



crypto
manuals

Cryptomanual
Cryptocurrencies'
Best Practices



down the
rabbit hole

N01
cryptomanuals.com



M. KRUISBRINK
A. DIJKSTRA

October 28, 2021

cryptomanuals, 2020

Kruisbrink, Max, author
Dijkstra, Abe, author
Cryptomands, publisher

Identity & Graphic Design: Canned Rainbow

Rotterdam & Groningen.
Cryptomands, June 2020.

Subjects: Bitcoin · Blockchain · Ethereum · Money · Cryptocurrencies ·
Digitale Currency · Economie · Financial Technology · Cryptocurrencies
Best Practices · Privacy · Security · Wallets · Exchanges · Research ·

VERSION 1.0

<https://www.cryptomanuals.com>
info@cryptomanuals.com

Disclaimer

The views expressed in the Cryptomanual are those of the authors' and should not be considered as financial advice. The material provided is for research and information purposes only and does not constitute advice or recommendations. Any products referenced or linked in the content are not endorsed by the author and people who choose to pursue particular products or services cannot hold the authors liable for any losses or other problems experienced. We refer to the Terms & Conditions,¹ as hosted on our website.

¹Cryptomanuals (2020); [Terms & Conditions](#).

Contents

List of Figures	vi
List of Tables	vii
Introduction	1
1 Cryptocurrency Exchanges	5
1.1 What are cryptocurrency exchanges	5
1.2 Converting FIAT into cryptocurrency	6
1.3 Market liquidity	7
1.4 Exchange types	7
1.5 Centralized versus decentralized exchanges	8
1.6 Broker exchanges	9
1.7 Trading exchanges	11
1.8 Exchange registration & sign-up	14
1.9 Regulation of cryptocurrency exchanges	15
1.9.1 Know Your Customer (KYC)	15
1.9.2 Anti-Money Laundering (AML)	16
1.9.3 Combating the Financing of Terrorism (CFT)	16
1.10 Best Practices - crypto exchanges	17
2 Cryptocurrency Wallets	20
2.1 Cryptocurrency wallets	20
2.2 Different wallet types	21
2.2.1 Hot storage versus cold storage wallets	22
2.2.2 Software wallets	22
2.2.3 Hardware wallets (cold)	24
2.2.4 Paper wallets (cold)	24
2.3 Important wallet considerations	25
2.3.1 Risk of storing crypto on exchanges	25
2.3.2 Security and technical complexity	26
2.4 Combinations of cryptocurrency wallets	26
3 Privacy & Security	28
3.1 Threat modeling	28
3.2 Securely setting up mobile devices	28
3.3 Password managers	29
3.4 Two-Factor Authentication (2FA)	29

3.5 Virtual Private Networks (VPN)	30
3.6 Encrypted email services	30
3.7 Encrypted messaging	30
3.8 Alternate internet browsers	31
3.9 Private search engines	32
3.10 Software updates	32
3.11 Backup sensitive data	32
3.12 Data phishing	33
4 Do Your Own Research (DYOR)	35
4.1 Action plan	35
4.2 Fundamental analysis	36
4.3 Coin statistics	38
4.4 Technical analysis	38
4.5 Market psychology & market sentiment	39
4.5.1 Bear markets	39
4.5.2 Bull markets	40
I DOWN THE RABBIT HOLE	42
5 HISTORY OF MONEY	43
5.1 Properties of money	43
5.2 Sound money	44
5.2.1 Store of value over time	44
5.3 Fake Money, Fake System	44
5.4 Fiat currency	45
5.5 Purchasing power	46
5.6 Questionable monetary policy	47
5.7 Post financial crisis 2008	48
5.8 Legacy financial infrastructures	50
6 FUTURE OF MONEY	51
6.1 Gold or Bitcoin?	51
6.2 The Blockchain [R]evolution	52
6.3 How does Blockchain work	52
6.4 Huge potential but Dangerous?	53
6.5 Technology has no agenda, People do	54
6.6 Financial-Technology Sector	55
6.7 Blockchain is Here to Stay	55
6.8 Open Blockchain Enables Inclusion	55
7 HISTORY OF THE LEDGER	57
7.1 The Ledger	57
7.1.1 Single-entry accounting	57
7.1.2 Double entry accounting	58
7.2 1 st generation: triple entry accounting - distributed ledger technology (DLT)	58



7.3	<i>2nd</i> generation: smart contracts and decentralized applications (DApp)	58
7.4	<i>3rd</i> generation: functionality, high performance and design	59
7.5	<i>4th</i> generation: improving technology and driving real-world adoption	59
7.6	Emerging markets and early adopters	60
8	ICE AGE OF CRYPTOCURRENCIES	61
8.1	Volatility	61
8.2	Global Cryptocurrency Market Perspective	61
8.3	Cryptocurrency Market Compared to S&P500	63
8.4	Alternative Cryptocurrencies (Altcoins)	65
8.5	Initial Coin Offerings (ICOs)	65
8.5.1	ICO scams	66
II	INVESTING, TRADING, MARKETS & PORTFOLIO	67
9	INVESTING AND TRADING	68
9.1	Disclaimer	68
9.2	Economic Cycles	69
9.2.1	Business cycles	70
9.2.2	Credit cycles driving business cycles	70
9.3	Investing Versus Trading	71
9.4	Investing	71
9.5	Trading	73
9.5.1	Trading styles	73
9.5.2	Your emotions will impact your decision making	73
9.6	3 Technical Trading Indicators for starters	74
9.7	Entry and Exit Strategies	74
10	PORTFOLIO MANAGEMENT	75
10.1	Stocks or Equities	76
10.2	Real Estate and Land	76
10.3	Commodities	76
10.4	Bonds and Fixed Income Investments	76
10.5	Futures and other Financial Derivatives	76
10.6	Cash or Cash Equivalents	77
10.7	Cryptocurrencies	77
10.7.1	Cryptocurrencies - categories and classification	77
10.8	Other Investments	78
10.9	Key Concepts	78
10.9.1	Evaluation of investment performance	78
10.9.2	Asset allocation	79
10.9.3	Diversifying your portfolio	81
10.9.4	Re-balancing your portfolio	81
10.10	Recommendations	83

III CRYPTOWORLD	84
11 BITCOIN AND THE BLOCKCHAIN [R]EVOLUTION	86
11.1Distributed Ledger Technology	87
11.2A Paradigm Shift	87
11.3Legacy financial infrastructures	87
11.4Bitcoin	88
12 HISTORY OF MONEY	89
12.1Properties of money	89
12.2Sound money	90
12.3Fake Money, Fake System	90
12.4Fiat currency	91
12.5Questionable monetary policy	92
12.6Post financial crisis 2008	93
12.7Legacy financial infrastructures	96
13 FUTURE OF MONEY	97
13.1Gold or Bitcoin?	97
13.2The Blockchain [R]evolution	98
13.3How does Blockchain work	98
13.4Huge potential but Dangerous?	99
13.5Technology has no agenda, People do	100
13.6Financial-Technology Sector	101
13.7Blockchain is Here to Stay	101
13.8Open Blockchain Enables Inclusion	101
14 4TH INDUSTRIAL [R]EVOLUTION	104
14.1Exponential science	104
14.2Fusing technologies	106
14.3Internet of Things	107
14.4Merging worlds	107
14.5Shaping the future	108
15 Lookahead	110
A Additional Information	114

List of Figures

4.1 Bear and Bull Markets and Market Psychology	40
4.2 Fear, Uncertainty and Doubt (FUD) evolves into Fear Of Missing Out (FOMO).	41
5.1 Central Government debt, total % of GDP for the Euro Area	48
5.2 Federal Government total public debt as a % of GDP for the US ..	48
5.3 Central Government debt, total % of GDP for Japan	49
6.1 Centralized, decentralized and distributed architecture.....	53
8.1 Global Market Capitalization	63
8.2 Cryptocurrency Market in Perspective	64
8.3 Percentage of the Global Market Cap (Dominance)	66
9.1 Fear, Uncertainty, and Doubt (FUD) evolves into Fear Of Missing Out (FOMO)	69
9.2 Business cycle excluding and including a generic growth trend ..	70
9.3 Bear and bull markets and market psychology	72
10.1 Portfolio allocation example	79
10.2 Generic portfolio allocation - left to right, high to lower risk	80
10.3 Generic representation of sub-classes within asset classes	80
12.1 Central Government debt, total % of GDP for the Euro Area	93
12.2 Federal Government total public debt as a % of GDP for the US ..	94
12.3 Central Government debt, total % of GDP for Japan	94
13.1 Centralized, decentralized and distributed architecture.....	99
14.1 Fourth Industrial Revolution. Mapping global transformations tool.	105
14.2 Internet of Things (IoT) sensors & actuators	109

List of Tables

1	List of cryptomanual affiliates and referrals	4
1.1	Starting points to learn about exchanges	8
1.2	Centralized versus decentralized exchanges	8
1.3	Recommended broker and trading exchanges	11
1.4	Recommended broker and trading exchanges	17
2.1	A selection of cryptocurrency wallets	27
5.1	Inflation rates > 20%	50
8.1	Historical snapshots cryptocurrency market capitalisation	62
9.1	Trading styles	74
12.1	Inflation rates > 20%	95
A.1	Data & research	115
A.2	News & social infrastructures	115
A.3	Market insights & analyses	116
A.4	Education & guides	117
A.5	Online anonymity, identity, safety and security	117

Introduction

The *Cryptomanual* is an excellent place to start if you don't want to spend months researching everything yourself. We have compiled over three years' worth of research in our digital products and wish to make starting with cryptocurrencies easy for everyone. All of our materials are easy to navigate and aim to help you leapfrog the basic pitfalls and misconceptions when exploring cryptocurrencies and learning about the relevant technologies and their implications.



The *Cryptomanual* covers some of our *Best Practices* and provides tools and information related to buying, storing and trading cryptocurrencies. You have taken the first step and are now a participant in the pioneering cryptocurrency markets. All of our contents can be read from start to finish but are also set up to be read chapter by chapter. We got some different rabbit holes for you to explore and invite you to go down the rabbit hole with us. How did we get here and what does this financial and economic [r]evolution has in store for us?

"Bitcoin was the first big app of the internet of value, sort of like e-mail was the first big application of the internet of information. But now we have these general purpose platforms emerging, that enable you to build any app, they look more like the world wide web, was to the internet of information."

— **Don Tapscott**

TIP

For a selection of video's to get you up to speed with the financial system, Bitcoin, blockchain and cryptocurrencies, visit our website.

Go to [cryptomanuals 5 videos](#).

Internet of value

The first wave of digitization brought us the internet of information. The second wave is bringing us - among other things - *the internet of value*. The internet of value is a new, distributed platform that could help us reshape the world of business and transform the old order of human affairs for the better.

"Technology goes beyond mere tool making; it is a process of creating ever more powerful technology using the tools from the previous round of innovation."

— **Ray Kurzweil**

The blockchain [r]evolution

Blockchain and distributed ledger technology will have a dramatic impact on business and society, by providing a secure, direct way of exchanging money, intellectual property and other rights and assets without the involvement of traditional intermediaries like banks, utility companies, and governments.

"Blockchain and distributed ledger technology might represent a second era of the internet or the Digital Age. For the last 40 years, we've had the internet of information; now, with blockchain and distributed ledger technology, we're getting the internet of value."

— **Don Tapscott**

Paradigm shift

The fact that the blockchain and distributed ledger technology is causing a paradigm shift in the financial services industry is undeniable. Where governments, financial institutions, and other powerful middlemen now have the

power, peer-to-peer (P2P) cryptocurrencies, such as Bitcoin, provide us with a potential tool to escape the fiat currency system and enables P2P exchange of value.

THIS TIME IT'S GLOBAL

The current ongoing phase of the digital [r]evolution enables people to move and transfer money on the internet, like information does today: near zero costs. Imagine instant global payments with almost zero fees. This will open up massive pools of innovation and creates more room for the creation of real value.

Bridging the knowledge gap

From day one, we have been intrigued with the original idea behind Bitcoin and blockchain technology. During our research, we experienced and realized that there is an enormous 'knowledge gap' when it comes to people's understanding of monetary history, monetary policy and the fundamentals of money in the first place. When it comes to new sorts of money in the form of cryptocurrencies it is essential to know the history and meaning, meanwhile learning about revolutionary cryptocurrencies, new way of exchanging value peer to peer. Therefore, we invite you to go *down the rabbit hole* with us while we discuss cryptocurrency wallets, exchanges, online privacy and security and how to perform your own cryptocurrency related research. Some of the questions we answer in Cryptomanuals' Best Practices' are:

- (a) How do I buy and trade Bitcoin, Ethereum or other cryptocurrencies and Altcoins?
- (b) How do I know which cryptocurrency wallets and exchanges are right for me?
- (c) How do I safely store and secure my digital assets?
- (d) How can I analyze a cryptocurrency project or coin/token?
- (e) How can I improve my online security and privacy and boost my anonymity?

BEST PRACTICES

"A best practice is a method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things."

Affiliates and referrals

Please note that we would greatly appreciate anyone signing up to wallets, exchanges or other services using our referral codes (presented throughout this document, if applicable). We only list referrals and affiliates of services and products we have used personally. These play a significant part in our revenue model (free content without advertisement) and using them would greatly aid us in keeping up our development. By listing these in the open, we stimulate transparency but emphasize that affiliate and referral income enables us to perform more research to present to the community.

TIP

In the cryptocurrency environment, many companies use affiliate marketing. Sign up for services such as exchanges and wallets via our partner links and earn your first cryptocurrencies immediately. For example, you can get a cash-back (in crypto) on your first deposit if you signed up via our affiliate link.

INVITE A FRIEND

The following table lists all referral and affiliate links that you can find throughout this document. Using our affiliate or referral links can and should be seen as a donation to our cause!

Table 1: List of cryptomanual affiliates and referrals

Name	Type	URL
Coinbase	Broker Exchange	coinbase.com
KuCoin	Trading Exchange	kucoin.com
Binance	Trading Exchange	binance.com
Liquid	Broker/Trading Exchange	liquid.com
Ledger	Hardware Wallet	ledger.com
Trezor	Hardware Wallet	trezor.io
KeepKey	Hardware Wallet	shapeshift.io/keepkey
Brave	Private, secure and fast browsing	brave.com
Minds	Open source social networking	minds.com

Chapter 1

Cryptocurrency Exchanges

In this chapter, we describe different exchange types and characteristics in more detail and provide a selection of several exchanges. We will outline what to look out for when you look for an exchange and identify the general steps involved when you sign up.

1.1 What are cryptocurrency exchanges

A cryptocurrency exchange is a marketplace where you can buy, sell or exchange cryptocurrencies for other digital cryptocurrencies and traditional [digital] currencies like US dollars or Euros. If you want to trade professionally and have access to fancy trading tools, you will likely need to use an exchange that requires you to verify your ID and open an account (known as the *Know Your Customer* protocol). If you want to make the occasional, straightforward trade, there are also platforms that you can use that do not require an account. There are four different types of cryptocurrency exchanges that you can use to trade and buy coins. Understanding the differences between the exchanges is the essential first step to choosing the best cryptocurrency exchange for you. But before this, an important aspect of exchanges and trading, in general, will be discussed.

(a) Broker Exchanges (section 1.6)

- Mostly centralized and primarily used to buy crypto with fiat currency.

(b) Trading Exchanges (section 1.7)

- Can be both centralized or decentralized and is primarily used to trade crypto to crypto.
- Nowadays, some trading exchanges enable you to buy crypto directly using traditional payment methods such as credit cards and PayPal.

1.2 Converting FIAT into cryptocurrency

Once registered on an exchange that allows for currency deposits, you can start to engage the market. You now have a host of different options available, depending on the available trading pairs for the currency you deposited. Depending on your country and the currency you're using - you will most likely end up using a broker exchange that operates either internationally and offers multiple currency trading pairs or a local one that also deals in your currency. Trading pairs that you will find almost everywhere would be Bitcoin and Ethereum (USD/BTC, USD/ETH, EUR/BTC, and EUR/ETH). Have a look at the trading pairs available for your currency at your broker exchange. You can deposit money on your exchange account in multiple ways (depending on your provider). You might be able to use bank deposits (SEPA), credit cards or perhaps even services like PayPal.

As mentioned before, not all types of exchanges accept fiat currency deposits (broker exchanges only); some exchanges only allow you to deposit cryptocurrencies to exchange other alternative coins (trading exchanges). Today, Bitcoin is still one of the most popular cryptocurrencies, and all exchanges offer Bitcoin. Therefore, you can consider it as one of the best gateways for purchasing other coins. In other words, if you want to buy any other cryptocurrencies, you must look at the trading pairs available and do the following:

1. Open a (domestic) cryptocurrency broker exchange account (in your country) and verify your account via the "Know Your Customer" (KYC) protocol if required. Please refer to section [1.6](#) for more information on broker exchanges.
2. Deposit funds from your bank account to your broker crypto exchange account so you can buy Bitcoin, Ethereum or another coin that has high liquidity and offers multiple trading pairs.
3. Open a trading exchange account that offers a variety of other cryptocurrencies. Usually, these exchanges do not accept fiat deposits and only allow crypto to crypto trading, withdrawals and deposits. Please refer to section [1.7](#) for more information on trading exchanges.
4. After verifying your account, transfer the cryptocurrency that you've bought from your broker exchange to your new trading exchange, and you can start trading. If you don't know how to transfer your freshly purchased coins out of your accounts, please refer to chapter [2](#) where we discuss wallets and transactions.

1.3 Market liquidity

Cryptocurrency exchanges, like all exchanges, have to deal with (il)liquidity. The cryptocurrency market itself is highly volatile and contains many relatively liquid (high market capitalization and trade volume) but also plenty of illiquid (hard to sell quickly due to a lack of ready and willing buyers) cryptocurrencies.

Liquidity describes the extent to which an asset or security can be quickly bought or sold in the market without affecting the asset price. Liquid assets are relatively easy to buy and sell, and the majority of people and businesses accept liquid assets as a means of payment.

LIQUID CASH

The prime example of a liquid asset is cash. Everybody accepts cash, and you can use cash almost anywhere in the world, although when traveling internationally you might have to exchange your cash currency for another currency based on your destination. The cash markets are so liquid that there is little to no volatility and exchange rates are generally very stable.

Keep in mind that this principle of liquidity and the relation to asset price applies to any market and asset. Some more examples of fairly liquid assets include stocks, bonds, and listed commodities, including precious metals such as gold and silver. These liquid assets can be sold almost instantaneously during regular market hours at fair value.

When choosing an exchange for buying and selling cryptocurrencies - take into account the trade volume of your exchange and consider your entry and exit strategy. Among others, look at the available options offered by various exchanges, trading pairs, and possibilities to use fiat currency. Bitcoin (BTC) dominates the market up to this day, but there are plenty of other smaller projects competing for a position in the top 100.

There are thousands of cryptocurrency projects, but simultaneously, there are numerous exchanges where all of these assets are sold, which is part of the problem. Essentially, the exchanges are competing with each other for liquidity in a relatively small market with relatively low market capitalization.

1.4 Exchange types

There are plenty of exchanges available which operate in your geographic location. If you're interested in purchasing a particular project, coin or token, you can use CoinMarketCap and CoinGecko as shown in table 1.1. Here you navigate to the specific asset or exchange, and you'll have access to a world of information, which you're able to filter. This overview is precious if you're looking for popular exchanges, exchanges with high volume, exchanges that list many coins or tokens or exchanges that have been around for years. In short, we believe such aggregated sites are a perfect place to start exploring.

Table 1.1: Starting points to learn about exchanges

Platform	URL
CoinMarketCap	coinmarketcap.com
CoinGecko	coingecko.com
CoinCheckup	coincheckup.com
CryptoCompare	cryptocompare.com
CoinPaprika	coinpaprika.com

1.5 Centralized versus decentralized exchanges

In the field of cryptocurrencies, exchanges are mainly divided into decentralized exchanges and centralized exchanges. Leading exchanges such as Binance, Coinbase, and Huobi are all of centralized nature, which are challenged by problems of opaque trading rules, in-transparent fund storage, and security. Decentralized exchanges hope to capitalize on many of the security problems faced by centralized exchanges. However, we conclude that decentralized exchanges - although very safe - are not yet popular among the general public and need a higher level of user-friendliness, especially liquidity, to attract more users.

In terms of the development of decentralized exchanges, inevitable trade-offs still have to be made, as shown in table 1.2. However, this is progressing and expected to change in the (near) future. You will likely need to register at least one centralized broker exchange that allows you to enter the market by depositing fiat currency. After making your first deposit, you are ready for your first trade (purchase of digital assets) and send your newly acquired assets to a decentralized or centralized trading exchange as you deem fit.

Table 1.2: Centralized versus decentralized exchanges

Decentralized	Centralized
User controls funds	↔ Exchange controls funds
Anonymous	↔ Not anonymous
No hacks and server down-time	↔ Hacks and server down-time possible
Not (yet) user-friendly	↔ Fairly user-friendly
Low trading volume (illiquidity)	↔ High volume (liquidity)
Basic trading options and tools	↔ Advanced options and tools

Decentralized exchanges (DEX)

A decentralized exchange or DEX is an exchange that allows you to trade cryptocurrency with other people utilizing the blockchain directly. Unlike a centralized exchange, you don't need a "middleman"; there is no central authority or main server required to make a transaction. In this sense, you could use it in the same way as a centralized exchange, although they usually have a

lower trade volume (fewer buyers and sellers) and might be a little less user-friendly in terms of user interface and user experience (UI/UX). However, the landscape is changing rapidly as technology advances, and more and more DEXs emerge.

YOUR OWN CENTRAL BANK

When you are not in control of your private keys and instead have your funds stored in a hot wallet on a custodial exchange account (i.e. Coinbase), you don't truly own your cryptocurrencies and thus run additional and unnecessary risks. By converting fiat currency into cryptocurrencies, you can store your assets in such a way that only you can access them, you have full control at any time, without counterparty risk.

Remember; **not your keys - not your crypto.**

Centralized exchange (CEX)

Centralized exchanges are the weakest link in the cryptocurrency community, and a chain is only as strong as its weakest link. Ironically, most existing digital currency exchanges built within the cryptocurrency ecosystem are centralized, making them vulnerable in ways our digital currencies are not. A centralized exchange such as Coinbase, Kraken or Binance is run by a profit-oriented company that gets revenue from their platform's fee structures. Both the access and exit points into the current blockchain ecosystem require fees - all of which go to the centralized exchanges that facilitate these services. The counterparty risk and high fees are the main reasons why decentralized exchanges are needed. In all honesty, it is worth mentioning that many centralized exchanges can execute fiat currency to cryptocurrency transactions while DEXs, on the other hand, are usually only able to facilitate crypto to crypto transactions (for now). Signing up for an exchange can be cumbersome due primarily to Know Your Customer (KYC), Anti Money Laundering (AML) and other regulations when it comes to interfacing with traditional financial infrastructures. We will go back to this in our chapter about cryptocurrency wallets (chapter 2).

1.6 Broker exchanges

A broker exchange allows you to buy crypto directly with your local currency. In other words, with a broker exchange, you can effectively convert your fiat currency for cryptocurrency or cash out your crypto and convert it back to fiat currency. A broker exchange is required for beginners and is your starting point if you don't have any cryptocurrency assets in the game which you can trade.

Coinbase

Coinbase is, without a doubt, one of the most well-known exchanges in the world. Coinbase is one of the largest broker exchanges, very user-friendly but charges relatively high fees. At Coinbase, you can buy and sell the most well-known cryptocurrencies such as Bitcoin and Ethereum by simply registering, linking your bank account and making a deposit. You can make deposits in almost all fiat currencies, provided that Coinbase is operating in your country (check [Coinbase Support](#)). Once your account is credited, you will receive a notification through email that you can now exchange your freshly deposited fiat currency for the cryptocurrency of your choice. Their website offers multiple web wallets in which you can store and hold your coins. From here, you can send and receive payments, deposit and withdraw (cash-out) to your bank account.

TIP

Sign up with [Coinbase](#) using **cryptomaniacs'** affiliate link and receive a bonus of €8 worth of Bitcoin on top of your first deposit of €100.

Learn more? Check [Coinbase Support](#).

The screenshot shows the Coinbase homepage with a blue header and a white main content area. At the top, there's a navigation bar with links for 'Prices', 'Products', 'Company', 'Earn crypto', and a green button 'up to \$166'. On the right, there are 'Sign in' and 'Get started' buttons. The main title 'Buy and sell cryptocurrency' is centered above a sub-header: 'Coinbase is the easiest place to buy, sell, and manage your cryptocurrency portfolio.' Below this is a 'Get started' button and an 'Email address' input field. The central part of the page features a table of four cryptocurrencies:

#	Name	Price	Change	Chart	Trade
1	Bitcoin BTC	€6,403.39	+2.37%		<button>Buy</button>
2	Ethereum ETH	€14773	+2.53%		<button>Buy</button>
3	Bitcoin Cash BCH	€216.94	+2.32%		<button>Buy</button>
4	Litecoin LTC	€39.48	+1.70%		<button>Buy</button>

Below the table, there's a section titled 'Earn up to \$166 worth of crypto' with a 'Start earning' button. To the right, there are four smaller sections: 'Orchid OXT', 'Tezos XTZ', 'EOS EOS', and 'Stellar Lumens XLM', each with a small icon and a 'Earn \$X' amount.

Liquid

Liquid is a unified, globally-sourced trading platform that bridges the worlds of fiat and crypto. A platform, which offers high liquidity through their "World Book", which connects liquidity pools from exchanges around the world. They also offer a wide range of fiat currency deposits and withdrawals, at very low fees and are fully regulated with a very intuitive user interface and user experience. Also, their native token QASH will provide you with 50% trading

discounts, and you can stake (lend) your tokens to margin traders on the platform to earn interest.

Kraken

[Kraken](#) was founded in 2011 and is known as one of the largest and oldest Bitcoin exchanges in the world. Kraken is consistently named one of the best places to buy and sell crypto online and has recently updated its website and UI/UX interfaces to appeal to a larger audience.

