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incrementum

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We would like to express our profound gratitude to our premium partners for supporting the Crypto Research Report.

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Editorial

Dear Reader,

Thank you for reading the inaugural edition of the Crypto Research Report (CRR). This edition and every future edition of the CRR will provide an extensive study of crypto assets and blockchain-related market developments. Incrementum applies a holistic approach to understanding cryptocurrency markets and the relevant impact these technologies will have on traditional asset classes.

Similar to the Internet, the blockchain technology is changing the way we do business. Distributed ledgers have the power to ensure the highest level of transparency and accountability in contractual agreements. Cryptocurrencies are an integral part of this newfound provenance, and first-mover investors are eagerly collecting these digital tokens backed by mathematics. However, the future of this technology is uncertain. Technological and legal risks may impede the adoption of the blockchain. On a quarterly basis, the CRR strives to provide a critical and academic perspective on the legal, technical, and economic aspects of crypto assets. **Each edition of the CRR includes:**

- **Exclusive interviews with leading financial and cryptocurrency experts**
- **Critical analyses of investments related to cryptocurrencies**
- **Reference work for anybody interested in learning more about the world of crypto assets**

A small investment in knowledge about these new technologies may prove to yield a high return over the coming years. The research published in this report is the result of countless hours reading and understanding the different risks associated with this disruptive technology. We share our findings in each edition of the CRR in order to decrypt the world of crypto for financial market participants and institutions.

As the market evolves, the CRR aims to become a reference source of information for financial and economic aspects of cryptocurrencies. All of the graphs and data featured in the CRR will be available on the homepage for the report, *CryptoResearch.Report*, and each publication will be available in both German and English. At the CRR, we look forward to learning and forging through this exciting new asset class together.

Demelza Kelso Hays
Research Analyst, Incrementum AG

Demelza Hays

Introduction to the Blockchain Technology and Cryptocurrencies

Key Takeaways

- The blockchain technology and cryptocurrencies are decentralizing money, contracting, and capital markets. A small investment in knowledge about these new technologies may prove to yield a high return over the coming years.
- Initial Coin Offerings (ICOs) are a disruptive force in the capital market. Start-up firms are challenging bank lending and venture capital by issuing cryptographic tokens directly to investors.
- Technological and regulatory risks may impede the proliferation of the blockchain. 2018 may witness unprecedented growth in this sector if scaling problems are surmounted and governments issue clear and supportive legislation.

“Bitcoin gives us, for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure, everyone knows that the transfer has taken place, and nobody can challenge the legitimacy of the transfer. The consequences of this breakthrough are hard to overstate.”

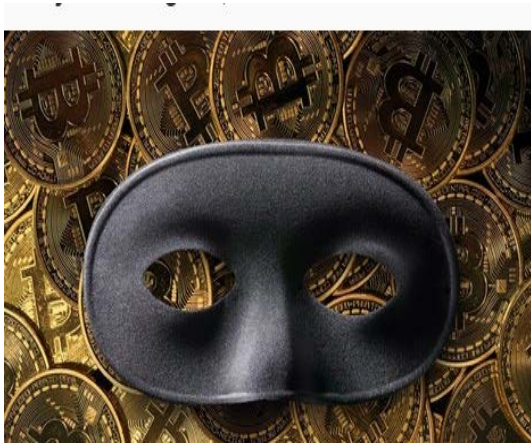
Marc Andreessen

This chapter focuses on the basics of the blockchain technology and the financial infrastructure that has developed in this space over the past eight years. Keywords such as blockchain, cryptocurrency, Bitcoin, cryptocurrency exchange, altcoin, and initial coin offering are defined.

*“Let’s try to secure everything.
 Let’s try to protect everything
 that’s important to us.”*

Nick Szabo

The terms blockchain, cryptocurrency, and Bitcoin are becoming increasingly relevant for finance. In 2008, a research proposal was released on an online forum called “[Bitcoin: A Peer-to-Peer Electronic Cash System](#)” by a mysterious programmer(s) going by the pseudonym Satoshi Nakamoto. Although the basic idea of a blockchain data structure had existed for several decades, this was the first time that blockchain technology had been combined with peer-to-peer (P2P) networking, cryptography, and distributed computing. In 2009, the developer of Bitcoin released the first version of the Bitcoin software protocol. During the first few months, programmers from around the world worked on improving the software code. By the end of 2009, the Bitcoin software was robust, open-source, and free. Anyone could download the software and begin sending transactions to other people.



After a decade, Satoshi Nakamoto is still unknown.

Source: Oliver Durrer on Scoop.it

The foundation for the blockchain technology was laid when the first Internet was created in California in 1969. Today’s widespread adoption of the Internet enables billions of users to engage in P2P networks that share files and information.

In a similar way to the Internet, Bitcoin’s P2P software is comprised of “nodes” that broadcast information about transactions to other nodes on the network. However, simply having a P2P network would not be sufficient for building decentralized digital money. The next part of the puzzle came when cryptographers discovered asymmetric encryption in the 1970s. Asymmetric encryption fundamentally changed the way people can share private information. Today, governments, banks, insurance

companies, and many other firms use encryption tools for applications such as storing sensitive customer data and enabling secure online payments.

Fast-forward a decade and the last piece of the puzzle was developed: blockchain. Up until this point, changes to digital data could not be chronologically ordered without relying on external timestamps. Although a seemingly small inconvenience, the inability to timestamp data made it possible for counterparties to change, add, and delete digital files without leaving footprints. The blockchain data structure enabled internal timestamping for the first time. From this point forward, governments and companies could digitally track every single change made to each data file.

Following these information technology discoveries, the first attempts at digital cash were made. American inventor David Chaum designed DigiCash, an electronic cash system that was based on cryptographic algorithms in 1983. In 1997, Adam Back, a British cryptographer created HashCash that used encryption tools to block email spam. In 1998, Wei Dai and Nick Szabo released b-money as well as bit gold, respectively. All failed to gain significant adoption.

“A lot of people automatically dismiss e-currency as a lost cause because of all the companies that failed since the 1990’s. I hope it’s obvious it was only the centrally controlled nature of those systems that doomed them. I think this is the first time we’re trying a decentralized, non-trust-based system.”

Satoshi Nakamoto

Then in 2008, the creator(s) of Bitcoin combined P2P networking, asymmetric cryptography, and the blockchain data structure to create a transparent and secure global monetary system. Cryptocurrencies and the blockchain allow users to generate units of currency and transfer funds without intermediaries.

The rigor of the underlying technologies provides evidence that this is not a scam or ponzi scheme. However, the adoption of this technology depends on several factors independent of the technology itself. Government regulation and consumer preferences will play key roles in the success of the blockchain. For example, government regulation has the power to either crush or support this nascent technology. In addition to government regulation, consumer preferences are a crucial determinant of the use of blockchain-based money. If consumers prefer “sound” or commodity monies such as gold or government monies such as the euro, then the blockchain technology may not become the global decentralized money that Nakamoto had envisioned. On the other hand, not everyone has to agree on using the same currency. Instead of completely replacing the commodity and fiat monies, cryptocurrency may become a third option with unique advantages and risks.

The remainder of this chapter provides an in-depth review of the blockchain technology, cryptocurrencies, and the financial infrastructure that has developed over the past eight years. The first section on the blockchain technology lays a foundation for the economic and technical features of this data structure. The second section explains how the technologies cryptocurrency and blockchain are inherently inseparable. The third section describes the top five cryptocurrency coins in detail. The penultimate section sheds light on the terms initial coin offering and token generating event. This chapter is concluded with an overview of the financial intermediaries including exchanges and brokerages that facilitate trading markets and provide liquidity for the cryptocurrency ecosystem.

a. The Blockchain Technology

“The root problem with conventional currency is all the trust that’s required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve.”¹

Satoshi Nakamoto

¹Nakamoto, S. (2009, February 11). Bitcoin open source implementation of P2P currency. *P2P foundation. The Foundation for Peer to Peer Alternatives*. Retrieved from <http://p2pfoundation.ning.com/forum/topics/Bitcoin-open-source>

Bitcoin Starter Kit

To jumpstart your Bitcoin education, keep these two books on your bedroom nightstand and read them for 10 – 20 minutes before bed each night.

1.) Steven Levy – **Crypto: How the Code Rebels Beat the Government. Saving Privacy in the Digital Age.**

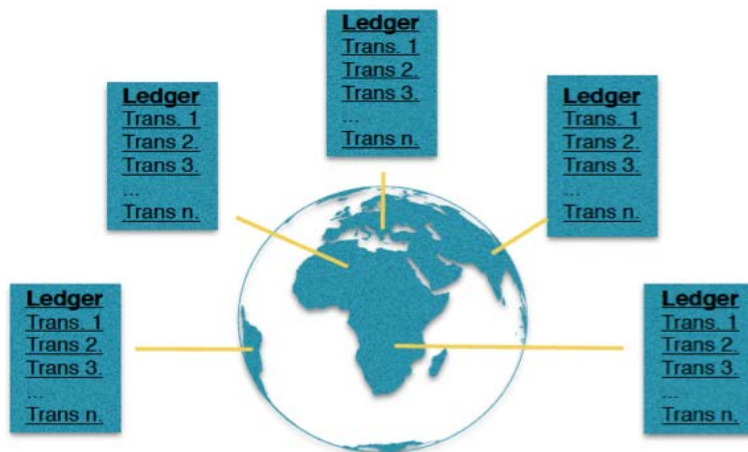
2.) Nathaniel Popper – **Digital Gold**

For those who prefer learning with videos, [signup for the free online course](#) on cryptocurrencies offered by the University of Nicosia. All of the old lectures can be watched on Youtube for free as well. Make sure to check out the Andreas Antonopoulos episodes, which we found to be the most informative and entertaining.

The blockchain technology refers to a collection of digital methods for storing identical data in multiple locations. The blockchain technology, also called the distributed ledger technology (DLT), was popularized in a white paper released in 2008 by a covert author under the name of *Satoshi Nakamoto*.² A blockchain can be thought of as a database that stores the amount of accounting units held by each user.³ Users can receive and spend their account units, referred to as cryptocurrencies, with an encrypted password, referred to as a public-private key pair. Since 2008, over 1000 different blockchains and corresponding cryptocurrencies have been created.

A blockchain is a collection of information that is not held by one entity but rather distributed across all computers in the network known as nodes. Due to the redundancy of data storage, blockchains are enormously expensive to operate and they are slow. Each computer around the world that stores a copy of the database must agree to each change made to the database before the

network can process new data entries. Despite the setbacks, blockchains harness unparalleled computing power and security, which provide users with services that cannot be provided by any other technology. The Bitcoin blockchain is an example of a peer network node data storage system that continuously grows as transactions are broadcasted and verified by the network. Storing identical data in multiple locations provides security benefits and latency drawbacks compared to storing data in one location.



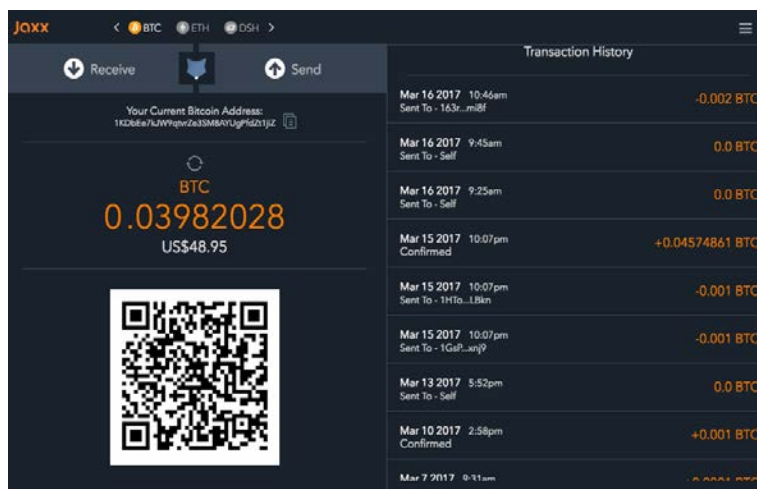
Bitcoin relies on a distributed ledger that is distributed among computers all around the world. Each computer stores an identical copy of the ledger. The ledger contains a list of each transaction that has occurred in the network's history. Source: Incrementum

² Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. Retrieved from <https://bitcoin.org/bitcoin.pdf>
³ Unlike normal databases, public blockchains are not owned by a central entity.

“The blockchain keeps everyone honest, and a whole layer of banking bureaucracy is removed, lowering costs.”

Paul Vigna

In information science, the former method is referred to as distributed computing while the latter is referred to as single point of failure (SPOF) storage. A centralized database that has a SPOF can be easily hacked and sensitive data can be



The mobile version of a popular cryptocurrency app showing balance and transaction history. Source: Jaxx Cryptocurrency Wallet

compromised, changed, deleted, or altered. In contrast, data stored in computers located in different geographic regions throughout the world makes an adversary’s job exponentially more difficult. Distributed computing commonly uses two fictional characters, Alice and Bob, to illustrate concrete use cases of the technology.

To understand how a basic blockchain transaction works, imagine that Alice is a customer at a coffee shop and Bob is the owner of the coffee shop who is selling Alice a nice cup of coffee. Instead of using cash, Alice wants to send one digital coin to Bob in exchange for the physical coffee that she ordered in Bob’s coffee shop. If Bob happens to have the digital coin software, also referred to as a “cryptocurrency wallet,” on his phone, Bob can easily open the software on his phone and accept a payment from Alice by scanning the QR code shown on Alice’s software on her phone. Alice will instantly see her account debited by the amount that she specified, and Bob will see his account credited with the same amount. For Alice and Bob, their work is done. Bob’s phone will get a beep sound that signifies to him that Alice’s transaction has been broadcast to the P2P network of computers around the world that are actively listening for new transactions. The individuals or groups of individuals that operate the computers that listen to transactions are often referred to as miners. Using special hardware, miners create blocks containing a list of transactions that have been broadcasted to the network by users. Next, blocks are added one after the other in a chronological order, creating a chain, hence, the name, *blockchain*. Once the miners hear Alice’s transaction Bob’s wallet, they will add this transaction to a list of transactions stored in a “candidate” block. A candidate block is a block that has not been confirmed in the blockchain. Before confirming the candidate block and the transactions inside of it, the miners compute hashes until they find a desirable number that is less than a specific number set by the software protocol. In the Bitcoin protocol for example, miners must find the right “nonce”, or arbitrary number, that produces a hash

“At their core, cryptocurrencies are built around the principle of a universal, inviolable ledger, one that is made fully public and is constantly being verified by these high-powered computers, each essentially acting independently of the others.”

Paul Vigna

lower than the difficulty target set by the software. The hash that is lower than the difficulty target becomes that specific block's identification number. The first miner to find a hash that is lower than the given difficulty target will receive a reward and the transaction fee that Alice paid to the network when she broadcasted her payment. After approximately ten minutes, the transaction will be confirmed by all of the computers in the network, and there will be no way for Alice to complete a chargeback on the money that she sent to Bob. Although, Satoshi Nakamoto created the blockchain technology to facilitate decentralized currency, entrepreneurs are constantly innovating and creating new applications of the blockchain technology. A famous blockchain enthusiast, Vitalik Buterin, built a blockchain-based decentralized contracting platform called Ethereum in 2014. More recently, start-ups are using the blockchain technology to decentralize lending markets. For example, the German company eSports.com is accepting cryptocurrency investments to crowdfund the capital required to launch their business idea. **Similar to the Internet decentralizing information, blockchain technology is decentralizing money, contracting, and capital.**

b. Cryptocurrencies

The past few years have witnessed an explosive growth of Google searches and social media posts about the blockchain technology and cryptocurrency. However, people aren't only searching for these terms. Over 600 applications were filed in

the U.S. for blockchain and cryptocurrency related patents during 2016 and the beginning of 2017. Mainstream interest in cryptocurrency began in 2014, when the price of the most famous cryptocurrency, Bitcoin, soared for the first time to over 1,000 USD per Bitcoin. The exponential growth garnered worldwide attention and became the main topic at FinTech and finance conferences. Following this rally, over 400 books on the topic of cryptocurrency were released on Amazon.com. Amazon responded by creating a new book subcategory, "Digital Currencies," which feature several best sellers.

Cryptocurrencies are a medium of exchange and store of value like currencies; however, they have no physical or digital existence. Instead, cryptocurrencies are account amounts held

in a digital ledger that can be transferred to other users. The term cryptocurrency is really a misnomer because there is no such thing as a cryptocurrency with an identification number such as token number "1234567." In fact, none of the cryptocurrency coins have unique identifiers because a cryptocurrency is not actually a coin in the traditional definition of the term. Rather, each cryptocurrency account name is linked to a certain number of cryptographic accounting units, and these accounting units have been given the name cryptocurrency.

