



Is blockchain the most disruptive asset class in history?

Sergio Avilés Pastor



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Introduction

Is blockchain the most disruptive asset class in history?

“For me, I’ve never seen such an incredible asset in the financial market”.

As a fund manager, I would like to provide a general view of blockchain technology as an asset class and to explain how the traditional theories of investment are about to change forever.

This study has been developed from a strict academic and professional perspective, and is also based on more than fifteen years of experience in the financial markets.

The basis of this study is grounded in solid arguments and real world examples. This is possibly the first time blockchain technology has been calculated like any other asset class providing a theoretical value and its global economic impact.

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Definitions

Investment

"The act of putting money or effort into something to make a profit or achieve a result".

Investment Asset

"Investment assets are tangible or intangible items obtained for producing additional income or held for speculation in anticipation of a future increase in value".

Asset Class

"An asset class is a grouping of investments that exhibit similar characteristics and are subject to the same laws and regulations.

Equities, fixed income, cash and cash equivalents, real estate, commodities, futures and other financial derivatives are examples of asset classes.

There is usually very little correlation, and in some cases a negative correlation, between different asset classes.

Financial advisors focus on asset class as a way to help investors diversify their portfolio. The possibility of being traded and being valuable are necessary to be invested".

Bitcoin

"Bitcoin is a cryptocurrency, a form of electronic cash. It is a decentralized digital currency without a central bank or single administrator that can be sent from user to user on the peer-to-peer bitcoin network without the need for intermediaries.

Transactions are verified by network nodes through cryptography and recorded in a public distributed ledger called a blockchain".

Blockchain

"A blockchain is a type of distributed ledger, comprised of unchangeable, digitally recorded data in packages called blocks (rather like collating them on to a single sheet of paper). Each block is then 'chained' to the next block, using a cryptographic signature. This allows block chains to be used like a ledger, which can be shared and accessed by anyone with the appropriate permissions".

Source: Blockchaintechnologies, Wikipedia, Investopedia and Bitcoinwiki.



Ethereum

"An open software platform where developers build and run decentralized apps that contribute to the value of ETH cryptocurrency ecosystem. Ethereum is a public blockchain network.

Is also a Turing-complete contract processing and execution platform based on a blockchain ledger.

Ether is the integral element of the Ethereum blockchain network. Ether functions as a fuel of the Ethereum ecosystem. Ether acts as a medium of incentive or form of payment for the network participants to execute their requested operations on the network".

Token

"Token is a unit of value issued by a tech or crypto start-up, intended to be a piece in the ecosystem of their technology platform or project. Tokens are supported by blockchains. They only physically exist in the form of registry entries in said blockchain. Initially, most tokens were based on the ERC20 protocol by Ethereum.

Tokens are different from bitcoins and altcoins in that they are not mined by their owners nor primarily meant to be traded, but to be sold for fiat or cryptocurrency in order to fund the start-up's tech project.

Utility token

Utility tokens are such kind of tokens that allow their owner buying different services and service items. Utility tokens are used for financing of projects of common infrastructure that couldn't receive such financing previously.

Security token

Security ("investment") tokens are such kind of tokens that give their owner the right to implement his investment interests. It may be the right to participate in a legal entity, capital, profit, the status of a creditor or a lender.

U.S. Securities and Exchange Commission (SEC) gave its official assessment on ICOs on July 25, 2017. According to the regulator, the rules that are valid for common stocks of companies when they enter an exchange should be applied to the tokens".

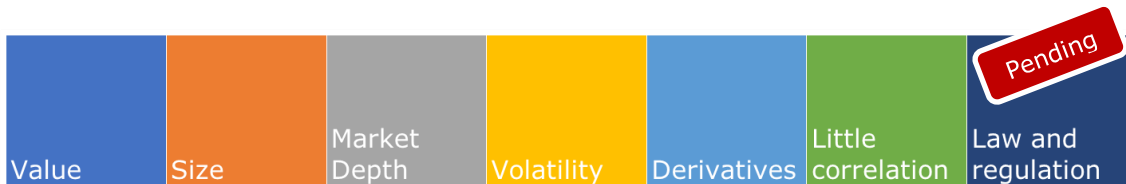
Source: Blockchain technologies, Wikipedia, Investopedia and Bitcoinwiki.



Is blockchain an Asset Class?

As a fund-manager, what assets do I need to add to my portfolio?

An asset has to be analyzed from different perspectives before being traded. These 7 characteristics are the most important and have to be checked before any other thing.



The next pages show that in terms of blockchain, there are only two assets suitable for inclusion in an investment portfolio. These are the Bitcoin and Ethereum, both of which fulfill the main requirements.





Blockchain Theoretical Value

This model, which is based on the traditional profit and loss statement, provides a theoretical market value of the blockchain.

As a technology, blockchain is going to have a real impact on the profit and loss statement of companies, making business much more efficient.

Staff costs and other operating expenses are going to be reduced, but by how much?

