

CRYPTOCURRENCIES: WHAT YOU NEED TO KNOW

JUNE 2018

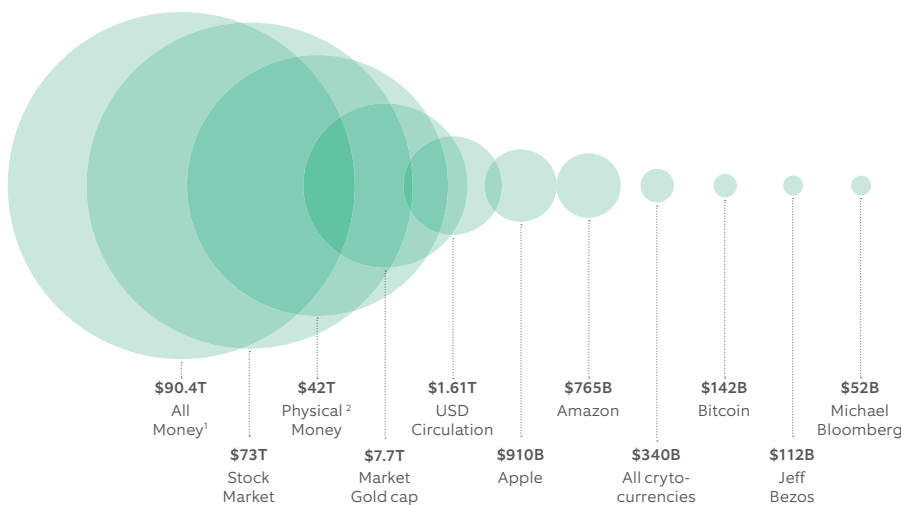
Around the world, there is tremendous interest in cryptocurrency, with equal parts of confusion, uncertainty and doubt. Bitcoins, cryptocurrencies, blockchain and ICOs: what do these terms mean? How do they all work? And what implications do they have on the financial services industry, Northern Trust and our clients?

INTRODUCTION TO CRYPTOCURRENCIES

- There are currently about 1300 different cryptocurrencies available¹ – each with differing use cases and likely levels of sustainability.
- The market is currently dominated by three main cryptocurrencies and Bitcoin represents 42% of crypto market capitalization (see figure below).
- Cryptocurrencies can be used in exchange for goods and services but opportunities for this are currently very limited.
- Its unregulated and speculative nature creates enormous price volatility and risk, with no regulatory investor protections.
- There has been a mixed reaction in the financial services industry with some institutions blocking the use of cryptocurrencies and others taking a more permissive approach.

¹Source: <https://coinmarketcap.com/all/views/all/> (as at June 2018)

BITCOIN AND CRYPTOCURRENCIES IN PERSPECTIVE



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 medium of exchange, generally notes, coins, and certain balances held by banks.

Sources: Date as of 14 March 2018

www.visualcapitalist.com, www.cia.gov, www.federalreserve.gov, www.nasdaq.com, www.coinmarketcap.com, www.usatoday.com

GLOSSARY

Altcoins: Cryptocurrencies other than Bitcoin.

Bitcoin: The first recognised cryptocurrency, initially traded in 2009.

Blockchain: The foundational technology of Bitcoin and other cryptocurrencies which provides a seamless, simultaneous integration of transactions, settlements and ledger updates directly between multiple parties without the need for a central authority.

Cryptocurrency: A digital currency in which encryption techniques are used to regulate the generation of units of currency and verify transactions, operating independently of a central or commercial bank.

Crypto-miners: Individuals or groups that confirm transactions and create new transaction blocks onto the network.

Distributed Ledger Technology (DLT): Another term for blockchain technology.

Digital Wallet: Online (hot) or offline (cold) secure facility to store private keys which prove ownership of cryptocurrencies.

Fiat: Government backed currency (eg. US Dollar, Euro).

Fork: Change in blockchain code that may create a separate cryptocurrency with different mining and validation rules.

