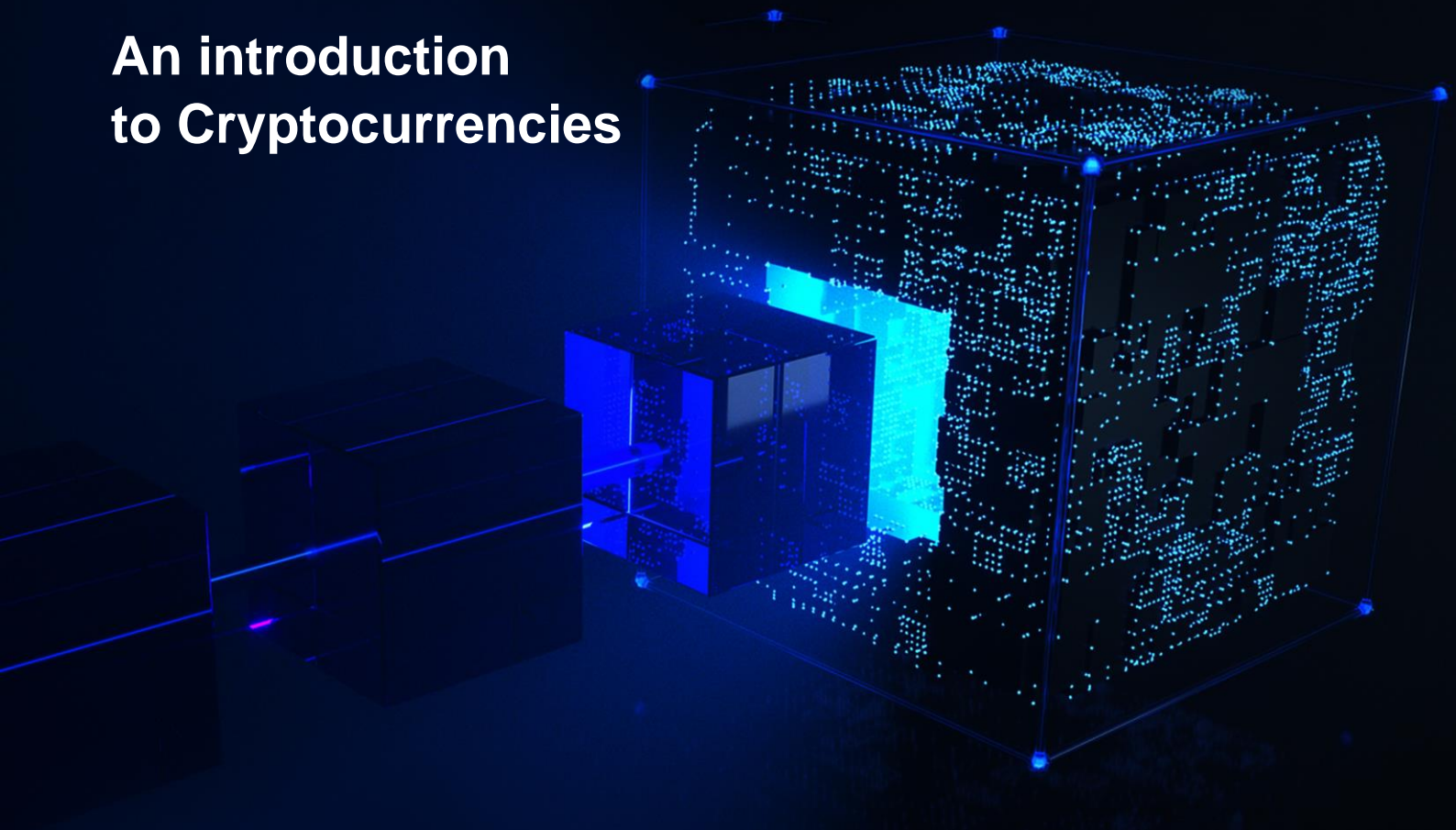




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Cryptocurrencies

An introduction
to Cryptocurrencies



Introduction to Cryptocurrencies

Cryptocurrencies have taken the world by storm, with Bitcoin's and Ethereum's market capitalisation growing by approximately 10x and 24x, respectively, over the past 3 years.

As investor interest continues to rise rapidly in this asset class, this 360 Perspectives should help add some colour on major Cryptocurrencies, including on the following topics:

- What is a Cryptocurrency?
- An introduction to Bitcoin and Ethereum
- How does blockchain technology work?
- Potential applications of Cryptocurrencies
- How does Bitcoin compare against Fiat money?
- How could one value Bitcoin and Ethereum?
- Risks involved with investing in Cryptocurrencies

What is a Cryptocurrency?