1.7 Trading exchanges

This type of exchange is considered the "traditional" cryptocurrency exchange. It allows you to trade cryptos for other cryptos. For example, if you own Bitcoin and would like to own some Ethereum or other Altcoin, you could sell some of your Bitcoin for something else, using a trading exchange. A trading exchange could be a centralized [CEX] or decentralized exchange [DEX]. We'll list a few in the sections below and indicate if they're decentralized. Remember, these are just some examples - if you want to get the full picture, start with some of the sources listed in table 1.1.

Binance

[Binance](#) is one of the biggest and most popular CEX with huge trade volume and an incredible amount of token listings. It offers a referral program that provides commissions over the trades executed by referrals. It doesn't, however, provide dividends for token holders. Binance is, at the time of writing, a much larger exchange (global 2nd) in terms of volume. Furthermore, it offers many quality coins, has a very active and involved community and provides many tools for trading. It devotes a considerable sum of its budget to marketing and promotions; hence, it's not surprising that it's one of the largest and fastest-growing exchanges with great potential for the future.

KuCoin

[KuCoin](#) is a relatively new player in town which you can compare to Binance. Kucoin has trading incentives in place, essentially sharing 90% of its trading

Table 1.3: Recommended broker and trading exchanges

Exchange	Type	UX/UI	URL
Coinbase	Broker	Beginner	https://www.coinbase.com/
KuCoin	Trading	Beginner	https://intro.kucoin.com/
Binance	Trading	Beginner	https://www.binance.com/en/
Liquid	Broker/Trading	Beginner	https://www.liquid.com/
Kraken	Broker/Trading	Intermediate	https://www.kraken.com/

fees with its users, promoters and investors. It is a competitive new startup based in Hong Kong, and it runs a sleek design, UI/UX interfaces, and an interesting business model. KuCoin pays out its dividend bonuses daily to KuCoin token holders.

TIP

KuCoin distributes daily dividend bonuses to KuCoin Shares (KCS) holders. This dividend consists mostly out of the transaction fees of that particular day and is divided proportionally over everyone with KCS stored on the platform (in a custodial wallet).

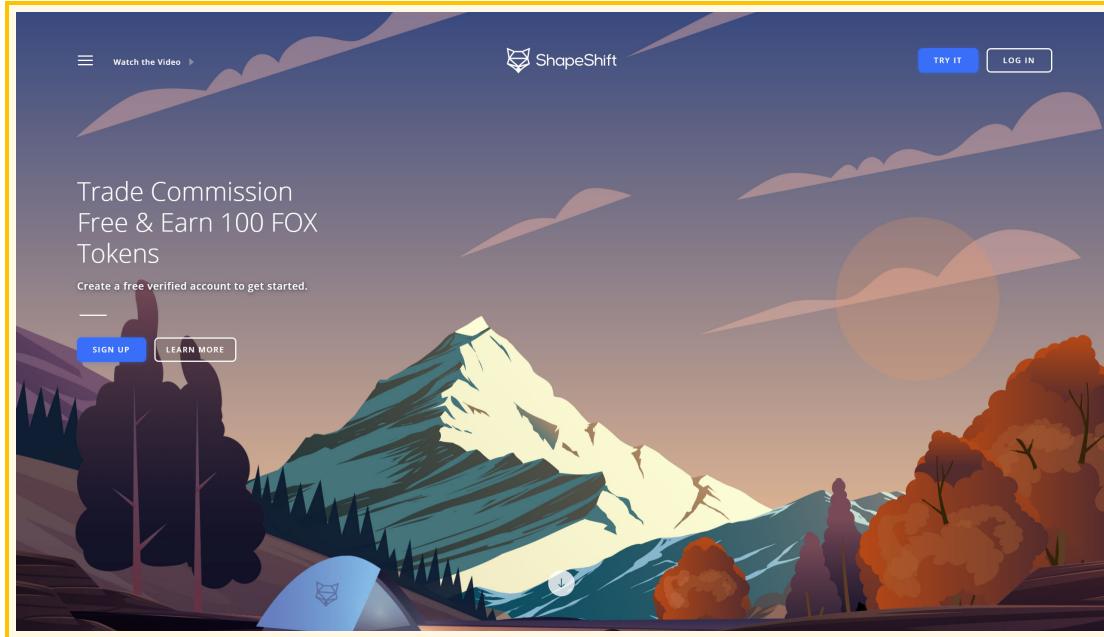
Do you want to know how much you can earn on a daily basis? Visit [stakingrewards](#)

Changelly of Shapeshift

Cryptocurrency swap platforms such as Changelly and ShapeShift offer an extremely convenient way of trading, with a strong focus on user experience, design, and safety. You choose the crypto to sell and buy, and you can instantly swap tokens and coins. As of recently, there are no more fees on the ShapeShift platform, which is quite amazing.

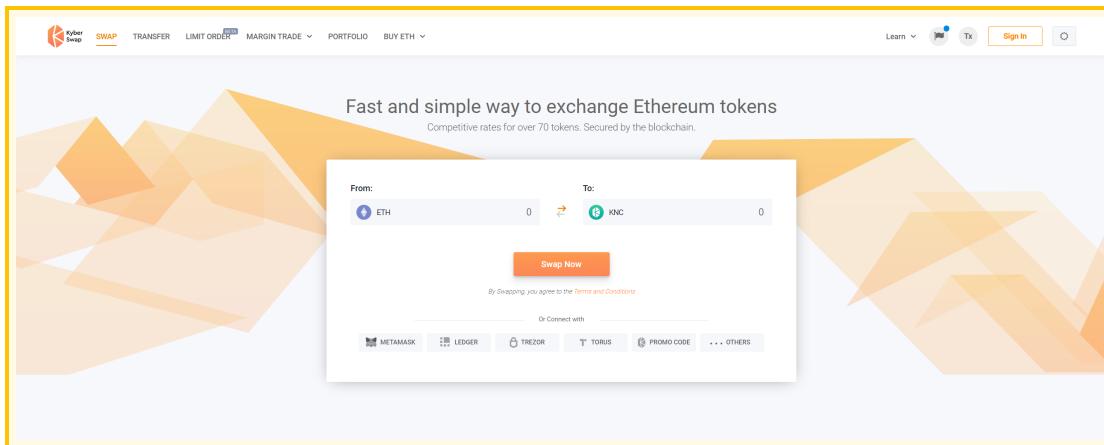
Changelly is an instant cryptocurrency exchange platform where you can quickly buy and sell cryptocurrency. You can buy on Changelly using a traditional bank account. Changelly offers competitive crypto-to-crypto rates and supports over 140 cryptocurrencies.

ShapeShift is the only cryptocurrency trading platform that offers zero-commission crypto trading and where the private keys of the trading account are in your control. ShapeShift allows users to purchase crypto with fiat currency and efficiently manage, trade and sell their crypto. Secure your crypto via a beautiful and straightforward web-interface.



Kyber Network (DEX)

[Kyber Network](#) fills a gap in the existing system of cryptocurrency exchanges with its decentralized nature and instant trades. As the number of cryptocurrencies available grows, so will the need for decentralized systems like this, of which Kyber is a pioneer. As more features arrive, including support for arbitrary token pairs, it will become even more helpful for those with cryptocurrency investments.



1.8 Exchange registration & sign-up

Signing up for an exchange is relatively straightforward. It is just like registering for any other online service where you need to create an online profile or account. Only now, you are registering for a digital exchange, and you will deposit fiat currency and can start buying and selling cryptocurrency. You must choose the right exchange, so take some time to get familiar with the different types of exchanges, their services, and the pros and cons. Please refer to section 1.4 if you're unsure of the kind of exchange you require. In many cases, you'll end up with multiple exchange accounts at some point.

Opening a broker account

1. Open an exchange account and go through all the necessary steps to verify your account. For more information about the KnowYour Customer (KYC) protocol, refer to section 1.5.
2. Deposit money from your bank account to your broker exchange account. Each exchange offers several ways to deposit money.
3. The exchange notifies you as soon as the money has arrived. Now you can buy Bitcoin, Ethereum or any other cryptocurrency.

TIP

If you intend to purchase cryptocurrency as an investment, you do not need to create an account directly on a trading exchange. Nowadays, many broker exchanges offer quite a lot of trading pairs. If you can buy your cryptocurrency instantly from a broker exchange, you can send it directly to a (hardware) wallet - more about hardware wallets in chapter 2.

Opening a trading account

4. Open a trading exchange account at an exchange which offers a variety of other cryptocurrency trading pairs. Usually, these exchanges don't accept any fiat currency deposits. You have to send your crypto to this account from a broker exchange. See section 1.7 for more information about trading exchanges.
5. After the account is verified, you send the purchased cryptocurrency from the broker account to the trading account. You can then start trading.
6. You can send a part of the purchased cryptocurrencies directly to the hardware wallet, to keep it safe. Please refer to chapter 2, where we discuss wallet and cryptocurrency trades further.

1.9 Regulation of cryptocurrency exchanges

Globally, regulators and legislators want to ensure that cryptocurrency exchanges apply both best security practices and measures against criminal activities. These measures discourage illegal activities and also improve the online security of central exchange accounts and the associated cryptocurrency wallets.

1. *Know Your Customer (KYC)*
2. *Anti Money Laundering (AML)*
3. *Combating the Financing of Terrorism (CFT)*

Knowing that these regulatory frameworks exist, and what they stand for is essential. Everyone that wishes to participate in regulated cryptocurrency trading and investing will have to prove their identity when registering with an exchange.

1.9.1 Know Your Customer (KYC)

KYC refers to a set of rules, procedures and processes that exchanges use to identify their customers. When you deposit fiat currency to make purchases and trades, you'll almost always have to verify your identity. This verification can be done in different ways, depending on the nationality and the chosen exchange. It often means that you'll need to upload a photo of yourself with your ID, passport, driver's license or other official documentation.

For low amounts of money, this may not be a requirement - and there is a difference between broker and trading exchanges - but if you plan to deposit and withdraw more substantial amounts of money regularly, you may need to go through several verification stages. Access to a higher level translates into uploading additional personal documents such as bank statements or a rental agreement. This entire process is known as KYC (Know Your Customer).

ID verification for new users

Exchanges usually require you to verify your identity. Verifying your identity means you might have to upload a photo of yourself holding your ID, paired with your personal information and bank account details if you wish to deposit currency to start trading. For low amounts of money or low volume trading, this might not be a requirement, and there is a difference between broker and trading exchanges (section 1.4). If you intend to deposit and withdraw more substantial sums of currency regularly, different stages of verification might be required. Higher-level perks translate into uploading personal documents such as bank statements, or driving licenses, addresses and phone numbers (verifying your identity). Completing different stages of KYC could provide you with more perks at the exchange in question concerning maximum deposits, withdrawals, fees and perhaps more. Please refer to the requirements of the centralized exchange which you are interested in.

1.9.2 Anti-Money Laundering (AML)

AML covers a range of procedures, laws and regulations designed to stop illegal activities such as money laundering. Some of them include tax evasion, market manipulation, misappropriation of public funds, trafficking of illicit goods and other activities of this nature.

AML regulations require financial institutions to carry out ongoing due diligence procedures to detect and prevent malicious activities.

1.9.3 Combating the Financing of Terrorism (CFT)

CFT refers to the series of procedures aimed at investigating, dissecting, discouraging and blocking sources of funding for activities that may be linked to terrorism. This funding is then intended for activities that achieve religious, ideological or political ends through violence, or the threat thereof, against civilians. This set of CFT procedures provides agencies with an alternative and potentially effective way to detect and block terrorist activities in the financial sector.

1.10 Best Practices - crypto exchanges

The **Cryptomanual** “Best Practices” provides recommendations and highlights items of importance when considering cryptocurrency exchanges. It is essential to do a little homework before signing up for any exchange. There are a few things you might want to check before making a decision.

Reputation

The best way to find out about an exchange is to search through reviews from individual users and well-known industry websites. You can ask any questions you might have on official social media and community platforms.

Trading pairs

At the same time, you also look at what affects that trading volume, such as the options in terms of available *trading pairs* such as USD/BTC, USD/ETH, EUR/BTC and EUR/ETH. Bitcoin (BTC) has dominated the cryptocurrency market to date, but there are plenty of other cryptocurrencies - such as Ethereum - with huge trading volumes over 24 hour periods.

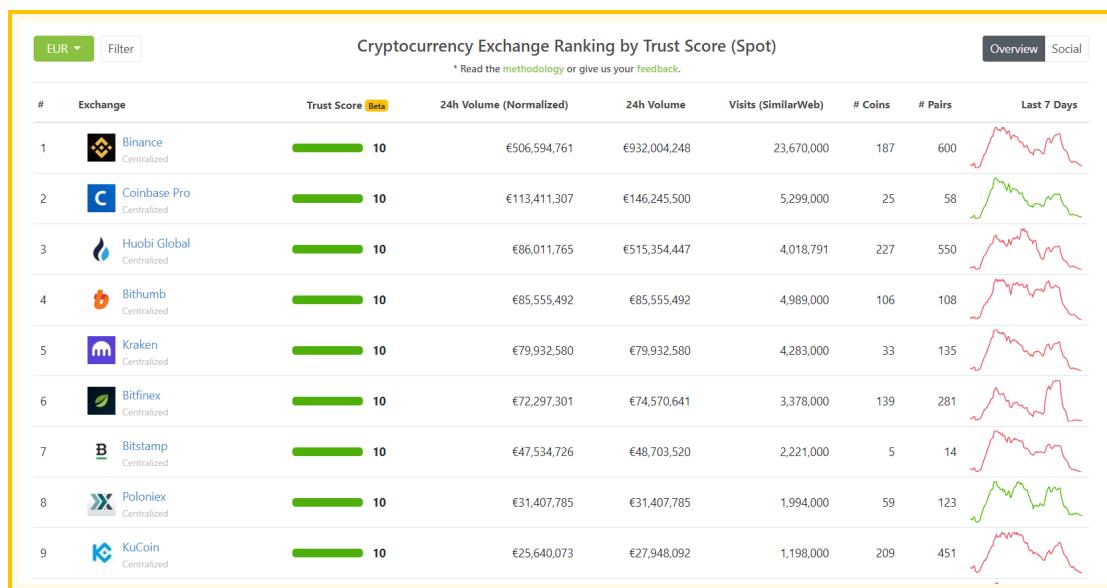


Table 1.4: Recommended broker and trading exchanges

Exchange	Type	UX/UI	URL
Coinbase	Broker	Beginner	coinbase.com
KuCoin	Trading	Beginner	intro.kucoin.com
Binance	Trading	Beginner	binance.com
Liquid	Broker/Trading	Beginner	liquid.com
Kraken	Broker/Trading	Intermediate	kraken.com

Fees

Most exchanges should have fee-related information on their websites. Before joining, make sure you understand deposit, transaction and withdrawal fees. Fees can differ substantially depending on the exchange you use.

Payment methods

What payment methods are available on the exchange? Credit and debit card? Wire transfer? PayPal? If an exchange has limited payment options, then it may not be convenient for you to use it. Remember that purchasing cryptocurrencies with a credit card will always require identity verification and come with a premium price as there is a higher risk of fraud and higher transaction and processing fees. Purchasing cryptocurrency via wire transfer will take significantly longer as it takes time for banks to process.

Verification requirements

The vast majority of the Bitcoin trading platforms both in the US and the UK require some ID verification to make deposits & withdrawals. Some exchanges will allow you to remain anonymous. Although verification, which can take up to a few days, might seem like a pain, it protects the exchange against all kinds of scams and money laundering.

Geographical restrictions

Some specific user functions offered by exchanges are only accessible from certain countries. Make sure the exchange you want to join allows full access to all platform tools and services in the country in which you currently live.

Exchange rates

Different exchanges have different rates. You'll be surprised how much you can save if you shop around. It is not uncommon for exchange rates to fluctuate up to 10% and even higher in some instances.

Converting FIAT into cryptocurrency

Once registered on an exchange that allows for currency deposits, you can start to engage the market. You now have a host of different options available, depending on the available trading pairs for the currency you deposited. Depending on your country and the currency you're using - you will most likely end up using a broker exchange that operates either internationally and offers multiple currency trading pairs or a local one that also deals in your currency. Trading pairs that you will find almost everywhere would be Bitcoin and Ethereum (USD/BTC, USD/ETH, EUR/BTC, and EUR/ETH). Have a look at the trading pairs available for your currency at your broker exchange. You can deposit money on your exchange account in multiple ways (depending on your provider). You might be able to use bank deposits (SEPA), credit cards or perhaps even services like PayPal.

As mentioned before, not all types of exchanges accept fiat currency deposits (broker exchanges only); some exchanges only allow you to deposit cryptocurrencies to exchange other alternative coins (trading exchanges). Today, Bitcoin is still one of the most popular cryptocurrencies, and all exchanges offer Bitcoin. Therefore, you can consider it as one of the best gateways for purchasing other coins. In other words, if you want to buy any other cryptocurrencies, you must look at the trading pairs available and do the following:

1. Open a (domestic) cryptocurrency broker exchange account (in your country) and verify your account via the "Know Your Customer" (KYC) protocol if required. Please refer to section [1.6](#) for more information on broker exchanges.
2. Deposit funds from your bank account to your broker crypto exchange account so you can buy Bitcoin, Ethereum or another coin that has high liquidity and offers multiple trading pairs.
3. Open a trading exchange account that offers a variety of other cryptocurrencies. Usually, these exchanges do not accept fiat deposits and only allow crypto to crypto trading, withdrawals and deposits. Please refer to section [1.7](#) for more information on trading exchanges.
4. After verifying your account, transfer the cryptocurrency that you've bought from your broker exchange to your new trading exchange, and you can start trading. If you don't know how to transfer your freshly purchased coins out of your accounts, please refer to chapter [2](#) where we discuss wallets and transactions.

Chapter 2

Cryptocurrency Wallets

Traditionally, you hold your cash in your wallet or banks store your fiat currency in an account in your name. The consensus is that you have access and can withdraw your currency at any time. In theory, this might sound correct, but the bank doesn't necessarily have your money. By converting fiat currency into cryptocurrencies, you can store your assets in such a way that only you can access them, you have full control at any time, without counterparty risk, because you do not depend on anyone to get access.

"When you put your money in the bank, the bank becomes the owner of that money. With Bitcoin, you own your money. When the banks own that money, they spend it as they wish. When you own it, you spend it as you wish. It is censorship-resistant, and no one decides whether you can or cannot spend it and on what you will spend it on."

— Simon Dixon

2.1 Cryptocurrency wallets

Cryptocurrency wallets are software programs that enable us to interface with the network (blockchain) to keep track of our transactions and assets. You can compare a cryptocurrency wallet with your bank account, a mailbox or an email address. You can interact with each of them if you have the required proof (respectively identity, key or password). If you want to own and use Bitcoin or any other cryptocurrency, you will need to have a wallet that supports the specific coin or token.



PLAY ON THE BLOCKCHAIN

"A cryptocurrency wallet functions in the same way as your bank account in the sense that you can interface with the network and transact (deposit and withdraw) (crypto)currencies (\$, £, €) to and from your bank account. With a cryptocurrency wallet, you manage your cryptocurrencies in the form of validated transactions on the blockchain. The wallet generates and stores private and public keys, interacts with the respective network (blockchain), and enables users to perform and sign transactions." ^a

^aEthos (2018); [What are Cryptocurrency Wallets, Private Keys and Addresses.](#)

2.2 Different wallet types

There are several types of wallets that provide different ways to store and access your digital currency. Wallets can be broken down into three distinct categories: software, hardware, and paper wallets. Software wallets could function on a desktop, online or mobile device and hardware wallets use software but fall in their category.

2.2.1 Hot storage versus cold storage wallets

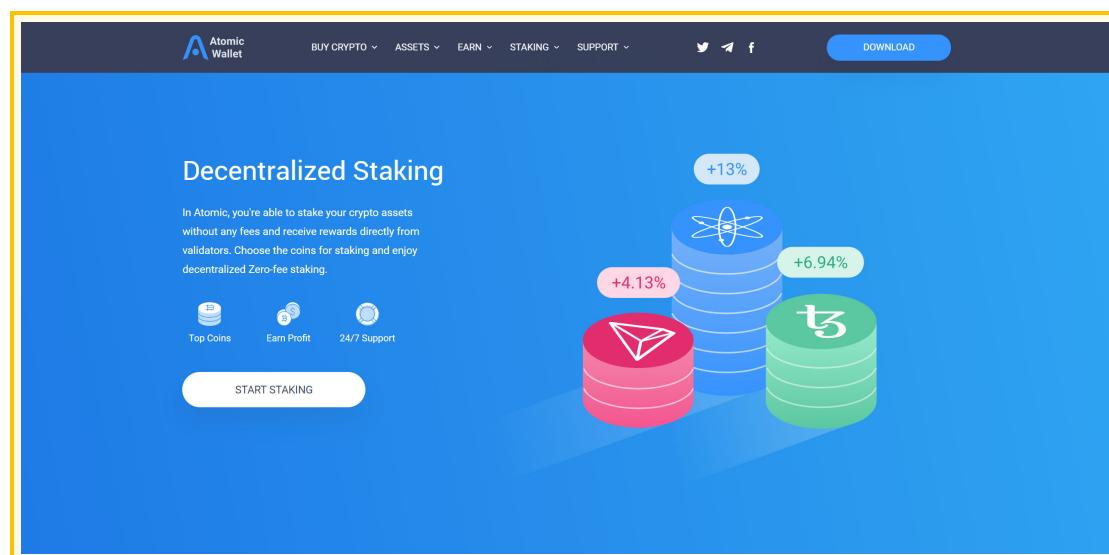
While you are reading about wallets, you might come across the terms “hot” wallets and “cold” wallets. All the different types of cryptocurrency wallets fall under either one of these two types. In general, anything that is connected to the internet is less secure than something that is not. This is the difference between hot and cold wallets, with internet-connected wallets being hot and the other being cold. Online, desktop and mobile wallets are hot wallets, while hardware and paper wallets are cold wallets, also known as cold storage or hardware wallets (specialized USB enabled devices). Some might say that hardware wallets are prone to physical damage, loss or theft. However, the advantage is that they are far less likely to fall victim to hacking.

2.2.2 Software wallets

Software wallets can function on a desktop, online or on a mobile device. Hardware wallets use their own software, although they fall under the hardware category because they are run as specialized USB devices.

Desktop wallets (hot)

These are downloaded and installed on a PC or laptop. They are only accessible from the single computer on which they are downloaded. Desktop wallets offer one of the highest levels of security; however, if your computer is hacked or gets a virus, there is a possibility of losing all your funds.



TIP

Desktop (software) wallets support many cryptocurrencies and are easy to use. Perfect for beginners.

You can use [Atomic Wallet](#) or [Exodus Wallet](#).

Mobile wallets (hot)

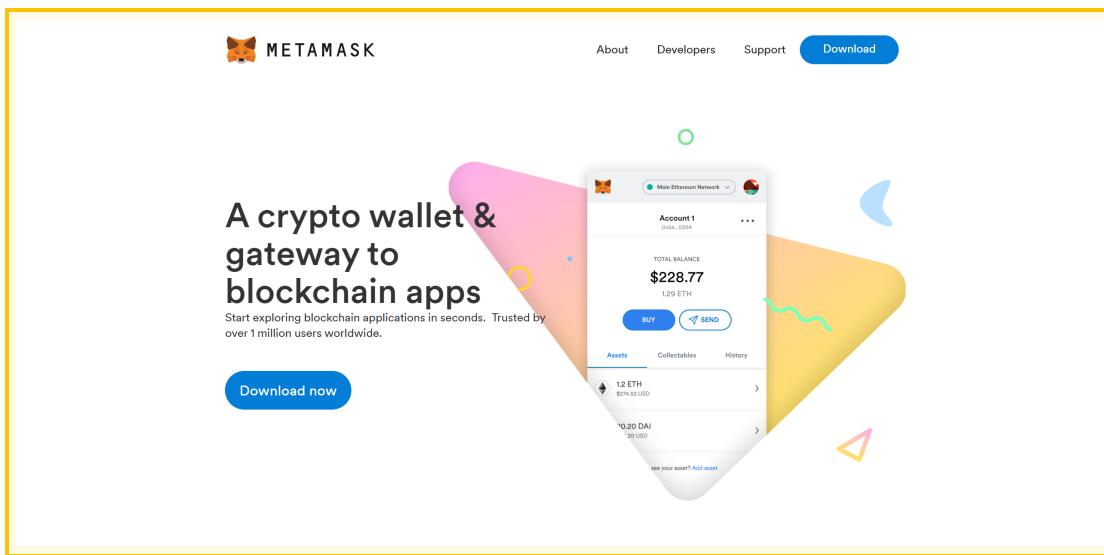
These run on an app on your phone and are useful because they can be used anywhere, including retail stores. Mobile wallets are usually much smaller and simpler than desktop wallets because of the limited space available on a mobile.

Web wallets or online wallets (hot++)

Online wallets are the most notorious of all because you don't own your private keys. Exchange wallets are a prime example. Online wallets are accessible from any computing device and any location. While they are more convenient to access, online wallets store your private keys online, and if an exchange hosts the wallet, your keys are controlled by a (custodial) third party with centralized storage which makes them a huge target. These parties (usually large exchanges) are more prone and vulnerable to hacking and theft which is not uncommon as there is plenty of information available on the loss of user funds due to large scale security compromises. These were online "hot" exchange wallets where the user doesn't own his or her funds since he or she does not own the private keys.

Hosted wallets (custodial) The most notorious web wallets are the wallets that are managed by the various exchange platforms in a so-called *online exchange wallet*. With these wallets, the user is not in possession of his or her private keys and the exchanges manage these for their users. Exchange account holders can log into their accounts with username and password combination, which are linked to the private keys of their stored cryptocurrency.

Non-hosted wallets Examples of non-hosted wallets are [MyEtherWallet](#) and [MetaMask](#). Both enable users to fully control the cryptocurrencies themselves and are easy to manage and operate.



2.2.3 Hardware wallets (cold)

These differ from software wallets in that they store a user's private keys on a hardware device like a USB. Although hardware wallets make transactions online, they are stored offline, which delivers increased security. Hardware wallets can be compatible with several web interfaces and can support different cryptocurrencies; it just depends on which one you decide to use. What's more, making a transaction is easy. Users plug in their device to any internet-enabled computer or device, enter a pin, send currency and confirm. Hardware wallets make it possible to easily transact while also keeping your money offline and away from danger.