We can say that the Worldwide Index members spend on average 12.50% of their total revenues for paying staff costs and other operating expenses. If this technology allows companies to reduce those costs by 10%, it will mean an improvement of 1.25% in Ebitda Margin.

The more this technology is developed, the bigger its expected impact.

To determine the economic impact of blockchain, the Ebitda Margin improvement (1.25%) has to be multiplied by the Worldwide Index Market Cap. This provides a total amount of 462B\$, which is more than 70% higher than the current Cryptocurrencies Market Cap of 270B\$.

Data 27/05/2019

Sergio Aviles Model		USD
Criptocurrencies Cap USD	270.987.858.036	
Worldwide Index Cap USD	57.000.000.000.000	
Price to sales	1,54	
Revenues	37.012.987.012.987	
Gross Margin	30,47%	
Ebitda Margin (0)	17,97%	
Staff Cost + Operating expenses	12,50%	
Blockchain Impact	10%	
Ebitda Margin Improvement	+1,25%	
Ebitda Margin (1)	19,22%	
Theoretical Criptocurrencies Cap USD	462.810.389.610	
Potencial Upside	+70,79%	

Worldwide Index: Design to represent performance of the large and mid-cap companies across 23 developed countries and 24 emerging markets. More than 2700 constituents.

Profit & Loss Statement

- (+) Operating Revenues
- (-) Cost of Sales
- (+) Gross Margin**
- (-) Staff costs
- (-) Other operating expenses
- (+) Operating Cash Flow (EBITDA)**
- (-) Depreciation and Provisions
- (+) Operating profit (EBIT)**
- (+) Income
- (-) Expenses
- (+) Ordinary Profit**
- (+) Extraordinary Income
- (-) Expenses
- (+) Profit before taxation**
- (-) Taxes
- (+) Net Income**

$$\text{Sales} = \frac{\text{Worldwide Index Cap}}{\text{Price to Sales}} = 37 \text{ Trillion \$}$$

$$\text{Staff Cost + Operating Expenses} = \text{Gross M.} - \text{Ebitda M.} = 12,50\%$$

$$\text{Ebitda Margin Improvement} = \text{Blockchain Impact} \times 12,50\% = +1,25\%$$

$$\text{T° Criptocurrencies Cap} = \text{Ebitda M. Improv} \times \text{Revenues} = 462 \text{ Billion \$}$$

Is blockchain the most disruptive asset class in history?

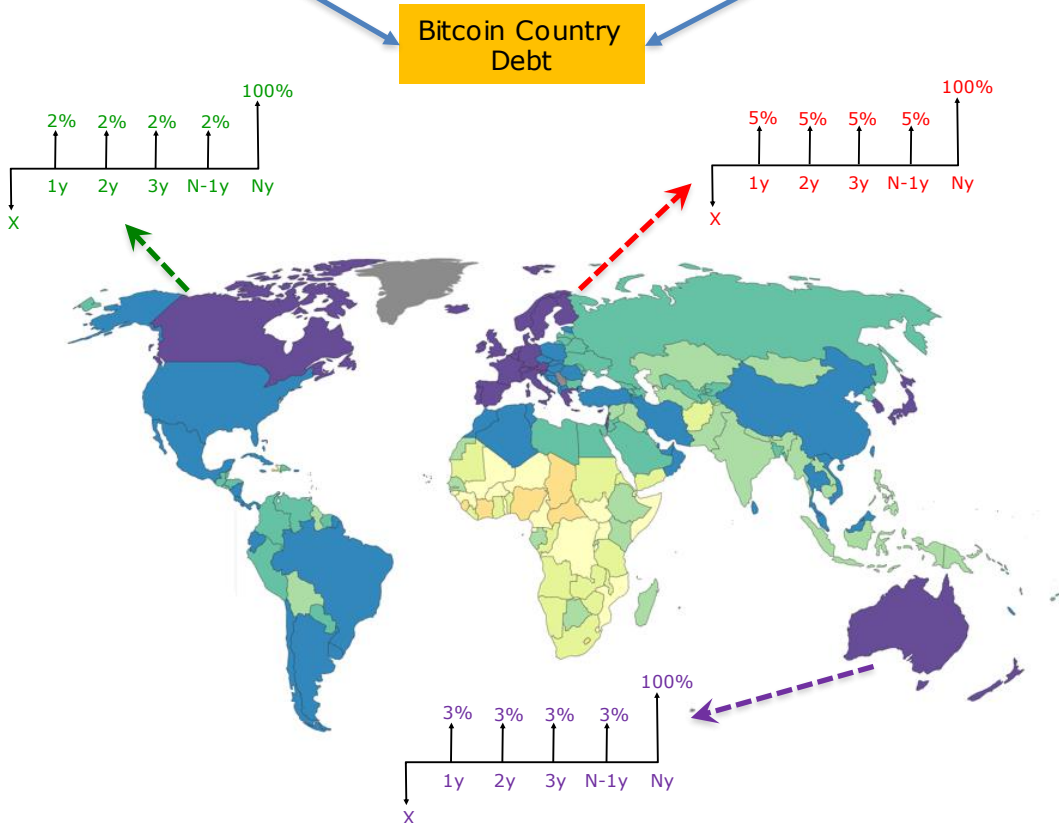
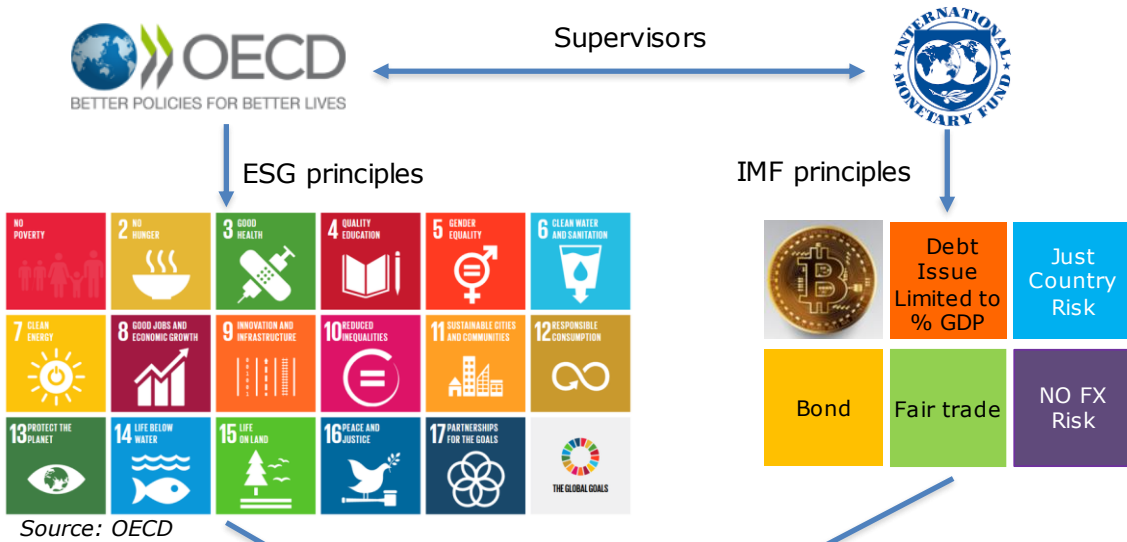
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Bitcoin as an investment asset