- Cryptocurrencies are a form of **digital cash** that allows users to transmit value
- Transaction data is stored on a 'distributed ledger' or database that is widely distributed across a computer network rather than dependent on a centralized node
- This avoidance of central control arguably makes it more resistant to hacks
- Transactions are peer-to-peer, not needing financial intermediaries like banks
- Cryptocurrencies are **functional 24/7** and **permissionless** – meaning anyone with an internet connection can transact

Manpreet Gill

Head, FICC Strategy

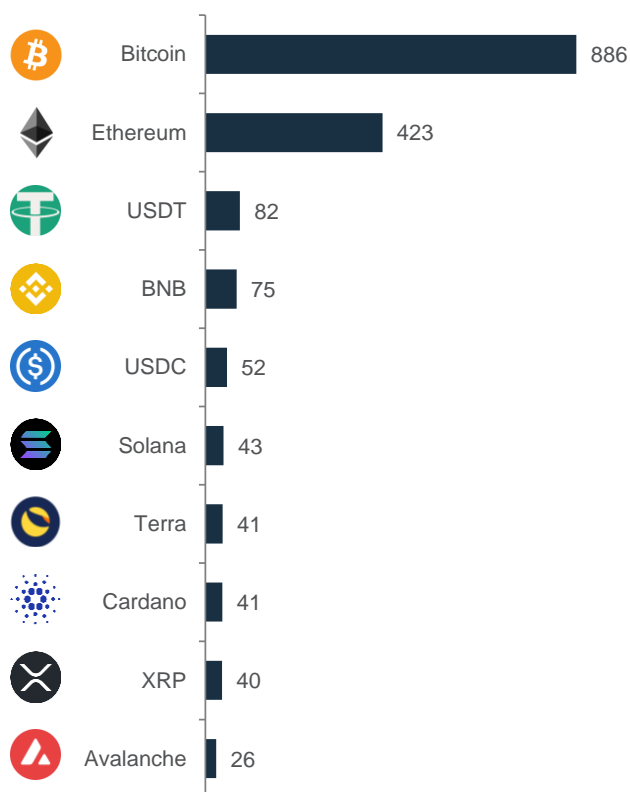
Nguyen Trang

Senior Portfolio Strategist

Nataniel Tang

Investment Strategist

Fig. 1 Market cap of the 10 largest Cryptocurrencies
USD bn



Source: Binance, CoinMarketCap, Standard Chartered Bank
Data as of 5 April 2022

A deeper look into the two largest Cryptocurrencies

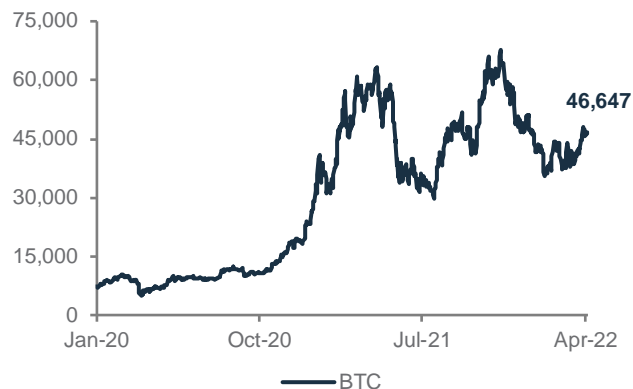
A closer look at Bitcoin [BTC]



- First major cryptocurrency (as we understand it today), launched in 2009 by Satoshi Nakamoto (Pseudonym)
- Goal is to be **digital money**
- **First crypto project that was widely adopted** and has thus far held 'value'
- Often referred to as 'digital gold' as there is a **finite supply of coins, is energy-intensive and difficult** to produce
- BTC has a total supply of 21m, with close to 19m in circulation
- **BTC rewards earned from mining gets halved** every 210,000 blocks (approx. 4 years). The last halving took place on 11 May 2020