TIP

Hardware wallets store the private keys in a protected environment of the USB-device and the keys cannot be exported as text. In addition, hardware wallets are immune to computer viruses.

For ultimate security, consider using a [Ledger](#) Hardware wallet.

2.2.4 Paper wallets (cold)

These are easy to use and provide a very high level of security. While the term paper wallet can refer to a physical copy or printout of your public and private keys, it can also refer to a piece of software that is used to generate a pair of keys, which are then printed securely. Using a paper wallet is relatively straightforward. Transferring Bitcoin or any other currency to your paper wallet is accomplished by the transfer of funds from your software wallet to the public address shown on your paper wallet. Alternatively, if you want to withdraw or spend currency, all you need to do is transfer funds from your paper wallet to your software wallet. This process, often referred to as 'sweeping',

can either be done manually by entering your private keys or by scanning the QR code on the paper wallet.



TIP

Use a cold wallet (hardware) to safely store the bulk of your crypto. Hot wallets (mobile, desktop or online) for that allocation of your portfolio with which you actively place buy and sell orders.

2.3 Important wallet considerations

It is always a good idea to reduce potential risks by spreading around your assets if you have a lot of them. Take some digital 'cash' with you on a mobile wallet and keep the rest safe in (multiple) other locations. Don't keep all of your wealth in one place.

2.3.1 Risk of storing crypto on exchanges

Security is a hot topic and a huge issue in the crypto environment and should never be taken lightly. On many centralized exchanges, you are not in control of your private key. Instead, exchanges let you log-in with a username and password combination. This implies that you do not truly own your assets, as the exchange "custodians" hold your private keys. Not owning your private keys means that you do not have full control over your funds.

Everyone knows exchanges are subject to attacks from malicious parties, trying to gain access to the funds of all users and the exchange reserves. For example, you sign up with an exchange, create an account protected with a password (and 2FA) and the exchange gets hacked or otherwise compromised; you might well lose your investments since the hackers now have access to the private keys of registered users of the exchange. Now the exchange functions precisely the same as a regular bank.

“Not your keys, not your Bitcoin.”

— proofofkeys.com

2.3.2 Security and technical complexity

Keep in mind that a safer and more secure wallet adds more layers of technological sophistication. This complexity, in itself, imposes additional risks if you do not know precisely what you are doing. It is a lot easier to run a wallet on your mobile phone or desktop with a simple PIN or password, then it is to run dedicated cold storage or multi-signature wallet. People who overextend (because they aim for higher security) might just as well lose their funds because they underperform on execution and handling of these more complicated systems. Assessing what an acceptable level of risk for your specific situation and circumstances is based on your commitment and invested funds.

Which wallet is best for me?

There are a lot of different wallets available and more diverse and advanced wallets are being launched frequently. Before selecting a wallet, you should think carefully about how you intend to use it. Do you need a wallet for everyday purchases, or do you need a wallet where you can actively trade? Should you also have a dedicated wallet that functions as an offline vault for your long term investments? Are you planning on using a host of cryptocurrencies, or only Bitcoin? Do you require access to your digital wallet from multiple devices or just your mobile phone?

TIP

Take the time to assess your requirements and only then decide on the most suitable wallet(s) for you. You cannot go wrong with the wallets we recommend, with which you will have a complete cryptocurrency set-up.

2.4 Combinations of cryptocurrency wallets

In general, try to reduce potential risks by spreading around your assets if you have a considerable amount invested. When you diversify, you aim to manage your risk by spreading out your funds. You can, of course, expand and

Table 2.1: A selection of popular cryptocurrency wallets for your review. Exchange wallets are not considered, but some of these are highlighted in chapter 1.

Wallet	Support	Platform	URL
Ledger	multi	hardware	ledger.com
KeepKey	multi	hardware	shapeshift.io
Trezor	multi	hardware	trezor.io
Electrum	BTC	desktop	electrum.org
Atomic	multi	desktop	atomicwallet.io
MEW	ETH	web	myetherwallet.com
MetaMask	ETH	web	metamask.io
Exodus	multi	desktop	exodus.io
Ethos	multi	mobiel	ethos.io
Abra	multi	mobiel	abra.com
Edge	multi	mobiel	edge.app
Changelly	multi	web	changelly.com
ShapeShift	multi	web	shapeshift.com

diversify both within and among different asset classes. But when it comes to cryptocurrencies, you can take any number of assets with you on a mobile wallet and store the rest safely on (multiple) other locations. For instance, you would have registered at one broker exchange (to convert your fiat to crypto) and at another trading exchange (where you trade crypto to crypto). You might also have a dedicated hardware wallet to store the majority of your assets offline and have a small portion on a wallet on your phone to be able to take with you for easy access and liquidity purposes. Take some time to assess your requirements and only then decide on the most suitable wallet(s) for you.

Chapter 3

Privacy & Security

There are several things you could and should pay attention to when you start your crypto-journey. An initial useful selection is provided in this chapter. Please feel free to check out all of our suggestions but don't forget that there are other alternatives out there that might be better for you, for whatever reason. Because of this, we've decided to keep it general and provide a link, a short description plus an example where possible.

"Holding and managing your own wealth comes with great responsibility. You - and you alone - are responsible for your own investments as there is no bank or other intermediary or third party involved in handling and safeguarding your assets."

— [cryptomanuals.com](#)

3.1 Threat modeling

Threat modeling might sound a bit extreme, but it can be quite beneficial as it provides you with the opportunity to step back, assess the situation objectively and decide on your next steps in terms of protecting yourself.

It involves several elements where you identify your online activities and the risks that might accompany those activities. Who might be interested in what you do online? What can you do to minimize that risk? It comes down to you creating a small risk matrix where you outline the potential dangers that might arise from your activities as an investor or a trader (or something else like your activities involving your job or hobbies for that matter). Most people don't stop and think about such things, and they go with the flow - thinking they'll be OK. What if you're not? Put in some effort to reduce or eliminate your risks by performing a brief analysis, based on your situation.¹

3.2 Securely setting up mobile devices

When you have installed wallet software on your phone and are carrying around a sum of cryptocurrencies, make sure your mobile phone is encrypted, is al-

¹AccessNow (13-06-2019); [Digital Security](#).

ways locked and both your mobile and the specific software applications that you use to access your funds are secured with an active PIN. Biometrics such as fingerprint and face scanning is advised against as people with bad intentions can coerce you into unlocking your phone or wallet.

3.3 Password managers

It is highly advised to use a password manager extension (on both desktop and mobile) which generates ultra-safe passwords (up to 100 characters!) for you to use on both your crypto-related (exchange) accounts and personal accounts. LastPass provides local-only encryption of your password related data stored in your “vault” (extension to your browser). Your data is encrypted and decrypted at the device level. Data stored in your vault is kept a secret, even from LastPass. Your master password and the keys used to encrypt and decrypt data are never sent to their servers and are never accessible by LastPass. A password manager eliminates the reuse of old passwords and makes sure that you use unique and robust passwords.

TIP

Use Bitwarden, a free and open-source password manager which is very easy to operate. Bitwarden generates strong passwords that are all encrypted. Weak passwords never need to be (re)used because only the end-user has access to this protected environment.

Go to [Bitwarden](#).

3.4 Two-Factor Authentication (2FA)

Two-factor authentication is a security mechanism that requires two types of credentials for authentication and is designed to provide an additional layer of validation, minimizing security breaches. Two-Factor authentication is also known as strong authentication. Two-Factor authentication works with two separate security or validation mechanisms. Typically, one is a physical validation token, and one is a valid code or password. Both must be validated before accessing a secured service or product. Generally, an authenticating procedure requires a physical token or identity validation, followed by a logical password or personal identification number (PIN). The security procedure for an ATM is a typical example of Two-Factor authentication, which requires that a user possesses a valid ATM card and PIN. The need for second layer security is undeniable and should be a part of everyone's login process to protect against phishing attacks, fraud, identity, and monetary theft.

TIP

In our case, you will most likely use your phone to download an application such as Google Authenticator (mobile device only) or Authy (mobile and desktop app). In this case, we recommend Authy since it offers a way to back up your codes on multiple devices in case you lose access to one of them (mobile, desktop or tablet).

Go to [Authy](#).

3.5 Virtual Private Networks (VPN)

A Virtual Private Network (VPN) extends a private network across a public network and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network. Applications running across a VPN may, therefore, benefit from the functionality, security, and management of the private network. VPNs cannot make online connections completely anonymous, but they can usually increase privacy and security. To prevent disclosure of private information, VPNs typically allow only authenticated remote access using tunneling protocols and encryption techniques.

TIP

ProtonVPN offers excellent free and paid solutions, which come in tandem with their encrypted email services provided by ProtonMail.

Go to [Protonmail](#).

3.6 Encrypted email services

[ProtonMail](#) offers a very nice alternative email service, and safety and security are an inherent aspect of their platform. It is open-source, anonymous, comes with Swiss privacy, all emails are protected by end-to-end encryption, and it is straightforward to use and pleasant on the eyes. Use a safe and dedicated email address for all things related to crypto and preferably set it up with 2FA and or a PIN.

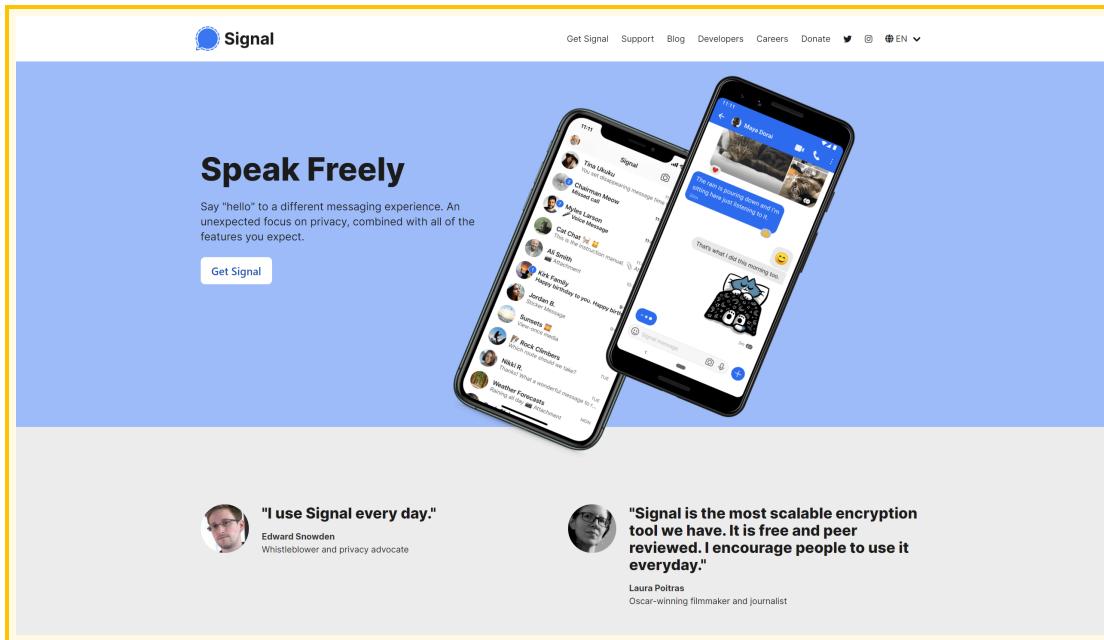
3.7 Encrypted messaging

End-to-end encryption keeps online conversations and calls secure. Nobody can eavesdrop and read any of your messages. Privacy is not an optional mode - it's just the way these applications work. Every message, every call and every time.

TIP

As an alternative to the traditional messaging service WhatsApp, we recommend Signal. Signal enables fully encrypted messages, and offers numerous additional options for enhanced user privacy.

Have a look at [Signal](#).



3.8 Alternate internet browsers

[Brave](#) offers you a completely new browsing experience, which does not track you online. Your browsing habits cannot be used to create an online shadow version of you, which is used to target ads against you. Your browsing experience will not only be faster and more secure but also private. Brave loads major news sites two to eight times faster than the leading browsers on mobile devices and two times faster on desktops. Brave automatically blocks all ads and trackers, which drastically improves loading speeds and increases the browsing experience. Brave also supports a blockchain-based token called the Basic Attention Token (BAT) which allows the user to tip their favorite content creators. Being much more than a browser, Brave is a new way of thinking about how the web works, enabling micro-transactions and one step closer toward a new internet of value. Brave is open source, and built by a team of privacy focused, performance oriented pioneers of the web, founded by the inventor of JavaScript and co-founder of Mozilla.

"If you are not paying for your product, you very well might be the product."

TIP

Brave uses the cryptocurrency BAT (Basic Attention Token) which allows users to tip their favorite websites and content creators. You can also earn crypto while browsing and using the internet.

Learn more? Go to [Brave](#).

3.9 Private search engines

DuckDuckGo is a search engine extension application, which is already implemented in the Brave browser but also usable in Chrome. DuckDuckGo doesn't collect or share any of your personal information and doesn't store your search history. Therefore, they have nothing to sell to advertisers that track you across the internet. Whereas other search engines can also track you in private browsing mode, DuckDuckGo never tracks users.

TIP

DuckDuckGo is a search engine extension and application (built-in Brave). It does not collect or share personal information and does not store your search history. As a result, it has no data to sell to advertisers who are tracking you over the Internet. While other search engines can still track you in private browsing mode, DuckDuckGo *never* tracks users.

Checkout [DuckDuckGo](#).

3.10 Software updates

Software updates include but are not limited to wallet software. Also think about anti-virus software, spyware, and malware software, windows updates, mobile wallet applications, etc. Exchanges provide you with a wallet that you have no direct control over (no access to private keys) and you don't need to update these. Keep your PC or mobile up to date on security packages and external (wallet or exchange) software offered by the official developers on your mobile device or your desktop.

3.11 Backup sensitive data

Even if you have a password manager, it is always recommended to have at least one copy (or printout) of your passwords, private keys, passwords, PINs or seed phrases in a safe location. If for any reason you lose access to your mobile, or your desktop computer breaks down, you can access your funds

from another device and restore your respective wallets with your backup. Ultimately, the best method of storing your sensitive login information is by thinking of as many bad scenarios as you can think of and plan accordingly, creating redundancy. For instance, it is completely ill-advised storing your data on a note-taking app, computer, cloud storage, Google Drive, or Dropbox due to the risk of your computer or the centralized firm that keeps your data being hacked and your seed stolen. Even something written on a piece of paper might be lost due to one of the following; the ink might fade, the house might burn down, burglars might steal your files or deposit box, friends or family might (accidentally) take it, and the list goes on and on. Think about these implications.

The gravity of this must not go unnoticed as many people fall victim to security breaches every week for many reasons. They could have had their cryptocurrencies on an exchange wallet, which got hacked. They could have forgotten to set up 2FA. They could have used weak passwords, they could have accidentally used a phishing website which stole their login details, and the list goes on.

3.12 Data phishing

Finally, you can throw as much software at your threats as you want, but privacy and security are still contingent on human error. If you get hacked, all the encryption in the world won't protect you. The origin of a hack can often be traced back to an individual clicking on a malicious link or unknowingly downloading malware from an email - such attacks are called phishing. There are plenty of prime examples of phishing attacks out there, and we advise you to browse your spam folder if you're unsure what phishing might look like as you will find plenty examples in your inbox.

TIP

If a proposition sounds too good to be true? Be careful, as this is true for 99% of all cases! Be extra cautious when you are asked to click on some unknown link or log into an account in order to claim free crypto or a reward of any kind. Remember the points identified below.

Learn more at [Securitymetrics](#).

Legit online activities will **always**:

- (a) ... call customers by their name.
- (b) ... use their own, company-related domain names.
- (c) ... use correct language and grammar.

Legit online activities will **never**:

- (a) ... request sensitive information via e-mail.

- (b) ... give away vast amounts of free crypto on social media or other platforms.
- (c) ... try to persuade people to click on buttons and links to get important information.
- (d) ... send unsolicited attachments.

The information in this e-manual is intended to help you enter the market with the required basic knowledge and tools to keep it as safe as you possibly can. Don't be irresponsible, take the topic of online safety seriously, even beyond the cryptocurrency space. If you act carelessly in terms of security, you expose yourself to unnecessary risks and increase the chances of your funds being compromised.

"As you are your own bank(er), you - and you alone - are responsible for your investments."

— **cryptomanuals**

Chapter 4

Do Your Own Research (DYOR)

Before you register for an exchange and rush in to get some cryptocurrency, it is vital to understand what you are purchasing. To comprehend what you are buying or supporting, you have to research the project in question and perform some due diligence.

4.1 Action plan

We advise you to take a holistic approach when it comes to your research. The story of Bitcoin and blockchain would be a great start for understanding the environment. For example, you might have heard about Bitcoin at some point and decided that it is time to read up on the subject and perhaps get some for yourself. In that case, you might want to start with the story of Bitcoin and blockchain technology which have severe implications for the future.

TIP

In appendix A you will find a wide range of sources (tables A.1 to A.5), that we've used over time to learn about Bitcoin, blockchain, cryptocurrency, money, and economics.

Another example - and a logical next step - might be that you want to get involved with some of the alternative cryptocurrencies (altcoins) which are out there in droves. It is essential to understand that Bitcoin and blockchain are the fundamentals and it is crucial to understand these principles (at least in a general sense) before moving on to specific projects that involve cryptocurrency and are based on and make use of blockchain technology. Again, there is much information to be found on the subject of doing your research, which we will summarize in a concise checklist of elements. In appendix A you will find a broad range of tabulated resources (tables A.1 to A.5), in which we have documented some of the resources we have used in our research efforts.

4.2 Fundamental analysis

Typically, when investing in a company, fundamentals are key. The financial reports, the numbers, the performance of previous years and transparency are of vital importance to you being comfortable with your investments. Performing proper fundamental analysis of your prospective investments will drastically reduce your risk and will provide you with confidence regarding your own investment decisions.

When considering cryptocurrency and blockchain projects, which are still in their infancy stages, there are usually no financial reports, there is no track record of past performance, and many people base their decisions on speculation or hype. A company or corporation is centralized where a blockchain-based project can be designed fully decentralized. The community drives the development of these projects. You can consider the following elements when performing your fundamental analysis on your project of choice. From our own experience: it is effortless to get enthusiastic about a project which inevitably leads to forgetting to do your due diligence.

1. Technological Foundations

- How strong or innovative is the technology?
- Are there bugs, network issues or vulnerabilities?
- How good is the codebase?
- What is the trade-off between speed, scalability, and security

2. Usefulness

- Short term utility? Long term utility?
- Does this project, and the corresponding token intend to solve a problem?
- Is it better than what we already have? Why?
- Is there a foreseeable demand for the token? Is it useful?

3. Development Team

- Does this project have a dedicated development team?
- How strong are their credentials?
- What is each member's previous experience?
- Active contributions? Check commit history or activity on GitHub?
- How is the project funded?

4. Community

- Is there a passionate and friendly community behind the project?
- What is the level of activity in the community? How are people contributing?

5. Governance

- Is the project decentralized?
- Is the project open-source? Can you inspect the code for instance?
- Company funding, venture capital, foundation backing?
- Voting? Community influence?

How are you going to obtain all of this information? From what sources? For a total overview of the cryptocurrency market, we recommend starting at CoinMarketCap. This site provides information regarding the total market capitalization (and other metrics) of the cryptocurrency space and specifics on all of the enlisted projects. It also provides you with the links to the project website, social feeds, chats and source code. For fundamental analysis, the primary source of information is most likely the project's whitepaper, which is published by the development team. You will find the whitepapers on their respective websites. The whitepapers outline the vision, mission, problem statement and proposed solution and technical properties of the token or coin. In addition to the whitepaper, you should seek information regarding the level of activity of the developers and community. An excellent place to start would be the official social media and communication channels that the project has set up. You will find this information on the project website.

STATE OF THE DAPPS

State of the DApps is a not-for-profit curated directory of Decentralized Applications, also called DApps, which run on various several blockchains. State of the DApps was initially created to categorize and showcase developed projects built on the Ethereum Blockchain, but more recently they have added support for EOS, POA and Steem as well. The inspiration for the State of the DApps came from FreshMeat, now known as FreeCode. FreeCode is a site reference for Linux users, which hosts a big inventory of the open source applications, games and all sources for Linux. In the State of the DApps there are many projects covering different fields such as health, games, virtual reality, artificial intelligence, education, registries, job markets, tinder for horses and many more.

[State of the DApps; Learn more about DApps](#)

Project progression and development

It is essential to follow the projects' progression to assess if they are taking their road-maps, timelines, and deadlines seriously and if they are transparent in their communication with the community. Other sources include community forums and video and blog sites. All these sources are a reliable way of obtaining diversified information and feedback from the community. Your effort stimulates the development of your understanding of what is going on

with this particular project. You will spend quite some time reading or watching videos, but this is undoubtedly required and will aid you in developing your personal opinion and beliefs. Obtaining diverse information, which you have gathered yourself, based on your experience, forms a crucial part of your decision whether to invest or not.

TIP

The cryptocurrency world is alive on Twitter! There are plenty of alternatives, but Twitter is 'the place to be'. Do you want to stay up to date with the latest developments within the cryptocurrency environment? Be sure to follow us on Twitter.

[Follow the Rabbit](#) op Twitter.

4.3 Coin statistics

Now that you have thoroughly investigated your potential future buy by doing your research as mentioned above, you could have a look at the statistics of the coin or token. Again, you will find many of these elements in the whitepaper, and usually, you will find at least some statistics and metrics while performing a certain degree of fundamental analysis.

1. Supply

- Capped or Uncapped? Circulating vs. Total Supply?
- Current Supply?
- Emission and Inflation?
- Distribution? Token Holders, Development Team, Marketing?

2. Algorithm

- Block Time and Confirmations
- Consensus Mechanism? Proof of Work, Proof of Stake or something complete else?
- ASIC Resistance?

3. Market Capitalization, Trading Volume, and Liquidity

- Check coin metrics on platforms such as listed in table A.3
- Check ratios of Daily Trading Volume to Market Cap

4.4 Technical analysis

Technical analysis is a trading tool employed to evaluate securities and identify trading opportunities by analyzing statistics gathered from trading activity, such as price movement and volume. Unlike fundamental analysts,

who attempt to evaluate a security's intrinsic value, technical analysts focus on charts of price movement and various analytical tools to evaluate a security's strength or weakness. Technical analysts believe past trading activity, and price changes of securities are better indicators of their likely future price movements than the intrinsic value of the securities themselves. They think that the fundamental value is included in the stock or coin price.

Traders have many tools at their disposal provided by the technical analysis (TA), which can be used to analyze charts. Traders use technical analysis as a basis on which they time their buy and sell decisions. However, if you are not an experienced trader and have no clue what technical analysis is, you could learn the basics to prepare yourself with the knowledge to assess the optimal entry or exit point in this volatile market.

TIP

Learn more about the most popular trading-indicators such as the Bollinger Bands (BB), Relative Strength Index (RSI) and Moving Average Convergence Divergence (MACD) in [this article](#).

Go to [TradingView](#) and add cryptocurrencies to your watchlist to track price movements.

There are several platforms you could use to have a go at technical analysis, and there are even platforms that provide you with several indexes and a whole bunch of aggregated services. [TradingView](#) offers a platform to analyze charts of different markets which also hosts a community of active traders who post and share trading ideas. [CoinCheckUp](#) is a research platform which offers - among other things - different analysis methods and tools to help you get started. There are plenty more sources and platforms you could use, which we leave up to you to discover.

4.5 Market psychology & market sentiment

The technical analysis aspects contribute to the economics of supply and demand at certain price levels of the (digital) asset. Market psychology and market sentiment also play a considerable part. The market for any (digital) asset consists of people, businesses and institutions from all over the world, all of which tend to behave both rational and irrational, and when markets move, emotions play a significant role. Recognizing this will be vital for success.

4.5.1 Bear markets

When bear markets hit, there is fear, uncertainty, and doubt (FUD) and people tend to sell since the news is overwhelmingly negative. Bear markets can last for a very long time, which eliminates weak hands early on in the process.



Figure 4.1: Market psychology is essentially what drives the so-called “bear” and “bull” markets. In every stage of the emotional cycle, there are decisions to be made by investors.

Source: Brightscope; Research and Data.

Furthermore, people who base their actions on what they see or hear usually failed to do fundamental research in the first place. In these scenarios, if you have performed your due diligence and feel confident about your previous investment decisions, you will have the strength to hold on for dear life (HODL). In other words, which enables you to ride out the storm and survive the potential onslaught of a cryptocurrency bear market. When sentiment is low, and selling seems to be the way to go - think again because it might be time to buy. If you didn't acquire any securities, stocks or coins, bear markets are an excellent time to consider entering the market, providing you to do the research. When timing buy-ins, technical analysis can come into play. You should feel more confident due to your fundamental analysis efforts and have just spotted an overall negative market sentiment. People are selling, as indicated by the price and chart movement.

4.5.2 Bull markets

When bull markets hit, there is a high degree of fear of missing out (FOMO), which can lead to overpriced stock. Trading volumes skyrocket and everybody seems to join in on the hype. Again, market sentiment and psychology play a huge role and are usually severely influenced by a torrent of positive news which creates a feedback loop. At the end of a bull run, the overpriced stocks plummet which may cause additional risk if you didn't time your exit point carefully.

Keep in mind, the price is what you pay, and value is what you get – pay too high a price, and returns are decimated. The value of a stock is relative to the number of earnings it will generate over the life of its business. In particular,



Figure 4.2: Fear, Uncertainty and Doubt (FUD) evolves into Fear Of Missing Out (FOMO).

this value is determined by discounting all future cash flows back to a present value, the intrinsic value. When you buy in too high (at unsustainable price levels) - the return that arises as an asset gravitates back to its intrinsic value over time will erode. Act greedy when others are fearful and reap enhanced profits. Explained; buy low, sell high and try to keep those emotions in check while making important decisions.

TIP

Learn to control your emotions when making important decisions. Keep thinking critically, draw up a strategy, and be aware of the prevailing market sentiments and market psychology at the moment you decide to buy-in or buy-out.

