed to grow in market capitalization, being one of the reference assets of today.

In this work, it has been revealed the growth capabilities of cryptocurrencies that meet certain requirements such as a certain age, a solid project, with great follow-up and sufficient volume of transactions to check their ability to survive. The assets have maintained a large capacity of capitalization obtaining results that are not within the reach of other markets or investments. The truth is that, being a novel system, based on a very advanced technology, it is not possible to estimate whether these assets are really profitable or a passing fashion of investment, where when it happens, the market capitalization will be diluted.

Therefore, although cryptocurrencies still have a very short life as assets we can define several arguments for and against the stabilization of cryptocurrencies as a reliable and profitable asset.

On the one hand, we have several factors that lead us to think about a promising future for cryptoassets:

- Although its value is more volatile than other financial assets, in the long run it has had a great return. It seems that this market is young and is overly influenced by rumors, news or experts predicting variations in the price. Likewise, it is this

volatility in the short term, but growth in the long term is what partly catches the attention of investors.

- The progress of 'Blockchain' technology is advancing rapidly with a growth in different projects and utilities never seen since the development of the internet. Its value can be volatile, but the 'Blockchain' contrary to what many experts say if they have an intrinsic value of their own technology, very interesting R&D to improve the performance of companies and transactions.
- There is no central body that can control their value, and that makes them independent of the market, being interesting to diversify investment portfolios. If we differentiate them from the usual currencies, cryptocurrencies will not have an entity that acts as a central regulator regulating their prices, therefore, their value is based on the capitalization and intrinsic value of the project. This is economically interesting and can generate controversy for the current banking system, much criticized for the unstable situation with inefficient central bank control.
- Cryptocurrencies are a mostly deflationary asset, therefore, if the economy grows in a stable way, its price must grow in a correlative way.

But there are also reasons against cryptocurrencies as an investment:

- Countries intending to regulate cryptocurrencies or ban them. There are certain countries with a greater weight for example China, the United States that has limited its use and therefore, hinders its operation, this is a disadvantage for cryptocurrencies, but in a way it demonstrates the "nervousness" of certain countries that people find these payment methods more attractive than their currency, devaluing it. Countries' own fears can prohibit a technology that could improve their transactions and operability within the country, lowering commissions and expenses.
- At the present time they are still unknown to a large part of the population. Cryptocurrencies must achieve greater knowledge of the population for more regular use. This was also a constant in the regulation of other technologies such as the use of the electrical network, the telephone, GPS or internet. All new

technologies have their times for their application and use, being an unknown if cryptocurrencies will be integrated into society as the previous examples.

8. Limitations and future research

Finally, with this descriptive analysis there have been some variables and financial factors that can help to understand the determinations of the price of cryptocurrencies, but it is unlikely that the valuation methods can determine their prices effectively, also taking into account that the crypto market is open 24 hours and exchange without any restriction. This work is an approach to find the precise explanations about the changes in the price of Bitcoin and its competitors, in addition to the interest presented by more and more institutions, researchers and investors. Over time and for future research it should be analyzed according to existing economic theories to more efficiently determine why its high volatility and ROI. Without a doubt, blockchain technology will achieve greater significance in today's globalized world and with greater knowledge of these projects more people will join their use and / or investment so it is necessary to understand that these new technologies that can decrease the role of governments and central institutions when applying monetary policies and controlling inflation or price levels. It would be interesting to study how these products can affect governments and central banks, or whether governments themselves will try to make it harder for citizens to use these technologies.

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