Fig. 2 Bitcoin's price run in USD terms

USD per BTC



Source: Binance, Bloomberg, Standard Chartered Bank
Data as of 5 April 2022

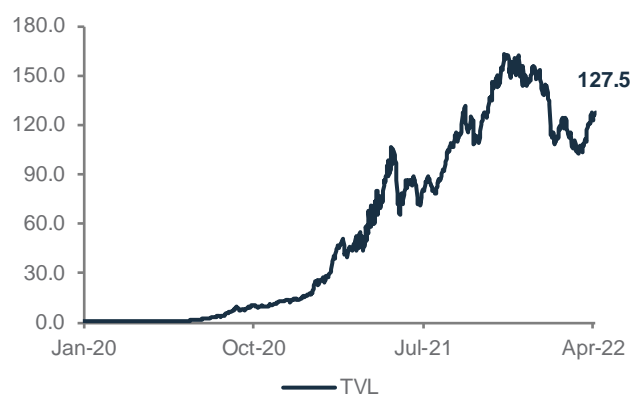
Insights into Ethereum [ETH]



- Launched in 2015 by **Vitalik Buterin**
- ETH is a cryptocurrency that **can be coded to execute smart contracts** (eg. if X satisfies condition Y, then send payment to Z)
- In addition to being a currency, **ETH is also a token, hence has derived value more from utility**
- ETH opened a new world of decentralised applications (dApps) such as De-centralized Finance (DeFi) and Non-Fungible Tokens (NFTs)
- **No cap on total ETH supply**, but only 18m ETH can be mined each year

Fig. 3 Total value locked (TVL) of Ethereum DeFi protocols¹

USD bn



Source: Binance, Defi Llama, Standard Chartered Bank

1. TVL refers to the total value of crypto assets that are deposited in decentralized (DeFi) protocols – analogous to asset under management (AUM)

Data as of 5 April 2022

How has BTC compared so far to traditional asset classes?

An overview across market scenarios, albeit with a very short history

Fig. 4 BTC as a “risk-on” play

BTC has had a very high positive correlation with small-cap stocks (0.92)

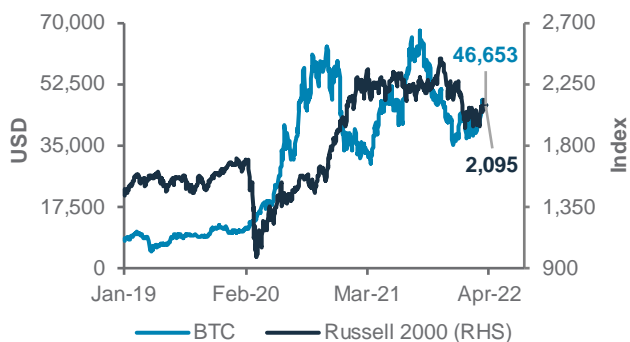


Fig. 5 BTC vs inflation

Some inflation hedge characteristics, but with a large amount of volatility



Fig. 6 BTC as a safe-haven

BTC has had a positive correlation with Gold (0.56)

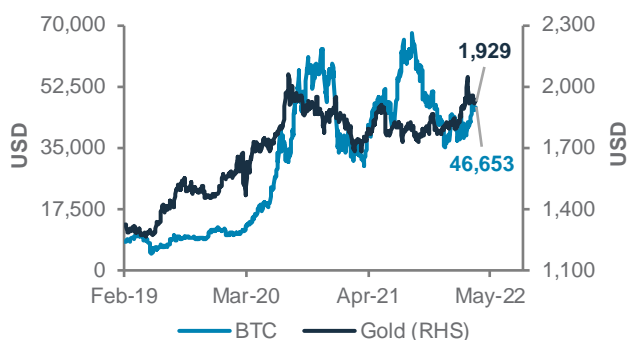
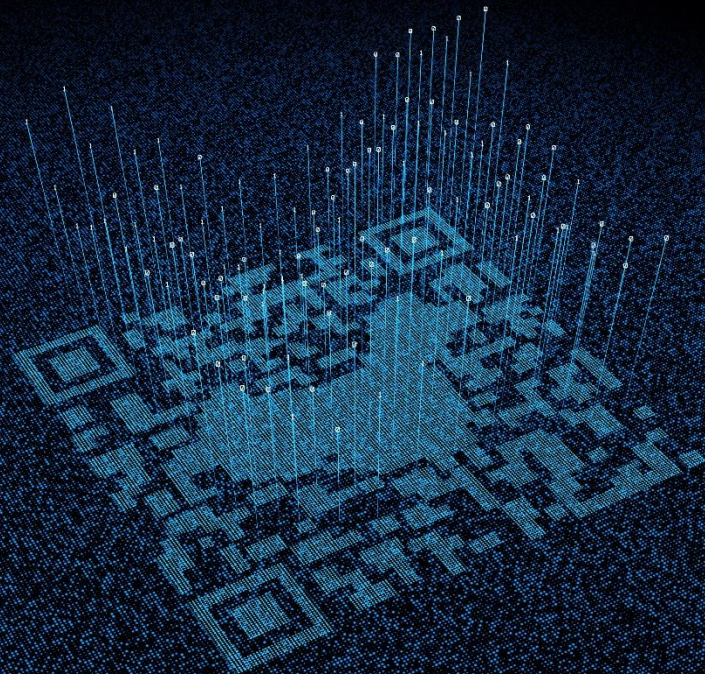