Part I

DOWN THE RABBIT HOLE

Chapter 5

HISTORY OF MONEY

How did we get here? How do we transfer value, and how did we do this in the past? When you think about it, what is currency and what is money? Throughout history, people exchanged value from one person to another through trade, bartering, exchange of goods and services but mostly by using something we call money. The crisis of 2008 showed us how vulnerable the current monetary system is. The current system is inherently flawed, debt-based and unsustainable. It benefits the few, not the many. If and when distributed ledger technology is implemented for the greater good, the potential for disruption is massive, particularly in the financial services industry. Before we go there, let's first discuss the history of money, fiat currency and the current monetary system and policies of today.

All Fiat Currencies become Worthless

Through recorded history, no fiat currency has survived, all fiat currencies that ever existed ended up with an intrinsic value of zero ([thebigreset](#)).

5.1 Properties of money

Money dates back to thousands of years. However, the money we have and use today is very different from the money we had in the past. Let's look at some of the most important properties of sound money as defined by worldwide bestselling author and internationally renowned expert on the history of money, Mike Maloney. In his book Guide to Investing in Gold & Silver: Protect your Financial Future, Mike states that the following characteristics define sound money:

- (a) Money is a medium of exchange
- (b) Money is a unit of account
- (c) Money is durable and does not spoil or corrode

- (d) Money is portable
- (e) Money is divisible
- (f) Money is fungible (each unit is interchangeable)
- (g) **Money is a true store of value over time**

5.2 Sound money

The first sound money system which was used in any known civilization was based on physical gold and silver. Pure, minted coins ensured that governments, unilateral organizations and bankers were kept in check as they could not create new currency out of thin air. A currency was either sound money or backed by sound money. In the case of civilizations that used real gold and silver coins, problems only occurred after governments started debasing their coinage, meaning melting down your currency and adding an inferior base metal to increase the total coin supply **goldsilver ep2**.

5.2.1 Store of value over time

The supply of gold is finite, effectively making it a scarce resource, both historically and today. It has and will always be necessary for people that money maintains its store of value over time. Assuring store of value over a long period is a prime example of what makes a commodity such as gold sound money. To top this off, nobody can produce or create more gold out of thin air, unlike the debt-based fiat currency based system we know today.

“In 500 BC, you could buy a Roman senator’s Toga for one ounce of gold, you could purchase a Brooks Brothers suit in the 19th century for one ounce of gold, and today a new Italian suit is worth one ounce of gold.”

— R.W. Jastram

5.3 Fake Money, Fake System

Unfortunately, today, countries no longer back up their currencies with commodities. For example, let's look at the pounds sterling (£) and the U.S. dollar (US\$), which we know as money today but are, in fact, just currencies.

The inherent flaws of the capitalist system have led us through several business and financial cycles that have resulted in the so-called “booms” and “busts” in asset prices. Ever since the \$USD went off the gold-standard in 1971, there have been no restrictions in terms of the money supply as it is no longer backed by sound money. Eventually, this leads to a situation where financial products, which add no value to the economy, are created exponentially.

In the process, intermediaries, middlemen and banks, who are the creators of those debt products, have made much profit and have simultaneously created an enormous amount of debt. Moreover, as financial products increase, the ratio of money that goes to products or services that add value to the economy and society is decreasing. The financial sector is booming, as there are no restrictions regarding the money supply, which allows them to conjure up credit out of thin air in forms of debts and loans and make money off interests. Debt is the product of the financial industry, and debt is how they are making a killing.

Nixon shock - off the gold standard

Since the United States cancelled the convertibility of the US\$ to gold with the "Nixon Shock" in the 70s, national currencies have had freely floating exchange rates. Central banks' monetary policies have mainly dictated these rates. In 1971, the Nixon administration took the international dollar off the gold standard and from this moment the U.S. reverted to a system which depended only on fiat currency where the US\$ was backed only by debts and promises.

This decision still affects the world today because the US\$ was - and still is - the global reserve currency. Ever since, banks and financial intermediaries but also as well as currency creators, such as the U.S. Federal Reserve, Bank of Japan, European Central Bank (ECB) and Bank of China have had a lot of control and influence over the money supply.

5.4 Fiat currency

Fiat currency is a currency that exists at the dictate or by fiat from a government (fiat is a Latin word for a currency that is circulating by force). Fiat currencies are indeed abundant and widely available within the jurisdictions where they are accepted. Modern paper money and coins, along with their digital counterparts, are durable enough; however, fiat money can no longer claim to have any intrinsic value. Its value is perceived based on faith, and that faith originates from the respective government backing and a national or international trust in the stability of the currency.

No government or bank has ever been able to discipline its monetary policy. History has shown that implementing a fiat currency model makes it easier for any government to do any of the following (there is no limit since the currency itself has no intrinsic value and is unbacked by sound money such as gold);

- (a) Increase the money supply through borrowing
- (b) Increase the money supply through simply printing
- (c) Increase spending (the particularly harmful deficit spending of currency we don't have)

- (d) Impose burdensome regulations on small businesses and implement monetary policies to expand its control further

Throughout history, no fiat currency has ever survived, and all fiat currencies that have ever existed went to a value of zero **fiattozero1; fiattozero2**. If you compare this to gold, this is entirely different. It doesn't matter if a gold coin has a value of \$120 or \$15000. The value lies in what real goods or services you can buy with it, not the absolute value expressed in some (national) fiat currency.

"Paper money eventually returns to its intrinsic value - zero."

— Voltaire

5.5 Purchasing power

Comparing gold to any fiat currency is like comparing apples to oranges. This is the same if we talk about paper fiat currency (cash) or digital fiat currency (on your bank account). Fiat currency meets two of the conditions of 'real money': it is a unit of account and a medium of exchange. However, fiat currency isn't a store of value over a long period. Any fiat currency created by any government tends to lose value over time for several reasons. One of them is inflation. Inflation is the result of too much money chasing insufficient goods, which makes your fiat currency depreciate as the money supply expands.

For example, an inflation rate of more than 2% per year, which is common nowadays in the western world, cuts your savings in terms of what you can buy with it (purchasing power) in half in 25 years. Without taking into account the consumer inflation for products; the same price for smaller quantities of the same product. Inflation occurs over a very long time, and many people do not realize that their currency is slowly but surely becoming worthless - like a time bomb set to explode. When the fiat currency based economy finally collapses after so many rounds of quantitative easing and hyperinflation kicks in - the results are usually catastrophic **weimarhyperinflation**.

Banking system

The rules of money and banking have changed every 20 or 30 years for the past three centuries, in an ongoing trial-and-error experiment in evolving a financial system, and a constant battle over whose interests it will serve. Presenting that timeline in full will take another article, but in a nutshell, we have gone from precious metal coins to government-issued paper script, privately-issued banknotes, chequebook money, gold-backed Federal Reserve Notes, unbacked Federal Reserve Notes, and the “near money” created by the shadow banking system. Money has evolved from being “stored” in the form of a physical commodity to paper representations of value, to computer bits storing information about credits and debits.

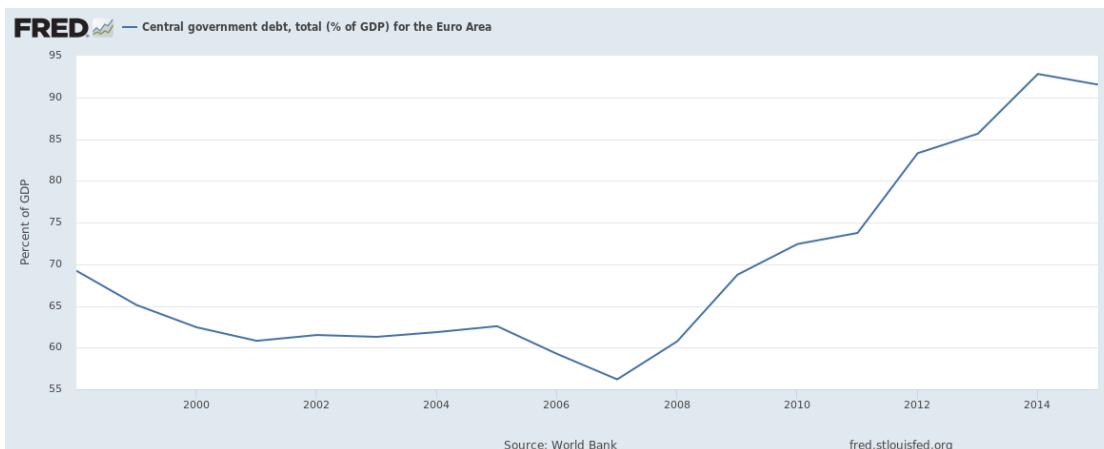
The rules have been changed before and can be changed again. Depressions, credit crises and financial collapse are not acts of God but induced by mechanical flaws or corruption in the financial system. Credit may stop flowing, but the workers, materials and markets are still there. The system needs a reboot. Hopefully, the next program that gets run will last more than 20 or 30 years. Ideally, we might mimic the ancient Mesopotamians, the oldest and most long-lasting civilization in history, and devise an economic system that lasts for millennia. **Ellen Brown**

When the world went off the gold standard, central banks and governments were not accountable to anybody or forced to restrict the money supply (as it was not pegged to something with real value anymore). Not having the requirement in place to back printed money with a physical asset has led to an explosion of debt in the financial sector. The financial industry now transacts trillions in a range of financial products, its effects are visible in many economic indicators.

5.6 Questionable monetary policy

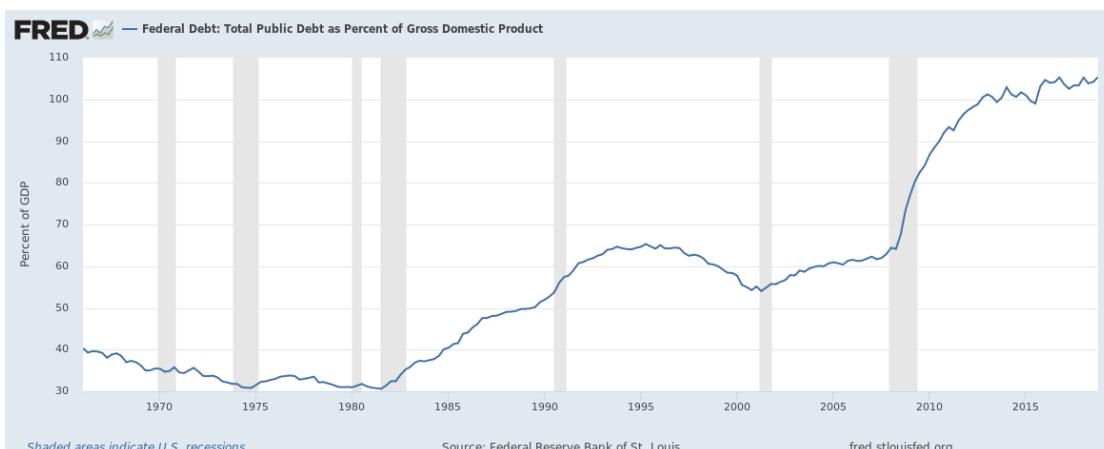
Several other factors and parties destroy the purchasing power of the fiat currency. Once a government has introduced a fiat currency, it usually can't resist the temptation of expanding the currency supply through deficit spending (increasing the public debt ceiling). Commercial banks are creating money out of thin air by fractional reserve banking. Central banks are creating money by providing loans to governments and commercial banks. On top of this, since 2008, almost all central banks all over the world such as the European Central Bank, Federal Reserve, Bank of England and the People's Bank of China have been executing the policy of what they call Quantitative Easing (QE). QE is an expansionary monetary policy whereby a central bank buys predetermined amounts of government bonds or other financial assets to stimulate the economy and increase liquidity. An unconventional form of monetary policy, it is usually used when inflation is very low or negative, and standard expansionary monetary policy has become ineffective.

Figure 5.1: Central Government debt, total % of GDP for the Euro Area



Source: Federal Reserve Bank of St. Louis, Economic Research **FRED**

Figure 5.2: Federal Government total public debt as a % of GDP for the US



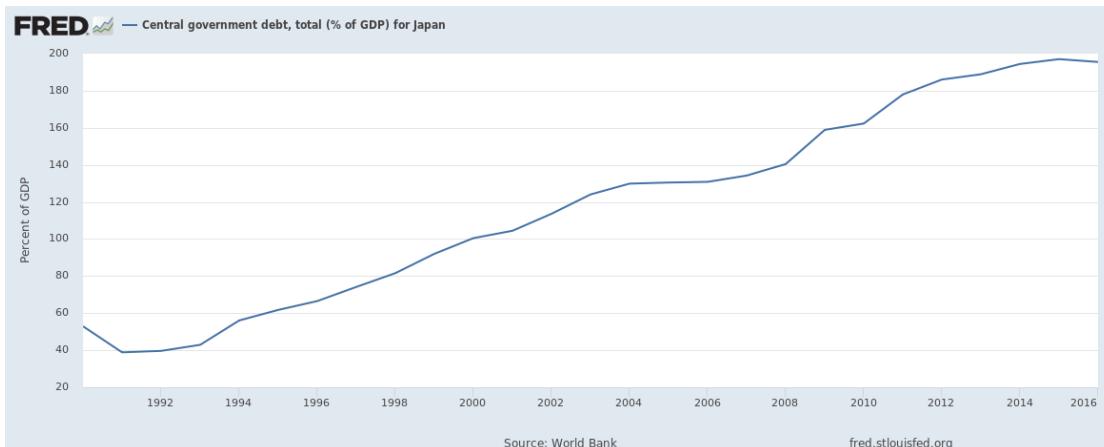
Source: Federal Reserve Bank of St. Louis, Economic Research **FRED**

This policy is nothing more than a process where the authoritative body injects an insane quantity of currency into the economy at near zero percent interest rates to serve as a stimulus for the economy. Ultimately, it's just more debt. Refer to figs. 12.1 to 12.3 for an impression of ever-increasing debt levels (as a % of GDP) for the US, EU and Japan. There are now many countries around the world where this policy is applied.

5.7 Post financial crisis 2008

The result was an even more gigantic debt bubble that heralded the financial crisis of '08. Inevitably, when interest rates are going to rise again, the lion's share of all debtors will have immense problems paying off their debts plus added interest.

Figure 5.3: Central Government debt, total % of GDP for Japan



Source: Federal Reserve Bank of St. Louis, Economic Research **FRED**

"In 2000, we had the dot-com bubble. In 2008, we had the housing bubble. In 2020, we had the everything bubble"

— Mauldin Economics

In the previous financial crashes, central banks had an opportunity to stimulate the economy by lowering interest rates, which made capital less expensive so people could lend more. Ten years after the last crash, interest rates are still near zero. Having interest close to zero provides very little to no room for lowering interest rates (again) and 'save' us from yet another depression. In 2008, they just delayed the inevitable, but in the future, we will have to deal with the consequences.

On top of this, by creating enormous amounts of fiat currency, the money supply expands, and more currency is chasing the same amount of goods and services, which results in high inflation rates. High inflation rates result in higher prices for products and services. Moreover, eventually, when all fiat (digital) currency is circulating in the economy, it could result in a global fiat currency crisis through hyperinflation. Table 12.1 shows countries with high inflation rates and note that Venezuela suffers from severe hyperinflation. Such an event has the potential to obliterate the saving accounts of entire generations, and all of our currency suddenly becomes worthless paper.

In short, the history of fiat currencies is a history of volatility. The average lifespan of a fiat currency is only twenty-seven (27) years. Even if a currency survives any longer, invariably it will experience increasing inflation. Inflation steadily erodes the purchasing power of fiat money over time. The world's oldest fiat currency, the British pound (£), is an excellent example; it has lost ninety-nine and a half per cent (99.5%) of its value since inception. Historically gold is more resilient, and holds its value better than any fiat currency and is particularly strong in times of economic instability.

"In the midst of every crisis, lies great opportunity."

— Einstein, Albert



Table 5.1: Inflation rates > 20%

Country	Inflation rates [%]		
	Q4 '18	Q1 '19	Q2 '19
Venezuela	1698488		282973
Argentina	47.1		57.3
Sudan		43.5	44.6
South Sudan	33.5		56.1
Zimbabwe	42.1		97.9
Iran	39.9		52.2
Liberia	26.6		23.3
Turkey		20.4	18.7

Source: Trading Economics. *Inflation Rate - World.* [tradingeconomics](#)

5.8 Legacy financial infrastructures

At present, we mostly rely on middlemen or intermediaries like banks, commerce platforms or governments to establish the element that allows our economy to function in a digitized space: trust. These third parties perform transactional logistics like authentication, record-keeping or payment clearance to ensure that both parties in a transaction oblige to some pre-specified terms and conditions, and thus allowing the buyer and seller to remain confident that the transaction will be executed securely and effectively. While these intermediaries are crucial to our digital economy, there are some significant issues.

- They use centralized databases which face high risks of being hacked
- They exclude billions of people, who lack access to resources and capital, from the global economy
- They charge transaction fees in the form of hefty commissions, not to mention the major timing inefficiencies
- They undermine the privacy of the users when they track and use our data as a function of their marketing efforts and business model
- They have appropriated the largest of the digital age asymmetrically, as we have wealth creation but growing economic and social inequality

Enter the New World of Blockchain

Chapter 6

FUTURE OF MONEY

After the financial crisis of 2008, people learned the hard way that the financial markets did not only experienced so-called 'booms' but also suffered from the occasional 'busts'. Many people lost money one way or the other, and many more realized their high degree of exposure to a fraudulent system. Trust in the banks, governments and the financial sector took a huge hit and has not adequately recuperated since. Around the same time, in 2008, Satoshi Nakamoto released the Bitcoin whitepaper.

Satoshi Nakamoto

One of the fundamental properties of the Bitcoin protocol is that there will never be more than 21 million Bitcoins created, and there can never be more than 21 million Bitcoins in circulation. Economies and societies tend to do better when governed by a "fixed money supply" or a "sound money system". Economies tend to do poorly in an economy which is governed by the creation of unlimited amounts of fiat currency and an ever-increasing debt bubble. Therefore, the Bitcoin protocol is fundamentally different from the current (digital) fiat currency monetary system. On one end, there is Bitcoin with its fixed supply (sometimes referred to as the 'digital gold'). On the other end, there are the (digital) fiat currency economies that print currency into oblivion and create massive debt-based societies with asset price bubbles around the globe

6.1 Gold or Bitcoin?

Golds recent surge in price and longer-term bull market confirms that money transfers to what has always been a safe-haven asset in times of crisis (i.e. when fiat currencies fail or stock markets crash). This time around, besides traditional safe-haven assets, we have a digital equivalent - Bitcoin. Although it has not yet proven to be a real store of value over time like gold (because of extreme volatility and relatively low liquidity), younger generations might

relate more to the "digital gold" of the 21st century than they relate with old-school physical gold. The first of its kind, Bitcoin originated (in essence) from the lack of trust as a result of the financial crisis in 2008 and will claim its fair market share as awareness of Bitcoin, blockchain and peer-to-peer cryptocurrencies grow.

Difference between Gold and Bitcoin

The main difference between gold and Bitcoin is that Bitcoin is deflationary and gold is inflationary (average yearly gold supply growing with 2%). If and when the system was to revert to a gold standard (or a "Bitcoin Standard" (**bitcoinstandard**)), it would drastically impact the monetary system. The financial and governmental institutions would have some restrictions and limitations in place. Thus the creation of financial products that add debt instead of long term value is restricted.

6.2 The Blockchain [R]evolution

Bitcoin utilizes blockchain technology. While an important one, Bitcoin is only one use case for blockchain. Blockchain allows people to exchange assets and perform transactions without a third party. Imagine a world where you don't need intermediaries. While traditionally we have needed central authorities to trust one another and fulfil contracts, blockchain makes it possible to have our peers guarantee that for us. However, how? Assets are no longer stored in a central place, but distributed across a global ledger, using the highest level of cryptography. When a participant conducts a transaction, it is broadcast to the network, which bundles, validates, and records these transactions as blocks in a process called mining.

Blockchain?

The act of embedding a previous block of data into the current block of data is called chaining, hence, the name blockchain.

6.3 How does Blockchain work

Let us imagine a sheet of paper that has 25 lines. When the sheet is filled up with 25 transactions, the network validates the sheet (or block) via group consensus. Once the system approves the sheet, it is added to a stack of previously approved sheets. Each sheet on the stack can be assumed to be trustworthy because, once a sheet is validated, it can't be changed. So to link our sheets together, we embed information from the previous sheet of paper into the new, recently validated sheet. In essence, a blockchain consists of bundled transactions in the form of blocks. **course:blockchain_usecases**

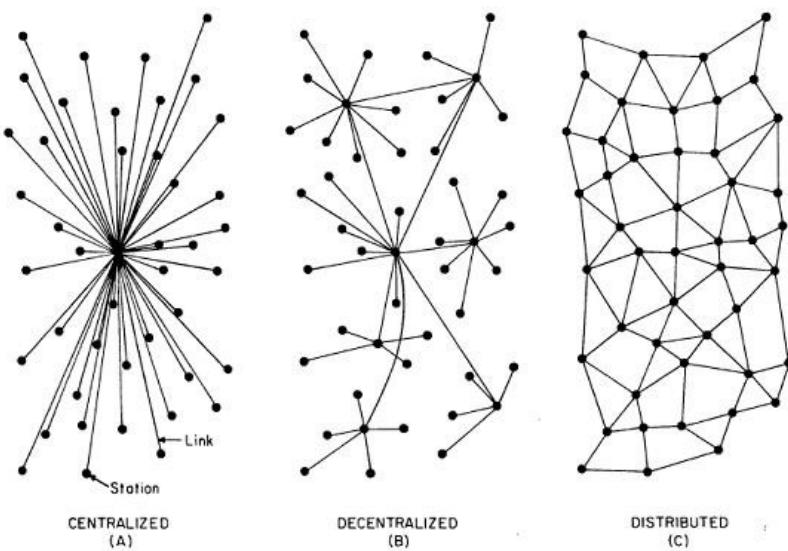


Figure 6.1: Centralized, decentralized and distributed architecture. Bitcoin is a protocol and functions as a currency which runs on distributed ledger. **lastamericanvagabond**

To compromise or hack a blockchain network, someone would have to gain control of the majority of computers in that network. Hacking or otherwise tampering with a blockchain network is extremely difficult to do but not impossible. There is much debate about blockchain safety and security and potential bad actors using it with ill will. However, compared with traditional centralized infrastructures, there is no longer a single point of failure, and this is one of the main reasons why blockchain is infinitely more secure. Furthermore, there exist multiple generations of blockchains that work toward answering most of the other questions such as network liquidity, power consumptions, scalability and speed - all required to scale globally.

"It often requires some (catastrophic) crisis to see what is in plain sight. When the next financial crisis hits us, the world economy, especially the financial sector and currencies, will suffer a massive blow, and billions of people will not have seen it coming. It is time to prepare - diversify your portfolio and manage your risks, because this time it is going to be global."

— Cryptomanuals

6.4 Huge potential but Dangerous?

In the long term, even central banks or multilateral organizations like the International Monetary Fund (IMF) will use this new technology - in the form of a central bank digital currency(CBDC) for instant payments. There are plenty of signs that indicate that distributed ledger technology might be used by some of these global agencies to implement their economic policies while

making use of fiat cryptocurrencies (a digital product that they can inflate and control) (**IMF_F&D**).

"In 1998, Wall Street bailed out the hedge funds. In 2008, central banks had to bail out Wall Street for them to survive. In the following crisis, whom do you think is going to bail out the central banks?"

— **J. Rickards**

Why do we address this in a cryptocurrency guide? Because we feel it's essential to look at both sides. This new technology has the potential to disrupt but can also be used to gain more control over populations (think 1984 by G. Orwell). For example, we are already heading toward a cashless society and less and less cash is accepted in the West. Think about factors such as e-cash, contact-less payments, credit cards, and mobile phone payments. Combine this with big data analysis of all the data we leave behind doing all sorts of social and economic transactions online. Think about your shadow identity that exists online, which is a trail of breadcrumbs left behind by you, during your time online. Google, Apple, Amazon and Facebook most likely know you better than yourself, in terms of what triggers you and what you did a few years ago on a particular day. Please take a look at China, for example, where they have implemented and are experimenting with social credit scores of individuals. China uses credit scores, obtained from cameras, online surveillance and big data analysis to rank citizens and provide either certain perks or take perks away, pending your score (**chinasocialscores**). These practices drastically affect the lives of millions of individuals. You might be severely discriminated against, depending on your ability to conform to this expected behavior and whether you show compliance to the "model citizen". Moreover, Western banks are already working with scorecards to check if you're allowed to receive credit. So these processes are already present here, although much less extreme.

"Technology is a force multiplier, it can be used for good and bad purpose"

— **Cryptomanuals**

6.5 Technology has no agenda, People do

It is essential to realize that technology has no personal agenda or objective and can be used and utilized by its creators as deemed fit. For example, planes and ships are used for both civilian and military purposes. Also, it would be safe to assume that the inventor of the wheel never anticipated Formula 1 race cars or sophisticated tanks. These are extreme examples but only serve to illustrate the fact that technology is just a tool which can be used for either good or bad things, depending on many factors.

Distributed ledger technology originated (in essence) from the financial crisis in 2008 and is here to stay. The question remains how we are going to apply this technology to utilize it to its fullest potential.

6.6 Financial-Technology Sector

Besides, this market has enormous potential when you think of the possibilities for potential growth on investments in the long term since it is still in its infancy stages. Some of these projects are here to stay, and many more are starting every day, introducing healthy competition that is going to boost the fin-tech industry. There is an ever-increasing demand for skilled people in the fin-tech sector. Businesses cannot find enough software engineers and blockchain developers, and everyone can get into it - take several free courses available on the internet to get you up to speed and develop new skill-sets that might boost your career and give you a new direction - this industry is just getting started. Not to mention the fact that the younger generations have been growing up in the digital age and the impact this makes on their lives cannot be overemphasized.

Mainly, the success of blockchain technology has already been set in stone since it's not dependent on cryptocurrency alone. Where blockchain can serve as a decentralised ledger that securely stores immutable data, we can also use it as such without the use of any cryptocurrencies. Cryptocurrencies or tokens might be used on specific networks because they have to serve a particular function. They might function as a utility token or as a means of payment to the network or to store, capture or move value around in the form of a digital currency.