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This theory is mainly based on National Debt Issue. From a social and economic point of view, ESG (Environment, Social and Government) investments are becoming more and more important for investors. Private companies are working hard to comply with ESG as there are even some investment funds that only invest in responsible companies.

What about countries?

Let's imagine a country which wants to develop any of the OCDE principles in a real project and needs to be financed. Instead of issuing traditional debt, that country is going to issue a limited percentage of its GDP in Bitcoin under supervision from the OECD and IMF.

The country's risk will vary in relation to its economic situation, and this affect bond prices. Every single trade, development, project milestone, or any other information would be in the ledger, providing a real-time flow of information to the stakeholders and giving them a great view of their investment.

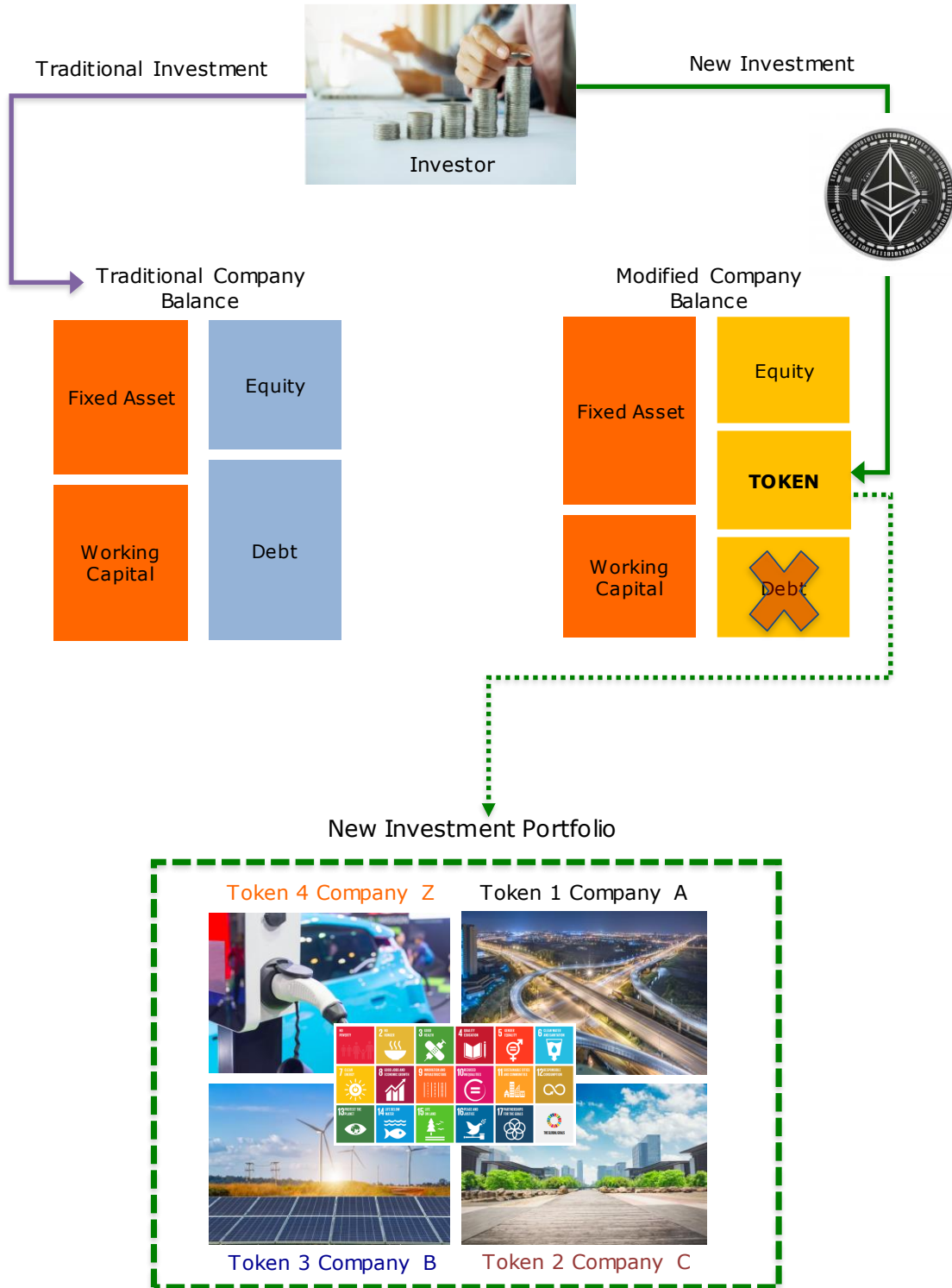
Also, having the support of the Bitcoin community could provide the jump-start for a more democratic world from an economic perspective.

As a conclusion, I would say it is a very fair way to get finance, with a limited risk and close monitoring of projects.





Ethereum as an investment asset





This new theory could change the traditional way to invest in a company and therefore affect how we evaluate its value. As an investor, why do I have to invest in the whole company?

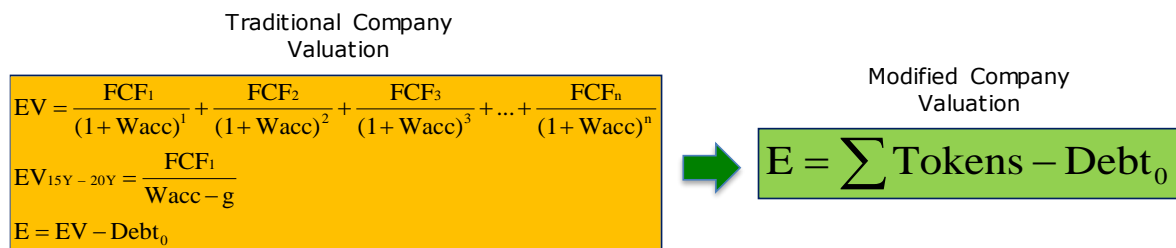
There are going to be certain areas of that company that could be very interesting from a ESG perspective and be suitable for inclusion in my portfolio, but others could be too risky or non-profitable.

But how can I do this?

Up to now companies have only developed technological projects under ERC-20 standards, but imagine if companies could also develop non-technical projects under ERC-20 and ESG standards.

Is this similar to Project-finance?

Yes, quite a bit, the main idea is having diversified token projects, sectors and companies in the same portfolio. Up to now, these kinds of investments have been usually done by institutional investors and other associations in order to create a joint-venture for a specific purpose.



Is blockchain the most disruptive asset class in history?