Fig. 7 BTC vs USD

BTC has been inversely correlated to the USD



Source: Bloomberg, Standard Chartered Bank
Data as of 5 April 2022

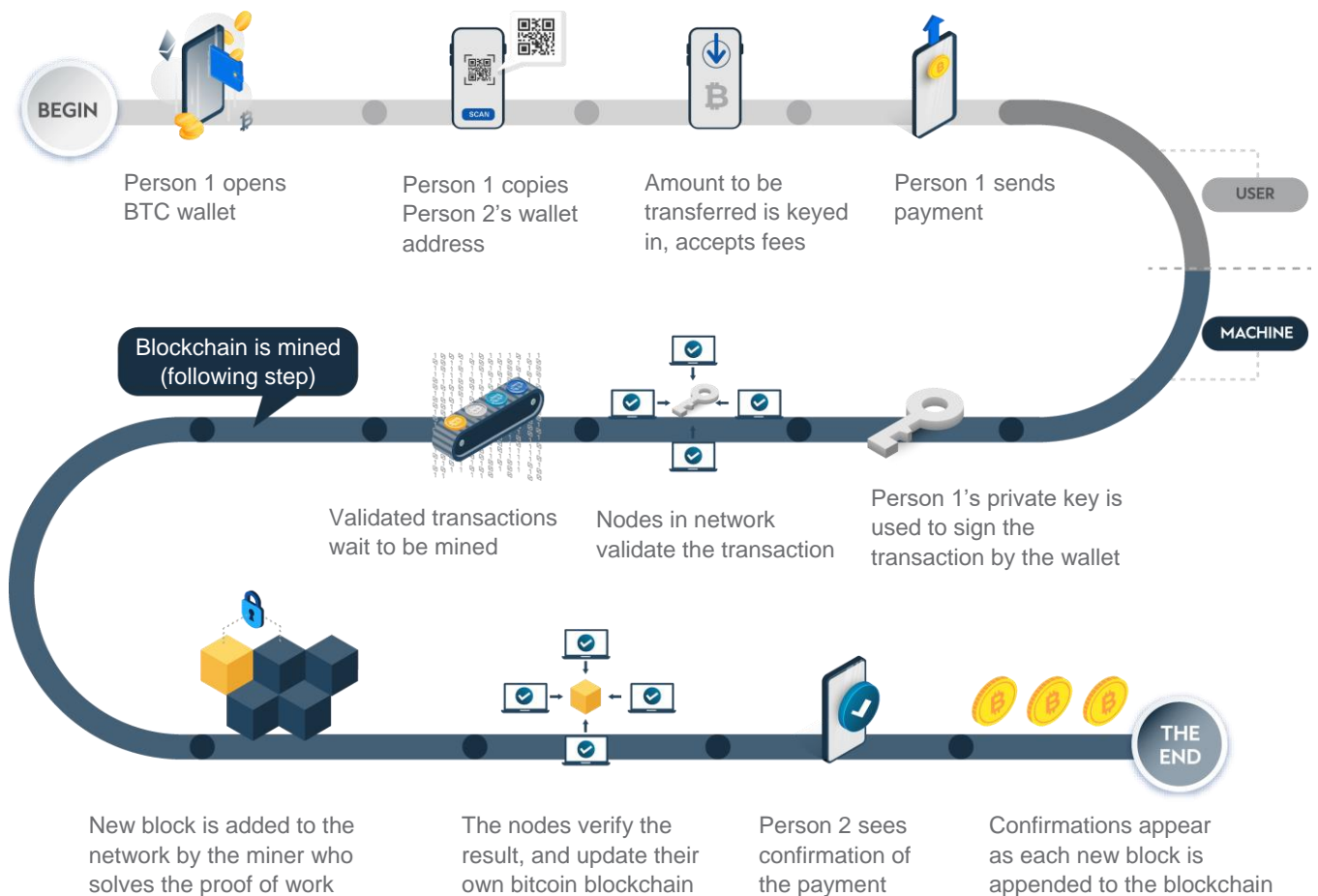


The underlying technology behind Cryptocurrencies: Blockchain

How does Blockchain technology work?