6.7 Blockchain is Here to Stay

We believe blockchain is here to stay, and it will be an integral element in our future infrastructure. The challenge is to oversee and guide the adoption process. For example, it is almost inevitable that private blockchain infrastructures are going to be used by governments and corporations. Good or bad? That's a loaded question as there might be more than one answer. Even though it may sound bad for cryptocurrency or blockchain in general - adaptive governments and nimble and experimental regulation, legislation and compliance policies will be of crucial importance to propel development forward. Besides Bitcoin, there are hundreds of other projects out there that are working on solving some of the most pressing matters in our financial spheres and other industries like supply chain, healthcare, energy and content creation. We believe blockchain is here to stay, and it will be an integral element in our future infrastructure. The challenge is to oversee and guide the adoption process.

6.8 Open Blockchain Enables Inclusion

Cryptocurrencies, particularly Bitcoin, already have massive momentum. We are not predicting whether or not all of this will eventually succeed. However, we do believe that the economy works best when it works for everyone, and this new platform represents an engine which stimulates and enables

inclusion. Open blockchain significantly lowers the requirements for people to obtain access to financial services and will compete with traditional central banking models. With Bitcoin, it is also completely different in terms of spending. Open blockchains like Bitcoins do not care; they are peer to peer. You can send it from person to person, without an intermediary. In summary, when you store money at the bank (or in the possible future at corporations), the bank becomes the owner of that money. With Bitcoin, *you own your money*. When the banks own that money, they spend it as they wish. When you own it, *you* spend it as you wish. It is censorship-resistant, and no one decides on what you can or cannot spend it.

Chapter 7

HISTORY OF THE LEDGER

As blockchain technology becomes more and more entrenched in our world and societies, acceptance of its value as a store of value is slowly increasing. News releases regarding Bitcoin (BTC), Ethereum (ETH) and many other cryptocurrencies and blockchain-based projects are becoming more common as startups start to deliver on promises and expectations and more people are gradually becoming aware of the potential of blockchain technology and cryptocurrencies.

"In this exciting time in history, every kind of asset, from tickets to money, and music, can be stored, moved, exchanged, and transacted without an intermediary. People can transact peer-to-peer with the addition of trust by using blockchain technology which offers unique ways of trust through collaboration and cryptography."

— **Tapscott, Don**

7.1 The Ledger

The first blockchain component that we're going to discuss is the ledger. However, before we discuss the ledger, let's evaluate the history of the ledger briefly. The story of blockchain is closely linked with the story of accounting. Historically, humans started with no way to prove ownership, and we began with a single entry accounting system.

7.1.1 Single-entry accounting

The single-entry accounting system for the first time in human history allowed us to prove ownership of the asset. The ledger was associated with an owner. The single-entry accounting system has worked for centuries. The issue with single-entry accounting is that it mandated that there was a sole authority, which is the reason why there was the necessity for a king or a queen to control the ledger.

7.1.2 Double entry accounting

To have international trade, we needed to have at least two authorities. So, for instance, for England to trade with France, we had the owner of the ledger, the single entry ledger, in England, trading with the king or queen of France, who also had their ledger. So we needed a new form of accounting, and that's where double-entry accounting came in. Double-entry accounting is in use up until this moment. Enter blockchain.

7.2 1st generation: triple entry accounting - distributed ledger technology (DLT)

Blockchain is the very first implementation of triple entry accounting, where the network records transactions on the ledger. The third entry and triple entry accounting is cryptography, where we have a cryptographic account of the transaction stored permanently and immutably on the ledger. That is the trust that blockchain can provide.

Distributed Ledger Technology (DLT)

A ledger is a collection of transactions. It is not a collection of assets. Assets are part of a transaction, but the ledger records the transaction. The network is maintained and run by nodes. Nodes are made up of the users of a network and can be both run and maintained by individuals, companies or institutions.

The difference with blockchain is that no one owns the ledger, or all of the participants (nodes) own and maintain the ledger. The ledger is distributed (there are nodes everywhere). It is, in other words, decentralised. So, there is a copy of the ledger that exists on every node that exists on the network. So the ledger is a distributed immutable record of a collection of transactions. The Bitcoin was the first asset to be recorded as a transaction on a blockchain ledger.

7.3 2nd generation: smart contracts and decentralized applications (DApp)

Blockchain isn't just for transactions. It also extends to contracts. These are called Smart Contracts. So what are they exactly? A smart contract is a digital (coded) software program which self-executes and handles the enforcement, the management, and performance of agreements between parties. Examples of smart contracts include insurance policies, copyrighted content, escrow and lending, wills, and trusts. Smart contracts will revolutionise how we do business as they serve as an intermediary and could potentially eliminate trusted third parties which are required for many businesses today.

As we move to more modern blockchains, we start to look at blockchains such as Ethereum, which not only records the asset on the blockchain, Ethereum and other public blockchains like Ethereum, they also allow you to have a permanent and immutable collection of code, also known as a smart contract, that runs on the blockchain. So, the ledger does not store any assets but only records the transactions on the blockchain, and it also holds the code. The code that is stored on the blockchain is a smart contract. Again, a smart contract is a program that runs on the blockchain. The blockchain is a network.

7.4 3rd generation: functionality, high performance and design

Third generation blockchains are considered to be the result of working on more efficient blockchain-like solutions. It may well be that some of these projects are designing post-blockchain technology, which is a new design (and might function completely different) to get rid of the flaws and limitations of the previous generations. Some examples of projects that implement new network designs and architectures are Holochain, Sidechain and Hashgraph. Even though these technologies are different, we can refer to them as the third generation of blockchain because they further develop on some of the blockchain's key characteristics and can be used similarly. Of course, many of the third-gen projects are blockchain-based.

The main features are wider functionality and better design that helps avoid problems in areas such as:

- (a) Speed and scalability (transactions per second, network architecture)
- (b) Interoperability (cross-chain, side chains, communication)
- (c) Sustainability (energy costs, data usage, efficiency)
- (d) Privacy (online identity and sovereignty)
- (e) Governance (DAOs, communities, voting)

7.5 4th generation: improving technology and driving real-world adoption

Blockchain has come a long way in the past decade. It has logged some tremendous achievements but has come to some standstill in terms of mass adoption. While big tech-companies and corporations, a few governments, a score of Silicon Valley entrepreneurs and several thousand blockchain startups might be riding the blockchain wave, the technology itself has not yet found its way to local entities such as schools, universities, hospitals, small businesses and ordinary people.

Blockchain 4.0 seeks to break that very divide, by making the technology accessible to institutions and industries, governments and ordinary people.

The blockchain platforms of the future should be easier to use and enable widespread adoption and usage. The complexity of the underlying blockchain technology is foreseen to evaporate in the background, and it might very well be this moment in time where blockchain technology breaks through. We believe this process of adoption will spark the true disruptive potential the technology holds and propel us into the future.

There are limitless possibilities with blockchain and other technologies, not just in the now, but with things we haven't even begun to think about yet. Blockchain 4.0 will be the business-friendly, high-performance public chain that can execute real-world use cases and applications.

7.6 Emerging markets and early adopters

When you consider that the cryptocurrency market remains highly volatile and largely unregulated, it is still highly speculative to invest in any of it. The road to mass adoption is not without significant hiccups. We need to give blockchain technology time to mature. If given that time, all these daring and promising startups will have to prove themselves, just like any other company and any other technology. Even though there is much debate around the question how we should deal with blockchain and cryptocurrencies in the coming years, history shows us that, the first reactions to any major scientific breakthroughs were never all-out positive from day one.

The Internet of Value

Create a single open, global payment network, that connects everyone.

Besides, this market has enormous potential when you think of the possibilities for potential growth on investments in the long term since it is still in its infancy stages. Some of these projects are here to stay, and many more are starting every day, introducing healthy competition that is going to boost the fin-tech industry. There is an ever-increasing demand for skilled people in the fin-tech sector. Businesses cannot seem to find enough software engineers and blockchain developers, and everyone can get into it - take several free courses available on the internet to get you up to speed and develop new skill-sets that might boost your career and give you a new direction - this industry is just getting started. Not to mention the fact that the younger generations have been growing up in the digital age and the impact this makes on their lives cannot be unseen.

Chapter 8

ICE AGE OF CRYPTOCURRENCIES

As the mother of all things crypto, Bitcoin holds the lion's share in the total cryptocurrency market at the point of writing. Table 8.1 shows some key historical figures in terms of cryptocurrency market capitalisation. Please note the enormous volatility that haunts this market up until this day and the rapid increase of cryptocurrency and blockchain-based projects that make up this market. The total market cap, the volume traded over the last 24 hours, and the ratio of BTC dominance relative to total market capitalization are subject to market activity and dynamics. Hence these values are subject to change and only serve as a first insight into the cryptocurrency market development of the last few years based on only a few parameters.

8.1 Volatility

The global historical chart presented in fig. 8.1 shows an immense amount of volatility in cryptocurrency markets. As you can see, total market hovered around \$1-2B in 2013 and peaked right before 2014 up to \$10B, it then remained rather constant up to 2017 where things started moving after massive amounts of liquidity entered the market. It has since then peaked at just over \$800B in early 2018 and has been receding ever since, with the occasional upward movements over a relatively small time-span. Speculation and hype drove market capitalization through the roof in late 2017 and early 2018. Everybody was talking about cryptocurrency and blockchain in those days, but regular fear-mongering sentiment was much around, and people were very skeptical of the future of cryptocurrency.

8.2 Global Cryptocurrency Market Perspective

What we believe to be very important and a thing we specifically want to emphasize is that it is imperative to zoom out to understand the scale of this economy. All these billions of dollars might seem like much money, but let us put all that money in perspective shall we? Figure 8.2 gives you a feeling of

Table 8.1: Historical snapshots cryptocurrency market capitalisation

Q	Date	Assets	Market cap.	24h vol.	BTC dom.
Q1	1-Jan-2015	533	\$ 5,483,191,815	\$ 17,590,900	78.3%
Q2	1-Apr-2015	553	\$ 3,951,215,532	\$ 26,496,700	87.5%
Q3	1-Jul-2015	588	\$ 4,450,571,456	\$ 41,494,000	83.2%
Q4	1-Oct-2015	599	\$ 4,015,520,613	\$ 23,581,000	86.5%
Q1	1-Jan-2016	573	\$ 7,135,452,840	\$ 48,482,900	91.3%
Q2	1-Apr-2016	541	\$ 8,137,620,941	\$ 80,037,900	78.8%
Q2	1-Jul-2016	608	\$ 12,788,684,228	\$ 170,788,000	83.0%
Q4	1-Oct-2016	650	\$ 12,228,772,789	\$ 86,459,400	79.4%
Q1	1-Jan-2017	636	\$ 18,260,123,309	\$ 121,072,000	87.2%
Q2	1-Apr-2017	763	\$ 26,095,849,095	\$ 578,474,000	67.2%
Q3	1-Jul-2017	880	\$ 95,604,911,387	\$ 2,715,040,000	41.1%
Q4	1-Oct-2017	1111	\$ 148,853,058,782	\$ 2,520,660,000	48.8%
Q1	1-Jan-2018	1365	\$ 616,875,617,584	\$ 24,719,400,000	38.2%
Q2	1-Apr-2018	1557	\$ 254,298,972,658	\$ 9,942,170,000	45.4%
Q3	1-Jul-2018	1573	\$ 257,373,095,796	\$ 13,875,600,000	42.6%
Q4	1-Oct-2018	1925	\$ 222,182,499,719	\$ 15,176,969,795	51.7%
Q1	1-Jan-2019	2076	\$ 129,940,274,883	\$ 13,463,554,390	51.6%
Q2	1-Apr-2019	2138	\$ 170,879,300,093	\$ 45,035,593,451	54.4%
Q3	1-Jul-2019	2254	\$ 310,619,496,955	\$ 58,374,967,544	65.3%
Q4	1-Oct-2019	N/A	\$ 221,235,513,684	\$ 61,555,937,344	65.3%
Q1	1-Jan-2020	5154	\$ 191,542,043,659	\$ 66,156,212,697	68.3%

Source: Coinmarketcap, 27-02-2020; *Historical Market Data*.

the size of this market when compared to some of the main markets worldwide.

Can you even imagine a billion or a trillion dollars? Cryptocurrencies are a hot topic; not only during the bubble of late 2017/early 2018. However, as soon as the hype was over, the trend reversed. Due to sheer panic, many people sold their assets at terrible losses and are now determined never to touch cryptocurrencies or blockchain technology again, feeling robbed. On the other hand, many people who got in earlier (2013-2017) might have gotten rich quickly. We think that this market is about innovation and change, and the opportunity that comes with it can provide you with disruptive profits. Furthermore, it is about people and projects using new technology to bring us incredible things. The majority of people in the “west” already have access to financial applications, credit and the financial system. As long as nothing drastically impacts their standard of living, there is no immediate sense of urgency and certainly, no specific need to get to know or let alone even use Bitcoin or any other cryptocurrency for that matter.

What then, about all the people in other areas around the world who don't have easy access to financial services such as banking applications, regular bank accounts, mobile money transfers and the like. Necessity drives adoption, and if there is an urgent requirement, real-world use case and applica-



Figure 8.1: Global Market Capitalization

Source: Coinmarketcap (17-02-2020); *Global Charts*.

tion sprout naturally. Many countries where people don't have access to the financial system are already using new technology to gain access to such services. This technology has the potential to drastically impact and improve the quality of life for many people around the world.

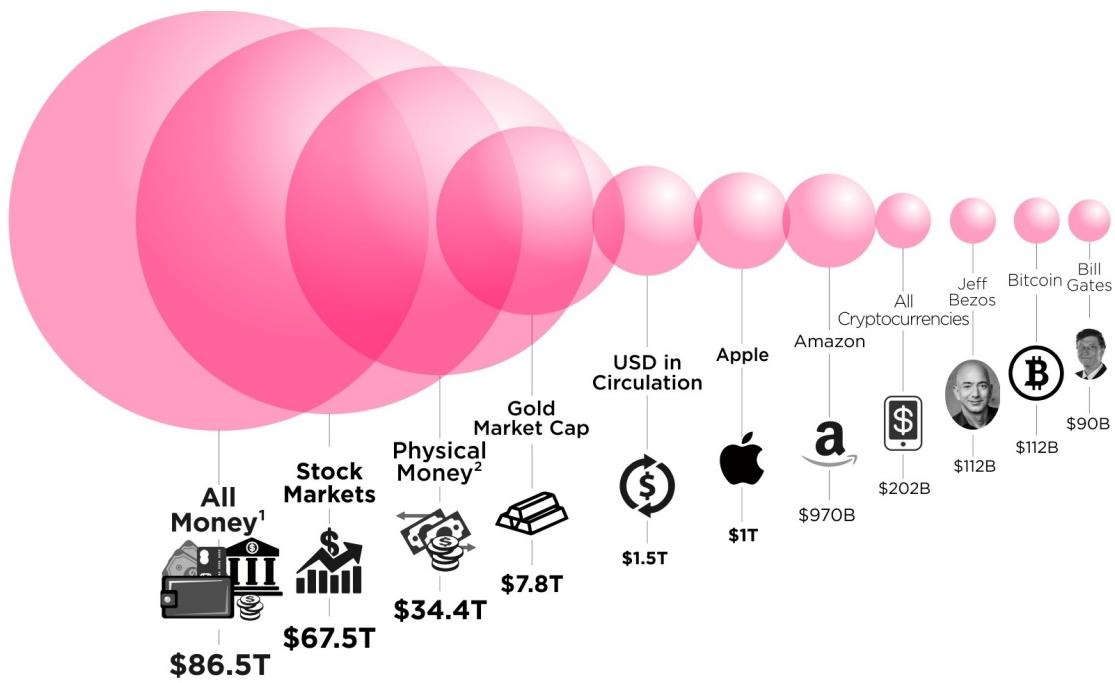
Although it sounds fantastic, many of these projects still have a very long way to go, which is precisely why this isn't a get-rich-quick scheme for us, but an investment for the (hopefully near) future. Looking at the scale of the different global markets and the stage of blockchain and cryptocurrencies at this point and the problems that are yet to be solved, it is going to take some time for this market to get rid of the volatility and speculation, create liquidity, rid itself of bad actors and get regulated. All of this and more is needed to facilitate the way to mass adoption.

Bull Market 2017/2018

Speculation and hype were the dominant market forces during the bull market in 2017/2018. Almost every asset was overvalued, and at the same time, the creation of real value was few and far between. Unsustainable and unnatural growth defined this period.

8.3 Cryptocurrency Market Compared to S&P500

The derivatives markets hold vast amounts (trillions) of dollars and might sound unfamiliar. What about some of the world's biggest companies? Let us have a look at some of the top companies listed in the S&P500 (Standard & Poor's 500 Index). The S&P500 is a market-capitalization-weighted index of the 500 largest U.S. publicly traded companies by market value. The total value of the cryptocurrency market worldwide has come fairly close to the value of a globally recognized corporation such as Apple or Amazon back in January 2018



* All figures are shown as of latest available data on September 17th, 2018

Article & Sources:
<https://howmuch.net/articles/worlds-money-in-perspective-2018>
<https://coinmarketcap.com>
<https://www.forbes.com>
<https://www.federalreserve.gov>
<https://www.cia.gov>

¹ All Money = money in any form including bank or other deposits as well as notes and coins.

² Physical Money = money in forms that can be used as a medium of exchange, generally notes, coins, and certain balances held by banks.

Figure 8.2: Cryptocurrency Market in Perspective

Source: Howmuch, 2018; *Understanding Money*.

but has dropped significantly since. Massive volatility is plaguing this emerging market due to a lack of regulation, liquidity and true fundamentals. Nevertheless, as indicated before, there are close to 6000 projects or cryptocurrencies each of which has its individual and unique goals and ambitions. Some (not all) are utilizing revolutionary new technology and can be very disrupting to existing markets (and thus companies!) in the long run. It might be possible that out of the current 6000 projects - with entrepreneurs around the world launching new projects almost every day - several next-generation companies are bound to emerge.

Although the cryptocurrency market might have similarities with big corporations in terms of market share, the point is that many cryptocurrency projects are fundamentally different from regular companies or corporations in the way they operate and function. We highly anticipate at least several successes where blockchain-based projects might have a considerable disruptive impact. In the long term, this will lead to an increase in market share, which is driven by the revolutionary new fundamentals and business models of these new businesses.

8.4 Alternative Cryptocurrencies (Altcoins)

Bitcoin used to dominate the cryptocurrency market prior to the altcoin and ICO boom in 2017. “altcoin” is a combination of two words: “alt” and “coin”; alt signifying “alternative” and coin signifying Bitcoin or “cryptocurrency”. Together they imply a category of cryptocurrency that is an alternative to the digital cryptocurrency Bitcoin. After the success of Bitcoin, many other peer-to-peer digital cryptocurrencies have emerged in an attempt to imitate that success.

Altcoins

While Bitcoin was the first cryptocurrency, and the only cryptocurrency tested on the biggest scale without any significant failure, it is now only one of more than a thousand cryptocurrencies, which all seek to improve upon Bitcoin or innovate, revolutionize and disrupt in various other segments.

Many of these altcoins have built upon the necessary frameworks provided by Bitcoin or have developed their blockchain architecture. Because of the decentralised and distributed architecture of most blockchain networks, most altcoins are peer-to-peer, involving a mining process by which users solve severe problems to unlock blocks and offer efficient and cheap ways to carry out (value) transactions on the web. However, even with many overlapping features, altcoins vary widely from each other - altcoins differentiate themselves from Bitcoin with a range of procedural variations, including different consensus algorithms, transaction speeds and levels of scale-ability. They also deploy various means by which users can mine blocks and get rewarded and make use of application enhancements to - for example - increase user anonymity. As mentioned earlier, there are close to two thousand cryptocurrencies at this time, and that number is growing. Performing fundamental analysis on altcoins is a must before you make any decisions, and we've outlined the basics in our section about doing your research (chapter 4). Ever since the altcoin explosion in 2017 - Bitcoins dominance has decreased significantly due to ever-increasing numbers of promising projects.

8.5 Initial Coin Offerings (ICOs)

It is incredible to realize how much the altcoin market has grown in the last two years alone. ICOs have become so popular that well over 90% of total funds raised through this mechanism came from 2018 alone. While it's hard to put this sudden ICO explosion in context, there are animations and info-graphics^{1,2} out there that do the phenomenon sufficient justice by showing a timeline of ICOs and funds raised since early 2014.

¹Elementus (39-09-2018); [ICO Market August 2018](#).

²Visual Capitalist (30-12-2017); [The Rise of the ICO](#).

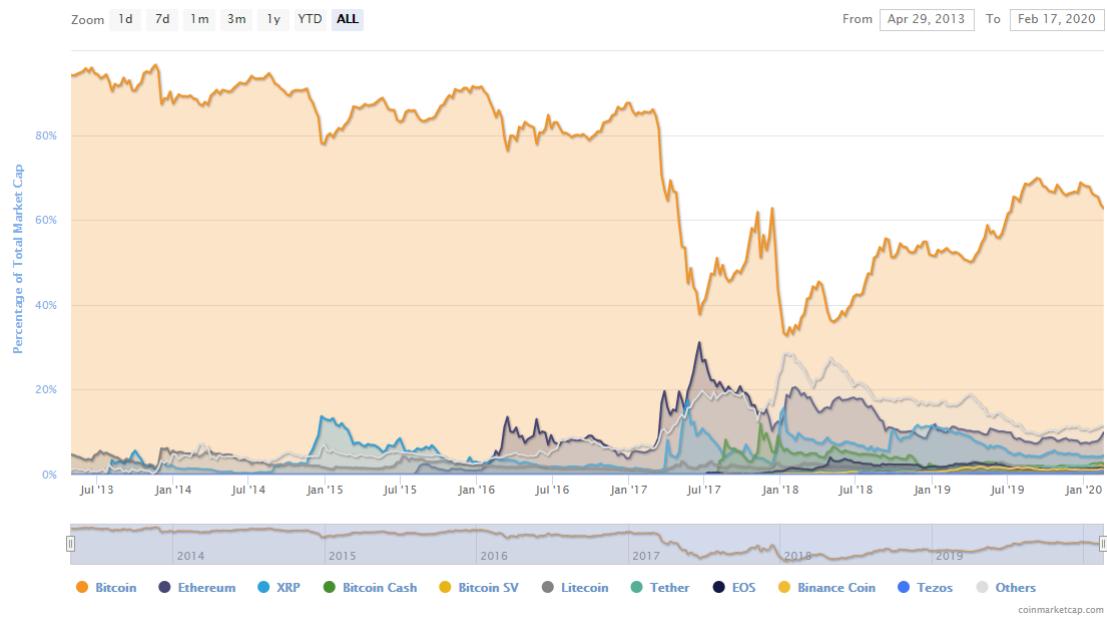


Figure 8.3: Percentage of the Global Market Cap (Dominance)

Source: Coinmarketcap (17-02-2020); *Global Charts*.

8.5.1 ICO scams

There's a big difference between a typical ICO now and one in 2017. A staggering amount of ICO's didn't even make it to an exchange - according to a study performed on the quality of ICO's by Statis.³ Most of the money is now being raised via private offerings, while public token sales have become rare. Why? Plying retail investors with high-stakes propositions that could (and often do) lose them a ton of money is not a good look. Most ICO projects these days are also taking steps to comply with regulators as almost all ICOs are considered to be securities. Bart Stephens, the co-founder of Blockchain Capital, told The Wall Street Journal that what we are seeing is the "normalization" of the ICO market.

Keep in mind that there is always a possibility that a project or a coin is a scam and be skeptical while assessing if it can deliver on what it has promised. People can lose faith, developers can have bad intentions or abandon the project, regulatory policy and compliance frameworks were not even close to being implemented in 2017 (sidelining many institutions), but the regulatory landscape is evolving rapidly. These factors might well have meant the end of your investment if you have invested at the peak of the bubble as prices plummeted and development ground to a standstill. You can check if a coin or project is reported as a scam or a dead coin on Coinopsy⁴ and on Deadcoins.⁵ This story has close ties with our section regarding how to perform your research (chapter 4) and prevent getting scammed.

³Medium (25-05-2018); [ICO quality: Development & Trading](#).

⁴Coinopsy (05-02-2019); [Dead Coins](#).

⁵Deadcoins (05-02-2019); [Full List of Dead Coins](#).

Part II

INVESTING, TRADING, MARKETS & PORTFOLIO

Chapter 9

INVESTING AND TRADING

This section covers the basics of two strategies - investing and trading - which you can deploy to help you reach your goals. Investing and trading are two very different methods of attempting to profit in the financial markets. With trading and investing, it is more about odds and probabilities than it is about certainties. You can drastically improve those odds by performing your own research (DYOR). As such, you should always dedicate some time and effort before making important decisions. Invest only in projects which you have identified as having potential or trade solely based on proper technical analysis or other research efforts.

Investing is the act of owning something, it could be an individual stock, a mutual fund, a property, or anything else you feel has less value today than you think it will have in the future. Trading is the actual transaction that occurs when you buy or sell investments. If you are an investor, typically it means you are a person who is holding on to something to earn a profit when the value increases. If you are a trader, then you are the person creating transactions. You are buying or selling the investments for yourself or others.

Traders attempt to take advantage of short term market swings, while investors take a more long term approach. Both investors and traders seek profits through market participation. In general, investors seek more substantial returns over an extended period through buying and holding. Traders, by contrast, take advantage of both rising and falling markets to enter and exit positions over a shorter time frame, making smaller, more frequent profits.

9.1 Disclaimer

The cryptomanual is the beginning of a journey, not the end. Where we present stimulating reading material we base on multiple years of research and experience, the results should only be treated as candidates for your own (further) research, not as a buy list or set of recommendations. Screening may help narrow a search based on pre-defined criteria, but it is not a substitute for independent research reflecting your criteria for investing/trading. Where we offer our readers evaluation tools, these are solely for informational and educational purposes so that readers are equipped with the basic tools required to perform their own (e)valuations. Our content is simply a starting



Figure 9.1: Fear, Uncertainty, and Doubt (FUD) evolves into Fear Of Missing Out (FOMO)

point based on global assumptions that we have applied across the entire market - users should amend them as they deem fit and not regard them as a substitute for their own judgment.