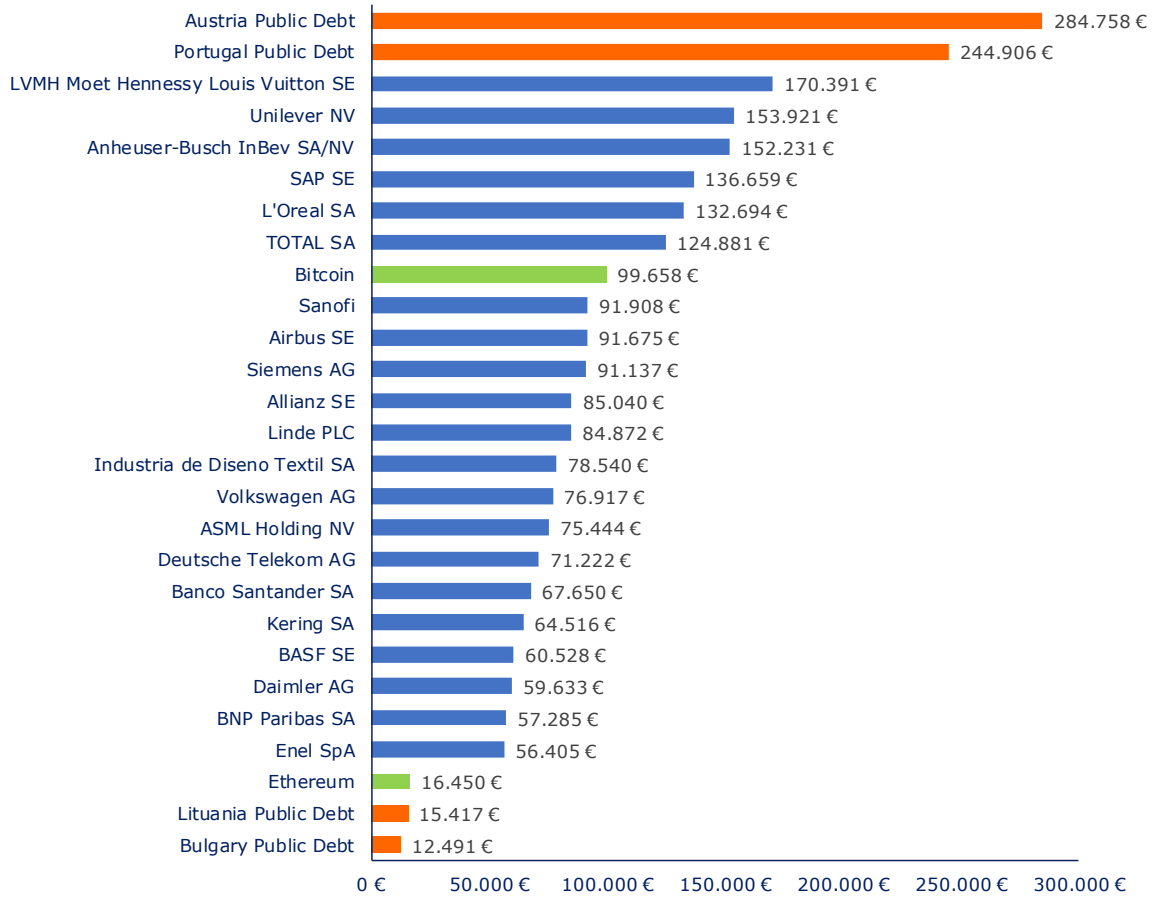
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Market Capitalization MM€



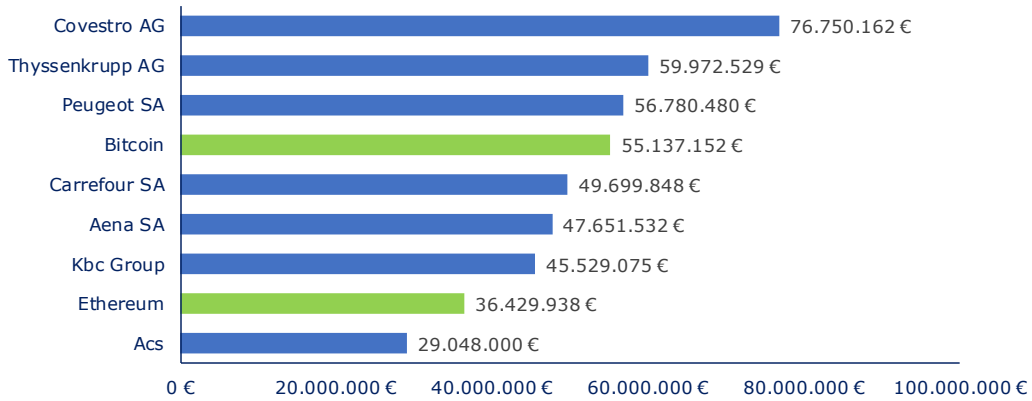
Data 10/05/2019

This graph compares the market capitalization of some of the biggest european companies (Members of the Eurostoxx 50 Index), some European Countries Public Debt, Bitcoin and Ethereum. Analyzing this graph, we can say that Bitcoin and Ethereum can compete with any top european company or country as an investment asset.





Daily average volume traded



Data 10/05/2019

This graph compares the daily average volume traded in the last 6 months of some of the most important European companies, Bitcoin and Ethereum. These companies belong to the Dax, Cac-40, Bel20 or Ibex 35. The conclusion is that Bitcoin and Ethereum have enough volume to be traded daily.