Initial Coin Offering (ICO): The process of raising cryptocurrency capital for the launch of a new business.

Node: A computer that runs cryptocurrency software to validate transactions and stores a replicated copy.

- Current crypto-exchanges focus on the direct exchange of traditional (fiat) and cryptocurrencies (similar to foreign exchange) but other products such as futures are becoming available from established, regulated institutions. These provide investors with an alternative vehicle to invest in cryptocurrencies while avoiding the need to actually hold the coins in a digital wallet

Differences Between Traditional and Cryptocurrency

	FIAT CURRENCY	CRYPTOCURRENCY
Money?	Yes	No
Legal tender?	Yes	No
Backed by central government?	Yes	No
Supply?	Controlled	Limited
Issued by?	Governments	Computers
Volatility?	Relatively Stable	Very High
Use to purchase goods?	Yes	Limited

HOW IT WORKS

- Cryptocurrency transactions take place person-to-person and do not require central authorities or intermediaries. Note that individual cryptocurrencies have differing levels of anonymity and opacity.
- Digital wallets are used to store cryptocurrencies and can be held online (hot), with risk of hacking, or offline (cold) on digital storage which is only connected to the internet during transactions.
- Transactions are validated across a distributed network of computers (nodes) by miners and, once validated, are recorded on a blockchain.
- Unlike fiat currencies, where supply is controlled by a central bank, cryptocurrencies use complex mathematical problems and cryptography to regulate supply and usage of coins.
- The process of mining cryptocurrencies performs two key functions – the creation (minting) of new coins and the auditing or validation of transactions (see sidebar).
- Miners may work alone or, more commonly, in a group, called a pool. This pool splits rewards based on the computing power each miner brings to the pool.
- This validation process is particularly important in preventing the ‘double spending’ problem. Unlike physical currency, with a digital transaction there is the risk that the holder could make a copy of their coins and send it to another party whilst retaining the original. The mining process scrutinizes transactions to ensure the same coin is not spent more than once.
- Mining is an extremely energy intensive process due to the amount of computing power that is required. According to the PowerCompare website³, if all bitcoin mining operations globally were grouped, the combined energy consumption would place as 61st of all countries in the world (more than Ireland, New Zealand and Hungary).

³ Source: <https://powercompare.co.uk/bitcoin/> (as of June 2018)

MINING

‘Mining’ cryptocurrency performs two key functions – the creation of new crypto-coins and the validation of transactions.

Cryptocurrency miners compete to solve complex mathematical problems and the fastest, once their solution is verified by 51% of other miners (consensus proof), earns a reward (new coins) and receives a transaction settlement fee from the parties.

Bitcoin Example

As of June 2018, Bitcoin can handle adding a new block of around 2000 transactions every 10 minutes with a reward of 12.5 Bitcoins for the winning miner; today worth ~\$100,000².

This rate of Bitcoin minting is maintained by adjustments to the difficulty of the mathematical problems that need to be solved.