- Also known as ‘Distributed ledger technology’
- Data is stored in blocks across a network of databases known as nodes
- Each block is built on top of the previous block and is **linked together via hashing***
- **Each block will point back to the previous block** via the hash
- When a transaction wants to be done it will be broadcast to the network
- **Miners compete to hash the block.** Once done, all other nodes will validate and update their copy of the blockchain

The life cycle of a BTC transaction





Source: Binance, J.P. Morgan, Standard Chartered Bank

* Hashing – To pass data through mathematical algorithms to receive an output string of a fixed length

Application of Cryptocurrencies

A sampling of current and potential future applications of Cryptocurrencies

Use cases	Applications 	Adoption 
Gaming, NFT Industry	<ul style="list-style-type: none"> Web 3.0 gaming allows players to earn cryptocurrencies which can be sold for actual fiat money NFTs allows the artist/player to have ownership over their digital assets 	<ul style="list-style-type: none"> According to DappRadar, number of games using blockchain-based currencies has grown 71% y/y to 1,179 Axie Infinity, the second largest blockchain game by user base, recorded USD 3.5bn in NFT transactions in 2021 Total NFT market cap forecast to have surpassed USD 35bn in 2022 and expected to surpass USD 80bn in 2025
Remittance, payments	<ul style="list-style-type: none"> Cost of remitting money is high, slow and reliant on a third party Sending money through a blockchain system could be faster, more reliable and cheaper 	<ul style="list-style-type: none"> JPM has launched the JPM coin, which helps facilitate transfer of payments for institutional clients via a blockchain-based currency Ripple has partnered with over 300 customers – including Santander and Western Union – and sends international payments in 3 seconds via a blockchain-based currency compared to 5 days for traditional transfers

Source: Binance, Deloitte, CoinDesk, Business Insider, J.P. Morgan, Standard Chartered Bank

Is Crypto “Money” or “Digital Gold”?

ETH, BTC, Gold and US Dollar compared across the three functions of “Money”

Criteria	Ethereum	Bitcoin	Gold (Commodity Money)	US Dollar (Fiat Money)
Medium of exchange	Limited (better than BTC) <ul style="list-style-type: none"> Increasingly more traded. Not suitable for physical goods and services, but important for crypto transactions 	Limited <ul style="list-style-type: none"> Increasingly more traded, but not suitable for frequent, low-value transactions 	Limited <ul style="list-style-type: none"> Large, infrequent transactions mainly by financial institutions 	Good <ul style="list-style-type: none"> Improved over the years thanks to the increase of eCommerce and digital payment solutions. Widely accepted internationally across good and services
Unit of account	Poor (better than BTC) <ul style="list-style-type: none"> Not widely adopted outside crypto enthusiasts' community. Its high volatility makes it unsuitable for the pricing of goods and services. However, important for crypto transactions 	Poor <ul style="list-style-type: none"> Not widely adopted outside crypto enthusiasts' community. Its high volatility makes it unsuitable for the pricing of goods and services 	Poor <ul style="list-style-type: none"> Not common to price goods and services in gold. Investment practitioners may use it more regularly to make historical price comparisons/adjustments 	Good <ul style="list-style-type: none"> Common to see goods, services priced in USD

Criteria	Ethereum	Bitcoin	Gold (Commodity Money)	US Dollar (Fiat Money)
Store of value	Mixed <ul style="list-style-type: none"> Till date, Ethereum has increased in value against inflation. However, its history is short, prices are volatile, and ETH is seen more as a utility token rather than as a store of value. Also, inflationary in nature as supply is unlimited 	Mixed (better than ETH) <ul style="list-style-type: none"> Over its 13-year existence it has preserved and strongly increased in value against inflation. However, it suffers from 5x higher median volatility versus gold and 11x versus the USD 	Good <ul style="list-style-type: none"> Historically good inflation hedge, negatively correlated to real interest rates and the US dollar 	Mixed <ul style="list-style-type: none"> A dollar earned today will always be a dollar even in the future. However, money loses purchasing power over time when inflation is positive. Enjoys low volatility of c. 6% annualised over 12m periods

Source: Standard Chartered Bank

How can Cryptocurrencies be ‘valued’?