The terms cryptocurrency and blockchain are used interchangeably due to the inability of separating these technologies. Bitcoin is the name of one cryptocurrency and blockchain. Ethereum is another. Ripple is another. There are



The City of Zug and the City of Chiasso both accept payments in Bitcoin. Source: Reuters/Arnd Wiegmann

over 1,000 different cryptocurrencies.⁴ Different cryptocurrency coins use different incentive structures to encourage computer nodes around the world to listen to new incoming transactions. The first successful implementation of a blockchain and cryptocurrency was Bitcoin. However, different strategies for verifying transactions within a decentralized network have given rise to different cryptocurrencies such as Litecoin, Nxt, Monero, and Bitcoin Cash.

c. Bitcoin

“Bitcoin is the beginning of something great: a currency without a government, something necessary and imperative.”

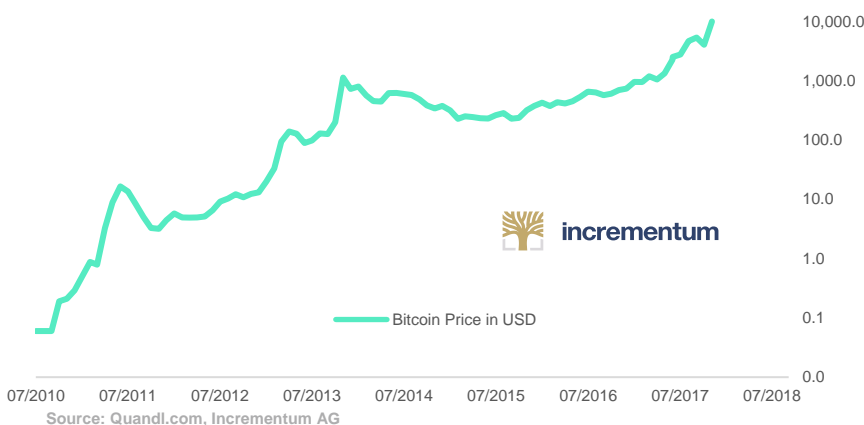
Nassim Taleb

“If we remember, 15 years ago if you were doing anything on the Internet you were going to make millions. I think it could be the same with Bitcoin.”

Jared Kenna, TradeHill CEO

After attempts at making a private virtual currency had failed for 20 years, Bitcoin emerged amidst the 2008 global banking crisis. The creator of Bitcoin, unknown, was determined to create a decentralized, private, and secure way to transfer value online, which did not rely on trusting sovereign entities, central banks, or financial intermediaries.⁵ After being ridiculed as money for computer nerds and a conduit for illegal activity, investors are finally beginning to take notice of Bitcoin and the underlying technology, the blockchain. During November of 2017, the price a Bitcoin breached \$11,000 per coin as shown in Figure 1.

Figure 1. Logarithmic Time Series of Bitcoin Price.



Bitcoin was the first and is still the most popular cryptocurrency and use of the blockchain technology. This system allows participants to send accounting units that store value, referred to as Bitcoin, from one user’s account to another user’s account without intermediaries. As a cryptocurrency, Bitcoin is a store of value and a medium of exchange combined in one.

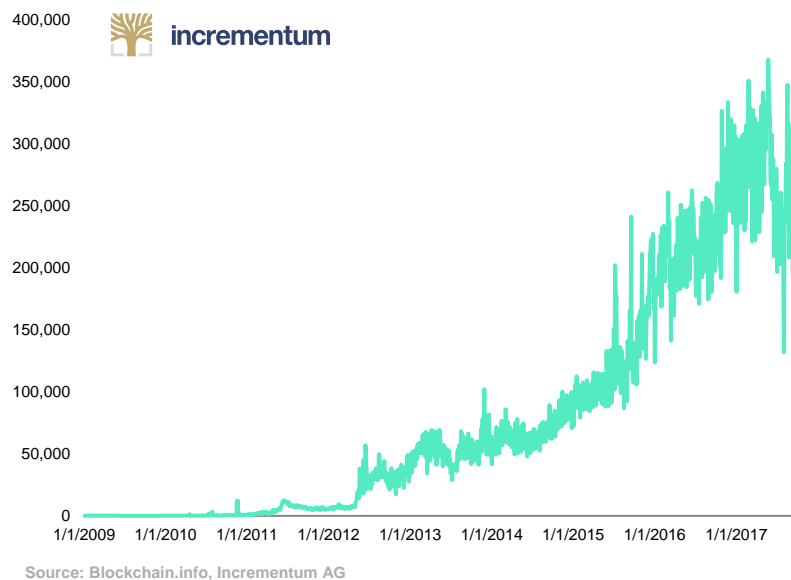
Bitcoin has a fixed supply capped at 21 million and the currency’s inflation rate is programmed to decrease by half about every four years. Daily, around 1,800

⁴ Coinmarketcap.com
⁵ Lo, S., & Wang, J. C. (2014). Bitcoin as Money?. Federal Reserve Bank of Boston *Current Policy Perspectives*, 2014(4). Retrieved from <https://www.bostonfed.org/publications/current-policy-perspectives/2014/Bitcoin-as-money.aspx>

Bitcoin are released onto the market. This rate will half to 900 Bitcoin per day in 2020, and then to 450 Bitcoin per day in 2024. According to estimates, Bitcoin's last coin will be mined in the year 2140 A.D. At the time of this report, approximately 16.5 million Bitcoin have been mined. The finite supply gradually enters the market according to a mathematical algorithm that releases approximately 12.5 Bitcoin into the network's supply of Bitcoin every ten minutes. The inflation rate therefore decreases over time according to the algorithm until every unit of the finite supply has been released into the economy.

Since Bitcoin was launched in 2009, the transactions on the network have doubled every year. Figure 2 shows that that the Bitcoin network averages hundreds of thousands of transactions every day. The Bitcoin network is gaining in popularity as a payment system because transactions of any amount can be sent at anytime of the day to any place in the world.

Figure 2. Number of Bitcoin Transactions Per Day.



"Bitcoin is a technological tour de force."

Bill Gates, Microsoft co-founder

Although blockchain transactions do exist in physical servers, Bitcoin are not physical or even digital coins. Instead, a Bitcoin is a chain of electronic signatures that represents units on a digital ledger. Network users can trade and store these fungible accounting units by debiting the account controlled by one participant and crediting the account held by another participant. An individual that creates a Bitcoin wallet can transfer accounting units to other users by digitally signing a private key on a transaction. The combination of several innovations from distributed computing and cryptography form the basis of the Bitcoin ecosystem, including the blockchain and the Bitcoin protocol.

Satoshi Nakamoto's invention was the first system, which effectively solved the "double-spending problem" and thereby enabled a safe peer-to-peer payment system. Double-spending is the digital version of counterfeiting fiat currency or debasing a physical commodity money, such as gold. In the aforementioned example, Alice could attempt to pay two people, Bob and Charlie using the same coin by duplicating the string of bits that represents the coin with serial number

"If you like gold, there are many reasons you should like Bitcoin."

Cameron Winklevoss

1234567.⁶ Centralized payment systems, such as PayPal, solve the double-spend problem by using a centralized mechanism of validating real transactions. In computing terminology, a centralized solution to the double-spend problem is called an example of an SPOF because if PayPal's server is jeopardized, the entire system fails.

Instead, Bitcoin relies on the "proof-of-work" consensus mechanism to achieve decentralized consensus. Proof-of-work is an incentive structure in the Bitcoin software that rewards miners with transaction fees from users and with a pre-defined number of Bitcoin for successfully adding a block to the chain of previous transactions. The proof-of-work protocol timestamps the transactions recorded in the blockchain. The correct blockchain is always the blockchain with the longest history of proof-of-work computing. Using the simple rule to always mine on the longest blockchain ensures that miners all add transactions to the list of transactions that has received the highest amount of computing resources. Network agreement on the state of transactions eliminates the potential to double-spend the same coin without the presence of a central clearinghouse.

There are two main entry strategies for physically holding your own Bitcoin: buying Bitcoins and mining Bitcoins.

1) Buy Bitcoin:

When investors buy Bitcoins, they can hold and wait for a price increase or they can actively trade Bitcoin on online exchanges that allow shorting, options, and leverage. However, the main setback of buying coins directly is the responsibility of securely storing cryptocurrency. Storing Bitcoin securely can be a tricky endeavor for non-tech savvy investors. Therefore, most investors leave their coins in the digital wallets controlled by the online exchange where they purchased the Bitcoins. However, this is even more precarious because over a third of Bitcoin exchanges have been hacked, and only a few of them offer deposit insurance.

2) Mine Bitcoin:

The second strategy for gaining exposure to Bitcoin is to buy mining hardware and mine Bitcoin. However, this option also presents a considerable amount of risk. Mining hardware requires heavy upfront investment costs ranging from \$10,000 to \$1 million. The technology used to build mining hardware is rapidly advancing, which shortens the useful lifetime of a miner to approximately 1.5 to 2 years. Furthermore, several mining companies fail to deliver equipment on time. Overall, mining is a specialized division of labor, and is not the best strategy for an investor that simply wants to gain exposure to fluctuations in the price of Bitcoin.

Bitcoin vs. Gold

The 2017 [In Gold We Trust report](#) provides a thorough introduction to the topic of Bitcoin and gold in the chapter, *In Bitcoin We Trust?* Due to the positive feedback and curiosity that the chapter piqued, a more in-depth analysis of these two assets is elaborated on in this section.

Originally, Bitcoin and the underlying blockchain technology were designed to replicate the characteristics of gold, which make it uniquely suited to be money. However, Bitcoin constitutes an unparalleled asset class and can be a fundamental part of wealth management from the portfolio diversification perspective. For the past eight years, Bitcoin's daily returns have had a low to slightly negative correlation with gold. The main reason is that Bitcoin and gold have different use cases and

different risks. However, from a portfolio construction point of view, one must be aware of the extremely high volatility, which this asset class exposes.

⁶ This is a simplification of the double-spend problem in cryptography. As previously mentioned, each Bitcoin does not have a unique serial number.

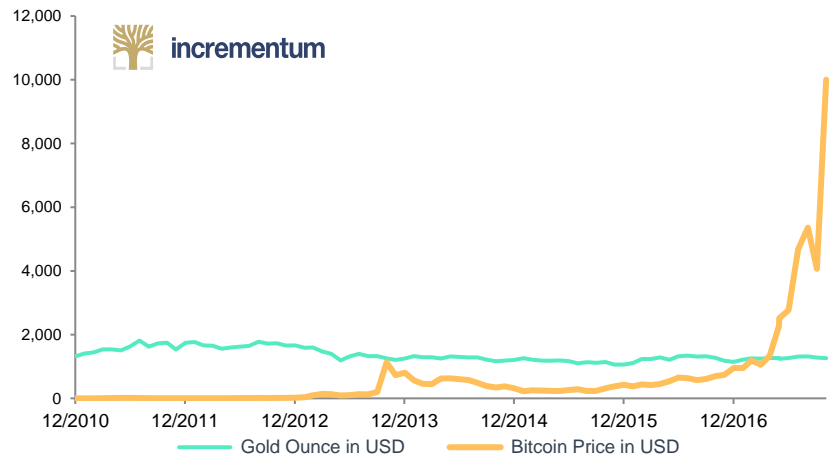
"Gold is a great way to preserve wealth, but it is hard to move around. You do need some kind of alternative and Bitcoin fits the bill. I'm not surprised to see that happening."

Jim Rickards

"If Bitcoin is a better gold or seen as a type of gold-like asset, then it could be in the trillions on a market cap."

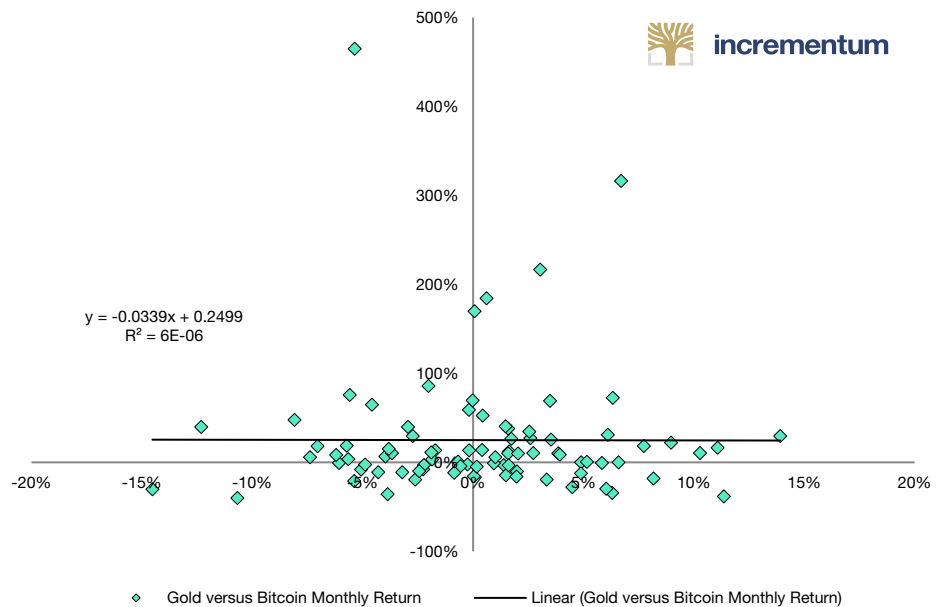
Tyler Winklevoss

Figure 3. Daily Price of Bitcoin and Gold from 2010 – 2017.



Bitcoin is entirely digital, and therefore, does not exist in a physical form like gold. Also, in contrast with gold, Bitcoin does not have industrial applications. Instead, demand for Bitcoin comes from people around the world who demand a fast, private, and appreciating asset. Like gold, Bitcoin is scarce. Throughout history, 5.6 billion ounces of gold have been mined. In comparison, 16.5 million Bitcoin have already been mined, and the inventor capped the total amount of Bitcoin at 21 million. Also, similar to gold, Bitcoin is a store of value and a medium of exchange combined in one. However, the cryptographic and digital nature of Bitcoin makes it inherently both easier to transfer and harder to find than gold.

Figure 4. Monthly Price Return of Bitcoin and Gold from 2010 – 2017.



The scatterplot in Figure 4 shows the monthly returns of gold plotted against the monthly returns of Bitcoin. The y-axis represents Bitcoin and the horizontal axis gold. During the past eight years, Bitcoin's monthly return ranged from positive 465% in November of 2013 to negative 40% in September 2011. During the same

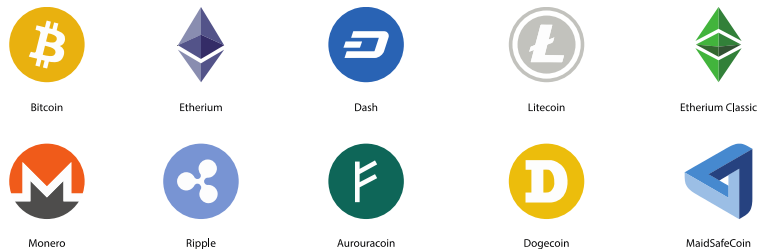
“Until recently we had individuals from financial institutions buying Bitcoin because they were working on crypto projects at their company and wanted to see how it worked. This year it is the institutions themselves that are investing in cryptocurrencies.”

Alexis Roussel, CEO Bity

time, gold’s volatility was much lower. Gold’s largest decrease in return of 14.5% occurred in June of 2013, while gold’s largest increase of 13.9% occurred in January of 2012. The black trend line shows that the historical monthly returns for Bitcoin and gold are primarily uncorrelated.

However, Bitcoin does not win a unanimous vote compared to gold. Unlike gold, the risks associated with Bitcoin are uncertain. Gold’s track record is 5,000 years, while Bitcoin’s is only a couple of years. The value of the Bitcoin network relies on the Internet and the geographic dispersion of computers around the world that maintain the network and history of transactions. Loss of the Internet would cripple the Bitcoin blockchain. Due to the different risk and return profiles, Bitcoin and gold constitute two distinct asset classes. A growing body of academic research increasingly suggests that a diversified portfolio should only be 1 to 2% in Bitcoin.⁷

d. Alternative Cryptocurrencies



These icons represent the brand logos of some of the most famous cryptocurrencies. Source: Freebies.com

Bitcoin’s novel combination of distributed computing, encryption, and open-source programming inspired the creation of over 1,000 cryptocurrencies. In 2011, Bitcoin was the only currency and therefore held 100% of the cryptocurrency market’s capitalization. Today, Bitcoin’s share of the cryptocurrency market has fallen to less than half. In addition to Bitcoin, cryptocurrencies such as Litecoin, Dash, Ethereum, and Bitcoin Cash are attracting traditional investors to this new digital asset class. Upon closer inspection, each of the top ten cryptocurrencies attempts to solve a different problem. Incrementum has created a cryptocurrency classification system to enhance investor proficiency of this asset class.