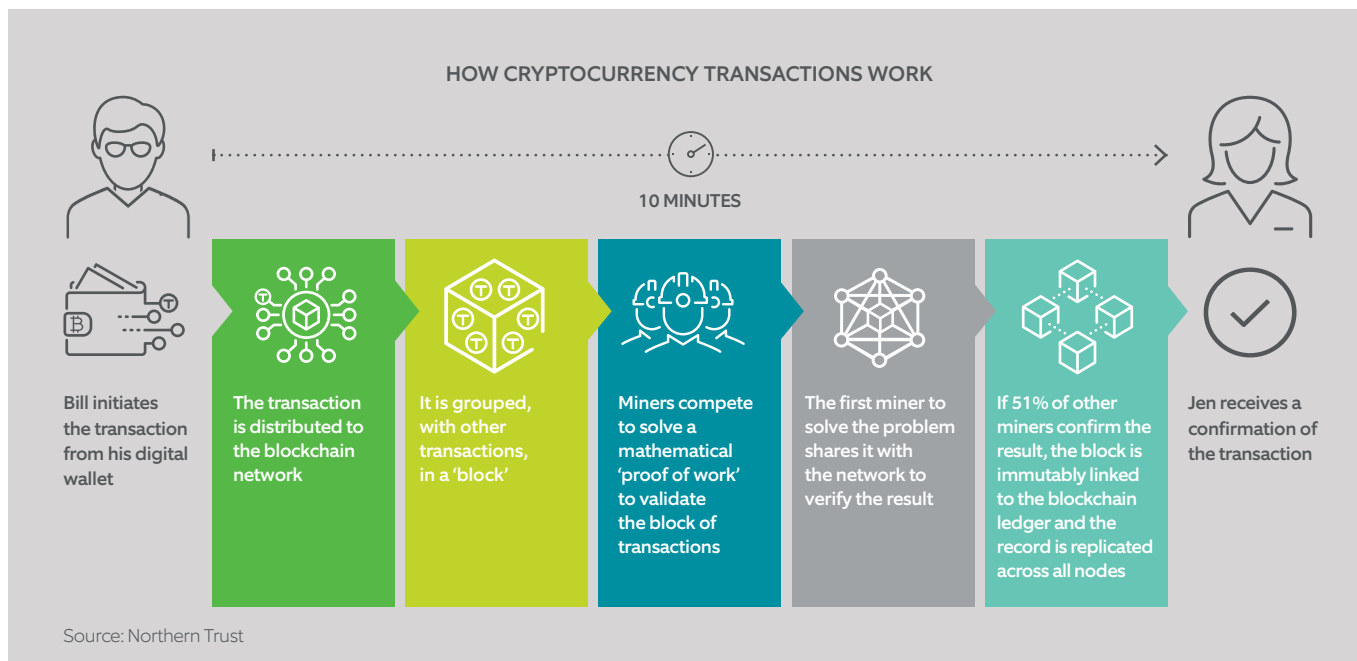
To mitigate potential future inflation, the total supply of Bitcoins is limited to 21 million and, subsequently, the rewards earned from mining activities halves approximately every four years.

This limitation has the potential to create challenges to the profitability of mining in the long term.

² Sources: <https://www.coindesk.com/>; <https://blockchain.info/charts/n-transactions-per-block>

CRYPTOCURRENCIES: A SNAPSHOT

- As a result of environmental concerns and power consumption by crypto-mining consortia, a number of countries, states and even cities have either banned or imposed strict limitations on cryptocurrency mining operations.



CURRENT LANDSCAPE

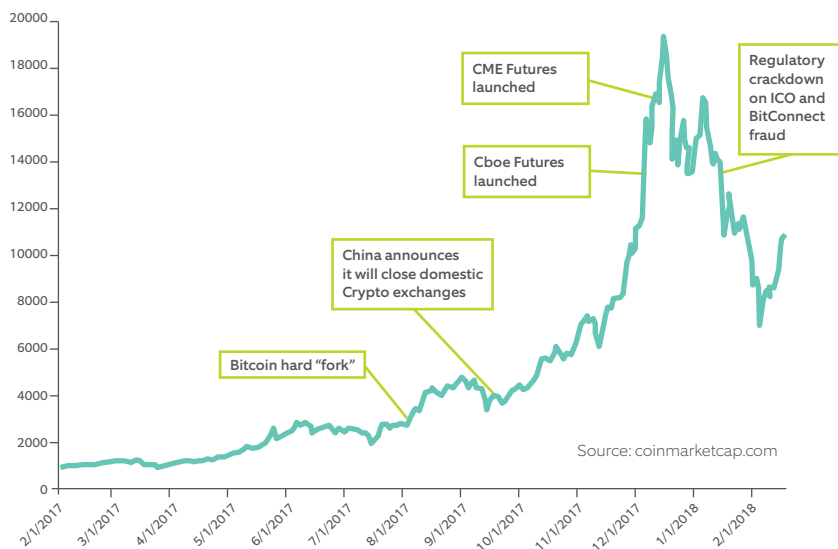
- The market is currently dominated by three main cryptocurrencies (65% of market capitalization, field of 1300) – Bitcoin, Ethereum and Ripple.