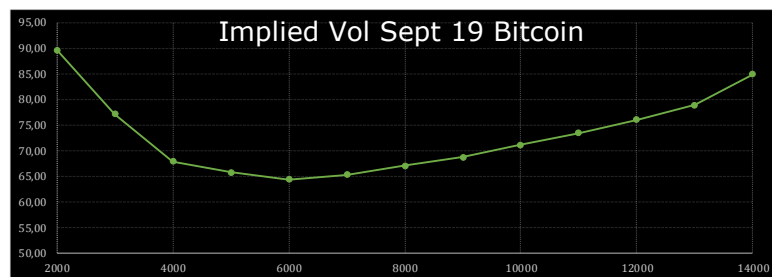
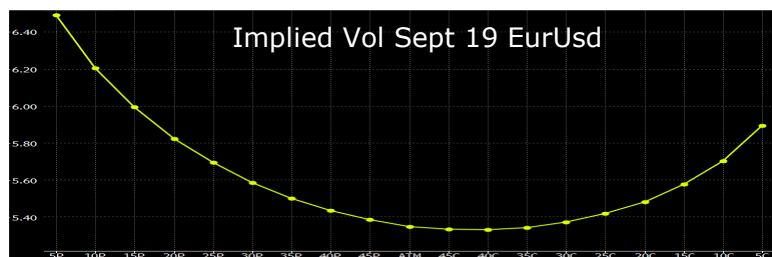
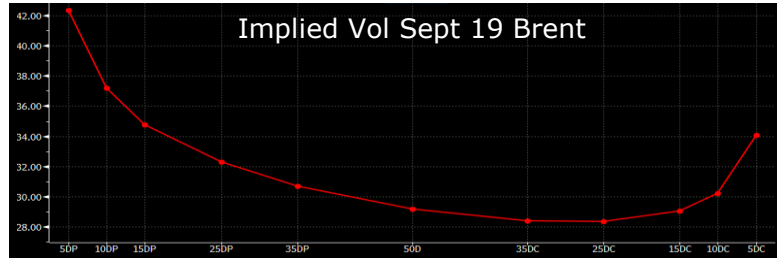
One of the most important things for a professional investor is having enough market depth for trading an asset.

Supervisors and Risk Departments make a great effort to control positions in no-liquid investments. They limit them to a maximum of 10% of the total portfolio or have even banned them. Bitcoin and Ethereum don't have that problem.





Derivatives: Options



Source: Bloomberg

Do you see a smile?

Here, we can see the Sept 19 implied volatility curve of three assets; EURUSD, Brent and Bitcoin. This curve is known as the Smile and is the typical curve for currencies and commodities.

The option pricing can be calculated with Black-76 Model. You can calculate the call or the put price from the Call-Put parity formula.

The Black-76 model makes certain assumptions:

- The option is European and can only be exercised at expiration.
- No dividends are paid out during the life of the option.
- Markets are efficient (i.e., market movements cannot be predicted).
- There are no transaction costs in buying the option.



- The risk-free rate and volatility of the underlying are known and constant.
- The returns on the underlying are normally distributed.