No widely agreed method, leading to a wide range of ‘fair value’ estimates

Crypto-currency	Valuation method	Details	Implication if applied today
01 BTC	Transactions to market cap (multiple)	<ul style="list-style-type: none"> Argument: As BTC is used as a digital currency, equity multiples of major credit card companies can be used to estimate crypto market cap 	<ul style="list-style-type: none"> BTC is slightly undervalued
02 BTC	Institutional adoption	<ul style="list-style-type: none"> Argument: Estimate the total market cap of BTC as share of global institutional assets under management assuming a 2% allocation 	<ul style="list-style-type: none"> BTC is significantly undervalued
03 BTC	Intrinsic value of BTC	<ul style="list-style-type: none"> Argument: BTC does not have any intrinsic use as a currency (limited usage), as store of value (too volatile), as inflation hedge (not enough evidence) 	<ul style="list-style-type: none"> BTC has zero value
04 ETH	ETH market cap vs Banks market cap	<ul style="list-style-type: none"> Argument: Since Ethereum facilitates lending and trading, ETH market cap can be compared to global banks’ market cap 	<ul style="list-style-type: none"> ETH is significantly undervalued
05 ETH	Institutional adoption	<ul style="list-style-type: none"> Argument: Like BTC, estimate the total market cap of ETH as a share of global assets under management assuming a 2% allocation 	<ul style="list-style-type: none"> ETH is significantly undervalued
06 ETH	Fair value of ETH	<ul style="list-style-type: none"> Argument: ETH faces strong competition from new blockchains which aims to replicate and improve on smart contract functionality. Risk of obsolescence 	<ul style="list-style-type: none"> ETH is significantly overvalued

Source: Standard Chartered Bank



Risks of Cryptocurrencies

Risks involved with investing in Cryptocurrencies

RISK				
 HACKING <ul style="list-style-type: none"> Cryptocurrencies are often subjected to hacking Hackers target wallets holding cryptocurrencies, often via phishing emails to steal the private keys 	 REGULATORY <ul style="list-style-type: none"> Cryptocurrencies are currently unregulated There is an increasing probability of greater regulation across most major markets. This risks creating additional price volatility, or sending their value to zero by rendering cryptocurrencies illegal, at an extreme 	 VOLATILITY <ul style="list-style-type: none"> In general, cryptocurrencies are a very volatile asset class (median six-month annualised volatility for BTC since October 2012 is 76.3%, vs. 11.6% for global equities) This means investors will need the risk appetite to ride through such high volatility levels to implement any directional views 	 SCAMS <ul style="list-style-type: none"> There are many scammers who market ("shill") their crypto projects to pump up the value of their tokens before disappearing with investors money (known as a "rug pull") <ul style="list-style-type: none"> Eg. Squid Game token 	

Risk of Cryptocurrencies – how could regulations evolve?

Deeper dive into US regulatory risks

Date	Policy 	Regulatory Implications 
November 2021	<ul style="list-style-type: none"> Bipartisan Infrastructure Bill – Updated tax reporting for digital assets 	<ol style="list-style-type: none"> Crypto and NFTs treated as "assets" Capital gains on crypto are taxed Form 1099, in which crypto brokers need to provide IRS with customer names and transactions
November 2021	<ul style="list-style-type: none"> President's Working Group – Recommendation report on Stablecoins 	<ol style="list-style-type: none"> Stablecoin issuers should be insured depository institutions Custodial wallet providers are subjected to federal oversight Stablecoin issuers to comply with activities restriction that limit affiliation with commercial entities
March 2022	<ul style="list-style-type: none"> Biden's Executive Order on Digital Assets 	<ol style="list-style-type: none"> Ensuring responsible development of digital assets Half-dozen agencies and executive offices are tasked with studying distributed ledger technology Focus: stricter AML, regulations to protect investors, implications of adoption

Source: Coindesk, US Treasury, CNBC, Standard Chartered

Conclusion

What does the future hold for Cryptocurrencies?



Our concluding thoughts on Cryptocurrencies

Is there an investment case for Cryptocurrencies?

- A case can be made that adoption of cryptocurrencies will only rise from here, both in existing industries/processes (e.g. traditional industries like remittances), or as a tool to help implement blockchain-based contracts.
- However, it appears far from clear whether this translates into higher or lower prices for major cryptocurrencies:
 - 1) Valuation methods are rudimentary at best and highly subjective
 - 2) Volatility of cryptocurrencies remains very high, a significant hurdle to wider adoption
 - 3) Emerging regulatory landscape is a key risk that could significantly impact the outlook for cryptocurrencies, in either direction
- Key factors to watch from here include how regulations develop, whether investor allocations become more widespread and how use cases evolve

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