Our classification system has three subclasses of cryptocurrencies:

- **Money: Medium of Exchange or Store of Value**
- **Infrastructure**
- **General Purpose**

For example, Bitcoin, Litecoin, Dash, and Bitcoin Cash are part of the money subclass because these digital tokens compete with fiat currencies such as the U.S. dollar, euro, and renminbi. This subclass offers fast, private, and “permissionless”

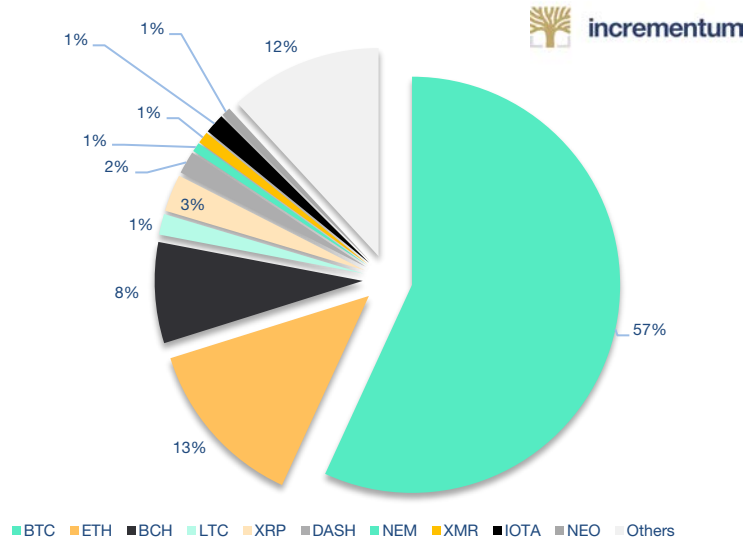
⁷ Hong, K. (2016). Bitcoin as an alternative investment vehicle. Retrieved from <https://link.springer.com/content/pdf/10.1007%2Fs10799-016-0264-6.pdf> and Brière, M., Oosterlinck, K. & Szafarz, A. Virtual currency, tangible return: Portfolio diversification with bitcoin. *Journal of Asset Management (2015) 16: 365*. Retrieved from: <https://doi.org/10.1057/jam.2015.5>

payments. Each of the money cryptocurrencies has a unique monetary policy. For example, the total supply of Litecoin is four times the total supply of Bitcoin. Also, Dash offers more privacy compared to Bitcoin or Bitcoin. Bitcoin cash focuses on increasing the number of transactions that can be processed per second.

“There is only one type of crypto investor – one who wishes they had bought more.”

Niklas Nikolajsen, CEO Bitcoin Suisse

Figure 5. Highest Market Capitalization Coins.



Source: Coinmarketcap.com, Incrementum AG

In contrast, cryptocurrencies such as Ethereum, Lisk, and IOTA are infrastructure coins. Instead of competing with fiat money, the subclass of infrastructure tokens enables decentralized contracting. For example, marriage contracts, cosmetology licenses, and seal of approval certificates can be issued and publicly stored on the Ethereum network. The final subclass of cryptocurrencies includes all of the remaining cryptocurrencies. These coins solve unique problems that are not related to money or infrastructure. For example, Augur is a decentralized prediction market that is built on the Ethereum infrastructure. Another coin, TenX, is a credit card that allows users to spend cryptocurrencies where credit cards are accepted.

These three subclasses; money, infrastructure, and general purpose, make up the super class of cryptocurrency assets. In the same way that stocks are highly correlated with other stocks, the subclasses of cryptocurrencies are also highly correlated. However, the correlations between cryptocurrencies provide evidence for the cryptocurrency classification.

Each cryptocurrency has different applications and different risks, which should be considered when making investment decisions. The table below shows the correlation of the excess daily logarithmic returns between Bitcoin, Litecoin, Dash, and Ethereum. As the cross-correlation matrix shows, Bitcoin’s excess daily logarithmic return correlation with other cryptocurrencies from the money subclass is higher than with Ethereum, which is a cryptocurrency in the infrastructure subclass. This indicates that Bitcoin is competing more with Litecoin and Dash compared to Ethereum. As shown in row 2 and column 1 of the matrix, Bitcoin’s return correlation value of 0.56 with Litecoin means that Bitcoin is more

“The Bitcoin world is this new ecosystem where it doesn’t cost that much to start a new Bitcoin company, it doesn’t cost much to start owning Bitcoin either, and it is a much more efficient way of moving money around the world.”

Tim Draper

correlated with Litecoin than with Dash or Ethereum. Overall, all of the cryptocurrencies are correlated positively; however, there is statistical support for a classification system based on the application of each cryptocurrency.

Table 1. Correlation of Highest Market Capitalization Coins.

Correlation Matrix				
	Bitcoin	Litecoin	Dash	Ethereum
Bitcoin	1			
Litecoin	0.56	1		
Dash	0.39	0.28	1	
Ethereum	0.26	0.19	0.22	1

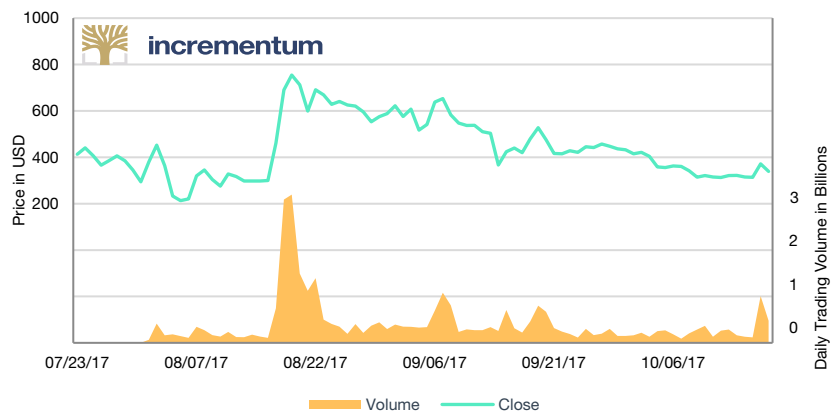
Source: Coinmarketcap.com, Incrementum AG

Incrementum focuses on the subclass of money and infrastructure cryptocurrencies. From the money subclass, the highest market capitalization coins include Bitcoin, Litecoin, Dash, and Bitcoin Cash. From the infrastructure class, Ethereum is leading the way. To provide a better understanding, a summary for each of the four alternative cryptocurrencies is available below.

1) Bitcoin Cash

Similar to Bitcoin, Bitcoin Cash is a cryptocurrency from the money subclass. Bitcoin Cash was created on August 1, 2017 during a hard-fork⁸ of the original Bitcoin cryptocurrency. With a value of approximately \$1,400 per coin and 16.5 million coins in circulations, Bitcoin Cash has a market capitalization of \$23 billion.

Figure 6. Bitcoin Cash Historical Price and Trading Volume.



Source: Coinmarketcap.com, Incrementum AG

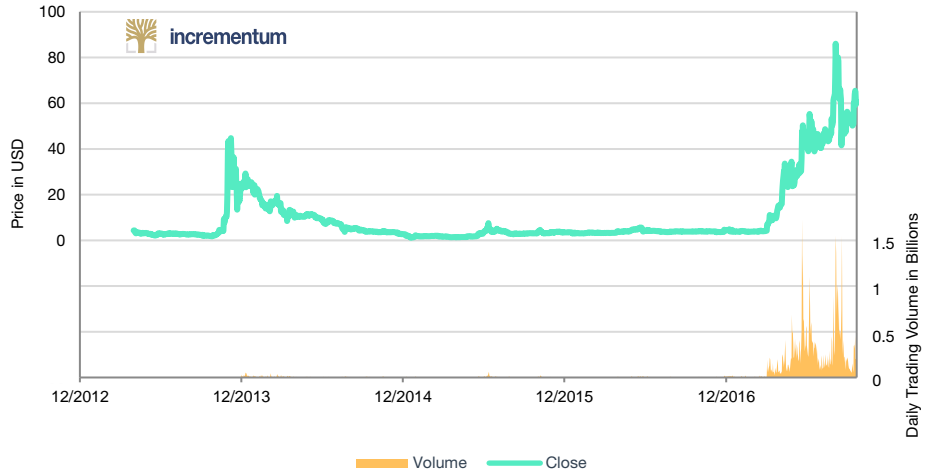
2) Litecoin

Litecoin was announced as an alternative to Bitcoin in 2011. In the cryptocurrency market, Litecoin is often referred to as “silver” and Bitcoin is referred to as “gold.” Litecoin is considered to be silver because the Litecoin network can process transactions four times faster than the Bitcoin network. Also, the total supply of Litecoin is 84 million while Bitcoin’s supply is capped at 21 million. This four-fold

⁸ A fork in the blockchain occurs if the protocol is been upgraded, but not all users agree on the changes. The existing chain of transactions is split into two paths. One path which follows the new, upgraded blockchain, and one path which continues along the old path.

increase in cryptocurrency units means that the inflation rate of Litecoin is higher than Bitcoin.

Figure 7. Litecoin Historical Price and Trading Volume.



Source: Coinmarketcap.com, Incrementum AG

3) Dash

“The bigger thing with Bitcoin is not Bitcoin itself, but what does that decentralized technology do?”

Ashton Kutcher

Invented after Bitcoin and Litecoin, Dash focuses on privacy and pseudonymity. Prior to being rebranded as Dash, this cryptocurrency went by the name Darkcoin. Dash developed new methods for reducing the traceability of transactions by mixing many transactions together before sending them to the final destination. The process of mixing blurs the identity of the original sender. To increase privacy further, Dash does not have a publicly available ledger. Recently, the developers of Dash have made successful efforts to increase merchant acceptance.

Figure 8. Dash Historical Price and Trading Volume.

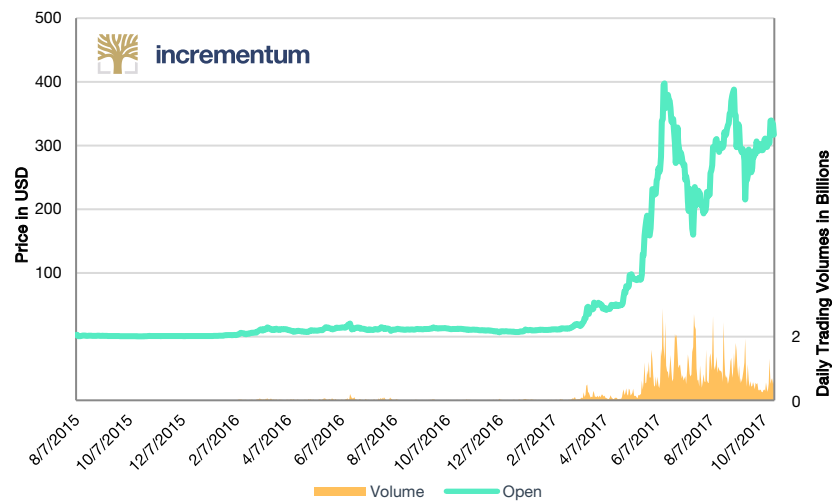


Source: Coinmarketcap.com, Incrementum AG

4) Ethereum

Unlike Bitcoin Cash, Litecoin, and Dash, Ethereum is an infrastructure cryptocurrency that enables “smart” contracts – digital contracts that automatically execute preprogrammed agreements. Similar to the Bitcoin network, the thousands of Ethereum nodes around the world maintain the Ethereum network. The Ethereum infrastructure provides a platform where decentralized applications can be built and operated by anyone. Ethereum smart contracts operate without downtime or censorship. Smart contracts work with the Ethereum network’s native cryptocurrency referred to as ether. With approximately 94 million ethers and a price of \$460 per token, Ethereum’s market capitalization is approximately \$44 billion.

Figure 9. Ethereum Historical Price and Trading Volume.



Source: Coinmarketcap.com, Incrementum AG

e. Initial Coin Offering or Token Generating Event

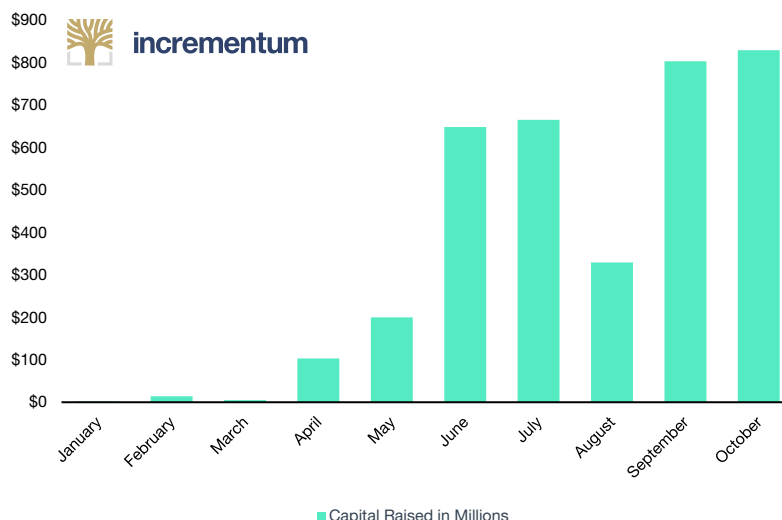
Currently, there are over 1,000 actively listed cryptocurrencies, and every week a few more cryptocurrencies are released to the market.⁹ When a group of developers is ready to launch their new cryptocurrency, they can have an “initial coin offering” (ICO) or “token generating event (TGE)”.¹⁰ In 2017, ICOs raised over \$1.7 billion in investment capital. For example, the French developers behind the cryptocurrency Tezos raised \$232 million in July of 2017. The month prior, Bancor raised \$150 million. In fact, out of the 25 highest crowd-funded projects in all of history, 18 of them are blockchain companies.¹¹

⁹ Coinmarketcap.com

¹⁰ ICO and TGE have the same meaning. In order to make ICOs look less like IPOs, some law firms, such as MME in Zug, recommend for developers to avoid traditional finance terms that may signal to authorities that cryptocurrencies are securities. Some developers do not do an ICO. Instead, they rely on Airdrops, Hardforks, or Initial Minings.

¹¹ The Cover Card (2017, July 13). 18 Of The Top 25 Highest-Funded Crowdfunding Projects Are Blockchain Startups. *Forbes*. Retrieved from <https://www.forbes.com/sites/thecovercard/2017/07/13/18-of-the-top-25-highest-funded-crowdfunding-projects-are-blockchain-startups/> - 29d3359f619a

Figure 10. Capital Raised during 2017 ICOs.



Source: Tokendata.io, Incrementum AG

"ICOs are disrupting my industry beyond belief. The funny thing is, I like it."

Jamie Burke, Venture Capitalist

"By creating a token that has inherent product utility, a company can secure a network of suppliers and buyers that is difficult to attain so rapidly by any other mechanism."

Deloitte

The term ICO is based on the term IPO, which stands for initial public offering. However, initial public offerings are fundamentally different from initial coin offerings. Therefore, what is called an ICO in the cryptocurrency world is not exactly a parallel concept to an IPO. An ICO is more of a crowdfund whereas the first day the token is launched on an exchange is the IPO because you cannot easily trade your tokens during an ICO. Instead, investors have to wait until the token is launched on an exchange. Therefore, the more fitting equivalent of a stock IPO is the first day a token is launched on an exchange. However, the comparison does not fit exactly because firms that go to IPO usually have a history and a track record for investors to research. In contrast, many of the firms going to ICO now do not have a history.

According to the PWC report, *Considering an IPO (2012)* firms have to pay \$3.7 million to go to IPO.¹² In contrast, ICOs can cost close to nothing to conduct. Instead, the development team that performs the ICO often has "no skin in the game". Developers and entrepreneurs, who are sometimes not even incorporated in any geographic location, can launch an ICO without involving an underwriter, receiving the appropriate green lights from regulators, or paying the costs associated with the traditional framework. Due to no barriers to entry for investors or for firms, ICOs should not have the systematic underpricing pattern that stock J. Ritter reported on IPOs in 1991.¹³

Underpricing refers to the fact that the price of a firm's stock share is significantly lower during the initial public offering compared to the closing price of the share on the first day of secondary market trading. Using data on the [past 50 years](#), Professor Ritter has found that stock IPO prices have been 16.8% lower during the IPO on the primary market compared to the price on the secondary market at the 3-year anniversary of the IPO. This equates to approximately \$125 billion being earned by IPO investors instead of going to the firms. Several explanations have

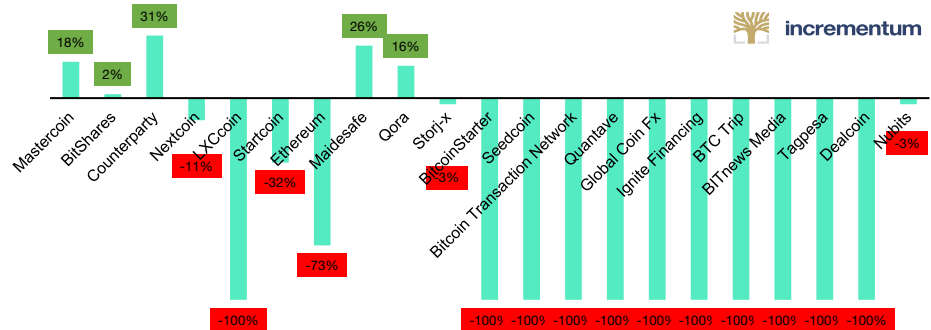
¹² Strategy& Formerly Booz & Company, & pwc. *Considering an IPO? The costs of going and being public may surprise you.* Retrieved from https://www.strategyand.pwc.com/media/file/Strategyand_Considering-an-IPO.pdf

¹³ Ritter, J. R. (1991). The long-run performance of initial public offerings. *The Journal of Finance*, 46(1), 3–27.

been given for the cause of the underpricing. A major cause has been attributed to the conflict of interest between the investment banks that underwrite the IPO and the firm going to IPO. By artificially decreasing demand with eligibility requirements that limit investment, investment banks can secure low prices for themselves and their clients. When secondary markets open, investment banks and their clients are often able to realize instant gains because of the systematic underpricing.