BITCOIN	ETHEREUM	RIPPLE
Consensus proof by mining	Consensus proof by mining	No consensus proof. No mining.
Cryptocurrency	Cryptocurrency and smart contracts	Settlement token for currency/ asset exchange
\$142 Billion Market Cap (14.3.18)	\$62 Billion Market Cap (14.3.18)	\$28 Billion Market Cap (14.3.18)
42% of market	18% of market	8% of market

Source: <https://coinmarketcap.com/coins>

- The technology and primary use cases for each have distinct differences but, recently, all three have seen significant volatility swings

BITCOIN PRICE MOVEMENTS FOR THE 12 MONTHS ENDING 1ST FEBRUARY 2018



- Volatility has been tied to mainstream press coverage. Recent declines in market cap have been linked to an increase in negative coverage around hacking, fraud and hijacking involving cryptocurrencies.
- Bitcoin has been a particular target of negative coverage – as the most widely known cryptocurrency, its emphasis on anonymity has left it open to use in questionable behaviors and this has resulted in a number of high profile enforcement actions.
- As Bitcoin and other cryptocurrencies mature, with a reducing number of profitable mining pools and companies, there is a risk that the 51% consensus required to validate transactions could fall under the influence of a small number of bigger miners leaving the system vulnerable to market manipulation.
- Efforts are being made to increase trust in the marketplace – a key example is the launch of futures products on major derivatives exchanges (CME Group, Cboe) which aim to provide greater accessibility and protection. However, the impact has so far been limited with some suggesting the launches have added to volatility by allowing investors a method to “short” the product while other providers are taking a wait-and-see approach leaving room for new specialist exchanges to enter the market.
- Increasingly, crypto-exchanges are being required to carry out full AML and KYC checks on customers to restrict illegal usage and to report to regulatory and tax authorities, thus removing the owners’ anonymity.

TYPES OF CRYPTOCURRENCY

While there are over 1,300 various cryptocurrencies⁴ available today, the basic make up of cryptocurrencies can typically be broken down into three main categories:

Transactional currency – the most familiar type of cryptocurrency. These coins are generated by verification of transactions on the blockchain and primarily serve the purpose of being a store of value. They offer varying levels of anonymity to holders.

Consumer/Utility tokens – coins issued to provide access to future products or new applications. The most recognizable example of this is Ethereum which is used to create applications that can automatically trigger event actions, etc. (e.g. smart contracts). Consumer/Utility tokens are common for payment systems.

Security tokens – coins issued backed by external tradable assets or real-world securities. These tokens are becoming more common in the Initial Coin Offering (ICO) market as a means to issue security-like capital-raising offerings. These tokens have been singled out by the SEC and other national regulators as subject to their regulatory oversight.

⁴Source: <https://coinmarketcap.com/all/views/all/> (as at June 2018)

KEY INVESTOR RISKS

- High volatility and price manipulation
 - Forks
 - Limits on supply
 - Potential for monopoly control of value
- Reputational risk
- Lack of consistent tax treatments
- Data/key loss
- Exchange rate risk
- No facility for chargebacks or refunds in the event of error

GOVERNMENTS, CENTRAL BANKS AND REGULATORS

Global

Increasing support for global action by G20 but expected to take years to trickle down which puts onus on regional and national regulations.

EMEA

European Commission is actively investigating cryptocurrency regulation and has already enacted KYC/AML rules for all exchanges with a May 2019 deadline. The EU is reluctant to impose heavy regulation to avoid stifling innovation. Currently, there are diverse approaches amongst EU nations ranging from restrictive to permissive.