9.2 Economic Cycles

Economic cycles or trade cycles are also known as business cycles. Solid (long-term) investment strategy should include and take into account the current position in the business cycle.

Economic cycles explained

"The economic cycle is the natural fluctuation of the economy between periods of expansion (growth) and contraction (recession). Factors such as gross domestic product (GDP), interest rates, levels of employment and consumer spending can help determine the current stage of the economic cycle. During times of expansion, investors seek to purchase companies in technology, capital goods, and primary energy sources. During times of contraction, investors look to buy shares of utility, financial and healthcare companies."^a

^aInvestopedia; [What is the Economic Cycle](#).

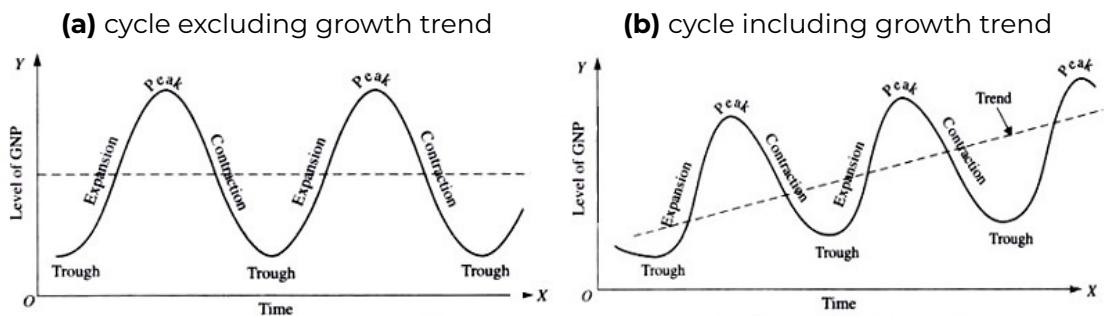


Figure 9.2: Business cycle excluding and including a generic growth trend

Source: Your Article Library; [Knowledge Sharing Platform](#).

9.2.1 Business cycles

Business cycles represent the rise and fall in production output of goods and services in an economy. Business cycles are fluctuations in economic activity within that economy, which it experiences over many years or decades. These fluctuations include output from all sectors, including households, non-profits (NGOs), governments as well as other business outputs. Periods of economic expansion and contraction characterize the business cycle. During an expansion, the economy experiences growth, while a contraction (recession) represents a period of economic downturn or decline. Figures 9.2a and 9.2b show the typical stages of the business cycle: expansion, peak, recession or contraction, depression, trough, and recovery. Some economists believe that the business cycle is a natural part of the economy. Others believe that central banks indirectly control and influence the cycle by intervening with monetary policy.

9.2.2 Credit cycles driving business cycles

The credit cycle embodies the expansion and contraction and represents access to credit over time. It describes recurring phases of easy and tight borrowing and lending within the economy. Some economists, including Hyman Minsky and Steve Keen, regard credit cycles as the fundamental process driving the business cycle. A credit cycle describes the phases of access to credit by borrowers. Credit cycles first go through periods in which funds are relatively easy to borrow; lower interest rates characterize these periods, decreasing lending requirements and an increase in the amount of available credit, which stimulates a general expansion of economic activity. A contraction follows these periods in the availability of funds. During the contraction of the credit cycle, interest rates climb, and lending rules become more strict, meaning that less credit is available for business loans, home loans, and other loans. The contraction period naturally continues until risks are reduced for the lending institutions, at which point the cycle troughs out and eventually starts over with renewed credit.

9.3 Investing Versus Trading

We tend to focus more on long term investing and wealth preservation; then we do on short term trading. Mainly originating from the fact that real value is created over a more extended period, and you can see your investments grow and develop. On top of this, trading effectively requires a lot of time, patience and effort to learn. Trading is usually not based on the fundamentals and principles of a particular cryptocurrency but based upon technical analysis of (historical) market movements, trends and price action. Trading usually involves much stress and is generally very time consuming since you're always on the clock, watching and analysing charts. Because of the technical nature of trading, you might easily overlook the intrinsic or fundamental value of a cryptocurrency or blockchain-based company or project.

With investing, this process is a little different. The fundamentals of a company or project are most important. Items such as the official whitepaper, the roadmap, community size, activeness and development are often leading. If you feel a project has a solid value proposition, it is usually related to the long term investment since many - if not all - plans are still in their infancy. For example, we could decide we want to invest in a company, which is designing a much-needed application to revolutionize voting. In itself, this has immense value, but the process of adopting this technology and implementing it in everyday life is long and tiring. You might monitor this project for a while, and if and when you are convinced it has potential and is moving in the right direction, you might decide to invest and start looking at the charts and price action. Then you analyze an optimal point of entry and determine if you feel comfortable taking a small position, after which you can expand periodically if so desired.

Here, the differences between the trading and investing approaches come into play. Traders might have bought this asset without having any personal connection with the actual product or service - they are just looking at positions with profit margins, regardless of the aim of the project itself. Therefore, they don't need to look at fundamentals since they can take advantage of fluctuating price action in minutes, hours or days. Investors feel comfortable with their investment and can ride out the storm (if there is any) where traders might sell to take fewer profits in much shorter periods.

9.4 Investing

The goal of investing is to gradually build wealth over an extended period through the buying and holding of a portfolio of stocks, baskets of stocks, mutual funds, bonds and other investment instruments. Investors often enhance their profits through compounding or reinvesting any profits and dividends into additional shares of stock. Investors often hold investments for years, or even decades, taking advantage of perks like (compounded) interest, dividends and stock splits along the way.

While markets inevitably fluctuate, investors will "ride out" the downtrends



Figure 9.3: Market psychology is essentially what drives the so called “bear” and “bull” markets. In every stage of the emotional cycle there are decisions to be made by investors.

Source: Brightscope; [Research and Data](#).

with the expectation that prices will rebound and any losses you suffered will eventually recover. Investors are typically more concerned with market fundamentals, such as price/earnings ratios and management forecasts.

Investors

Investors speculate on the development of the cryptocurrency application and its eventual adoption, which will bring about a premium over its current prices. He or she minimizes risks by doing due diligence, diversification, and portfolio management.

As a rule of thumb, when investing, ask yourself the following question; do I want and need this and if so, how badly? Do I want to use this utility in the future and is it beneficial to other people and me?

When you conclude that you feel safe with this investment, you can start looking at the optimal entry points (this is the same for both short and long term) on a platform such as [Coinigy](#) or [TradingView](#). The following highlights might be of importance:

1. Technical analysis - entry and exit points → buy low, sell high
2. Accumulation, periodic buys and dollar-cost averaging (same amount in US\$ or any other currency)
3. Don't be afraid to take profits! FOMO can lead to your emotions taking over
4. Learn to recognize your emotions and how they influence your decision making

5. Learn about your trading tools, i.e. use stop losses if so desired
6. Give your investments time to mature - try to imagine what your investment could be worth years from now
7. Periodically re-assess your situation and decide if you keep your position(s) or perhaps need to diversify, re-balance or buy/sell

9.5 Trading

Trading, on the other hand, involves the more frequent buying and selling of stock, commodities, currency pairs or other instruments such as cryptocurrencies, to generate returns that outperform buy-and-hold investing as mentioned above. While investors may be content with a 10% to 15% annual return, traders might seek a 10% return each month.

Traders

Traders speculate a specific direction of the prices based on historical data and patterns. In doing so, they minimize risk with a set of technical tools and expertise. Trading can be highly stressful, but traders may profit from both bear and bull markets at the cost of the considerable higher risk involved.

Trading profits are generated by buying at a lower price and selling at a higher price within a relatively short period. The reverse is also true: trading profits are made by selling at a higher price and buying to cover at a lower price (known as selling short) to profit in falling markets. Where buy-and-hold investors wait out less profitable positions, traders must make profits (or take losses) within a specified period, and often use a protective stop-loss order to close out losing positions at a predetermined price level automatically. Traders often employ technical analysis tools, such as moving averages and stochastic oscillators, to find high-probability trading setups.

9.5.1 Trading styles

In trading, several styles refer to the time-frame or holding period in which cryptocurrencies, stocks, commodities or other trading instruments are bought and sold. Traders generally fall into one of the four categories presented in table 9.1. Traders often choose their trading style based on factors including account size, amount of time that they can dedicate to trading, level of trading experience, personality and risk tolerance (high risk/reward ratio exposure).

9.5.2 Your emotions will impact your decision making

Whatever you want to buy, it will still be there tomorrow, and perhaps it will be even cheaper. Be aware of the following at all times and try not to let certain emotions impact your decision-making capabilities:

Table 9.1: Trading styles

Trader type	Positions held
Position	from months to years (might also be called investing)
Swing	from days to weeks
Day	throughout the day only - no overnight positions
Scalp	for seconds to minutes with no overnight positions

1. When markets move, so does overall market sentiment. People get excited and are prone to overextend. Don't overextend. Recognize hype and learn to take profits or risk losing it all.
2. Do not become emotionally attached to your investment - you will not get every trade right; do not take it personally. Always aim for rational choices, but if you're aiming at the long term, keep your investment choices in line with your personal beliefs.
3. Do not get scammed. People may have their reasons for steering you in any particular direction. Your level of due diligence is directly related to your ability to recognize and identify a potential red flag.
4. Do not panic or give in to hype (FOMO - FUD). Rationally think about your decisions, based on your analysis, which is further substantiated by your research.

9.6 3 Technical Trading Indicators for starters

1. RSI
2. STOCH
3. MACD

9.7 Entry and Exit Strategies

1. Stop Loss
2. Dollar cost average
- 3.

Chapter 10

PORTFOLIO MANAGEMENT

Portfolio management is all about making decisions. With markets, you can identify strengths, weaknesses, threats, and opportunities. While working toward a balanced investment portfolio, you are continuously aware of the context of your investment by reading up on developments and performing research. Please note that your investment portfolio is a reflection of your decisions, and if you make bold or ill-calculated moves, you will potentially end up with high risk throughout your investment portfolio. There are several essential concepts of which you should take note. Let us first discuss the critical portfolio management concepts and continue with the main types of investments and asset classes.

Opportunity Management

Some investment opportunities are considered "high risk, potentially high reward". Think about the profitability of investing in internet applications and protocols back in the day. Imagine investing in companies such as Apple and Facebook when they were still operating out of their garage. Think of Bitcoin and the development thereof. In 2008, many people lost trust in the banking system, invested in Bitcoin and took some serious risks. In hindsight, this has been a truly golden and almost once in a lifetime opportunity. What if we tell you there is more?

Asset Classes - Types of Investments

An asset class is a group of similar investments based on having similar characteristics and financial structure. These investments are typically traded in the same financial markets, subject to the same rules and regulations, and you can categorize them by location. Investors and market analysts often view investments in domestic securities, foreign or international investments, and investments in emerging markets as different categories of investments.

10.1 Stocks or Equities

Equities are shares of ownership that are issued by publicly-traded companies and traded on stock exchanges (such as the New York Stock Exchange, NASDAQ, London Stock Exchange, and Hong Kong Stock Exchange) You can potentially profit from equities either through a rise in the share price or by receiving dividends.

10.2 Real Estate and Land

Real estate is a real (tangible) property made up of land as well as anything on it, including buildings, flora and fauna and natural resources such as crops, minerals or water. Real estate investing involves the purchase, ownership, management, rental or sale of real estate for profit. Real-estate is an asset form with limited liquidity relative to other investments; it is also capital intensive and is highly cash flow dependent. If these factors are not well understood and managed by the investor, real estate could become a risky investment.

10.3 Commodities

Commodities are basic goods used in commerce which are interchangeable with other commodities of the same type. Some of the more commonly traded commodities are gold, beef, lumber, oil and natural gas. Other examples include silver, copper, iron ore, salt, sugar, tea, coffee and more - you get the picture. Commodities are used as inputs in the production of other goods or services. The quality of a given commodity may differ slightly, but it is essentially uniform across producers. When participants buy or sell commodities on an exchange, they must also meet specified minimum standards, also known as a basis grade.

10.4 Bonds and Fixed Income Investments

Bonds and other fixed-income investments are investments in debt securities such as corporate or government bonds that pay a fixed rate of return in the form of interest.

10.5 Futures and other Financial Derivatives

This category includes futures contracts, the foreign exchange (forex, FX) market, options, and an expanding array of financial derivatives, i.e., financial instruments that are based on or derived from, an underlying asset. For example, stock options are a derivative of the underlying stocks.

10.6 Cash or Cash Equivalents

The primary advantage of cash or cash equivalent investments is their liquidity. Money held in the form of cash or cash equivalents can be quickly and easily accessed and traded at any time.

10.7 Cryptocurrencies

ICOs and cryptocurrencies (such as Bitcoin) can also be considered to be a subclass of cash or cash equivalents but although they are less liquid, more volatile and also often considered as high risk. Cryptocurrencies have high potential, and the long bear-market of 2018 is again providing plenty of opportunity for the avid risk-taker.

10.7.1 Cryptocurrencies - categories and classification

The market for cryptocurrencies and tokens has exploded. The cryptocurrency space got its start with Bitcoin, a decentralized peer-to-peer cryptocurrency. Then Ethereum created a functional token, Ether (ETH) that acts as “gas” to a decentralized computer operating system. Many other tokens followed. A dynamic, rapidly-growing market to buy, sell and trade cryptocurrencies and tokens has been the result. There are now thousands of tokens - also, a myriad of token offerings, often known as a “ICO”. While there is substantial public interest and demand for cryptocurrencies and tokens, there is little knowledge and structure to classify and organize tokens. The names that label tokens are mostly organic and not yet standardized.¹

Class 1: Utility and Functional Tokens

“The first class of tokens is functional or utility tokens. The values of these tokens are derived from the thing to which they provide access. A bridge token that allows access to a bridge has a price derived by how much people are willing to pay to cross the bridge. Ether has a price that is derived by how much people are willing to pay for access to the Ethereum Virtual Machine or the distributed worldwide computer that runs Ethereum Applications. ETHOS is an ERC20 functional token spawn out of the Ethereum ecosystem that builds on the Ethereum Protocol Layer 4 as a set of applications providing access to the Ethos ecosystem. This ecosystem allows users, businesses, and institutions the ability to create financial applications powered by open standards. These tokens are closest to virtual commodities like oil, gas, steel, grain or gold.”

¹Ethos (2017/2018); [Ethos Token Classification System: A Framework for Understanding Types of Blockchain Based Tokens](#).

Class 2: Cryptocurrencies or Transactional Tokens

"The second class of tokens is transactional tokens or cryptocurrencies. These tokens don't have any 'inherent' value, but they derive value from the network effect and belief that these tokens have value. Similarly, fiat currency is widely accepted as something that has value; Bitcoin has been widely accepted by people around the world to have value. Cryptocurrencies are harder to understand intuitively and are often criticized as being bubbles with no fundamental value backing them. These tokens are closest to the virtual property since they are scarce, but unlike property, you can't use them as a place to live. It is unclear whether currencies in this category should be regulated as property, commodities or even currencies."

Class 3: Representation - Tokenized Securities

"The third type of token is tokenized securities. These tokens derive value by representing something else of value - the most common being a share of a company. The value proposition behind these tokens is evident, but need to be highly regulated just like any securities market and exchange should be. Ethereum provides an incredibly powerful platform for tokenized securities and the means to regulate them if appropriately constructed. Tokens that fall under this category should be regulated as securities."

10.8 Other Investments

These might include artwork, various other collectibles, peer to peer lending, hedge funds, private investments (private equity, venture capital, angel investing). Generally speaking, alternative investments experience less liquidity and are riskier. Risk and liquidity are both depending on the position in the business cycle.

10.9 Key Concepts

All investors should understand a few essential investment concepts, including how to evaluate investment performance, asset allocation, diversification, rebalancing and the role that risk plays in virtually all aspects of investing.²

10.9.1 Evaluation of investment performance

Choosing investments is just the beginning of your work as an investor. As time goes by, you'll need to monitor the performance of these investments to see how they are working together in your portfolio to help you progress

²Finra; [Key Investing Topics](#).

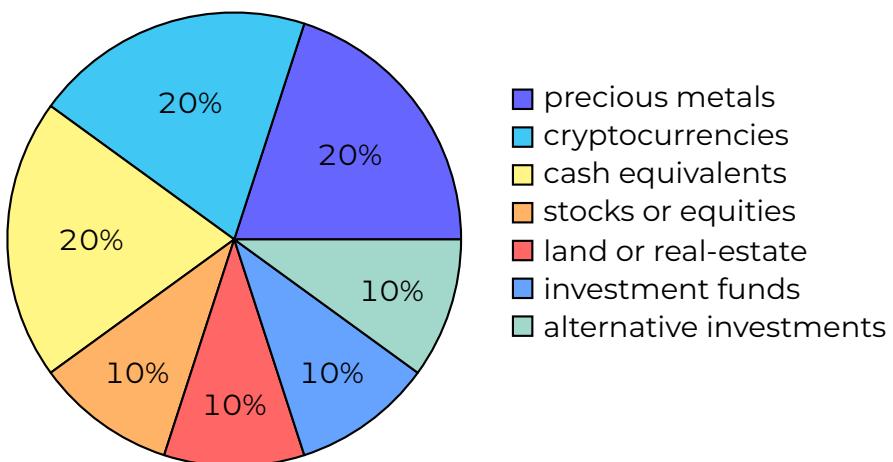


Figure 10.1: Portfolio allocation example

toward your goals. Generally speaking, progress means that your portfolio value is steadily increasing, even though one or more of your investments may have lost value.

If your investments are not showing any gains or your account value is slipping, you'll have to determine why and decide on your next move. Also, because investment markets change all the time, you'll want to be alert to opportunities to improve your portfolio's performance, perhaps by diversifying into a different sector of the economy or allocating part of your portfolio to international investments. To free up money to make these new purchases, you may want to sell individual investments that have not performed well, while not abandoning the asset allocation you've selected as appropriate.

10.9.2 Asset allocation

When you allocate your assets, you decide - usually on a percentage basis - what portion of your total portfolio to invest in different asset classes, like stocks, bonds, and cash or cash equivalents. You can make these investments either directly by purchasing individual securities or indirectly by choosing funds that invest in those securities. As you build a more extensive portfolio, you may also include other asset classes, such as real estate, which can help spread out, and thus moderate, your investment risk.

Asset allocation is a useful tool to manage systematic risk because different categories of investments respond to changing economic and political conditions in different ways. By including different asset classes in your portfolio, you increase the probability of some of your investments providing satisfactory returns even if others are flat or losing value. The practice of reducing investment portfolio risk by diversifying your investments across different asset classes and subclasses is referred to as asset allocation. An example portfolio and some generic portfolio allocations are shown in figs. 10.1 to 10.3 - let your imagination do the rest.

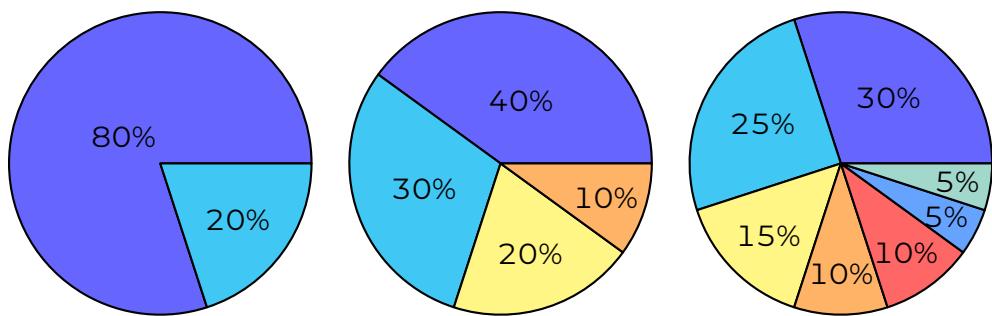


Figure 10.2: Generic portfolio allocation - left to right, high to lower risk

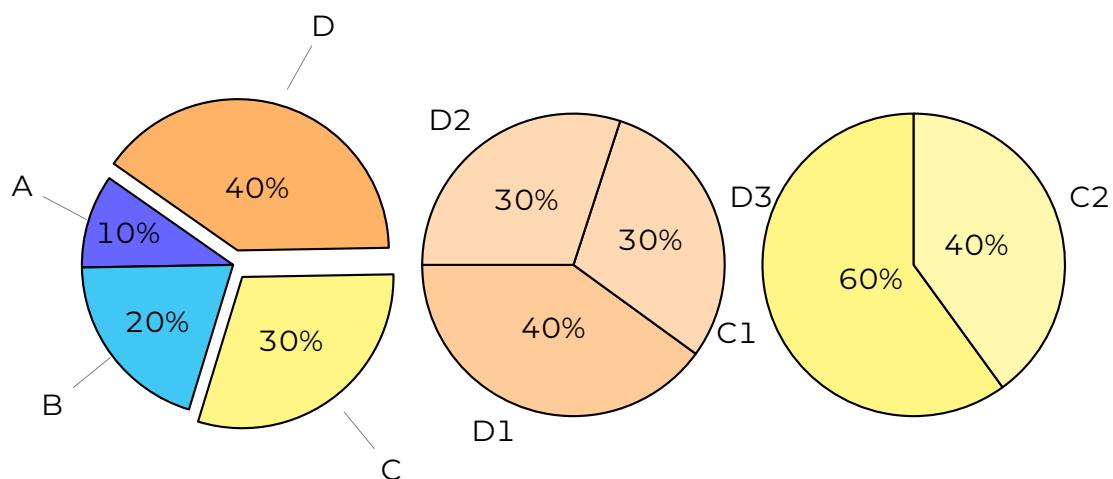


Figure 10.3: Generic representation of sub-classes within asset classes

10.9.3 Diversifying your portfolio

When you diversify, you aim to manage your risk by spreading out your investments. You can expand and diversify both within and among different asset classes. You can also diversify within asset classes, in which case they are referred to as sub-classes. For example, you divide the money you've allocated to a particular asset class, such as stocks, among various categories of investments that belong to that asset class. An investor may own different commodities such as gold, silver and palladium, but at the same time, trade in oil and coffee beans. By simultaneously holding multiple sub-classes that are not correlated, you are effectively reducing risk.

"It often requires some (catastrophic) crisis to see what is in plain sight. When the next financial crisis hits us, the world economy, especially the financial sector and currencies, will suffer a massive blow, and billions of people will not have seen it coming. It is time to prepare - diversify out of fiat currencies, because this time it is global."

— **Cryptomanuals**

10.9.4 Re-balancing your portfolio

As market performance alters the values of your asset classes, you may find that your asset allocation no longer provides the balance of growth and return that you want. In that case, you may want to consider adjusting your holdings and stabilizing your portfolio. Assets grow at different rates - which means that your portfolio might end up out of line with the allocation you have chosen. For example, some assets might recently have grown at a much faster rate. To compensate, you might reallocate some of the value of fast-growing assets into assets with slower recent growth, which may now be poised to pick up steam while recent high-performers slow down. Otherwise, you might end up with a portfolio that carries more risk and provides a smaller long-term return than you intended.

You can reallocate holdings in your portfolio in different ways to bring it back in line with the allocation balance you intend it to have. Here are three common approaches to rebalancing:

- (a) Redirect money to the lagging asset classes until they return to the percentage of your total portfolio that they held in your original allocation.
- (b) Add new investments to the lagging asset classes, concentrating a larger percentage of your contributions to those classes.
- (c) Sell off a portion of your holdings within the asset classes that are outperforming others. You may then reinvest the profits in the lagging asset classes.

How you rebalance your portfolio depends entirely on your preferences and the current situation. In general, people are more comfortable with the

first two alternatives than the third. People often find themselves attached to investments, which are performing well and find it hard to let them go. If they let them go, they would be able to take profits and invest these profits into the under-performing investments.

Moreover, remember that if you invest in the lagging and under-performing classes, you will be positioned to benefit quite handsomely if they turn around and begin to thrive again. Don't become too emotionally attached to the investments, or you won't be ready to sell them when the opportunity arises.

10.10 Recommendations

There are some essentials, which require additional attention when investing or trading and managing your investment or trading portfolio. It is not the most exhaustive list but includes that which we have found to be crucial so far, and we will continue to modify and fine-tune the list as we progress and develop. We want to emphasize that many things ultimately come down to your preference, personality and style - the way you handle it. This information serves as an anchor for people with limited knowledge and experience regarding these practices. Ultimately, it comes down to the investors doing their research. Basic fundamental analysis is considered an absolute minimum requirement for any investment. Pair this with some technical analysis for the optimal entry point, and you will be off to a good start.

- I Research. Especially regarding cryptocurrencies, there are more projects than you can count and plenty of use cases in almost every industry niche. There's an astonishing amount of investment opportunity in the cryptocurrency sector, but it is extremely speculative unless you are well aware of the landscape and know what you are doing. Rash decisions can easily make you lose your investments.
- II Never invest more than you can afford to lose. Invest using expendable income only; you should never be using lines of credit or rent money.
- III Patience. Don't go on a shopping spree if investing for the long term and acquire too many (undiversified) assets too soon. Think in years, months and quarters instead of months, weeks and days and always have some reserves for when prices are low.
- IV Asset allocation. Don't spread your positions too thin over too many assets (i.e. twenty different assets with small positions). Again, diversification is key.
- V Diversification. Try to cover different industries and market niches (cryptocurrencies, commodities - precious metals such as gold or silver, stocks or equities, real estate or land).
- VI Rebalancing and re-evaluating your portfolio occasionally is a perfect exercise. Make deliberate choices based on real and verified information.

Part III

CRYPTOWORLD

DOWN THE RABBIT HOLE

Chapter 11

BITCOIN AND THE BLOCKCHAIN [R]EVOLUTION

We stand at the verge of a technological revolution that will fundamentally change the way we live our lives, perhaps even without us being aware of all of it. The immense scale, scope and complexity of this transformation will be unlike anything we have experienced before, and we cannot yet be confident how this scenario is going to play out. One could argue this technological revolution will have the same impact as the internet had if not more.