The only coins that have at least three years of data provide empirical evidence that ICOs have systematic overpricing. Overpricing refers to a higher closing price on the first day the token is traded on an exchange compared to the closing price on the three-year trading anniversary of the token.

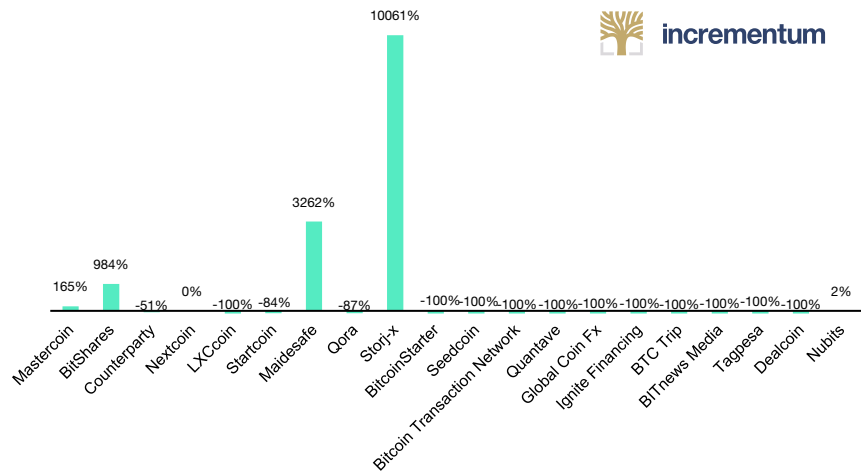
Figure 11. Exchange Return on Investment for 2013 and 2014 ICOs.



The coins that lost 100% were not traded on an exchange. They lost 100% of their value directly after the ICO sale ended. Return measured by closing price minus opening price divided by opening price on the first day the token was traded.
Source: Bitcointalk.org and Coinmarketcap.com, Incrementum AG

Figure 11 shows that only 5 out of the 21 ICOs in 2013 and 2014 had a positive return on the first day of trading on an exchange. These five coins were Mastercoin, Bitshares, Counterparty, MaidaSAFE, and Qora. The main takeaway is that most cryptocurrencies are immediately dumped on the market the moment the coins are traded on an exchange. Even the second largest market capitalization coin, Ethereum, lost 73% in value the day it was launched on an exchange. Currently, little research has been done on the cause of this phenomenon.

Figure 12. Return on Investment for 2013 and 2014 ICOs.



Source: Bitcointalk.org and Coinmarketcap.com, Incrementum AG

Figure 12 shows that the exchange adoption returns do not improve by the third-year anniversary of the coin. Only 5 out of 20 had a positive return between their opening price on the day of exchange adoption and the closing price on their third-year anniversary of being traded.¹⁴ The five coins were Mastercoin (165%), BitShares (984%), Madsafe (3,262%), Storj-x (10,061%), and Nubits (2%).



Someone just held up a "buy bitcoin" sign behind Yellen during her testimony



A young man raised the sign "Buy Bitcoin" while Federal Reserve Chairwoman Janet Yellen testified in front of Congress. Source: [Twitter.com/stevekopack](https://twitter.com/stevekopack)

However, the limited amount of data available on 2013 and 2014 means that inferences made are not statistically significant. The cryptocurrencies that went to ICO in 2013 and 2014 may not be representative of the entire population of cryptocurrency ICOs. Since less than 30 coins went to ICO in total, the central limit theorem does not apply. As more data becomes available, further analysis should be applied to check the sign of the average return on ICOs and ICO three-year anniversaries.

As a final caveat, the cryptocurrency market has changed rapidly since these coins went to ICO. If a price pattern does exist and investors determine the pattern, then the pattern will change. For example, if the price always increases after the ICO then investors will try to invest during the ICO phase. If a large number of investors invest during the

ICO phase in anticipation of post-ICO gains, then the ICO price may become overvalued.

¹⁴ Ethereum had to be dropped from the analysis because only two years of trading data are available.

f. Financial Infrastructure

As shown in Table 1, financial infrastructure is maturing in the cryptocurrency market. Private banks are beginning to offer customers cryptocurrency bank accounts. Start-up companies, such as the Tenx in Singapore, are issuing credit cards that can be filled with cryptocurrencies. Companies such as Bitcoin Suisse in Switzerland are operating cryptocurrency automatic teller machines (ATMs) that dispense Bitcoin for Swiss francs and accept Swiss francs for Bitcoin. Cryptocurrency exchanges, such as Bitfinex and Poloniex are paying interest on “cryptocurrency deposits.” Wallstreet “quants” are building algorithms for trading bots that take advantage of arbitrage opportunities on different exchanges. Large players are negotiating special pricing with cryptocurrency exchanges and miners. The cryptocurrency market even has an equivalent of the traditional underwriter. Cryptocurrency brokers and law firms offer underwriting for initial coin offerings and charge a percent of the capital raised during the ICO. Finally, legal licenses are being granted to a handful of firms that satisfy regulatory requirements. This section outlines the basics of cryptocurrency exchanges, over-the-counter markets, and brokerages.

1) Cryptocurrency Exchanges

A cryptocurrency exchange is a website where investors can buy and sell cryptocurrencies for other cryptocurrencies or for fiat money such as USD and EUR. Cryptocurrency exchanges are generating the highest revenues during the cryptocurrency boom. Coinbase, the biggest exchange in the U.S., has a valuation of over \$1 billion.¹⁵ Gemini is an exchange made by the Winklevoss Twins, who sued Mark Zuckerberg over the ownership of Facebook. However, Gemini is only open to U.S. based cryptocurrency traders. The six most important exchanges on an international basis include Kraken, Poloniex, Bitstamp, Bitfinex, and Bittrex, and GDAX owned by Coinbase.

Kraken

Kraken is a cryptocurrency exchange that has its headquartered in San Francisco, California. The exchange has been in business for six years, and has the largest daily trading volume for the Bitcoin/euro pair. The exchange offers trading in several fiat currencies including USD and EUR and several cryptocurrencies including BTC, ETH, ETC, DASH, GNO, ICN, Litecoin, MLN, Monero, REP, Ripple, Zcash, and Stellar. Kraken has fees ranging from 0.05 – 0.50% per trade depending on the trader's volume and the cryptocurrency they are trading.

Poloniex

Unlike Kraken, Bitstamp, and Bitfinex, Poloniex is a cryptocurrency exchange that does not allow fiat deposits and withdraws. Therefore, customers must purchase cryptocurrencies from other sellers and then deposit cryptocurrencies on the exchange before they can begin trading. Poloniex has fees ranging from 0.00% – 0.25% per trade depending on the trader's volume and the cryptocurrency they are trading.

“I think the fact that within the Bitcoin universe an algorithm replaces the functions of the government is actually pretty cool. I am a big fan of Bitcoin.”

Al Gore

¹⁵ Peterson, B. (2017, Aug. 10) Bitcoin exchange Coinbase confirms its unicorn status with \$1.6 billion valuation. *Business Insider*. Retrieved from <http://www.businessinsider.com/coinbase-now-unicorn-valuation-series-d-funding-2017-8>

Bitstamp

Bitstamp is a cryptocurrency exchange headquartered in Luxembourg. The exchange has been in business since 2011. The exchange offers trading in several fiat currencies including USD and EUR and several cryptocurrencies including BTC, ETH, LTC, and Ripple. In 2015, Bitstamp was hacked for approximately 19,000 Bitcoin, and the exchange shutdown services for one week.

Table 2. The Ways to Open or Close a Position in Bitcoin.

Infrastructure	Service	Company
Exchanges	<ul style="list-style-type: none"> Requires extensive KYC and AML Fees are approximately 0.25% for each trade Open order books Stop and limit orders Online trading platform SWIFT and ACH enabled 	<ul style="list-style-type: none"> Kraken Poloniex Bitstamp Bitfinex Bittrex GDAX
Over-the-Counter	<ul style="list-style-type: none"> Does not require identification Fees are 0.00% of each trade. Optional escrow service available for 1% of the trade volume Cash and SWIFT enabled 	<ul style="list-style-type: none"> LocalBitcoins.com Bitcoin.de Bisq.io
Brokerages	<ul style="list-style-type: none"> Requires extensive KYC and AML Fees are approximately 1.5% for each trade Customized service for high-net-worth individuals SWIFT and ACH enabled 	<ul style="list-style-type: none"> Bitcoin Suisse Bity Coinfinity Bit Panda
Automatic Teller Machines	<ul style="list-style-type: none"> Does not require identification Fees are approximately 5% for each trade Discrete however customer support available if required 	<ul style="list-style-type: none"> General Bytes Lamassu Genesis Coin
Mining	<ul style="list-style-type: none"> Does not require identification Fees are approximately 0.00% for each trade; however, substantial investments in hardware, electricity, and storage are required. Discrete 	<ul style="list-style-type: none"> Bitmain Canaan Creative
Options Market	<ul style="list-style-type: none"> Requires extensive KYC and AML Fees are dynamic based on market conditions 	<ul style="list-style-type: none"> Ledger X Derivabit

Bitfinex

Bitfinex is a cryptocurrency exchange headquartered in Hong Kong. The exchange has been in business since 2012, and the exchange has the largest daily trading volume for the Bitcoin/USD pair. The exchange offers trading in USD and several cryptocurrencies including BTC, ETH, ETC, DASH, Litecoin, Monero, IOT, Ripple, and NEO. In 2016, Bitfinex was hacked and a value of \$72 million was stolen. By April of 2017, all customers had been paid back for the hack.

Bittrex

Bitfinex is a cryptocurrency exchange headquartered in the USA. Bittrex was founded in 2014. Like Poloniex, Bittrex is a cryptocurrency exchange that does not allow fiat deposits and withdraws. Therefore, customers must purchase cryptocurrencies from other sellers and then deposit cryptocurrencies on the exchange before they can begin trading. Bittrex has a fee of 0.25% per trade regardless of the coin or the volume being traded.

GDAX

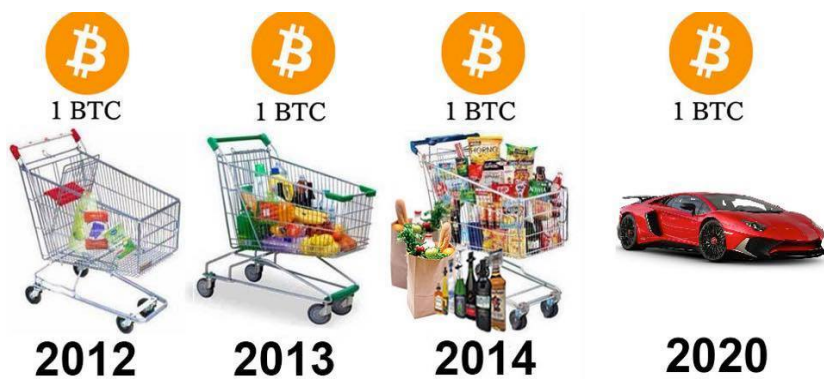
The Global Digital Asset Exchange (GDAX) is owned by Coinbase, which is registered in San Francisco, California. Coinbase has been in operation since 2012, has over 7 million registered users, and operates in 32 different countries. Coinbase is one of only three firms that has received the New York BitLicense, which entitles them to provide services to New York persons. GDAX offers BTC, ETH, and LTC. GDAX is a cryptocurrency exchange that allows USD, EUR, and GBP deposits and withdrawals. GDAX has fees ranging from 0.1% – 0.25% per trade depending on the trader’s volume and the cryptocurrency they are trading.

2) Over-the-Counter Markets

Over the counter (OTC) markets in the cryptocurrency sphere refer to websites that allow buyers and sellers to make customized contracts with one another. A major reason for the popularity of OTC markets for cryptocurrencies is that personal identification is often not required. The most famous OTC markets include LocalBitcoins.com based in Finland and Bitcoin.de based in Germany. Many transactions on OTC markets include no fees. However, OTC markets also offer optional escrow services that customers can elect to pay for. For example, LocalBitcoins.com charges 1% of the amount in escrow.

3) Cryptocurrency Brokerages

In addition to cryptocurrency exchanges and Over-the-counter markets, the cryptocurrency ecosystem has the equivalent of traditional investment banks like



The ubiquitous Lamborghini meme illustrates the historical and predicted Bitcoin purchasing power. Source: wiggy222 on Reddit.com

Goldman Sachs. In the crypto world, brokerages are the new investment banks. They help new cryptocurrency companies launch initial coin offerings by setting up escrow accounts, clearing qualified investors, and settling trades. Brokerages charge a percentage of total revenue earned by the ICO. Brokerages also offer customized service for high-net-wealth individuals who want to gain exposure to cryptocurrencies. This service is paid for by the spread between the price that the

brokerage buys or sells the cryptocurrency at on an exchange, and the price they charge the customer. The largest brokerage in Europe, Bitcoin Suisse in Zug, Switzerland has a monthly turnover of \$150 million. Other brokerages include Coinfinity in Graz and BitPanda in Vienna.

Conclusion: Cryptocurrency Financial Infrastructure is Maturing

In conclusion, cryptocurrencies and the blockchain technology are becoming everyday words. **The cryptocurrency market has grown from a market capitalization of \$0.00 in 2010 to over \$430 billion in 2017.** The absolute

return of over one million percent has driven interest in this technology. The interest has attracted great minds and investors into the space. Today, the market is maturing into an efficient market with updated versions of traditional financial intermediaries. Exchanges, brokerages, derivatives, and credit cards are developing for the cryptocurrency market.

However, the impact that these technologies will have on the world is still unknown. The open-source nature of public blockchain software allows anyone to use Nakamoto's inventions for the development of new technologies. At the same time, if governments decide that permissionless blockchains are too revolutionary, governments may try to limit further innovation.

At each step of development in the cryptocurrency market, the Crypto Research Report hopes to be your go-to-guide for critical analysis. The constantly evolving cryptocurrency space needs a reliable source for up-to-date information, and Incrementum has accepted the challenge. We wish you an informative and educational read through our inaugural report. The rest of this edition includes exclusive interviews, statistical analyses of different cryptocurrencies, and helpful insights on frequently asked questions.

Also, we invite you to look for each subsequent edition of *The Crypto Research Report*. Over time, the CRR aims to become a leading authority on cryptocurrency and blockchain investments for financial market participants and institutions. We look forward to understanding the investment potential of these exciting new technologies together!

**We welcome your feedback:
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ICOs: Money, Scams, and Big Hopes

Key Takeaways

- The cryptocurrency boom resembles the beginning dotcom boom. Billions of dollars are being poured into blockchain-based technologies and start-ups.
- Initial coin offerings are a new way to raise capital for ideas. Over 3 billion has been invested in initial coin offerings in 2017 so far. However, this decentralized version of kickstarter is illegal in several countries and not regulated in most.
- Many cryptocurrency experts including venture capitalist Jamie Burke and Ethereum founder Vitalik Buterin believe that up to 90% of all ICOs will fail.



“Developers, businesses, and individuals increasingly are using ICOs – also called coin or token launches or sales – to raise capital. There has been media attention regarding this form of capital raising. While these activities may provide fair and lawful investment opportunities, there may be situations in which companies are publicly announcing ICO or coin/token related events to affect the price of the company’s common stock.”

U.S. Securities and Exchange Commission

We want to sincerely thank Nikolaus Jilch for contributing this chapter. Nikolaus is a journalist with the daily newspaper *Die Presse* in Austria. Among other things, he covers monetary policy, precious metals, and general macro topics. He is also the author of a weekly finance column called “Wertsachen”. Nikolaus has been writing about Bitcoin and the blockchain since 2012. To follow his work, follow him on Twitter at @JilNik.