US

US Treasury taking lead on a coordinated approach but classifications differ across government agencies. Regulators calling for increased policy collaboration in the oversight of cryptocurrencies. Individual states and geographies already legislating but these may be overtaken at federal level.

APAC

Range of approaches from heavy-handed to open arms. Fragmented approach across the region with little indication of collaboration.

- There is extremely diverse, fragmented and inconsistent treatment across geographies. Ultimately, a global approach is required but this isn't anticipated in the short term. The US and EU are looking to enact their own measures in the long term but there is significant uncertainty from other jurisdictions.
- There is also the added complication of a lack of common classification of coins amongst governments, regulators and tax authorities. For example, in the US, the Securities and Exchange Commission (SEC) considers most cryptocurrencies as securities, the Commodity Futures Trading Commission (CFTC) has designated them as a commodity and the Internal Revenue Service (IRS) believes them to be property and thus subject to capital gains tax.
- This diversity of regulatory approach is also seen between countries - for example, Germany will treat cryptocurrencies as equivalent to legal tender for tax purposes whilst China has virtually banned the issuance and trading of cryptocurrencies at this time.
- Meanwhile, a number of central banks are considering issuing central bank digital cash (CBDC) including Sweden, Norway, Switzerland and Singapore.

STRUCTURAL RISKS

Across the global institutions (G20, FSB, BIS) there is consensus on the leading risks and issues posed by cryptocurrencies needing the most urgent actions:

- Use of cryptocurrencies for criminal activities such as money-laundering
- Evasion of taxes, income, capital gains, sales or value added tax
- Absence of protection for all categories of consumers
- Threats from cyber-security, fraud, theft and hacking
- Extreme price volatility, lack of transparency and the potential for market manipulation

POTENTIAL BENEFITS

- Digitalization of payments – direct processing without an intermediary and their associated fees
- Shortened settlement windows – underlying technology to support 'near real-time' process
- Peer to peer network – allows clients to transact directly with each other
- Digital identification – secure, permissioned storage of digital identification information
- Non-centralised capital raise via ICO – method of crowdfunding a capital raise for new technology endeavors

FINANCIAL SERVICES INDUSTRY PERSPECTIVES

- Cryptocurrencies and DLT may disrupt traditional financial services infrastructure with increased transparency, “immutable” records and technology to replace intermediaries in the value chain.
- There is continued interest in the development of these technologies from a wide range of perspectives. This is likely to increase as governments and regulators solidify their guidelines and regulatory frameworks.
- The bulk of change will be in the infrastructure to manage transactions. One potentially significant outcome would be increased interoperability and standardization across the industry. First movers will gain most in standardization and cost saving.
- Consumers are growing to trust new financial services providers and cryptocurrencies have delivered an alternative to traditional settlement infrastructures and payments networks. This creates a sense of a more individually-driven experience in the marketplace.
- There is a clear movement toward a decentralised approach to financial services but there are still significant issues. For example, there is still scope for fraudulent activity to be conducted at the periphery of a blockchain eco-system where it connects to existing infrastructures.
- However, one of the primary advantages is the immutability of the records created and the availability of a “golden source” of data.
- The potential future benefits are still very much in flux and will be shaped by the continuing evolution of the technology, its deployment in the industry and marketplace and the pace of regulatory developments.
- Whilst governments, legislators and regulators are currently wrestling with the immediate risks and challenges, most acknowledge that the cryptocurrency phenomenon will, in some form, become a permanent feature of the future global digital economy and the pace of regulatory developments..

GLOBAL DIGITAL FINANCE

Global Digital Finance (GDF) is a not-for-profit initiative that has convened some of the most influential digital currency companies, thought leaders, academics and influencers to engage with global policy makers and regulators.

The participants in the GDF initiative believe in the need for a robust code of conduct that is observed globally and can be adapted to suit local market needs.