Calls										Underlying: BTC-27SEP19(\$7215.54) 27 Sep 2019 Expires In 132d 19h 9m										Puts	
Last	Size	IV	Bid	Ask	IV	Size	Vol	Δ Delta	Strike	Last	Size	IV	Bid	Ask	IV	Size	Vol	Δ Delta			
0.8150	-	-	-	-	-	-	-	-	1500	0.0005	-	-	-	0.0020	\$14.47	123.4%	40.0	0.1	0.00		
0.7550	5.1	0.0%	0.0065 \$46.91	0.7290 \$5261.25	122.3%	1.0	-	0.99	2000	0.0025	6.6	97.2%	0.0015 \$10.84	0.0035 \$25.28	110.7%	10.0	5.1	-0.01			
0.6975	10.1	0.0%	0.0065 \$46.97	0.6715 \$4852.46	129.5%	2.0	-	0.98	2500	0.0045	5.8	100.3%	0.0055 \$39.73	0.0090 \$65.01	110.7%	15.0	7.1	-0.02			
0.5850	20.1	0.0%	0.0065 \$46.97	0.6190 \$4472.87	133.3%	2.0	-	0.96	3000	0.0135	19.0	84.4%	0.0055 \$39.71	0.0145 \$104.69	104.3%	19.0	-	-0.04			
-	0.1	0.0%	0.0075 \$54.16	0.5930 \$4282.28	133.0%	1.0	-	0.95	3250	0.0095	15.0	89.9%	0.0110 \$79.49	0.0180 \$130.08	101.7%	19.0	-	-0.05			
0.5200	1.0	0.0%	0.1610 \$1162.96	0.5050 \$3976.46	114.5%	0.5	-	0.94	3500	0.0155	15.0	89.2%	0.0150 \$108.38	0.0225 \$162.58	99.7%	4.0	9.0	-0.06			
-	0.2	0.0%	0.0035 \$25.29	0.5455 \$3941.66	133.2%	2.0	-	0.93	3750	0.0270	15.0	88.7%	0.0200 \$144.52	0.0280 \$202.33	98.2%	4.0	5.0	-0.07			
0.5440	2.0	0.0%	0.1650 \$1192.27	0.5095 \$3681.60	122.2%	2.0	-	0.91	4000	0.0340	21.0	88.8%	0.0265 \$191.46	0.0345 \$249.26	96.9%	4.0	0.5	-0.09			
0.2600	2.0	0.0%	0.0100 \$72.21	0.4865 \$3513.20	122.0%	2.0	-	0.89	4250	0.0270	20.8	88.2%	0.0335 \$241.83	0.0425 \$306.80	96.2%	4.0	-	-0.11			
0.4705	4.0	0.0%	0.0205 \$148.08	0.4650 \$3358.86	122.0%	3.0	-	0.87	4500	0.0295	20.5	88.1%	0.0415 \$300.52	0.0500 \$362.07	94.8%	0.5	-	-0.13			
0.3820	3.0	0.0%	0.0100 \$72.19	0.4615 \$3331.48	133.1%	3.0	-	0.85	4750	0.0420	20.1	88.0%	0.0515 \$372.21	0.0610 \$440.87	94.8%	4.0	1.2	-0.15			
0.4035	2.0	0.0%	0.1105 \$797.47	0.4245 \$3063.57	122.0%	2.0	0.5	0.83	5000	0.0695	5.0	89.0%	0.0640 \$462.44	0.0695 \$502.18	92.6%	0.1	26.9	-0.17			
0.3850	6.8	85.1%	0.3210 \$2316.18	0.3420 \$2467.70	96.8%	6.6	-	0.78	5500	0.0935	12.9	88.0%	0.0880 \$635.79	0.0950 \$686.37	91.9%	1.0	1.4	-0.22			
0.3430	0.1	90.7%	0.2925 \$2111.07	0.3025 \$2183.25	95.7%	0.8	-	0.73	6000	0.1000	11.8	87.0%	0.1165 \$840.66	0.1310 \$945.29	94.2%	3.2	5.2	-0.27			
0.2250	6.7	86.9%	0.2190 \$1580.20	0.2385 \$1720.91	95.5%	2.4	5.6	0.63	7000	0.1525	5.0	86.3%	0.1875 \$1353.56	0.2070 \$1494.33	94.9%	3.2	-	-0.37			
0.1730	2.0	88.5%	0.1720 \$1242.19	0.1890 \$1364.97	95.6%	2.4	4.8	0.54	8000	0.2745	12.0	86.9%	0.2760 \$1992.44	0.2980 \$2151.25	96.0%	2.4	6.2	-0.46			
0.1405	12.3	90.1%	0.1360 \$981.31	0.1520 \$1096.76	96.8%	2.4	2.0	0.45	9000	0.2650	2.4	85.6%	0.3725 \$2688.46	0.4010 \$2894.16	97.6%	2.4	-	-0.55			
0.1075	12.8	91.2%	0.1085 \$783.60	0.1235 \$891.93	97.7%	3.2	27.6	0.39	10000	0.3915	10.0	0.0%	0.0095 \$68.55	1.2320 \$8889.55	500.0%	0.3	-	-0.61			
0.1155	13.3	92.5%	0.0875 \$631.39	0.1025 \$739.63	99.4%	3.2	10.0	0.33	11000	0.4810	10.1	0.0%	0.0065 \$46.91	1.3630 \$9837.25	500.0%	0.3	-	-0.67			
0.0695	13.7	93.8%	0.0720 \$520.32	0.0860 \$621.49	100.7%	3.2	0.6	0.29	12000	1.7810	10.0	0.0%	0.0110 \$79.39	1.4950 \$10789.94	500.0%	0.3	-	-0.72			
0.0895	14.0	94.8%	0.0590 \$425.82	0.0730 \$526.87	102.2%	3.2	0.2	0.25	13000	-	50.1	0.0%	0.0065 \$46.90	1.6275 \$11743.21	500.0%	0.3	-	-0.75			

Source: Deribit

$$d_1 = \frac{\ln\left(\frac{F}{X}\right) + \left[\frac{\sigma^2}{2}\right] \times t}{\sigma \times \sqrt{t}}$$

$$d_2 = d_1 - \sigma \times \sqrt{t}$$

$$Call = e^{-ixt} \times [F \times N(d_1) - X \times N(d_2)]$$

$$Put = e^{-ixt} \times [X \times N(-d_2) - F \times N(-d_1)]$$

$$VI(Call) = MAX[e^{-ixt} \times (F - X); 0]$$

$$VI(Put) = MAX[e^{-ixt} \times (X - F); 0]$$

$$Call + X \times e^{-ixt} = Put + F \times e^{-ixt}$$

Bitcoin or Ethereum options can be traded on the OTC Market. There are two important platforms:





So, there is an alternative way to invest in Bitcoin and Ethereum building options strategies depending on if you are bullish or bearish in the market. Also, the possibility of hedging or even having a limited-risk exposure is interesting. There are many big companies that don't have derivatives listed because there is not enough volume to attract the market maker.