Summer 2017 was the summer of Initial Coin Offerings. ICOs and token sales in the crypto sector have seen explosive growth. In 2017, more money has been raised in this market than through venture capital or angel investments. However, this new market is a minefield for investors. Although no ICO regulation exists at the moment, that could soon change. This chapter focuses on initial coin offerings, bubbles, scams, and – of course - regulation.



Pets.com with ticker IPET went from \$11 to \$0.19 per share within nine months. Source: [CNN Money](#)

Who still remembers Pets.com? The rise and fall of this Internet company has become a symbol of the dotcom bubble at the end of the 1990s. The technological possibilities offered by the Internet fired up the imagination of investors quite a bit at the time. For a little while it was considered received wisdom on Wall Street that a good-sounding domain name was all it would take to guarantee success. Pets.com actually had more than just a domain name: it had a business concept, more than 300 employees – and an already existing network of storage facilities across the US. Amazon was an early investor in this provider of pet supplies. It seemed that nothing could go wrong. And yet, Pets.com eventually failed spectacularly.

The online store went public in 2000 – with great success. 82 million USD were raised on the first day. But a mere nine months after the initial public offering (IPO) it was all over: Pets.com was bankrupt. The famous domain name was later acquired by competitor Petsmart. Within just 268 days, the stock plunged from 11 USD dollars to 19 cents.

Pets.com joined the game too late. Other web sites, such as social media forerunner TheGlobe.com, initially had outstanding success. The stock skyrocketed by 600% on its first day of trading. But reality would soon intrude: “The rules of the game changed as soon as we went public”, co-founder Stephan Paternot wrote in his book *A Very Public Offering: A Rebel's Story Of Business Excess, Success, And Reckoning*, “It was not about developing our business model, but increasing shareholder value. We were doing well if our stock went up and badly if it went down.”

A mere 20 years later, history seems to be repeating. This time it is blockchain technology that stokes the imagination of investors. The ingredients are almost the same as back then: once again a new technology appears to offer seemingly revolutionary possibilities. Once again, no sphere of life seems likely to be untouched by it. And once again millions are rushing in as though nothing could possibly go wrong.

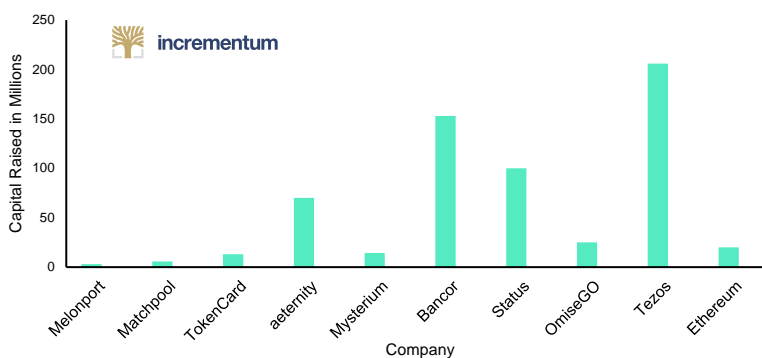
a. A New Market is Born

However, there are decisive differences as well. The blockchain sector based on the technology underpinning the cryptocurrency Bitcoin is to this day an almost

hermetically sealed market. Companies don't list on the stock exchange, they don't conduct an IPO but an ICO – an “initial coin offering”. In contrast to the dotcom mania, an entirely new market has sprung up – which is to date de facto unregulated. Neither investment banks nor hedge funds are the driving forces of the mania but private investors who made a lot of money in recent years as the prices of Bitcoin and other cryptocurrencies massively increased.

Only recently, eight years after Bitcoin first surfaced, the interest of investment bankers and hedge fund managers has been piqued. Goldman Sachs analysts have been giving consideration to Bitcoin since July. Unconfirmed reports suggest that at least 70 different hedge funds are currently entering the market.

Figure 13. Capital Raised during 2017 ICOs.



Source: Bitcoin Suisse, Incrementum AG

ICOs have grown explosively in number and success this year as well. Goldman Sachs states that more money was raised via these instruments since the summer months than internet start-ups received from venture capital firms and angel investors. The precise figures are open to debate though. Goldman Sachs estimates that around USD 300 million were raised in ICOs this July. The New York Times even reported a figure of USD 665 million, which various projects were supposedly able to raise in this month alone – referring to data collected by industry journal Tokendata.io.

These statistics are moreover distorted by the extreme price volatility in cryptocurrencies, as ICOs are not based on dollars but on Bitcoins or more recently increasingly ether as well, the currency of the Ethereum network. As a result of this, a company that made an ICO a year ago may possibly have more than a hundred million dollars in the form of ether coins at its disposal – provided it didn't exchange the cryptocurrency for dollars right away. The only thing that can be stated with certainty is: this new form of initial funding for start-ups is currently undergoing a boom that surpasses anything we have seen in the blockchain sector up to this point.

b. What is an ICO Actually?

The term ICO is of course an allusion to the established term IPO. There are in fact a number of similarities between these fund-raising procedures. Both aim to



The SEC and ESMA in Europe are closely watching ICOs.

Source: Sean at deBanked.com

collect money from investors who have become aware of a potential profit-making opportunity and are prepared to take risks. Two important differences were already mentioned: ICOs are mainly the domain of inexperienced retail investors. In addition to this, contrary to stock exchange listings, ICOs are neither precisely

defined, nor are they regulated. Lastly, only very few ICOs actually involve the sale of stakes in a company in the form of shares, but rather so-called tokens, the exact purpose of which can vary widely. It therefore seems to make more sense to regard ICOs as a new form of crowd-funding rather than confusing them with traditional stock market listings.

Often the people offering ICOs specifically stress that the process should be defined as a “token sale”, a “donation”, or a “crowd sale”. This is designed to prevent future problems with regulators. A number of the latter, such as the SEC in the US, have already signaled that they plan to examine ICOs closely in the near future. Should the sale of ICOs be equated to the sale of securities, the same laws and tax rules that apply to the stock market could be applied to them as well. Currently no binding rules exist. Many ICOs already exclude U.S.-based investors though in order to forestall potential future legal problems.

“It can be compared to Kickstarter”, said Julian Hosp in a private interview we conducted during fall of 2017. Together with three partners, the Austria-born entrepreneur has founded the start-up company TenX in Singapore. TenX has developed a prepaid debit card which can be connected with a cryptocurrency wallet on a smart phone. “We want to make cryptocurrencies spendable”, Hosp explains. TenX raised the equivalent of USD 80 million within seven minutes

Tweets Tweets & replies Media

 **PutinCoin** @PutinCoinPUT · Nov 2
 PutinCoin on its way to sky more updates incoming soon
 #putincoin #cryptocurrency #blockchain #bitcoin #altcoins

PutinCoin (PUT)	
\$0.047733 (95.01%)	
0.00000677 BTC (82.09%)	
Market Cap	Volume (24h)
\$9,582,169 1,359 BTC	\$27,104 3.84 BTC
Circulating Supply	Max Supply
200,745,165 PUT	2,000,000,000 PUT

With an all-time high market cap of almost \$9 million, Putin coin's sole purpose is to pay tribute to Putin and the people of Russia.

Source: [Twitter.com/putincoinput](https://twitter.com/putincoinput)

in a token sale it conducted this summer. A special decentralized structure was developed in collaboration with a law firm so as to make the token sale immune to legal challenges.

The token itself, which trades under the symbol PAY, has no purpose beyond its “kickstarter” function. Soon it is supposed to be possible to use it for payments via the TenX app and debit card. With respect to his opinion on ICOs in general, Hosp isn't exactly mincing words, neither in his YouTube videos, nor in interviews: “95 percent are scams and pure rip-offs. It probably won't be long before many of these projects go under. How many of them have actually a useful sphere of application?”



Floyd Mayweather in July became one of the first high-profile celebrities to endorse an ICO.

Source: [Twitter.com/floydmayweather](https://twitter.com/floydmayweather)

c. Beware of Scams

Analysts at Smith and Crown are listing several dozen upcoming token sales and ICOs scheduled to take place in the coming months: the ideas range from blockchain-based adult entertainment to the storage of wills – also on the blockchain. According to Smith and Crown, the history of ICOs can be traced back to 2013. At the time token sales were mainly organized through the Bitcoin Talk forum. The first ever ICO is said to have been conducted for the purpose of funding Mastercoin, a mega-protocol that was supposed to create additional features for Bitcoin. The Mastercoin ICO raised 1,000 Bitcoin. The cryptocurrency project NXT also originated via an ICO conducted through the Bitcoin Talk forum. In 2013 and 2014 numerous further ICOs followed, some of which were the work of scammers.

That is the other side of the coin, so to speak. The growing success of ICOs and the ever-larger amounts of money involved in these offers continue to attract numerous criminals to this day. In summer of 2017, the Enigma project became victim of an attack by hackers. The hackers altered the web site of the project and entered a false wallet address to which users were supposed to send money to purchase Enigma tokens. The damage reportedly amounted to half a million dollars. How big the long-term damage to Enigma's reputation will be remains to be seen. The hackers took advantage of the hype accompanying the project and the greed of potential investors.

Similar events occurred also on occasion of the ICO of Israeli project Bancor, which raised more than 150 million USD in June 2017. In this case false wallet addresses were distributed via social media, causing quite a few gullible investors to send money to them that is now lost forever.

d. The Role of Ethereum

The reason why ICOs have gathered significant steam this year has a name: Ethereum. The number two cryptocurrency by market capitalization was itself created by a token sale. Bitcoin equivalent to “only” USD 18 million were raised at the time. Ethereum is more than a currency, it is a platform providing a blockchain other enterprises can use for their own purposes. Moreover, Ethereum offers a feature called “smart contract”, which inter alia makes it possible to automatically

exchange ether tokens for other tokens. That is precisely what happens in a “standard” ICO. Users send their investment in form of ether coins to an ether wallet address and in return receive the tokens issued by the project they want to invest in. The ICO of Bancor took place on the Ethereum network and was so successful that the latter was overloaded for more than a day.

What purpose the different tokens distributed by their inventors serve varies

widely. There are several attempts to create tokens that will make it possible to receive passive income – such as, for example, dividend payments. In view of the looming threat of market regulation, this trend was at the very least hampered of late. Other tokens, such as the one issued by EOS, which will leave its ICO up and running for an entire year, are merely placeholders for the “real” token that will be traded on the still-to-be-developed

“real” EOS blockchain. Similar to many ICOs, participants in the EOS ICO invest merely in an idea and a team, not a ready-made final product. Until the EOS blockchain is ready, the EOS token remains an ETH token, which trades on the ETH blockchain. The highly successful token of Thai company Omise is an analogous case. Omise distributed an Ethereum token by the name of OMG. The token has in the meantime become tradable as well. Omise ultimately wants to develop its own blockchain though and exchange the tokens at a later point in time.

Investors as a rule don’t necessarily have to purchase a new token during the ICO phase, as most of them quickly tend to become tradable at cryptocurrency exchanges. At this juncture one would do well to remember the remarks of the CEO of Globe.com. Similar to start-ups at the time of the dotcom bubble, the survival of new ICO-funded blockchain enterprises should actually not depend on the prices at which their tokens are trading. On the contrary: many have raised enough money to be able to pursue their work for years without funding pressures. Alas, then as now, investors definitely tend to judge a project’s success by watching prices. That leads to a situation in which communication and public relations appear almost as important as the actual technological progress that is achieved – particularly in cases in which several projects in a specific sector are working toward the same goal.

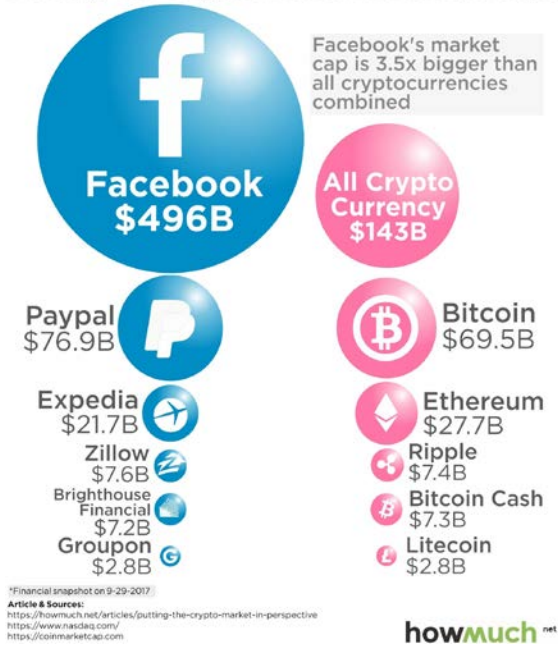


A typical blockchain product roadmap showing progression from idea to implementation.

Source: OxFina.com

e. The First Large ICO Failed

Putting the Crypto Market in Perspective



As of December 2017, Facebook's market cap is twice the size of the entire cryptocurrency market. Source: howmuch.net

Thus, several companies are currently working on building supercomputers based on blockchain technology, on the introduction of cryptocurrency debit cards, or the creation of blockchain-based cloud storage solutions. These are just three examples of spheres of application in which blockchain enterprises want to gain a foothold. A number of projects in the health care, travel and gambling sectors are underway as well. An additional complication is the question what role the token plays in a company's business concept. It is, for instance, possible that a token has to remain relatively cheap in order to support a project's functionality.

Ether itself of all things is subject to a recurring debate in this context: is ether actually a currency, or is it rather the fuel that is burned on behalf of other projects? Moreover, in the case of some projects it cannot be ruled out that their developers will flood the market with additional coins through a new ICO, which would inflate the total outstanding amount of the tokens concerned. In view of the sheer confusion and complexity of the several hundred ICOs in the pipeline for this year and next, interested investors will have no choice but to engage extremely thorough due diligence wherever possible – and to rather pass on investments if it isn't possible.

Just how dangerous an ICO investment can be is illustrated by the history of DAO. It was the first large-scale ICO on the Ethereum network, which raised around USD 130 million in May of 2016 already. Alas, hackers exploited a security flaw and were able to steal tokens valued at USD 50 million.

d. Regulatory Authorities are Coming

The event had two important consequences: a so-called hard fork of the Ethereum network was implemented in order to restore the stolen coins. Ever since, both Ethereum and Ethereum Classic exist. The DAO disaster was also the reason for the US regulatory agency SEC to begin a review of the issue. The wheels of justice grind slowly. In the summer of 2017, the SEC issued a statement asserting that the stolen DAO coins should have been registered as securities with the agency.

The importance of this decision has to be equaled with that of the CFTC to classify Bitcoin as a commodity, similar to gold. SEC decision could have an enormous impact on the blockchain industry. Currently ICO issuers are still careful and will rather circumvent the US market in order to avoid becoming a target for regulators. On the other hand, if tokens are treated as securities, an important

"It is an established fact that ninety percent of startups fail... And it should also be an established fact that ninety-percent of these ERC20s on CoinMarketCap are going to go to zero."

Vitalik Buterin

ICO Investing 101

Reputable research sources have not published literature on ICOs yet. Currently, the industry lacks a commercial-free and unbiased source of ICO information. Investors learn about ICOs through Reddit, BitcoinTalk, and Youtube.

1.) First read a few articles on how to evaluate the value of an ICO. [William Mougayar at Coindesk wrote a nice checklist for investors that are new to the scene.](#)

2.) Check Reddit for informed debates. Once I have targeted an ICO that I am considering as an investment, I go to Google and search the name of the ICO, the word "Scam", and the word "Reddit". For example, when I wanted to invest in the Polka Dot ICO, I typed, "[Polka Dot ICO Scam Reddit](#)" in Google. I found several discussion threads that showed advantages and disadvantages of investing in that particular ICO.

3.) Watch Youtube. My favorite Youtuber on crypto investing is Tai Zen from the channel Cryptocurrency Markets. He has a traditional finance background and is a technical analyst. Just skip the first five minutes of each video while he sets up his sound and slides. Tai Zen's video [#54 on risks of cryptocurrency investing](#) is an excellent starting place.

"I think the internet is going to be one of the major forces for reducing the role of government. The one thing that's missing but that will soon be developed, is a reliable e-cash."

Milton Friedman

Although the market capitalization of cryptocurrencies has grown nearly ten-fold since last year, the market remains very small compared to traditional financial assets. The market cap of Apple alone is almost five times larger than the entire sector. The combination of a maturing market, the slow emergence of more specific regulations and the rapidly growing interest on the part of investment banks and hedge funds leads us to conclude that the blockchain mania probably still has a lot of room to grow – perhaps it hasn't even really started yet. Only once the authorities have indeed leveled the regulatory playing field between blockchain assets and other securities will it be possible to truly compare the market to traditional financial markets.