Internet is everywhere

Think of all the applications that make use of the internet (what does not?). Think about the daily lives of people around the world and about the apps we all use daily. For example, think about the impact e-mail had historically. First, it took at least five days to send a letter from Switzerland to South Africa, with the invention of e-mail this duration was instantly reduced to a mere couple of seconds. The services provided by the internet have propelled forward its rates of adoption.^a

^a*Watch the internet as it grows in real-time.* [20-10-2018] <http://www.internetlivestats.com>

Blockchain and distributed ledger technology will have a dramatic impact on business and society, by providing a secure, direct way of exchanging money, intellectual property and other rights and assets without the involvement of traditional intermediaries like banks, utility companies and governments.

Digitization 2.0: The Internet of Value

“Blockchain and distributed ledger technology might represent a second era of the internet or the Digital Age. For the last 40 years, we’ve had the internet of information; now, with blockchain and distributed ledger technology, we’re getting the internet of value.”

11.1 Distributed Ledger Technology

Blockchain is the ingeniously simple, revolutionary protocol that allows transactions to be simultaneously anonymous and secure by maintaining a tamper-proof public ledger of value. Though its the technology that drives Bitcoin and other cryptocurrencies, the underlying framework has the potential to go far beyond. It has real utility and can record virtually everything of value to humankind, from birth and death certificates to land keeping records and even votes. Blockchain is a specific type of distributed ledger. It is designed to record transactions or digital interactions and bring much-needed transparency, efficiency, and added security to businesses. But these two technologies are not the same; blockchain is just the tip of the proverbial iceberg.

“The technology likely to have the greatest impact on the future of the world economy has arrived, and it is not self-driving cars, solar energy or artificial intelligence. Its called the blockchain and it is here to stay.”

— Tapscott, Don

11.2 A Paradigm Shift

The fact that the blockchain and distributed ledger technology is causing a paradigm shift in the financial services industry is undeniable. Where governments and financial institutions now have the power, peer-to-peer distributed cryptocurrencies such as Bitcoin provide us with a potential tool to escape the fiat currency system and enables peer-to-peer exchange of value.

Blockchain poses a threat to governments and financial institutions whose business models are based on the roles of intermediaries and their power to control and influence people's behaviour. It is hard to imagine that banks and financial institutions might disappear entirely simply because they have much influence and are usually labelled as “too big to fail”. More likely is the fact that traditional legacy infrastructure will have to keep up with these innovations and will adopt their versions of it. There will be centralised and decentralised systems operating next to each other. Both with their pros and cons. Most likely, it will be a combination of both, until decentralised systems and networks are capable of completely replacing our current centralised infrastructure without losing any of its core capabilities.

11.3 Legacy financial infrastructures

Blockchain poses a threat to governments and financial institutions whose business models are based on the roles of intermediaries and their power to control and influence people's behaviour. It is hard to imagine that banks and financial institutions might disappear entirely simply because they have much influence and are usually labelled as “too big to fail”. More likely is the

fact that traditional legacy infrastructure will have to keep up with these innovations and will adopt their versions of it. There will be centralised and decentralised systems operating next to each other. Both with their pros and cons. Most likely, it will be a combination of both, until decentralised systems and networks are capable of completely replacing our current centralised infrastructure without losing any of its core capabilities.

11.4 Bitcoin

Bitcoin started it all, genuine person to person (peer-to-peer) digital currencies that do not belong to, are not controlled by, any state or any corporation. What is unique about Bitcoin is that it represents the open blockchain, the blockchain that offers censorship resistance, open access and innovation without permission. This engine creates an explosion of innovative potential.

"Bitcoin is the first borderless, transnational, open system of access for financial payments and trust that enables innovation without permission, with high resistance to censorship, coercion and political manipulation. Bitcoin is a mathematical proofsystem that is fundamentally neutral to participants. It exhibits a principle that on the internet, we call net neutrality and brings that to finance. Which of course terrifies some groups of people, because what about authority?"

— **Antonopoulos, Andreas**

The power of open blockchain

*"What the internet did for communication, open blockchain is doing for finance. It is introducing a fundamentally different, network-centric, and flat system that allows us to perform transactions without the permission of authority and intermediaries. Bitcoin derives trust from the collaboration and computation of thousands of nodes and it uses a blockchain. The open blockchain and other open source projects will change the world. We cannot predict that this will be the only open blockchain that matters, nor that it will be the dominant one. The first car that we invented is not the car we have today. Why? Because it was not the best car, and it was the beginning of the automobile industry, which took time to develop the technology further. However, with technology, the best technology does not always necessarily win. So far, it is the only open blockchain, that operates on the public internet, that is tested on such a big scale, 24 hours a day, seven days a week, and it survives. Moreover, when Bitcoin survives, it is getting stronger every day. **future_of_money**"*

Chapter 12

HISTORY OF MONEY

How did we get here? How do we transfer value, and how did we do this in the past? When you think about it, what is currency and what is money? Throughout history, people exchanged value from one person to another by trade, bartering, exchange of goods and services but mostly by using something we call money. The crisis of 2008 showed us how vulnerable the current monetary system is. The current system is inherently flawed, debt-based and unsustainable. It benefits the few, not the many. If and when distributed ledger technology is implemented for the greater good, the potential for disruption is massive, particularly in the financial services industry. Before we go there, let's first discuss the history of money, fiat currency and the current monetary system and policies of today.

All Fiat Currencies become Worthless

Throughout history, no fiat currency has ever survived, and all fiat currencies that have ever existed went to a value of zero (**thebigreset**).

12.1 Properties of money

Money goes back thousands of years. However, the money we have and use today is very different from the money we have had in the past. Let's look at some of the most important properties of sound money as defined by worldwide bestselling author and internationally renowned expert on the history of money, Mike Maloney. In his book Guide to Investing in Gold & Silver: Protect your Financial Future, Mike states that the following characteristics define sound money:

- (a) Money is a medium of exchange
- (b) Money is a unit of account
- (c) Money is durable and does not spoil or corrode

- (d) Money is portable
- (e) Money is divisible
- (f) Money is fungible (each unit is interchangeable)
- (g) **Money is a true store of value over time**

12.2 Sound money

The first sound money system which was used in any known civilization was based on physical gold and silver. Pure, minted coins ensured that governments, unilateral organizations and bankers were kept in check as they could not create new currency out of thin air. A currency was either sound money or backed by sound money. In the case of civilizations that used real gold and silver coins, problems only occurred after when governments started to debase their coinage. Meaning melting down your currency and adding an inferior base metal to increase the total coin supply (**goldsilver_ep1**).

Store of value over time

The supply of gold is finite, effectively making it a scarce resource, both historically and today. It has and will always be necessary for people that money maintains its store of value over time. Assuring store of value over a long period is a prime example of what makes a commodity such as gold sound money. To top this off, nobody can produce or create more gold out of thin air, unlike the debt-based fiat currency based system we know today.

“500 BC you could buy a Roman senators’ Togo for one ounce of gold, you could purchase a Brooks Brothers suit in the 19th century for one ounce of gold, and today a new Italian suit is worth one ounce of gold.”

— R.W. Jastram

12.3 Fake Money, Fake System

Unfortunately, today, countries no longer back their currencies with commodities anymore. For example, let's look at the pounds sterling (£) and the U.S. dollar (US\$), which we know as money today but are, in fact, just currencies.

The inherent flaws of the monetary system have led us through several business and financial cycles that have resulted in the so-called “booms” and “busts” in asset prices. Ever since the \$USD went off the gold-standard in 1971, there are no restrictions anymore in terms of the money supply as it is no longer backed by sound money. Eventually, this leads to a situation where financial products, which add no value to the economy, are created exponentially.

In the process, intermediaries, middlemen and banks, who are the creators of those debt products, have made much profit and have simultaneously created an enormous amount of debt. Moreover, as financial products increase, the ratio of money that goes to products or services that add value to the economy and society is decreasing. The financial sector is booming, as there are no restrictions regarding the money supply, which allows them to conjure credit out of thin air in forms of debt and loans and make money of interests. Debt is the product of the financial industry, and debt is how they are making a killing.

Nixon shock - off the gold standard

Since the United States cancelled the convertibility of the US\$ to gold with the "Nixon Shock" in the 70s, national currencies have had freely floating exchange rates. Central banks' monetary policies have mainly dictated these rates. In 1971, the Nixon administration took the international dollar off the gold standard and from this moment the U.S. reverted to a system which depended only on fiat currency where the US\$ was backed only by debts and promises.

This decision still affects the world today because the US\$ was - and still is - the global reserve currency. Ever since, banks and financial intermediaries but also currency creators such as the U.S. Federal Reserve, Bank of Japan, European Central Bank (ECB) and Bank of China have a lot of control and influence over the money supply.

12.4 Fiat currency

Fiat currency is a currency that exists at the dictate or by fiat from a government (fiat is a Latin word for a currency that is circulating by force). Fiat currencies are indeed abundant and widely available within the jurisdictions where they are accepted. Modern paper money and coins, along with their digital counterpart, are durable enough; however, fiat money can no longer claim to have any intrinsic value. Its value is perceived based on faith, and that faith originates from the respective government backing and a national or international trust in the stability of the currency.

No government or bank has ever been able to discipline its monetary policy. History has shown that implementing a fiat currency model makes it easier for any government to do any of the following (there is no limit since the currency itself has no intrinsic value and is not backed by sound money such as gold);

- (a) Increase the money supply through borrowing
- (b) Increase the money supply through simply printing
- (c) Increase spending (the particularly harmful deficit spending of currency we don't have)

- (d) Impose burdensome regulations on small businesses and implement monetary policies to expand its control further

Throughout history, no fiat currency has ever survived, and all fiat currencies that have ever existed went to a value of zero (**thebigreset**). If you compare this to gold, this is entirely different. It doesn't matter if a gold coin has a value of \$120 or \$15000. The value lies in what real goods or services you can buy with it, not the absolute value expressed in some (national) fiat currency.

"Paper money eventually returns to its intrinsic value - zero."

— Voltaire

Purchasing power

Comparing gold to any fiat currency is like comparing apples to oranges. This is the same if we talk about paper fiat currency (cash) or digital fiat currency (on your bank account). Fiat currency meets two of the conditions of 'real money': it is a unit of account and a medium of exchange. However, fiat currency isn't a store of value over a long period. Any fiat currency created by any government tends to lose value over time for several reasons. One of them is inflation. Inflation is the result of too much money chasing insufficient goods, which makes your fiat currency depreciate as the money supply expands.

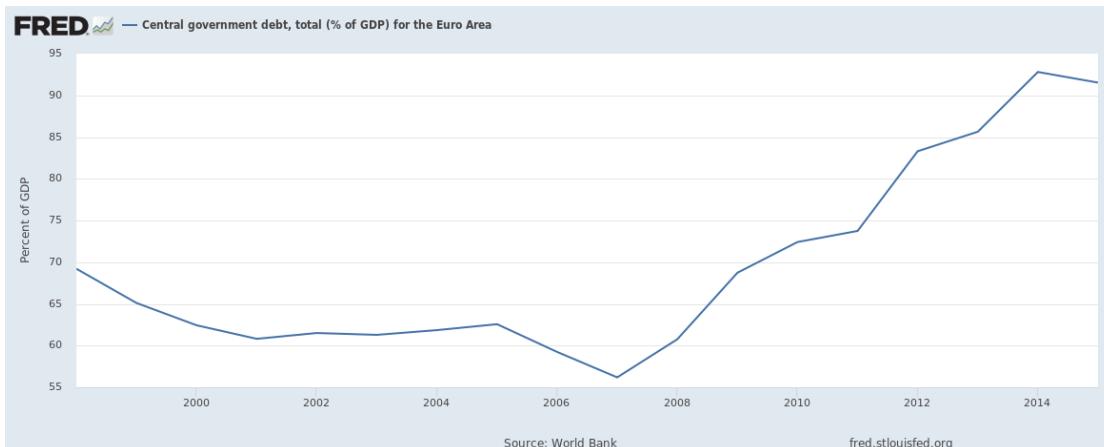
For example, an inflation rate of more than 2% per year, which is common nowadays in the western world, cuts your savings in terms of what you can buy with it (purchasing power) in half in 25 years. Without taking into account the consumer inflation for products; the same price for smaller quantities of the same product. Inflation occurs over a very long time, and many people do not realize that their currency is slowly but surely becoming worthless - like a time bomb set to explode. When the fiat currency based economy finally collapses after so many rounds of quantitative easing and hyperinflation kicks in - the results are usually catastrophic (**weimarhyperinflation**).

When the world went off the gold standard, central banks and governments were not accountable to anybody or forced to restrict the money supply (as it was not pegged to something with real value anymore). Not having the requirement in place to back printed money with a physical asset has lead to an explosion of debt in the financial sector. The financial industry now transacts trillions in a range of financial products, its effects visible in many economic indicators.

12.5 Questionable monetary policy

Several other factors and parties destroy the purchasing power of the fiat currency. Once a government has introduced a fiat currency, they usually can't resist the temptation of expanding the currency supply through deficit spending (increasing the public debt ceiling). Commercial banks are creating

Figure 12.1: Central Government debt, total % of GDP for the Euro Area



Source: Federal Reserve Bank of St. Louis, Economic Research (**FRED**).

money out of thin air by fractional reserve banking. Central banks are creating money by creating loans to governments and commercial banks. On top of this, since 2008, almost all central banks all over the world such as the European Central Bank, Federal Reserve, Bank of England and the People's Bank of China are executing the policy of what they call Quantitative Easing (QE). QE is an expansionary monetary policy whereby a central bank buys predetermined amounts of government bonds or other financial assets to stimulate the economy and increase liquidity. An unconventional form of monetary policy, it is usually used when inflation is very low or negative, and standard expansionary monetary policy has become ineffective.

This policy is nothing more than a process where the authoritative body injects an insane quantity of currency into the economy at near 0% interest rates to serve as a stimulus for the economy. Also referred to as "credit expansion but ultimately, it's just more debt. Refer to figs. 12.1 to 12.3 for an impression of ever-increasing debt levels (as a % of GDP) for the US, EU and Japan. There are now many countries around the world where this policy is applied.

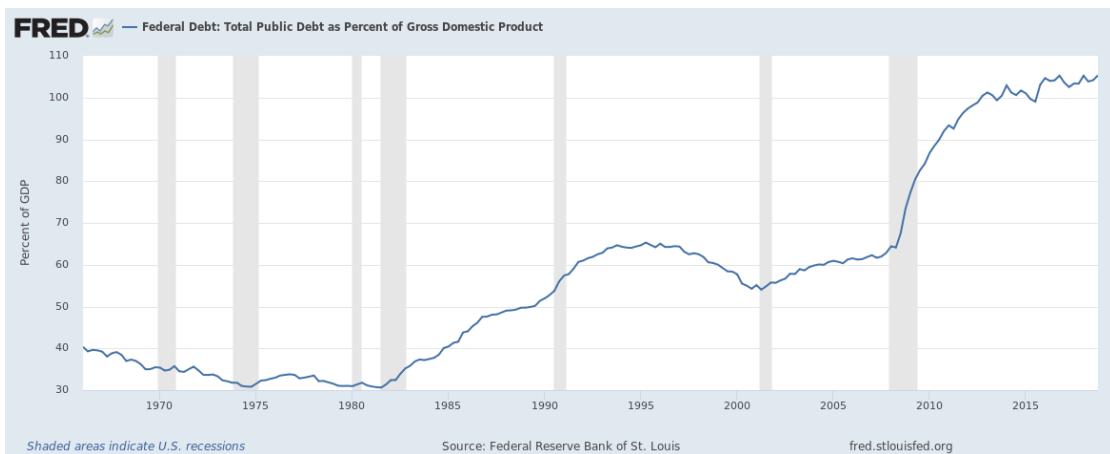
12.6 Post financial crisis 2008

The result was an even more gigantic debt bubble that heralded the financial crisis of '08. Inevitably, when interest rates are going to rise again, the lion's share of all debtors will have immense problems to pay off their debt plus added interest.

"In 2000 we had the dot-com bubble. In 2008 we had the housing bubble. In 2019 we have the everything bubble"

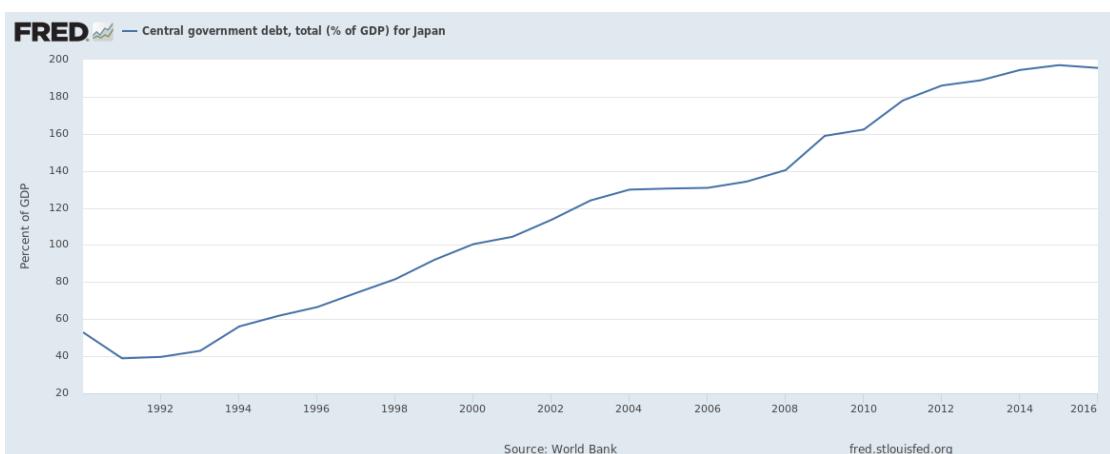
— Mauldin Economics

Figure 12.2: Federal Government total public debt as a % of GDP for the US



Source: Federal Reserve Bank of St. Louis, Economic Research (**FRED**).

Figure 12.3: Central Government debt, total % of GDP for Japan



Source: Federal Reserve Bank of St. Louis, Economic Research (**FRED**).

Table 12.1: Inflation rates > 20%

Country	Inflation rates [%]			
	Q4 "18	Q1 "19	Q2 "19	Q4 "19
Venezuela	1698488		282973	39114
Argentina	47.1		57.3	52.9
Sudan		43.5	44.6	57.7
South Sudan	33.5		56.1	69
Zimbabwe	42.1		97.9	521
Iran	39.9		52.2	27.8
Liberia	26.6		23.3	30.9
Turkey		20.4	18.7	11.8

Source: Trading Economics, 24-01-2020. *Inflation Rate - World.* ([tradingeconomics](#))

In the previous financial crashes, central banks had an opportunity to stimulate the economy by lowering interest rates, which made capital less expensive so people could lend more. Ten years after the last crash, interest rates are still near zero. Having interest close to zero provides very little to no room to lower interest rates (again) and 'save' us from yet another depression. In 2008, they just delayed the inevitable, but in the future, we will have to deal with the consequences.

On top of this, by creating enormous amounts of fiat currency, the money supply expands, and more currency is chasing the same amount of goods and services, which results in high inflation rates. High inflation rates result in higher prices for products and services. Moreover, eventually, when all fiat (digital) currency is circulating in the economy, it could result in a global fiat currency crisis through hyperinflation. Table 12.1 shows countries with high inflation rates. Highest inflation rate by country in 2019. The highest inflation rate in 2019 was reported in Venezuela, followed by Zimbabwe, South Sudan, Sudan, Argentina, Liberia, Iran and Ethiopia, Haiti and Angola. Note that Venezuela has suffered from severe hyperinflation. Such an event has the potential to obliterate the saving accounts of entire generations, and all of our currency suddenly becomes worthless paper.

In short, the history of fiat currencies is a history of volatility. The average lifespan of a fiat currency is only twenty-seven (27) years. Even if a currency survives any longer, invariably it will experience increasing inflation. Inflation steadily erodes the purchasing ability of fiat money over time. The world's oldest fiat currency, the British pound (£), is an excellent example; it has lost ninety-nine and a half per cent (99.5%) of its value since inception. Historically gold is more resilient, and holds its value better than any fiat currency and is particularly strong in times of economic instability.

12.7 Legacy financial infrastructures

At present, we mostly rely on middlemen or intermediaries like banks, commerce platforms or governments to establish the element that allows our economy to function in a digitized space: trust. These third parties perform the transactions in such a way to enable authentication, record-keeping or payment clearance to ensure that both parties in a transaction oblige to some pre-specified terms and conditions, and thus allowing the buyer and seller to remain confident that the transaction will execute securely and effectively. While these intermediaries are crucial to our digital economy, there are some significant issues.

- They use centralized databases which face high risks of being hacked
- They exclude billions of people, who lack access to resources and capital, from the global economy
- They charge transaction fees in the form of hefty commissions, not to mention the major timing inefficiencies
- They undermine the privacy of the users when they track and use our data as a function of their marketing efforts and business model
- They have appropriated the largest of the digital age asymmetrically, as we have wealth creation but growing economic and social inequality

Follow the Rabbit: Enter blockchain

Chapter 13

FUTURE OF MONEY

After the financial crisis of 2008, people learned the hard way that the financial markets did not only experienced so-called 'booms' but also suffered from the occasional 'busts'. Many people lost money one way or the other, and many more realized their high degree of exposure to a fraudulent system. Trust in the banks, governments and the financial sector took a huge hit and has not adequately recuperated since. Around the same time, in 2008, Satoshi Nakamoto released the Bitcoin whitepaper.

Satoshi Nakamoto

One of the fundamental properties of the Bitcoin protocol is that there will never be more than 21 million Bitcoins created, and there can never be more than 21 million Bitcoins in circulation. Economies and societies tend to do better when governed by a "fixed money supply" or a "sound money system". Economies tend to do poorly in an economy which is governed by the creation of unlimited amounts of fiat currency and an ever-increasing debt bubble. Therefore, the Bitcoin protocol is fundamentally different from the current (digital) fiat currency monetary system. On one end, there is Bitcoin with its fixed supply (sometimes referred to as the 'digital gold'). On the other end, there are the (digital) fiat currency economies that print currency into oblivion and create massive debt-based societies with asset price bubbles around the globe

13.1 Gold or Bitcoin?

Golds recent surge in price and longer-term bull market confirms that money transfers to what has always been a safe-haven asset in times of crisis (i.e. when fiat currencies fail or stock markets crash). This time around, besides traditional safe-haven assets, we have a digital equivalent - Bitcoin. Although it has not yet proven to be a real store of value over time like gold (because of extreme volatility and relatively low liquidity), younger generations might

relate more to the "digital gold" of the 21st century than they relate with old-school physical gold. The first of its kind, Bitcoin originated (in essence) from the lack of trust as a result of the financial crisis in 2008 and will claim its fair market share as awareness of Bitcoin, blockchain and peer-to-peer cryptocurrencies grow.

Difference between Gold and Bitcoin

The main difference between gold and Bitcoin is that Bitcoin is deflationary and gold is inflationary (average yearly gold supply growing with 2%). If and when the system was to revert to a gold standard (or a "Bitcoin Standard" (**bitcoinstandard**)), it would drastically impact the monetary system. The financial and governmental institutions would have some restrictions and limitations in place. Thus the creation of financial products that add debt instead of long term value is restricted.

13.2 The Blockchain [R]evolution

Bitcoin utilizes blockchain technology. While an important one, Bitcoin is only one use case for blockchain. Blockchain allows people to exchange assets and perform transactions without a third party. Imagine a world where you don't need intermediaries. While traditionally we have needed central authorities to trust one another and fulfil contracts, blockchain makes it possible to have our peers guarantee that for us. However, how? Assets are no longer stored in a central place, but distributed across a global ledger, using the highest level of cryptography. When a participant conducts a transaction, it is broadcast to the network, which bundles, validates, and records these transactions as blocks in a process called mining.

Blockchain?

The act of embedding a previous block of data into the current block of data is called chaining, hence, the name blockchain.

13.3 How does Blockchain work

Let us imagine a sheet of paper that has 25 lines. When the sheet is filled up with 25 transactions, the network validates the sheet (or block) via group consensus. Once the system approves the sheet, it is added to a stack of previously approved sheets. Each sheet on the stack can be assumed to be trustworthy because, once a sheet is validated, it can't be changed. So to link our sheets together, we embed information from the previous sheet of paper into the new, recently validated sheet. In essence, a blockchain consists of bundled transactions in the form of blocks. **course:blockchain_usecases**

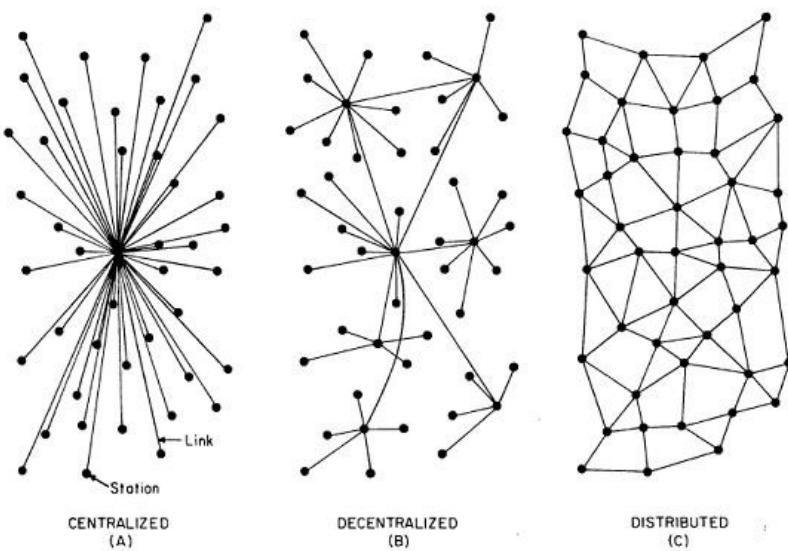


Figure 13.1: Centralized, decentralized and distributed architecture. Bitcoin is a protocol and functions as a currency which runs on distributed ledger. **lastamericanvagabond**

To compromise or hack a blockchain network, someone would have to gain control of the majority of computers in that network. Hacking or otherwise tampering with a blockchain network is extremely difficult to do but not impossible. There is much debate about blockchain safety and security and potential bad actors using it with ill will. However, compared with traditional centralized infrastructures, there is no longer a single point of failure, and this is one of the main reasons why blockchain is infinitely more secure. Furthermore, there exist multiple generations of blockchains that work toward answering most of the other questions such as network liquidity, power consumptions, scalability and speed - all required to scale globally.