Derivatives: Futures

Following the previous argument, there are Bitcoin futures listed in CME and CBOE, two of the most important derivatives exchanges in the world.



Also, there are alternatives exchanges mainly based on CFD contracts.

This is the formula we can use to calculate the future fair value:

$$F = Spot \times \left(1 + i \frac{T}{365} \right)$$

Exchange vs Over the Counter Market

"A stock exchange is a place where stockbrokers and trades trade stocks and other securities. It's main characteristics are:

- An exchange provides a centralized place where all trades are conducted.
- An exchange removes counterparty risk, because it stands on the other side of all trades.
- Exchanges offer greater regulatory oversight, since only members can trade on the exchange, and also only listed products can be traded on an exchange.

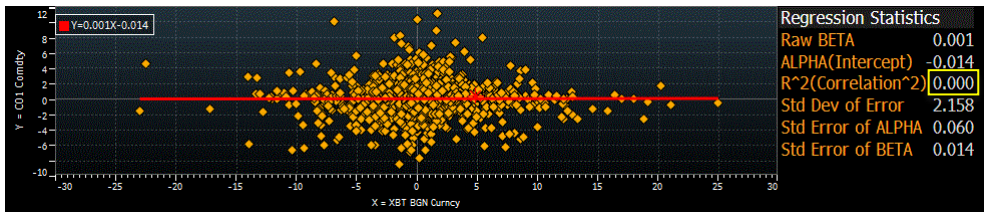
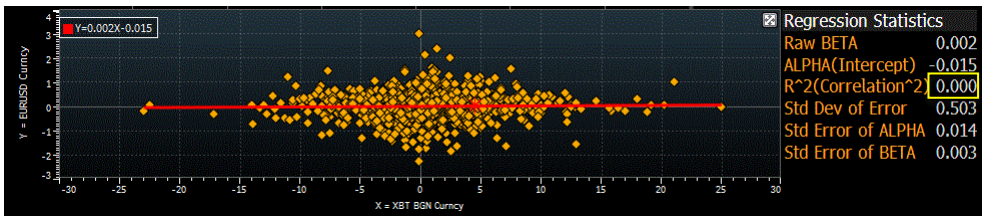
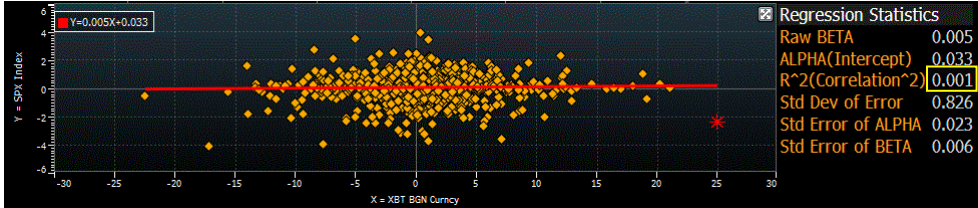
An OTC market is a decentralized market where non-listed securities are traded by the market participants. It has the following characteristics:

- The prices for the securities vary from trade to trade and from firm to firm. Even the quality of execution varies from firm to firm.
- OTC markets are prone to counterparty risk because there is no centralized exchange and the parties are directly dealing with each other.
- OTC markets generally have lower transaction costs compared to exchanges".

Source: *Financetrain*



Correlation



Data 10/05/2019

Source: Bloomberg

These graphs show a correlation analysis between Bitcoin and three of the most important assets in the world: SP500 Index, EURUSD and Brent. There is no correlation between Bitcoin and the other three assets, so we can say it could be very interesting to have that asset in our portfolio to reduce the systemic risk, and to diversify our portfolio.

Correlation is a statistical measure of the degree to which two variables move in relation to each other.

In finance, the correlation can measure the movement of a stock with that of a benchmark index, such as the Beta.

If the Correlation Coefficient (r) is close to 0, it means there is no relationship between the variables.

If r is positive, it means that as one variable gets larger the other gets larger.

If r is negative it means that as one gets larger, the other gets smaller (often called an "inverse" correlation).





In conclusion...

	Intrinsic Value	Market Cap	Liquidity	Volatility	Derivatives	Poor Correlation	Regulation
Bitcoin	✓	✓	✓	✓	✓	✓	Pending
Ethereum	✓	✓	✓	✓	✓	✓	Pending
Other Cryptocurrencies	?	✗	✗	✓	✗	✓	Pending

This document demonstrates how Bitcoin and Ethereum can be added to any investment portfolio because they have all these characteristics. Regulation is still pending in most of the developed countries, but this does not necessarily mean that there are no rules. Up to now, developed countries have been working with sandbox structures adapted from old jurisprudence.

The main problem for other cryptocurrencies is that they are not big enough to be traded with guarantees, and their intrinsic value is not clear enough yet to be considered as an investment assets.

This paper is dedicated to everyone who has taught me anything, big or small.



Author



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