The same applies to comparisons with the dotcom bubble: between 1997 and 2000 a total of 522 dotcom companies were listed, raising more than USD 43 billion in the process. On the day the Nasdaq Composite peaked it had reached a total market capitalization of USD 6.6 trillion - level that was of course hopelessly exaggerated. However, one must not forget that despite duds like Pets.com and Globe.com, numerous companies involved in this bubble later more than fulfilled their promise – such as, for example, Amazon. Amazon disrupted the retail business by offering an online shopping platform with customer reviews, fast

door will be opened as well. The reason is that a sufficient degree of market regulation is a precondition for an asset to become accessible to institutional investors, banks, hedge funds and other large financial market participants. **A blockchain asset regulated by the SEC could one day also become acceptable as collateral in the capital markets, which would give the importance of cryptocurrencies a massive shot in the arm.**

The same applies to the giant Chinese market. The PBoC recently "prohibited" the ICO business as practiced in recent years, which was followed by a brief panic that led to a sharp sell-off in Bitcoin. But even in Beijing the next step is likely to consist of issuing regulations specific to ICOs, which should ultimately boost confidence in the sector and help it to attract more investment.

Conclusion: enormous potential remains

It is therefore probably too early to dismiss the ICO-mania of the past two years as a bubble. Over the medium term there is undoubtedly a danger that the crypto-sphere could be struck by a medium-strength or even very strong earthquake, which could lead to a noticeable shift in the valuation of Bitcoin and other alt-coins. But the potential for the market to become much bigger seems quite obvious as well. Thus, the total market capitalization of all blockchain assets stood at less than USD 260 billion at the end of November 2017.

shipping, and free returns. Similarly, the blockchain technology may change the way we store value and pay for goods and services.

Investors in the late 1990s were not wrong with their assessment of the future – they were merely too early. The required infrastructure didn't exist yet. If one uses the Internet as a model for the prospects of the blockchain and believes that this technology will have a comparable revolutionary impact, investors can take steps to hedge themselves to some extent against the risks associated with a bubble: they only have to buy the Amazon equivalents of the sector and avoid falling for empty promises. That is of course easier said than done.

U.S. Regulated Bitcoin Derivatives: Blessing or Curse?

Key Takeaways

- The Chicago Mercantile Exchange is launching a Bitcoin futures contract by the end of 2017. The Chicago Board Options Exchange wants to launch futures and options by the end of the year as well. The first U.S. regulated bitcoin options market, LedgerX, already began trading in October.
- CME and CBOE futures will be settled in cash. LedgerX is settling swaps and options in bitcoin. Contracts that are not settled physically will not directly impact the price. Instead, psychological pressure will be the main channel.
- Regulated and liquid derivative markets may signal to retail and institutional investors that this technology is maturing into a real asset class. High-frequency trading and futures-based exchange-traded funds may come next.

“We believe that derivatives are the logical next step in the evolution of the Bitcoin market. In order for Bitcoin to continue to grow, you need to incorporate it into the existing market system.”

Winklevoss twins

Chicago Mercantile Exchange (CME) Group Inc. and the Chicago Board Options Exchange (CBOE) announced plans to launch a cash-settled Bitcoin futures product by the end of 2017. This chapter explains what cryptocurrency derivatives are, how investors are using them to trade, and how derivatives can impact the price of Bitcoin.

"We've really come to the conclusion recently that cryptocurrencies are here to stay."

John Deters, CBOE



A regulated and liquid option market would signal to retail and institutional investors that this technology is maturing into a real asset class.

Source: [Unsplash.com](https://unsplash.com)

a. Bitcoin Futures: A Blessing or a Curse?

The spike in Bitcoin's price after CME announced their new line of Bitcoin Futures may signal that market participants believe this is a blessing. The price of Bitcoin surged to a record high of over \$6,400. Although that record was washed away by Bitcoin's rally to over \$8,600 in late November, many financial analysts argue that Futures are a curse for Bitcoin. Dave Kranzler of *Investment Research Dynamics* thinks that futures can be used to manipulate the price of bitcoin. **By allowing an infinite amount of fiat-dollar-based paper Bitcoin contracts to be issued with only a limited number of buyers demanding the contracts, the futures price will plummet.** Kranzler even goes so far as to question Bitcoin's hard cap, "So much for the idea that Bitcoin supply issuance is firmly capped".¹⁶

However, one important caveat in this argument is missing. As Valentin Schmid of *The Epoch Times* points out, the futures are settled in cash. Effectively, these contracts are not futures. Instead, these contracts are derivatives that are based on the index price of bitcoin. Therefore, the futures are likely to have little to no effect on the price of the underlying in the long run.¹⁷ If an infinite amount of fiat-dollar-based paper Bitcoin contracts are issued and supply outpaces demand, then the futures price will drop. However, this is not directly connected to the price of Bitcoin.

There is only way to ensure that the futures price converges to the spot price: Arbitrage. Imagine if futures are trading at a 20% premium to Bitcoin's

¹⁶ Kranzler, Dave. (Nov. 1, 2017). Will The New Bitcoin CME Futures Contract Benefit Gold? *Investment Research Dynamics*. Retrieved from: <http://investmentresearchdynamics.com/will-the-new-bitcoin-cme-futures-contract-benefit-gold/>

¹⁷ Schmid, Valentin. (Nov. 18, 2017). The Ins and Outs of Bitcoin Futures Contracts. *The Epoch Times*. Retrieved from: https://www.theepochtimes.com/the-ins-and-outs-of-bitcoin-futures-contracts-2_2356514.html

"Money is one of the greatest instruments of freedom ever invented by man. It is money which in existing society opens an astounding range of choice to the poor man, a range greater than that which not many generations ago was open only to the wealthy."

F.A. Hayek

spot price of \$8,000. This could be for a one-month contract ending on the second business day before the third Friday in January 2018. The investor can sell Bitcoin futures and buy physical Bitcoin on an exchange and wait for the settlement date, January 17, 2018.

CME and CBOE Futures Contract Specifics:

- 1.) CME contracts will be equal to 5 Bitcoin. The price of 1 Bitcoin will be the CME Bitcoin Reference Rate, which is averaged from several cryptocurrency exchanges.
- 2.) Similarly, CBOE contracts will represent 1 Bitcoin, and the price of Bitcoin will be XBT used by the U.S.-based cryptocurrency exchange Kraken.

If the spot price of Bitcoin goes up to \$15,000, the investor's physical Bitcoin will go up in value and the futures will go down in value. If the price of Bitcoin goes down to \$4,000, the investor's physical Bitcoin will go down in value and the futures will go up in value. The two positions create a perfect hedge where exposure is neutralized and profits are zero.

As more investors collect the risk-free profit, the price of physical Bitcoins will go up and the

price of Bitcoin futures will drop, enabling the early arbitragers to gain at the expense of the later arbitragers. **These arbitrage opportunities will create temporary changes in the demand and price of Bitcoin because the arbitrageur will close their physical Bitcoin position after the Futures contract settles.**

Another clairvoyant point by Schmid is that long term Bitcoin buy and hold positions are what drive the price of Bitcoin. The shorting FUD (fear, uncertainty, doubt) argument stems from the well-documented market manipulation of gold, silver, and fiat currency.¹⁸ However, Bitcoin's transparent blockchain makes market manipulation easily traced and detected. Gold is easier to manipulate because fractional reserves go unreported. Dumps of fractional reserve gold certificates lead to margin-calls being executed, which further suppress the price. However, Bitcoin does not have a fake gold paper equivalent. Bitcoin paper cannot settle transactions on the Bitcoin network. Although the Bitcoin market is not immune to manipulation, the manipulation can at least be monitored routinely for suspicious behavior. **Market manipulation in a transparent market can only achieve limited gains. If market manipulators do not behave, they will be left holding worthless Bitcoin as long term holders switch to less manipulated cryptocurrencies.**

"That's a very important step for bitcoin's history. ... We will regulate, make bitcoin not wild, nor wilder. We'll tame it into a regular type instrument of trade with rules."

CME Chairman
Emeritus Leo Melamed

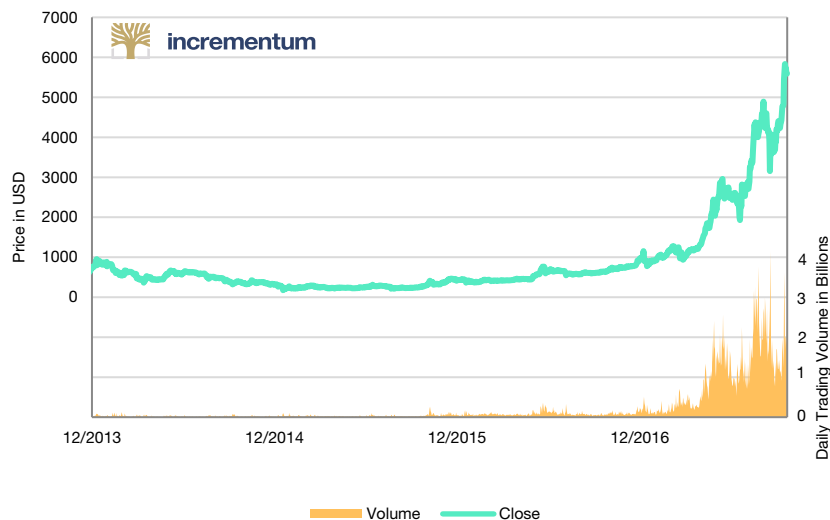
b. One Year Bitcoin Options Are Now Available

In addition to the futures market, the startup firm Ledger X has become the first Bitcoin options exchange in the U.S. In July of 2017, the Commodity Futures Trading Commission (CFTC) approved LedgerX's application to become a Swap Execution Facility and a Derivatives Clearing Organization. The main offering is Bitcoin to dollar option contracts with maturities ranging from one month to one year. Other companies offering Bitcoin derivatives, such as Deribit and the Bitcoin Mercantile Exchange (BitMEX), have garnered significant

¹⁸ First Gold Halt of 2014. (Jan. 6, 2014). Nanex Research. Retrieved from: <http://www.nanex.net/aqck2/4522.html>

interest from traders; however, their domiciles in the Netherlands and the Seychelles have limited their investor pool.

Figure 14. Price and Trade Volume History of Bitcoin.



Source: Coinmarketcap.com, Incrementum AG

The approval of LedgerX in the U.S. represents a momentous step toward establishing an efficient cryptocurrency market that is patrolled by U.S. financial market authorities. As a global leader in financial technology, the CFTC’s approval may encourage governments in Europe and in Asia to follow suit.

In traditional financial markets, an option market is a valuable source of information about market sentiment. Option markets can also be used to hedge volatile asset classes. Applied to cryptocurrencies, options can be used to bet on the future spot price and build positions. This section outlines several ways that investors can use options to trade cryptocurrencies.

c. Betting the Price Will Go Up

If a trader is convinced that the price of Bitcoin will go up in the future, they can buy a position at the spot price listed on one of the several exchanges or they can buy a call option on an options market. A call option on cryptocurrency works the same way as a call option on stocks. A cryptocurrency call option will give the investor the right to buy a specific amount of Bitcoin at a date in the future. Typically, an American option will have an expiration date of one to six months while a European option only allows investors to exercise the contract on the expiration date. For example, imagine today’s spot price is \$8,000 per Bitcoin. The investor can buy one Bitcoin today for \$8,000 or they can buy a call option for \$200, which will allow the investor to buy the stock at \$8,000 in one month from now. If the investor buys for \$8,000 today and the price goes up to \$10,000 in one

“...we ended up completing swaps and options trades worth over \$1,000,000 USD. Crucially, these trades were cleared through LedgerX, which is the only institutional grade, US federally regulated exchange and clearinghouse for digital currencies. And we are literally just getting started.”

LedgerX

“Bitcoin is the currency of resistance.”

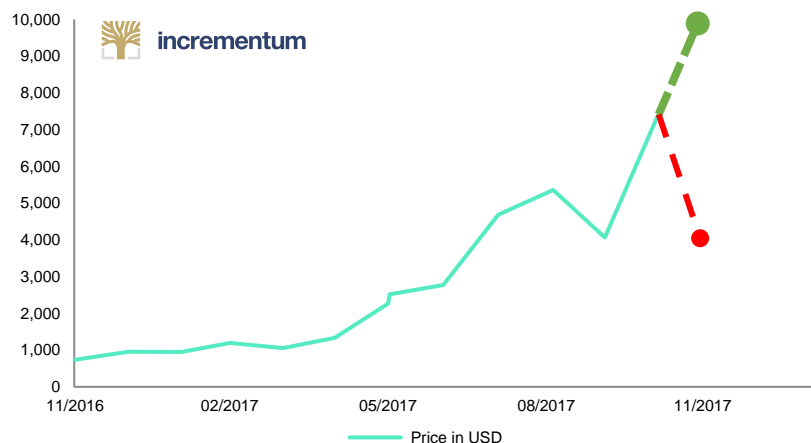
Max Keiser

month from now, then the investor can realize a gain of \$2,000 by selling the Bitcoin.¹⁹

On the other hand, if the investor buys a call option for \$200 and the price goes up to \$10,000 in one month, then the investor can exercise the call option and buy one Bitcoin at the price of \$8,000. However, the investor will only realize a gain of \$1,800 because the cost of the call option, equal to \$200, must be subtracted from the gain of \$2,000.

At first sight, the first scenario sounds better. However, the higher return is accompanied by higher risk. In the first scenario, the investor must risk \$8,000, whereas in the second scenario, the investor only needs to risk \$200. If the price had gone down instead of going up, the second scenario would have provided a higher return. Imagine if the price of Bitcoin had plummeted to \$4,000 instead of going up to \$10,000. In the first scenario, selling the Bitcoin will lock in a loss of \$4,000. On the other hand, if the investor had used a call option then they would only lose \$200. The investor only loses the amount that they paid for the option when the option is “out of the money.” Figure 15 is a graphical representation of the two hypothetical price movements.

Figure 15. Two Bitcoin Price Paths.



Source: Coinmarketcap.com, Incrementum AG

d. Betting the Price Will Go Down

In contrast, bearish traders who think the price of Bitcoin will decrease can buy a put option. Put options can be useful if internal debates, scalability issues, or government regulations challenge the future prospects of the technology. A cryptocurrency put option will give an investor the right to sell a certain amount of Bitcoin at a specific date in the future. In traditional markets, investors can bet on the price of an asset going down by shorting the asset. Shorting a cryptocurrency would involve borrowing the cryptocurrency, selling the cryptocurrency, and then buying the cryptocurrency again at a later date in order to return the

“Because the bitcoin contract is cash settled, the effects on bitcoin, whether positive or negative, will likely be small.”

Valentin Schmid

¹⁹ This is a simplified analysis of an options trade that does not consider the Greeks and implied volatility. Delta, Gamma, Theta, and Vega play a major role in the return on an options trade.

cryptocurrency to the lender.²⁰ However, in the absence of liquid lending markets, put options may be the only way to bet on the price of Bitcoin going down.

For example, imagine today's spot price is \$8,000 per Bitcoin; however, the investor believes that the price of Bitcoin is going to go down. Buying a one month European-style put option for the price of \$200 would enable the investor to sell one Bitcoin at the price of \$8,000 in one month from today. This option would be "in the money" if the price of Bitcoin is below \$8,000 on the day of the option's expiration. As in the previous example, if the price drops to \$4,000, then the investor could sell his or her Bitcoin at the price of \$8,000. The trader would realize a gain of \$3,800 after factoring in the costs of the put option.

Instead of buying a put option, the investor could short Bitcoin. In order to short a cryptocurrency such as Bitcoin, the investor would begin by borrowing a specific amount of Bitcoin on a lending market, such as the Poloniex lending market. Lending rates fluctuate constantly, and most loan periods are two days; however, interest on a two-day loan rolled over fifteen times to create a thirty-day loan ranges from 0.2% to 0.3% Bitcoin. With a spot price of \$8,000, shorting a Bitcoin would cost between \$16 and \$24. After borrowing a Bitcoin at the current spot price of \$8,000, the investor could sell the Bitcoin immediately at the price of \$8,000. If the price of Bitcoin dropped to \$4,000 after one month, then the investor could buy back in at \$4,000 and return the Bitcoin to the lender. After subtracting the lending costs of \$20, the investor would realize a gain of approximately \$3,980.

Like buying a call option, buying a put option reduces your risk. To see how this works, imagine the price of Bitcoin had gone up instead of going down. In this scenario, the cryptocurrency shorter has an infinite amount of loss. If the price of one Bitcoin went up to \$10,000 after thirty days, then the shorter would lose the amount they paid for borrowing the Bitcoin plus the difference between how much they sold the Bitcoin for and the new spot price. In total, the loss from shorting would be approximately \$3,700. In contrast, the second scenario only entails a loss of \$200. If the price of Bitcoin goes up instead of going down, then the investor only realizes a loss equal to the cost of buying the put option.

Unlike the CME and CBOE futures markets, LedgerX's swaps and options are settled physically. In addition to call and put options on Bitcoin, physical settlement allows investors to build positions by writing put options. The options market also enables active trading strategies such as call spreads and straddles. Furthermore, the total number of open or outstanding options may allow investors to gauge market sentiment. In traditional option markets, an increase in the number of outstanding options is interpreted as a bullish signal. Current research by the Nobel Memorial Prize winning economist Myron Scholes is investigating the role that option markets can play in forecasting risk.²¹

"It means a lot, not just for the industry, but globally, because the CFTC will set the example of what a well-licensed clearinghouse and exchange based around digital currencies will look like."