The key elements of this will include, but are not limited to best practice around:

- KYC / AML (including data sharing, reporting and transaction monitoring).
- due diligence pre-token issuance.
- post-sale due diligence.
- practices on investor protections across the industry (e.g. sensible limits, disclosure requirements and warnings).

INDUSTRY INTELLIGENCE

- There has been a shift in the regulated industry's viewpoint from an initial skepticism toward cautious potential.
- New market entrants are emerging that are looking to capitalize on the current regulatory uncertainty.
- Many commercial banks are taking steps they believe will protect customers – for example, preventing the funding of cryptocurrency trading accounts (BAML, Citi, Lloyds) using credit.
- Very few major banks have launched any crypto-related services and most are awaiting the right regulatory framework in which to operate with full investor protections.

HOW IS NORTHERN TRUST RESPONDING?

- Northern Trust is taking a cautious approach towards cryptocurrencies given the current lack of asset class definition by regulators and government. This approach is mirrored by other banks around the world.
- However, although there are many concerns associated with cryptocurrencies, Northern Trust believes that digital currencies, with appropriate regulatory oversight, are likely to play a role in shaping future developments in our industry and we are actively working with industry associations to advocate and contribute to the development of policy and regulatory frameworks.



“We are starting to see the regulatory community wake up to cryptocurrencies, crypto assets and digital fiat initiatives. We are well positioned at Northern Trust with senior engagement with policy makers to influence the regulatory direction of travel. It is imperative given the increased client focus on this area that we foster a safe and secure environment.”

**– JUSTIN CHAPMAN
GLOBAL HEAD, MARKET
ADVOCACY & INNOVATION
RESEARCH**

© 2018 Northern Trust Corporation. Head Office: 50 South La Salle Street, Chicago, Illinois 60603 U.S.A. Incorporated with limited liability in the U.S. Products and services provided by subsidiaries of Northern Trust Corporation may vary in different markets and are offered in accordance with local regulation. This material is directed to professional clients only and is not intended for retail clients. This information is not intended to be and should not be treated as legal advice, investment advice, or tax advice. Readers, including professionals, should under no circumstances rely upon this information as a substitute for their own research or for obtaining specific legal or tax advice from their own counsel. The information in this report has been obtained from sources believed to be reliable however Northern Trust accepts no liability in respect of the accuracy and completeness of this information. All information contained herein is subject to change at any time without notice. Any person relying upon information in this report shall be solely responsible for the consequences of such reliance. For Asia-Pacific markets, it is directed to expert, institutional, professional and wholesale investors only and should not be relied upon by retail clients or investors. For legal and regulatory information about our offices and legal entities, visit northerntrust.com/disclosures. The following information is provided to comply with local disclosure requirements: The Northern Trust Company, London Branch; Northern Trust Global Services PLC; Northern Trust Global Investments Limited; Northern Trust Securities LLP. The following information is provided to comply with Article 9(a) of The Central Bank of the UAE's Board of Directors Resolution No 57/3/1996 Regarding the Regulation for Representative Offices: Northern Trust Global Services PLC, Abu Dhabi Representative Office. The Northern Trust Company of Saudi Arabia - a Saudi closed joint stock company - Capital SAR 52 million. Licensed by the Capital Market Authority -License No. 12163-26 - C.R: 1010366439. Northern Trust Global Services PLC Luxembourg Branch, 6 rue Lou Hemmer, L-1748 Senningerberg, Grand-Duché de Luxembourg, Succursale d'une société de droit étranger RCS B129936. Northern Trust Luxembourg Management Company S.A., 6 rue Lou Hemmer, L-1748 Senningerberg, Grand-Duché de Luxembourg, Société anonyme RCS B99167. Northern Trust (Guernsey) Limited (2651)/Northern Trust Fiduciary Services (Guernsey) Limited (29806)/Northern Trust International Fund Administration Services (Guernsey) Limited (15532) Registered Office: Trafalgar Court Les Banques, St Peter Port, Guernsey GY1 3DA.