"It often requires some (catastrophic) crisis to see what is in plain sight. When the next financial crisis hits us, the world economy, especially the financial sector and currencies, will suffer a massive blow, and billions of people will not have seen it coming. It is time to prepare - diversify your portfolio and manage your risks, because this time it is going to be global."

— Cryptomanuals

13.4 Huge potential but Dangerous?

In the long term, even central banks or multilateral organizations like the International Monetary Fund (IMF) will use this new technology - in the form of a central bank digital currency(CBDC) for instant payments. There are plenty of signs that indicate that distributed ledger technology might be used by some of these global agencies to implement their economic policies while

making use of fiat cryptocurrencies (a digital product that they can inflate and control) (**IMF_F&D**).

"In 1998, Wall Street bailed out the hedge funds. In 2008, central banks had to bail out Wall Street for them to survive. In the following crisis, whom do you think is going to bail out the central banks?"

— **J. Rickards**

Why do we address this in a cryptocurrency guide? Because we feel it's essential to look at both sides. This new technology has the potential to disrupt but can also be used to gain more control over populations (think 1984 by G. Orwell). For example, we are already heading toward a cashless society and less and less cash is accepted in the West. Think about factors such as e-cash, contact-less payments, credit cards, and mobile phone payments. Combine this with big data analysis of all the data we leave behind doing all sorts of social and economic transactions online. Think about your shadow identity that exists online, which is a trail of breadcrumbs left behind by you, during your time online. Google, Apple, Amazon and Facebook most likely know you better than yourself, in terms of what triggers you and what you did a few years ago on a particular day. Please take a look at China, for example, where they have implemented and are experimenting with social credit scores of individuals. China uses credit scores, obtained from cameras, online surveillance and big data analysis to rank citizens and provide either certain perks or take perks away, pending your score (**chinasocialscores**). These practices drastically affect the lives of millions of individuals. You might be severely discriminated against, depending on your ability to conform to this expected behavior and whether you show compliance to the "model citizen". Moreover, Western banks are already working with scorecards to check if you're allowed to receive credit. So these processes are already present here, although much less extreme.

"Technology is a force multiplier, it can be used for good and bad purpose"

— **Cryptomanuals**

13.5 Technology has no agenda, People do

It is essential to realize that technology has no personal agenda or objective and can be used and utilized by its creators as deemed fit. For example, planes and ships are used for both civilian and military purposes. Also, it would be safe to assume that the inventor of the wheel never anticipated Formula 1 race cars or sophisticated tanks. These are extreme examples but only serve to illustrate the fact that technology is just a tool which can be used for either good or bad things, depending on many factors.

Distributed ledger technology originated (in essence) from the financial crisis in 2008 and is here to stay. The question remains how we are going to apply this technology to utilize it to its fullest potential.

13.6 Financial-Technology Sector

Besides, this market has enormous potential when you think of the possibilities for potential growth on investments in the long term since it is still in its infancy stages. Some of these projects are here to stay, and many more are starting every day, introducing healthy competition that is going to boost the fin-tech industry. There is an ever-increasing demand for skilled people in the fin-tech sector. Businesses cannot find enough software engineers and blockchain developers, and everyone can get into it - take several free courses available on the internet to get you up to speed and develop new skill-sets that might boost your career and give you a new direction - this industry is just getting started. Not to mention the fact that the younger generations have been growing up in the digital age and the impact this makes on their lives cannot be overemphasized.

Mainly, the success of blockchain technology has already been set in stone since it's not dependent on cryptocurrency alone. Where blockchain can serve as a decentralised ledger that securely stores immutable data, we can also use it as such without the use of any cryptocurrencies. Cryptocurrencies or tokens might be used on specific networks because they have to serve a particular function. They might function as a utility token or as a means of payment to the network or to store, capture or move value around in the form of a digital currency.

13.7 Blockchain is Here to Stay

We believe blockchain is here to stay, and it will be an integral element in our future infrastructure. The challenge is to oversee and guide the adoption process. For example, it is almost inevitable that private blockchain infrastructures are going to be used by governments and corporations. Good or bad? That's a loaded question as there might be more than one answer. Even though it may sound bad for cryptocurrency or blockchain in general - adaptive governments and nimble and experimental regulation, legislation and compliance policies will be of crucial importance to propel development forward. Besides Bitcoin, there are hundreds of other projects out there that are working on solving some of the most pressing matters in our financial spheres and other industries like supply chain, healthcare, energy and content creation. We believe blockchain is here to stay, and it will be an integral element in our future infrastructure. The challenge is to oversee and guide the adoption process.

13.8 Open Blockchain Enables Inclusion

Cryptocurrencies, particularly Bitcoin, already have massive momentum. We are not predicting whether or not all of this will eventually succeed. However, we do believe that the economy works best when it works for everyone, and this new platform represents an engine which stimulates and enables

inclusion. Open blockchain significantly lowers the requirements for people to obtain access to financial services and will compete with traditional central banking models. With Bitcoin, it is also completely different in terms of spending. Open blockchains like Bitcoins do not care; they are peer to peer. You can send it from person to person, without an intermediary. In summary, when you store money at the bank (or in the possible future at corporations), the bank becomes the owner of that money. With Bitcoin, *you own your money*. When the banks own that money, they spend it as they wish. When you own it, *you* spend it as you wish. It is censorship-resistant, and no one decides on what you can or cannot spend it.

FOLLOW THE RABBIT

Chapter 14

4TH INDUSTRIAL [R]EVOLUTION

The fourth industrial revolution builds on the second wave of digitization, representing new ways in which technology becomes embedded within societies and the human mind and body. The Fourth Industrial Revolution is marked by emerging technology breakthroughs in several fields, including blockchain, robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, The Internet of Things (IoT), 3D printing and autonomous vehicles (fig. 14.1).

14.1 Exponential science

There are several significant indicators why this transformation does not merely reflect a continuation of the Third Industrial Revolution but heralds something wholly new and unique. At present we live in a globalized, profoundly connected and intertwined world and it is changing rapidly. The speed, scope and impact of this transformation are unprecedented. The fourth Industrial Revolution is everywhere around us, and it is progressing at an exponential pace.

Throughout our history, breakthrough technological advances were few and far between. It is only until the last decennia that we have reached the unparalleled speeds at which we are currently progressing in every direction.

Rapidly changing technology is not only affecting how we live our lives but also the way we communicate and do business with each other. The coming years will be of crucial importance as governmental bodies, regulators and legislators might not keep up with the rapid changes in technology and infrastructure and seek to contain or prohibit its uses.

“Technology goes beyond mere tool making; it is a process of creating ever more powerful technology using the tools from the previous round of innovation.”

— **Kurzweil, Ray**

Everybody will be aware of the ongoing debate around big-data and data monopolies by large technology companies such as Amazon, Google and Facebook. It is not a surprise that privacy and online security must be considered

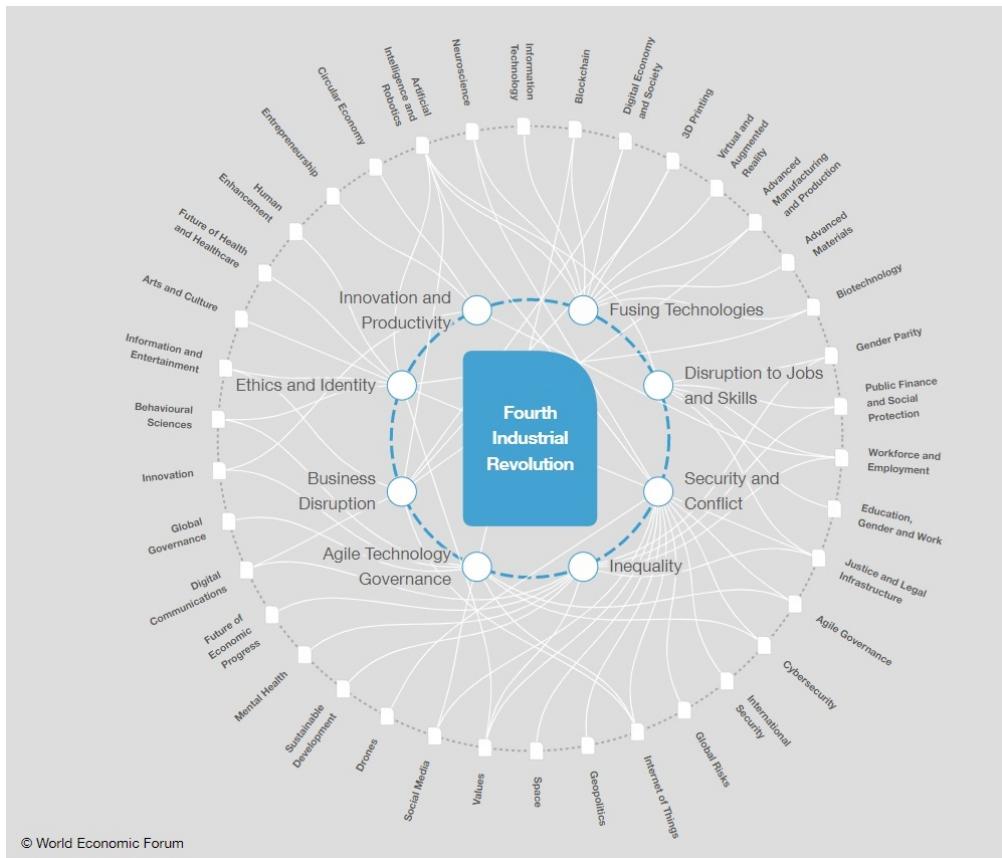


Figure 14.1: Fourth Industrial Revolution. Mapping global transformations tool.

Source: World Economic Forum. *Mapping Global Transformations. Global_Transformations*

to be one of the most pressing challenges which we will have to face. Daily, we are donating valuable data to technology giants. While we all seem to understand that this is very alarming, we know it is an essential part of our relatively new and interconnected lifestyle. We seem to be hesitant when it comes to giving up our luxuries of the 20th century.

However, what we lack is healthy competition to counteract these data monopolies. Smaller companies instantly get bought up and are assimilated when considered a threat to the monopolistic business model. New players - making use of decentralized and open-source technology have now entered the arena and are preparing to take on the fight.

“Debates about fundamental issues such as the impact on our inner lives of the loss of control over our data will only intensify in the years ahead. Similarly, the revolutions occurring in biotechnology and AI, which are redefining what it means to be human by pushing back the current thresholds of life span, health, cognition, and capabilities, will compel us to redefine our moral and ethical boundaries.”

— Schwab, Klaus

14.2 Fusing technologies

The Fourth Industrial Revolution has very distinctive features when compared with the industrial revolutions we have witnessed in the past. A crucial characterization is that it builds upon the fusion of (new) technologies, and there is increasing compatibility between - and collaboration of - various research disciplines.

The main catalysts of this phenomenon are our ever-increasing digital capabilities. Almost every new scientific development or breakthrough now uses and leverages digital capability. It is tough to come up with examples of non-digital technology in our digital world. Computers, processing chips and algorithms are everywhere.

For example, advances in biotechnology such as genome editing and potential brain-machine interfaces, would not have been possible without significant increases in computing power and increased data gathering and data analysis. Following the same trend, sophisticated robotics and artificial intelligence (AI) would not exist if not thanks to massive improvements and innovations in the field of computing and processing power and further digitization. Apart from our mobile phones, personal computers and laptops, our physical world has numerous interfaces with the digital world. Think about autonomous vehicles (cars, drones and ships), smart-homes and industrial-scale manufacturing processes utilizing 3D printing.

14.3 Internet of Things

Furthermore, the rise of the Internet of Things (IoT) and the corresponding advances in sensing (sensor) technology is enabling our autonomous systems to improve their understanding of the environment in real-time. Ultimately robots will no longer only exist on factory floors where they mindlessly operate the assembly lines. Robots and artificial intelligence will evolve, and new technology will empower them to perform more diverse and broad ranges of tasks.

These systems are now able to access real-time information remotely via the cloud and connect to exchange and analyze data and learn collectively (fig. 14.2). In the age of the Internet of Things (IoT), there will be an increasing emphasis on real-time data gathering, data analyses and human-machine collaboration.

Global nervous system

"The internet gave us the possibilities to connect in ways we would never have dreamed possible. The Internet of Things will take us beyond the connection to become part of a living, breathing and moving global nervous system."

14.4 Merging worlds

The physical and biological worlds are merging partly thanks to the creation of new materials that are designed to emulate the natural world. The discovery of new classes of recyclable, thermosetting polymers is a significant step towards a more sustainable economy, for example. New materials are now routinely used in medical implants and for tissue engineering. The creation of artificial organs and 3D printing is increasingly being used to create customized structures. The biological and digital worlds overlap most controversially in the world of genetic engineering. Widely-accessible and affordable gene sequencing and editing systems, such as CRISPR/Cas9,¹ make it possible to reliably and precisely remove or replace sequences in the genome of plants and animals. The biological and digital worlds are also overlapping in the form of sensors used to monitor personal health and behaviour and to understand and influence brain activity. Advances that might have once been confined to digital systems, like the application of cryptography to blockchain technology to create programmable, secure, and distributed records, are now having widespread impact in the real world. Blockchain, for example, while it may be best known as the framework for virtual currency, can provide new ways to manage land records and track deforestation.

¹<https://ghr.nlm.nih.gov/primer/genomicresearch/genomeediting>

14.5 Shaping the future

Neither technology nor the disruption that comes with it is an exogenous force over which humans have no control. All of us are responsible for guiding its evolution, in the decisions we make daily as citizens, consumers, and investors. We should thus grasp the opportunity and power we have to shape the Fourth Industrial Revolution and direct it toward a future that reflects our common objectives and values.

To do this, however, we must develop a comprehensive (and globally shared) view of how technology is affecting our lives. We need to understand how technology is reshaping our economic, social, cultural, and human environments. There has never been a time of more exceptional promise, or one of greater potential peril. Today's decision-makers, however, are too often trapped in traditional, linear thinking, or absorbed by the multiple crises demanding their attention, to think strategically about the forces of disruption and innovation shaping our future.

In the end, it all comes down to people and values. We need to shape a future that works for all of us by putting people and our environment (nature) first and empowering them. In its most pessimistic, dehumanized form, the Fourth Industrial Revolution may indeed have the potential to "robotize" humanity and thus to deprive us of our heart and soul. However, as a complement to the best parts of human nature - creativity, empathy, stewardship - it can also lift humanity into a new collective and moral consciousness based on a shared sense of destiny. It is incumbent on us all to make sure the latter prevails.

"The only thing that is constant is change."

— Heraclitus

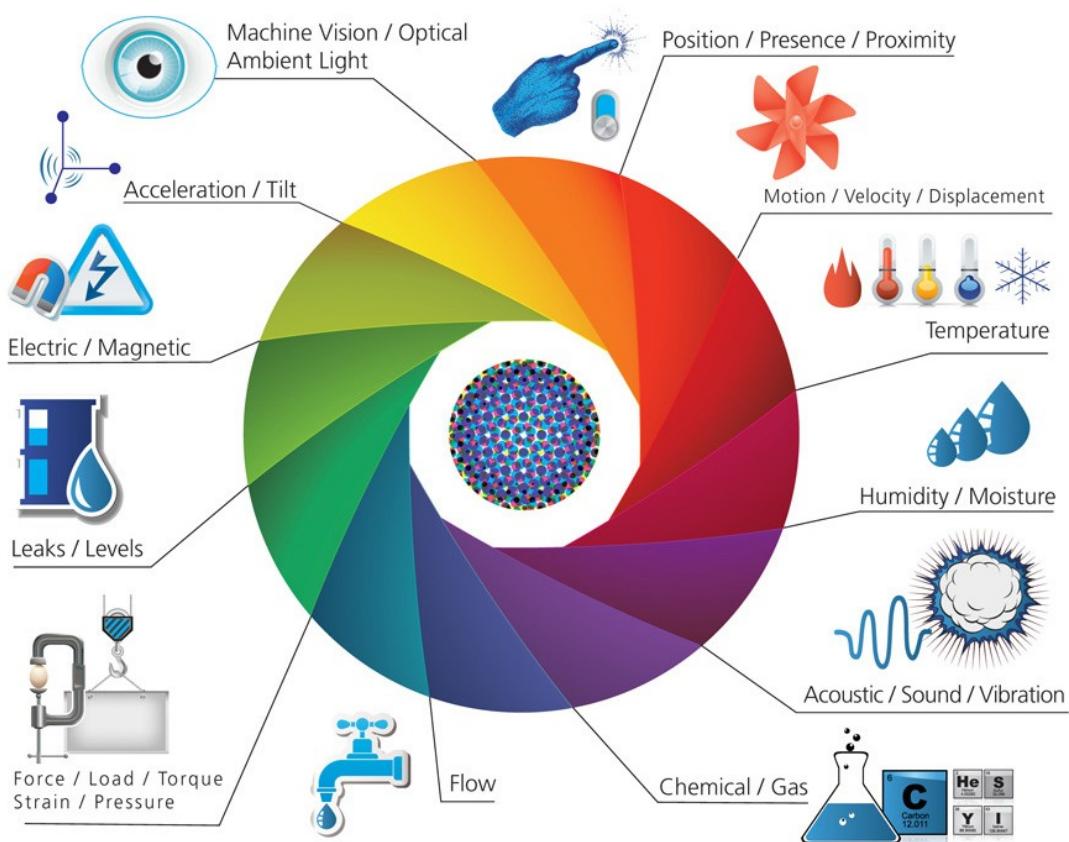


Figure 14.2: Internet of Things (IoT) sensors & actuators. We are giving our world a digital nervous system; location data using GPS sensors, eyes and ears using cameras and microphones, along with sensory organs that can measure and record everything (in real-time) from temperature to pressure changes.

Source: Harbor Research. *Info-graphic on the “Internet of Things”. IOT*

Chapter 15

Lookahead

When you consider that the cryptocurrency market remains highly volatile and largely unregulated, it is still highly speculative to invest in any of it. The road to mass adoption is not without significant hiccups. We need to give distributed ledger technology and blockchain technology time to mature. If given that time, all these daring and promising startups will have to prove themselves, just like any other company and any other technology. Even though there is much debate around the question how we should deal with blockchain and cryptocurrencies in the coming years.

“While technological change has been incredibly fast in the information era, the system of international payments has lagged.”

— **Don Tapscott**

Financial-technology sector

This market has enormous potential when you think of the possibilities for potential growth on investments in the long term since it is still in its infancy stages. Some of these projects are here to stay, and many more are starting every day, introducing healthy competition that is going to boost the fin-tech industry. There is an ever-increasing demand for skilled people in the fin-tech sector. Businesses cannot seem to find enough software engineers and blockchain developers, and everyone can get into it - take several free courses available on the internet to get you up to speed and develop new skill-sets that might boost your career and give you a new direction - this industry is just getting started. Not to mention the fact that the younger generations have been growing up in the digital age and the impact this makes on their lives cannot be unseen.

Open and decentralized finance

Cryptocurrencies, particularly Bitcoin, already have massive momentum. We are not predicting whether or not all of this will eventually succeed. However, we do believe that the economy works best when it works for everyone,



and this new platform represents an engine which stimulates and enables inclusion. Open blockchain significantly lowers the requirements for people to obtain access to financial services and will compete with traditional central banking models.

MONEY AT THE BANK

In summary, when you store money at the bank - and in the possible future at corporations - the bank becomes the owner of that money. With Bitcoin, *you own your money*. When the banks own that money, they spend it as they wish. When you own it, *you spend it as you wish*. It is censorship-resistant, and no one decides on what you can or cannot spend it.

New Regulations

Blockchain will be an integral element in our future infrastructures. The challenge is to oversee and guide the adoption process. Even though it may sound bad for cryptocurrency or blockchain in general - as long as its stimulates innovation - adaptive governments and nimble and experimental regulation, legislation and compliance policies will be of crucial importance to propel development forward.

Disrupting industries

Besides Bitcoin, there are hundreds of other projects out there that are working on solving some of the most pressing matters in our financial spheres and other industries like supply chain, healthcare, energy and content creation. Mainly, the success of blockchain technology has already been set in stone since it's not dependent on cryptocurrency alone. Where blockchain can serve as a decentralised ledger that securely stores immutable data, we can also use it as such without the use of any cryptocurrencies. Cryptocurrencies or tokens might be used on specific networks because they have a serve a particular function. They might function as a utility token or as a means of payment to the network or to store, capture or move value around in the form of a digital currency.

Both the economy and currencies need to evolve

In terms of global macroeconomic developments, and after having taken a more in-depth look at the blockchain and cryptocurrency spheres, we note many indicators which lead us to believe that rapid, drastic change may lie around the corner. We actively research these areas and look at these global developments, which are driving innovation and change. We see trends that have the potential to radically change vast chunks of industry and change the

lives of billions of people and find hope and opportunity in areas where others may not. In the face of any crisis, there is always ample room for new growth, in directions that may come as a surprise to many. What will happen when the inevitable strikes? Will economies collapse globally? Will life as we know it, be a thing of the past? If history is any indication, governments and banks will, once again, try to change the rules.

“In the midst of every crisis, lies great opportunity.”

— **Albert Einstein**

New Economy

We believe that this transition heralds the beginning of a new economic era, of an inclusive economy, where people's (intellectual) contributions are valued and rewarded according to the added value they bring to the economy as a whole, their immediate environment, community or family and friends. With Cryptomanuals, we inform people of what is going on in the global economy, provide some historical context and point out one of the most significant opportunities and wealth transfers of our lifetimes.

SUGGESTIONS

Don't forget to check out our pre-selection of useful applications, tools, videos and other information.

You can start right away on our website:

1. With the [five steps to start](#).
2. There are many ways to earn [free crypto](#).
3. A pre-selection of useful [portfolio tools](#).
4. Take a look at our selected [Bitcoin videos](#).
5. A selection of [privacy tools](#).

Appendix A

Additional Information

- Table A.1: selection of platforms for financial and economic related data
- Table A.2: selection of platforms for general information
- Table A.3: selection of sources to gain insight in cryptocurrency markets
- Table A.4: selection of learning platforms
- Table A.5: selection of applications to enhance privacy and security

Table A.1: Data & research

Platform	Description	Website
<i>IMF</i>	International Monetary Fund	imf.org
<i>FRED</i>	U.S. Central Bank	federalreserve.gov
<i>ECB</i>	E.U. Central Bank	ecb.europa.eu
<i>SSRN</i>	Tomorrow's research today	ssrn.com
<i>DNB</i>	De Nederlandsche Bank	dnb.nl
<i>WEF</i>	World Economic Forum	weforum.org
<i>TWB</i>	The World Bank	worldbank.org
<i>IOHK</i>	Academic studies of blockchain technology	iohk.io
<i>OWID</i>	Research and interactive data visualizations	ourworldindata.org
<i>OECD</i>	The Organisation for Economic Co-operation and Development	oecd.org
<i>IOSCO</i>	International Organization of Securities Commissions	iosco.org
<i>CCAF</i>	Cambridge Centre for Alternative Finance	jbs.cam.ac.uk
<i>BIS</i>	Bank of International Settlements	bis.org
<i>RSOS</i>	Royal Society of Open Science	royalsocietypublishing.org
<i>Bitmex</i>	P2P crypto-products platform and research centre	blog.bitmex.com
<i>Elsevier</i>	Global information analytics	elsevier.com

Table A.2: News & social infrastructures

Platform	Description	Website
<i>SingularityHub</i>	Technological change	singularityhub.com
<i>Keiser Report</i>	What really goes on in the global economy	rt.com/shows/keiser-report
<i>TechCrunch</i>	Startup & technology news	techcrunch.com
<i>Hacker Noon</i>	Aggregated technology news	hackernoon.com
<i>Cointelegraph</i>	News platform regarding the future of money	cointelegraph.com

Table A.2 – Continued from previous page

Platform	Description	Website
<i>Coindesk</i>	News platform regarding 'global leader in blockchain news'	coindesk.com
<i>Twitter</i>	News and updates	twitter.com
<i>Reddit</i>	Social platform	reddit.com
<i>Telegram</i>	Cloud-based instant messaging service	telegram.com
<i>Slack</i>	Cloud-based team collaboration tools and services	slack.com
<i>Medium</i>	Online publishing platform	medium.com
<i>Youtube</i>	Video sharing website	youtube.com
<i>Minds</i>	Open source and distributed social networking service	minds.com
<i>Steemit</i>	Blockchain based blogging and social networking platform	steemit.com
<i>DTube</i>	Blockchain based alternative to YouTube	dtube.com

Table A.3: Market insights & analyses

Platform	Description	Website
<i>CoinCheckUp</i>	Research platform	coincheckup.com
<i>CoinMarketCap</i>	Market capitalization, trading volume and liquidity	coinmarketcap.com
<i>CryptoCompare</i>	Compare crypto related projects, exchanges, wallets	cryptocompare.com
<i>CoinGecko</i>	Cryptocurrency market analyses	coingecko.com
<i>Tradingview</i>	Platform to analyze charts	tradingview.com
<i>HowMuch</i>	Infographics and visualization of money related topics	howmuch.net
<i>Demonocracy</i>	Economic infographics	demonocracy.info
<i>Tokeninsight</i>	Rating institute	tokeninsight.com
<i>Bitcoin</i>	Innovative payment network and a new kind of money	bitcoin.org
<i>Ethereum</i>	Open-source platform for decentralized applications	ethereum.org

Table A.4: Education & guides

Platform	Description	Website
<i>edX</i>	Free online courses	edx.org
<i>Investopedia</i>	Economic and financial definitions and explanations	investopedia.com
<i>BitDegree</i>	Tutorials on cryptocurrency and blockchain	bitdegree.org
<i>Blockonomi</i>	Cryptocurrencies, technology and the blockchain economy	blockonomi.com
<i>Blockgeeks</i>	Blockchain training	blockgeeks.com

Table A.5: Online anonymity, identity, safety and security

Platform	Description	Website
<i>ProtonMail</i>	End-to-end encrypted email service	protonmail.com
<i>ProtonVPN</i>	Virtual private network, encrypted internet connection	protonvpn.com
<i>LastPass</i>	Encrypted password management services	lastpass.com
<i>Brave</i>	Open source, secure and private browser	brave.com
<i>DuckDuckGo</i>	Search engine that doesn't track you	duckduckgo.com