Paul Chou, LedgerX

²⁰ A detailed explanation of cryptocurrency shorting will be published in the next edition of the *Crypto Research Report* coming out in Q1 of 2018.

²¹ Scholes, M. (2017). The Evolution of Investment Management. Lindau Nobel Laureate Meetings. Retrieved from <http://www.mediatheque.lindau-nobel.org/videos/37263/evolution-investment-management>

Conclusion: Bitcoin derivatives are a milestone for the financialization of the crypto sector

In conclusion, Bitcoin has had a steady upward trend over the past seven years despite being one of the most volatile assets. Only other cryptocurrencies are more volatile than Bitcoin. U.S.-based Bitcoin derivative markets with physical delivery can actually reduce volatility in the price of Bitcoin, which was the original intention of derivative markets in the 18th century. Bitcoin derivatives can be used to forecast risk, build positions in Bitcoin, hedge positions in Bitcoin, and speculate on price volatility; however, futures with cash settlements can only have a temporary impact on the demand and subsequently the price of Bitcoin. The most valuable takeaway from derivative markets will be the implied risk information that can help investors make allocation decisions. Instead of shorting FUD and doomsaying, regulated and liquid derivative markets may signal to retail and institutional investors that this technology is maturing into a real asset class worth investigating.

Constructing a Cryptocurrency Index

Key Takeaways

- The total capitalization of the cryptocurrency market had a 12-fold –or more than 1,100% – increase during the past 12 months.
- Investors who would like to gain a broad exposure to the cryptocurrency market can use the index as an allocation strategy or as a benchmark for active portfolio management.
- During the past year, a portfolio that tracked the top ten cryptocurrencies outperformed a portfolio only holding Bitcoin.



“The idea that any single individual without extra information or extra market power can beat the market is extraordinarily unlikely. Yet the market is full of people who think they can do it and full of other people who believe them. This is one of the great mysteries of finance.”

Daniel Kahneman

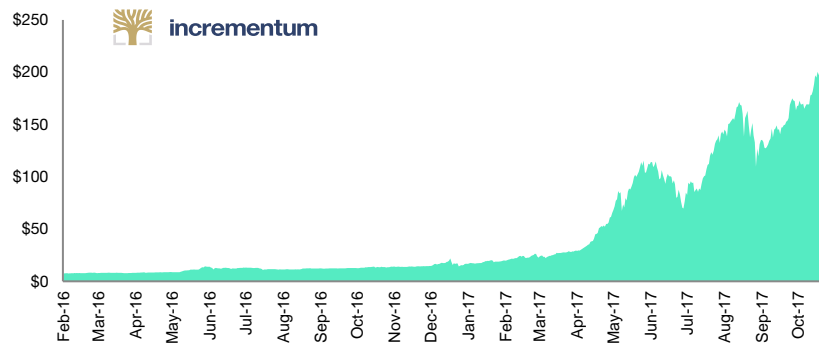
We want to sincerely thank Georg Bühler for contributing this chapter. Georg Bühler is a PhD student at Rey Juan Carlos University in Madrid, Spain. His research focuses on the economics of digital currencies such as Bitcoin and their price formation. He is also interested in Austrian economics and scientific approaches to portfolio management.

“Diversification is an established tenet of conservative investment.”

Benjamin Graham

The world of cryptocurrencies has seen a plethora of coins appear during the past five years. In total, the cryptocurrency market has reached a number of more than 1000 tokens and a total market capitalization²² of about USD 260 billion²³ as of November 2017, as Figure 16 shows.

Figure 16. Total Market Capitalization.



Source: Coinmarketcap.com, Incrementum AG

This amounts to an increase of more than 1,200% from what the crypto market was worth just twelve months ago. With these numbers in mind and Bitcoin continuing to outperform many traditional assets, it comes as no surprise that private and institutional investors long for cryptocurrency exposure.

“Diversification is a hedge for ignorance.”

William O'Neil

Some companies have started offering cryptocurrency funds that focus on Bitcoin, such as the US-based Bitcoin Investment Trust sponsored by Grayscale Investments. More recent cryptocurrency funds, such as the one by Incrementum that will be launched soon, are investing in a basket of cryptocurrencies in order to provide diversification benefits for investors.²⁴ As the article “U.S. Regulated Bitcoin Derivatives: Blessing or Curse?” in the inaugural edition of the *Crypto Research Report* points out, even option and futures trading will soon become available for Bitcoin. The number of investment vehicles is growing almost as quickly as the market itself.

The central question that investors ask, however, remains the same as with any other traditional asset class: How can I profit the most from the developments in this market? How can I hedge positions, reduce risks, and implement sophisticated investment strategies?

The choice of the right investment strategy differs with each individual and their specific goal. A portfolio destined for a down-payment on a house is most likely going to look different from one that is supposed to finance a private pension one day.

²² The market capitalization of a cryptocurrency is calculated by the price of a coin multiplied by the number of coins in existence. This is an estimate, however, because an uncertain number of coins are irretrievable in the network since users forget their private keys or send coins to the wrong addresses.

²³ CoinMarketCap (2017, 26 September). Cryptocurrency Market Capitalizations, *CoinMarketCap*. Retrieved from <https://coinmarketcap.com/coins/views/all/>

²⁴ Fonds Online Professionell (2017, September 4). Europäischer Kryptowährungsfonds vor Start, *Fonds Online Professionell, Deutschlands Unabhängiges Magazin für Anlageberater*. Retrieved from <http://www.fondsprofessionell.de/news/uebersicht/headline/premiere-erster-kryptowaehrungsfonds-europas-steht-in-den-startloechern-136702/ref/2/>

"Diversification may preserve wealth, but concentration builds wealth."

Warren Buffett

A reasonable strategy for private investors looking for consistent long-term gains is so-called indexing. Indexing refers to the allocation of assets in a portfolio so that the portfolio's performance matches that of an index.²⁵ This approach has been recently popularized by the financial expert Gerd Kommer. In his comprehensive work on indexing, Kommer states that more than 75% of all equity and pension funds fail to outperform a correctly selected benchmark (i.e. the market) in the long run.²⁶ This situation can be further illustrated by the S&P Indices Versus Active (SPIVA), which measures the performance of actively managed funds against their relevant S&P index benchmarks. The most recent SPIVA U.S. scorecard showed that during the one-year period ending December 31, 2016, 66% of large-cap managers, 89% of mid-cap managers, and 86% of small-cap managers underperformed the S&P 500, the S&P MidCap 400, and the S&P SmallCap 600, respectively.²⁷ The chances of outperforming the market diminish further as we

increase the time frame under scrutiny. During the five-year period ending December 31, 2016, 88% of large-cap managers, 90% of mid-cap managers, and 97% of small-cap managers underperformed their respective benchmarks.

Types of Headache

Migraine



Hypertension



Stress



Altcoins



To counter such bleak prospects for investors, Kommer suggests a radical cost optimization strategy based on passive investing, buying, and holding. While active investing is driven by the desire to outperform – or beat – the market, indexing enables investors to invest *with* the market, not against it. After all, the market is a dynamic process, which is spontaneous and highly complex, comprising billions of people with an infinite range of goals, tastes, valuations, and practical knowledge.²⁸ Individual investors cannot consistently yield better results than the market because no one can aggregate and understand all of the individual knowledge possessed by each market participant.

With over a thousand cryptocurrencies to choose from, picking the winners and losers has become increasingly difficult. Source: Steemkr.com

However, there are problems associated with passive investing as well. First of all, performance patterns change constantly. Some periods, active managers outperform passive managers and vice versa. Passive investments rely on bull markets to produce gains. In comparison, active managers can make manual decisions in a bear market. Once again – diversification – even on the level of management strategy appears to provide the highest return for a given level of risk.

²⁵ Investopedia (2017). Indexing. *Investopedia*. Retrieved from <http://www.investopedia.com/terms/i/indexing.asp>
²⁶ Kommer, G. (2015). *Souverän investieren mit Indexfonds und ETFs: Wie Privatanleger das Spiel gegen die Finanzbranche gewinnen*. Frankfurt am Main: Campus, p. 9.
²⁷ Soe, A. M., & Poirier, R. (2016). SPIVA® U.S. Scorecard. *S&P Dow Jones Indices. A Division of S&P Global*. Retrieved from <https://us.spindices.com/documents/spiva/spiva-us-year-end-2016.pdf>
²⁸ Huerta de Soto, J. (2010). *Socialism, Economic, Calculation and Entrepreneurship*. Cheltenham: E. Elgar Publishing, p. 35.

a. Designing a Cryptocurrency Index

"Not only is there no real [cryptocurrency] index – there is certainly no investable index."

Tim Enneking

"So in many ways, virtual currencies might just give existing currencies and monetary policy a run for their money. The best response by central bankers is to continue running effective monetary policy, while being open to fresh ideas and new demands, as economies evolve."

Christine Lagarde, IMF

"How many millionaires do you know who have become wealthy by investing in savings accounts? I rest my case."

Robert G. Allen

Keeping in mind the empirical and theoretical considerations highlighted above, we aim to develop a cryptocurrency index that tracks the entire cryptocurrency market. A professional index will give market participants a quick, concise impression of the direction of the relevant market segment or asset class. Primarily, an index serves as a benchmark and is a reference point for index investments. Most stock investors are familiar with 'popular' indices such as the German DAX, the Dow Jones, the British FTSE 100, or the SMI. Aside from these popular indices, there are lesser-known but often much more useful index families by specialized providers such as the S&P. The DAX index measures the performance of the 30 largest and most liquid companies on the German stock market, thus representing around 80% of the market capitalization of listed stock corporations in Germany.²⁹ The wider the index is, the less often its composition needs to be readjusted, which in turn reduces costs for index investments.

Currently, there are only a handful of cryptocurrency indices; unfortunately, these indices have disclosed very little to no information on their specific methodologies. In two articles published online, Thomas Ankenbrand and Denis Bieri from the Lucerne University of Applied Sciences and Arts briefly discuss several features of their Cryptocoin Index.³⁰ However, no academic papers on the theory and construction of a cryptocurrency index have been published yet.

So far, the most promising venture is the TaiFu index family provided by the Americans Tai Zen and Leon Fu, who started their service in June of this year.³¹ The TaiFu index family is market-capitalization weighted and consists of three separate indices. The TaiFu 30 Index tracks the largest 30 cryptocurrencies on a daily basis. The TaiFu 30 Altcoin Market Index measures the theoretical market capitalization of the 30 largest cryptocurrencies on a daily basis, excluding Bitcoin or any hard forks of Bitcoin such as Bitcoin cash. The TaiFu Bitcoin Aggregate Index focuses on the total market capitalization of Bitcoin and all hard forked versions of Bitcoin that share the same genesis block that was created by Satoshi Nakamoto in January 2009.

The originators point out that there are two practical issues with their indices: (1) a real-world cost of slippage³², commissions, and taxes and (2) the impracticability for investors to rebalance their portfolios on a daily basis. As Zen and Fu explain on their website, the indices were created "to help investors, reporters, hedge funds, institutions etc. gauge the health and 'pulse' of the cryptocurrency markets".³³ Their indices are not made for actual investment purposes. Therefore, we have developed a different approach to composing a cryptocurrency index.

²⁹ Deutsche Börse Group (2017). DAX – benchmark and barometer for the German economy. *Deutsche Börse Group*. Retrieved from <http://deutsche-boerse.com/dbg-en/media-relations/deutsche-boerse-spotlights/spotlight/DAX---benchmark-and-barometer-for-the-German-economy/2606404>

³⁰ Ankenbrand, T., & Bieri, D. (2017, July 18). Cryptocoin Index. *LinkedIn*. Retrieved from <https://www.linkedin.com/pulse/cryptocoin-index-thomas-ankenbrand/>

³¹ TaiFuIndices (2017). TaiFu Indices – The World's 1st Cryptocurrency Market Indexes. *Cryptocurrency Market, LLC*. Retrieved from <https://taifuindices.com/>

³² Slippage refers to the difference between the expected price of a trade and the price at which the trade is actually executed. Slippage may occur during periods of higher volatility when market orders are used or in the execution of large trades.

³³ TaiFuIndices (2017). TaiFu Indices – The World's 1st Cryptocurrency Market Indexes. *Cryptocurrency Market, LLC*. Retrieved from <https://taifuindices.com/>

b. Two Ways to Track a Market

The same way a stock market index records changes in the value of an equity basket (or portfolio) that represents a specific market or segment thereof, a cryptocurrency index should model changes in the price of cryptocurrencies. The goal of the cryptocurrency index – henceforth referred to as Cryptocurrency Market Index, or CMI – is to provide a broad-based exposure to the crypto market, where no single cryptocurrency or specific group thereof dominates the index. Rather than being driven by microeconomic events that affect only one specific coin or type of coin, the CMI aims to fairly represent the diversity of the cryptocurrency market.

To provide investors with a consistent and systematic representation of the crypto market, the CMI relies on three main principles in its design:

- (1) **Economic significance:** To determine the significance placed on a specific cryptocurrency by the market participants, the index will rely on two separate measures: market capitalization data and liquidity data. Reliance on market capitalization alone could lead to a high weight of currencies that are potentially illiquid and do not reflect the dynamics of the cryptocurrency market.
- (2) **Diversification:** A major goal of the CMI is to provide diversified exposure to cryptocurrencies as an asset class. Disproportionate weighting of any particular cryptocurrency would increase volatility. The CMI applies the following diversification rules:
 - I. No single cryptocurrency may constitute more than 20% of the index
 - II. No single cryptocurrency may constitute less than 0.2% of the index

The reasoning for these rules comes from the CMI's weighting method. The second rule helps to strengthen diversification of the index by giving even the smallest cryptocurrency a reasonably significant weight.
- (3) **Liquidity:** As declared above, a main goal of the CMI is to provide investors with a tool to efficiently track the developments on the crypto market, i.e. to replicate the index in an actual portfolio in a cost-efficient manner. A sufficient liquidity of the constituents will make the CMI suitable for private investments and institutional investments alike.

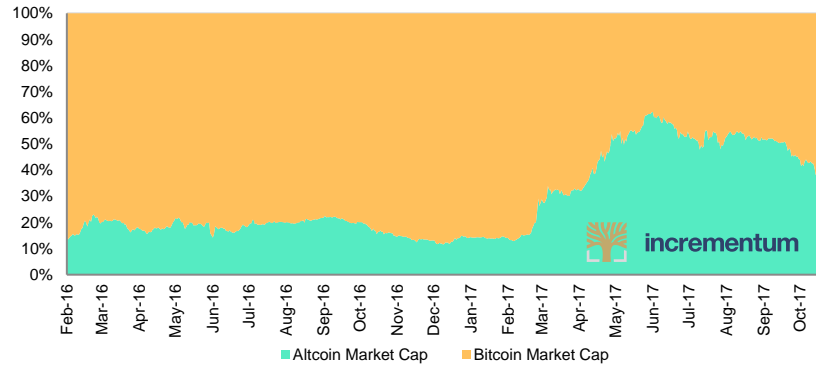
There are several different methods to construct an index. In general, indices can be categorized as either price-weighted or capitalization-weighted.³⁴

1. **Price-weighted:** Price-weighted: A price-weighted index holds assets in proportion to their prices. Price-weighted indices include an equal number of each asset in their basket; their weighting method is simple to understand and their daily value easy to calculate. If an index contains three stocks A, B, and C with current prices of \$3, \$8, and \$10 respectively, the ABC index level is calculated as $\$21/3 = \7 . Therefore, share A would have a weight of $\$3/\$21 = 1/7$ of the entire index.
2. **Capitalization-weighted:** The problems with the price-weighted index can be overcome by weighting the assets according to market value, which is measured by capitalization. In contrast with a price-weighted index, a capitalization-weighted index hold assets in proportion to their market capitalization. For example, if Bitcoin holds 60% of the entire market capitalization and Ethereum holds 20% then the portfolio allocation will have 60% of the funds invested in Bitcoin and 20% invested in Ethereum. The remaining 20% will be invested in the rest of the cryptocurrencies according to their proportion of the entire cryptocurrency market. The popularity of capitalization-weighted indices, such as the Laspeyres index, mostly comes from the fact that they are simple to understand and have a low turnover ratio. The latter results in decreased costs

³⁴ For further reading on indices, see Brentani, C. (2004). *Portfolio Management in Practice*. Amsterdam: Elsevier, 2004, pp. 55-67.

for the fund and increased returns for shareholders.³⁵

Figure 17. Percentage of Total Market Capitalization.



Nevertheless, capitalization-weighted indices harbor two problems. Firstly, in heavily concentrated markets they may be dominated by a few large constituents. In the case of cryptocurrencies, Bitcoin and Ethereum come to mind. Only when Bitcoin’s share of the cryptocurrency market started decreasing substantially in relation to altcoins such as Litecoin, Ripple, and Dash in March of this year as Figure 17 illustrates, the construction of a capitalization-weighted index for the cryptocurrency market became feasible. Excessive risk concentrations occur in traditional market indices, too. For example, the two companies Nestlé and Novartis make up more than 40% of the SMI. For that reason, there is a need to define a limit for the maximum weights for each cryptocurrency in the CMI. Secondly, there is a danger that cryptocurrencies with a small free float³⁶ may carry greater weight in the calculation of the index than they do in actual trading. A small free float will generally lead to increased volatility of the coin price, a wider bid-ask spread and reduced liquidity. It will take a transparent rules-based approach in order to prevent these problems from affecting the viability of our index. To keep up with the latest events in the rapidly evolving crypto market, rebalancing has to be given special attention. The CMI rebalances monthly to ensure a transparent and up-to-date index basket. All cryptocurrencies in the index are denominated in USD.

“If you have trouble imagining a 20% loss in the stock market, you shouldn’t be in stocks.”

John C. Bogle

c. Risks Associated with the Index

As cryptocurrencies entered the financial world only recently, investors should be aware of specific types of risk associated with the cryptocurrency market. These risks naturally pertain to any index replicating the cryptocurrency market.

Two main risks exist: (1) extreme volatility in prices and liquidity and (2) uncertainty stemming from the regulatory framework around cryptocurrencies.

³⁵ This is a simplification of how to build a capitalization-weighted index. The two most common ways to design a capitalization-weighted index are the Laspeyres method and the Paasche method. The Laspeyres method generates a base-period quantity-weighted index by measuring the current period prices of the index constituents weighted at the base period relative to the base period prices of the constituents weighted at the base period. For our purposes, the Laspeyres method proves to be superior to the Paasche method because it facilitates comparisons over time and requires less data.

³⁶ Similar to stocks trading, we use the term *free float* to refer to the number of coins freely available to the investing public.

Due to the idiosyncratic nature of the supply of many cryptocurrencies and their largely speculative demand, prices change unpredictably. Bitcoin's volatility mostly results from its built-in quantity commitment: variations in the demand for Bitcoin are accommodated almost entirely by variations in its price. When demand rises, there is virtually no quantity increase to dampen the rise in price; and vice-versa for a fall in demand. The lack of liquidity compounds the problem of fixed supply. Liquidity volatility can cause price distortions and in the worst case, investors may not be able to close or open a position.

"It is not a speculative investment even though it is being used as such by other people. As Bitcoin network grows the value of Bitcoin grows. As people move into Bitcoin for payments and receipts they stop using US Dollars, Euros and Chinese Yuan which in the long-term devalues these currencies."

John McAfee



Investors must choose between holding of their cryptocurrency investment in Bitcoin or building a diverse index of cryptocurrencies. The saying, "Don't Put All your Eggs in One Basket" means that lack of diversification can result in total loss. Source: Unsplash.com

"Investing should be more like watching paint dry or watching grass grow. If you want excitement, take \$800 and go to Las Vegas."

Paul Samuelson

The second major risk pertains to government regulation and intervention. Until today, the legal status of Bitcoin – and other cryptocurrencies – varies substantially from country to country. While it is mostly tolerated by governments in the Western world, a considerable amount of countries has not issued a legal opinion on the matter yet or bans the use of it completely. Such regulatory uncertainties can affect the price: When regulators in China recently outlawed initial coin offerings (ICOs) by declaring them "an unauthorized and illegal public financing activity"³⁷, the price of Bitcoin dropped from almost \$5,000 to only \$4,300 in less than 24 hours.

A specific challenge for the Cryptocurrency Market Index will be potential errors in data sources or other errors that may affect the weighting of constituents of the index. Eventually, the calculation, publication of the index values or other changes deemed necessary might be subject to discretion of the index provider. As we pointed out above, the current cryptocurrency indices in existence have disclosed very little to no information on their specific methodologies.

Conclusion: Index Investing is a Viable Benchmark for Cryptocurrencies

³⁷ Hackett, R. (2017, September 5). 7 Reasons Why China Banned ICOs. *Fortune*. Retrieved from <http://fortune.com/2017/09/05/china-bitcoin-blockchain-ico-ban/>

The cryptocurrency market is rapidly evolving. The supply of cryptocurrency-related financial products has an equally large growth potential. The Cryptocurrency Market Index (CMI) is one step in the direction towards a more developed, investor-friendly cryptocurrency market. Indexing is a time-proven method that does not rely on data or theory. Investors who would like to gain a broad exposure to the cryptocurrency market can use the index as an allocation strategy or as a benchmark for active portfolio management.

Taxation of Cryptocurrencies in Europe

Key Takeaways

- Each country has their own unique laws pertaining to cryptocurrency, and some countries have different laws depending on regions.
- Two Swiss towns, Chiasso and Zug, allow residents to pay taxes in Bitcoin. In Liechtenstein, speculative gains from trading in cryptocurrencies are tax-free and do not have to be declared
- Detection of cryptocurrency investments is difficult—to—impossible for government tax collectors. Instead, investors are expected to honestly declare cryptocurrency income and wealth to authorities each year.



*“Virtual currencies means a digital representation of value that is neither issued by a central bank or a public authority, nor attached to a legally established currency, **which does not possess the legal status of currency or money**, but is accepted by natural or legal persons **as a means of exchange or for other purposes**, and can be transferred, stored or traded electronically.”*

European Union Parliament

We want to sincerely thank Matthias Langer for contributing to this chapter. Matthias Langer, MBA, LL.M. is a tax consultant and partner at actus ag, Landstrasse 40, Triesen, as well as an author and speaker specialized in tax law. His advisory focus is on the tax laws of Liechtenstein and Germany as well as cross-border tax planning. In addition, he specializes in providing consulting services on taxation and accounting in the areas of cryptocurrency and blockchain-based applications.

“At its core, Bitcoin is a smart currency, designed by very forward-thinking engineers. It eliminates the need for banks, gets rid of credit card fees, currency exchange fees, money transfer fees, and reduces the need for lawyers in transitions... all good things”

Peter Diamandis

The countries in Europe are following a decentralized approach to cryptocurrency regulation. The UK treats Bitcoin like a foreign Currency. In Germany, bitcoin sales do not incur a capital gains tax; however, if the investment is held for less than one-year German income taxes apply. Income taxes in Germany are progressive and can be up to 45%. Surprisingly, even Switzerland the land of cryptocurrency, taxes are levied. Swiss residents must pay income tax, profit tax, and wealth tax on their cryptocurrencies holdings. Fortunately, in all EU countries and Switzerland and Liechtenstein, cryptocurrency sales are exempt from the VAT. Although paying taxes is a real bummer, at least this extra revenue will make regulators think twice before outlawing bitcoin.

What do tax law and cryptocurrencies have in common? Most people don't know the first thing about these topics. Moreover, the two subjects represent polar opposites from a cultural/ worldview perspective. In the eyes of many people tax law symbolizes excessive regulations imposed by a central government agency. This is in contrast to cryptocurrencies and the associated blockchain technology, which stand for a decentralized, unregulated and free society not under the thumb of a central power apparatus. The complexity of these two spheres increases if one attempts to integrate cryptocurrencies into the world of the tax code.

Table 3. Cryptocurrency Tax Law by Country.

Country	Classification	Taxation
Australia	• Property	• Capital gains tax • Goods Service tax is not applicable
Germany	• Private money	• No capital gains tax. • If owned less than one year, a progressive income tax of up to 45% applies for all gains. . • Sales tax is not applicable
Switzerland	• Foreign currency	• No capital gains tax • Sales tax is not applicable
U.S.	• Property	• Capital gains tax • Sales tax is not applicable
U.K.	• Asset or private money: Determined by court on a case-by-case basis	• Capital gains tax • Sales tax is not applicable
Japan	• Legal method of payment	• Capital gains tax • Exempt from consumption tax
China	• Virtual commodity	• No taxes

a. Taxation of Natural Persons

The following examination provides a cursory overview of the tax treatment of cryptocurrencies with respect to both natural and legal persons in Liechtenstein. In closing a brief excursion on the question of whether private asset structures are allowed to invest in cryptocurrencies is presented.

Since January 1, 2011 the worldwide income as well as all movable and immovable



The Bitcoin protocol combines “1” and “0” to produce instructions that computers can read. Even though cryptocurrencies are digital, governments are eager to levy taxes. Source: Unsplash.com

property of natural persons whose domicile or place of habitual residence is in Liechtenstein, are subject to taxation in Liechtenstein.³⁸ A special feature in Liechtenstein is the integration of tax on wealth into income tax as well as the principle that a source of income is either subject to wealth tax or to income tax (preventing double taxation).³⁹

“The Federal Reserve simply does not have authority to supervise or regulate Bitcoin in any way.”

Janet Yellen, Chair of the US Federal Reserve

With respect to the tax treatment of cryptocurrencies this means that every natural person with unlimited tax liability has to declare holdings of cryptocurrencies at the beginning of every fiscal year and convert their value to their Swiss franc equivalent. At the same time, speculative gains from trading in cryptocurrencies are tax-free and do not have to be declared. This is not only very attractive in terms

Frequently bought together



- This item: Ledger Nano S Cryptocurrency Hardware Wallet \$78.45
- Trezor bitcoin wallet, Black \$99.74
- GoodSense Coated Aspirin Pain Reliever Tablets, 325 mg, 500 Count \$6.69

Warning: the tax implications of a buy and hold cryptocurrency investment may induce headache. Source: Amazon.com

of the tax burden, but provides significant administrative relief as well. In consulting practice one rarely comes across cases involving the simple purchase and subsequent sale of a cryptocurrency (traditional speculation), but one far more often sees the following types of transactions (which require extensive declaration and documentation efforts in other countries): for example, CHF are exchanged for Bitcoins, later on Bitcoins are exchanged for ether, and these ether are then used to

³⁸ Article 6, paragraph 1 SteG
³⁹ Article 15, paragraph 1 SteG

take part in an ICO/TGE and one receives new tokens (or Bitcoins are used directly to, for example, pay a restaurant bill).

The tax treatment of coin mining also raises interesting questions. In the author's opinion, income from mining cryptocurrencies doesn't represent a tax-free capital gain but has to be seen as a separate commercial activity. Consequently this activity is subject to income tax, which on the other hand is offset by tax-deductible expenses associated with it (e.g., IT-related costs, electricity costs, rent, etc.).

b. Taxation of Legal Entities

"I understand the political ramifications of [Bitcoin] and I think that government should stay out of them and they should be perfectly legal."

Ron Paul

A far more complex picture emerges in connection with legal persons. Investment in cryptocurrencies is not subject to tax exemptions pursuant Article 48 SteG (Tax Act). This means that speculative income is taxable and has to be declared, thus profits and losses are subject to taxation (12.5% income tax).

With respect to the equity capital interest deduction, it should be noted that investment in cryptocurrencies does in principle qualify for the equity capital interest deduction, which reduces the effective tax burden. However, this is conditional on the investment representing part of a firm's core operating assets.



Bitcoin Farm in Gondo, Switzerland. Source: Alpine Mining/Ludovic Thomas

Investment in cryptocurrencies also constitutes a special challenge for corporate accounting. Customary accounting software is (currently) not able to recognize transactions in cryptocurrency terms. Moreover, the assessment of blockchain transactions requires solid technical understanding or an exceptional IT affinity.

c. Exclusion: Private Asset Structures and Cryptocurrencies

The term private asset structure (PVS/German: *Privatvermögensstruktur*) designates a special tax status for legal entities managing assets, which results in a

PVS being exclusively liable for minimum income tax pursuant SteG Article 62 paragraphs 1 and 2, and not being subject to tax assessment. A crucial condition is that a PVS must not be engaged in any commercial business activity. This condition is fulfilled if it solely purchases, owns, administers and sells financial instruments as defined in Article 4, paragraph 1 (g) of the Asset Management Act, as well as participating interests in other legal entities, liquid funds and bank deposits. Since most cryptocurrencies as a rule cannot be subsumed under the term financial instruments, these cryptocurrencies would have to be classified as “other assets”.⁴⁰ Accordingly, investment in cryptocurrencies would be permissible under the following two conditions:

1. There must be no regular, active trading in them *and*
2. Cryptocurrency holdings must not be used beyond the status of passive ownership, and in particular not to facilitate detrimental economic activities.

Conclusion: Different Countries Treat Crypto Differently

For us at Incrementum, Mr. Langer’s article means that cryptocurrencies may exist in the digital realm but their tax implications are very real. Detection of cryptocurrency investments is difficult–to–impossible for government tax collectors. Although investments that stay in the digital world may go unnoticed for a few more months, the rising value will ring the alarm for tax agencies. Banks that receive large transactions will ask questions and report suspicious activity. Instead, investors are expected to honestly declare cryptocurrency income and wealth to authorities each year.

⁴⁰ For comprehensive details see for example: Langer, M. (2017). Mehr Mut für Beschwerden im Steuerrecht: Entscheidung des VGH zur PSV (“More courage for complaints with respect to tax law: decision of the Administrative Court”), *LJZ*, 2017, 62.

Farewell 2017: Year of ICOs, Hard Forks, and Upward Trends

During the past year, Bitcoin and cryptocurrencies transitioned from being nerdy digital money to a mainstream investment. At the beginning of 2017, the cryptocurrency market had a market capitalization of \$7 billion. Today, the market is worth \$430 billion. During the past year, hundreds of companies held ICOs. Some of the most interesting ICOs were Melonport, Omise Go, and Modum.io; however, the majority of the companies that went to ICO were leveraging the popularity of Bitcoin and Ethereum instead of building a compelling business concept. Overall, the main winners in 2017 were altcoins that were released before 2017 including: Dash, Litecoin, IOTA, Lisk, Waves, and Ethereum Classic. Bitcoin had two hardforks: Bitcoin Cash and Bitcoin Gold. The former has had considerable success as the debate on how to properly scale Bitcoin continues. In 2018, we are looking forward to the [Valid ICO](#). Co-founded by Daniel Gasteiger and advised by Lucas Betschart, the Valid ICO aims to make personal data secure and user-controlled.



Thank you for reading the first edition of the CRR. Our next edition is coming out during Q1 of 2018. In the meantime, please follow us on Twitter [@CryptoManagers](#) and [@CryptoPhD](#) for new research and updates.

We are grateful for any feedback or improvements that can be made for the following editions. Please email your feedback to Crypto@Incrementum.li or fill out our contact form on our website at [CryptoResearch.Report](#).

Incrementum would like to wish you a merry holiday season and a great start to the beginning of the new year! Hopefully, Bitcoin's 1300% increase during 2017 can make your holiday bills be a little lighter.

About Us

Demelza Kelso Hays

Demelza Kelso Hays has been conducting research in the field of crypto-related assets since 2013. In addition to teaching a course on cryptocurrency at the University of Liechtenstein, Ms. Hays regularly presents and writes on the topic of cryptocurrencies. Her work has been published in several distinguished print and online magazines including Forbes, Süddeutsche Zeitung, [Zerohedge](#), [Mises.org](#), and Frankfurter Allgemeine Zeitung.



Incrementum AG

As a sister report to the internationally acclaimed [In Gold We Trust report](#), the Crypto Research Report brings the same quality and rigor to understanding the cryptocurrency market. The Crypto Currency Research Report is a report produced by Incrementum AG.

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What makes us stand out in the asset management space? We evaluate all our investments not only from a global economic perspective but also by taking into account global monetary dynamics. This analysis produces what we consider a truly holistic view of the state of financial markets. We believe our profound understanding of monetary history, out-of-the-box reasoning and prudent research allows our clients to prosper in this challenging market environment.

Dr. Christian Schärer, Stefan Kremeth, Demelza Hays, Ronald-Peter Stoeferle and Mark J. Valek



Advisors

In order to provide accurate information on the most important and recent updates in the crypto space, we have brought together a diverse team of thought-leaders, academics, and finance experts to form our board of advisors. The mission of our board is to stimulate discussion on the most pressing risks and opportunities in the cryptocurrency market. Our advisors come from different countries, different education paths, and different careers. However, they all have one trait in common: their avid interest in the blockchain technology and cryptocurrencies. To stay up-to-date, the advisory board meets on a regular basis to discuss current affairs and the next quarter's outlook. All meeting minutes are posted as a transcript and released for free on our website at www.CryptoResearch.Report. Our board members include:

Max Tertinegg

Max Tertinegg is the CEO and co-founder of Coinfinity in Graz. Since 2014, Mr. Tertinegg has worked with merchants, investors, and regulators in Austria to build a cryptocurrency community. Currently, he is working on cryptocurrency storage solutions that are affordable and easy to use.



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