

## Update: Bitcoin, Crypto and Digital Currencies

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Note: Information as of June 9, 2021, unless otherwise indicated.

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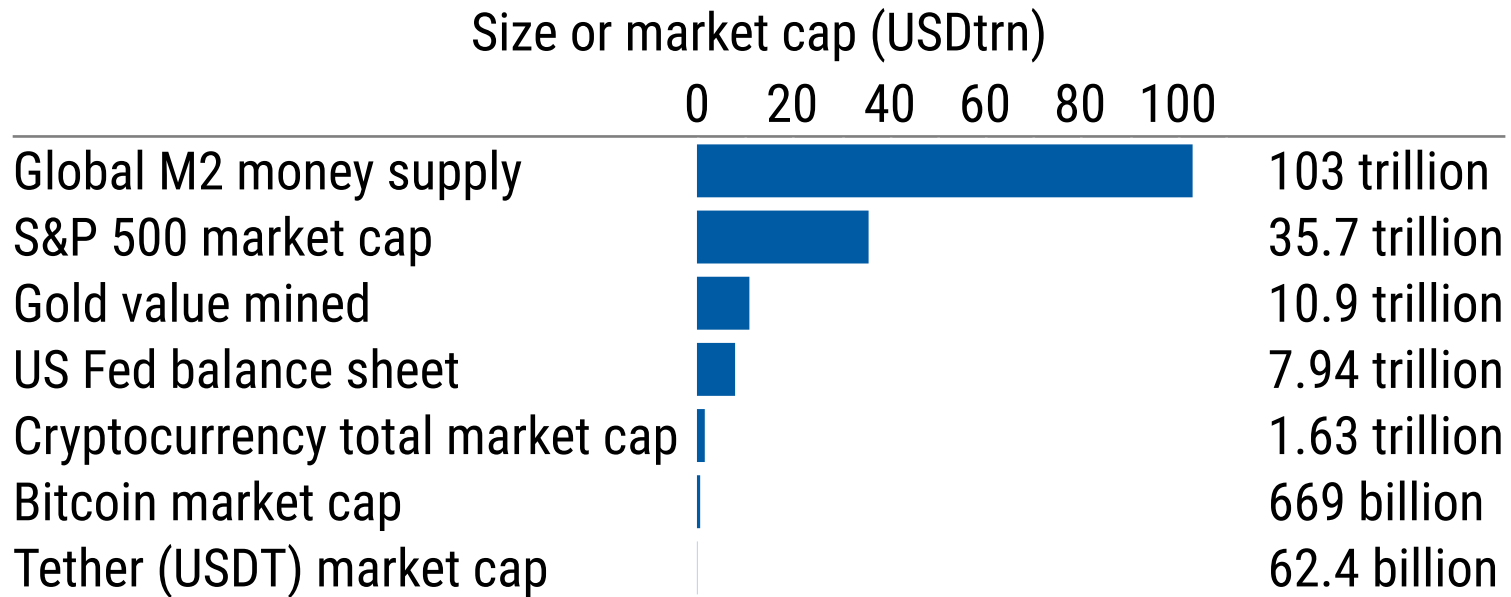
# Bitcoin and cryptocurrency price action

## Prices | **Crypto leverage growth**

- Leverage drives prices up and down: A 900+% rally in bitcoin followed by over a 50% correction is typical for the volatility seen in bitcoin's history.
- Bitcoin and other cryptocurrencies currently trade as speculative assets and not as currencies. We are not saying this cannot change in the future for any of these tokens.
- Over the past year, prices were boosted by retail and institutional involvement but also increased leverage in the cryptocurrency industry. For example, leverage via futures (up to 100x levered), options, decentralized finance projects offering flash loans and the growth of USD-based stablecoin issuance.
- China's historical participation via mining and exchanges has made its crackdown on the industry (bitcoin in particular), and speculative leverage overall, important. Miners are likely in the process of moving elsewhere (to use other energy sources) or cashing out, which has not helped prices.
- Alt-coins outperformed bitcoin for a variety of reasons including: lower \$ value so more chance of high percentage gains, momentum in prices increasing at times, worries about bitcoin energy usage and Ether's new money supply plan.

## Macro | Money supply and the size of the cryptocurrency market

### Putting it into context



Source: Macrobond, Morgan Stanley Research

## Prices | Macro drivers

- **Fed and central bank balance sheet expansion**

In mid-2020, many cited rapid Fed money supply expansion leading to high USD inflation expectations as a reason to hold bitcoin as its money supply growth is currently fixed. The 'inflation' factor is fading as the main reason to hold crypto now, as seen in a recent [hedge fund survey](#), particularly as price momentum has slowed and the factor is well known.

- **Stablecoin supply growing**

We could consider the growth of stablecoin supply (mostly USD-based) as similar to the way macro investors look at the impact of the growth of the Fed's balance sheet. There is currently \$105 billion of stablecoins issued, having grown 18x since the start of 2020. Over 99% are USD-based, with 60% USDT (Tether) and 22% USDC (Circle). We could argue that these coins are backed by deposits/assets but the crypto stablecoins are now widely used to create leverage in the crypto system.

- **China's concerns about market leverage and energy usage**

China's regulators have become more worried about speculation in markets and its impact on financial stability, [saying they would](#) "crack down on bitcoin mining and trading behavior", which caused a 25% fall in bitcoin initially in a few days. Environmental concerns over the use of coal for energy for bitcoin mining and bitcoin being a competitor to the digital RMB are all reasons for the new focus.

## Prices | **Macro drivers**

- **ESG concerns**

- Rising bitcoin usage and electricity shortages contributing to efforts to curtail mining (e.g., Iran and China).
- Environmental concerns being raised around new 'renewable' projects to provide electricity for mining operations.
- Bitcoin advocates push increased renewable yield thesis.

- **Government stimulus**

- Employment benefits boosted retail participation in the equity and crypto markets.
- Focus will move towards whether cryptocurrency prices can recover if the stimulus is reduced or goes away.

## Prices | ESG concerns/energy usage

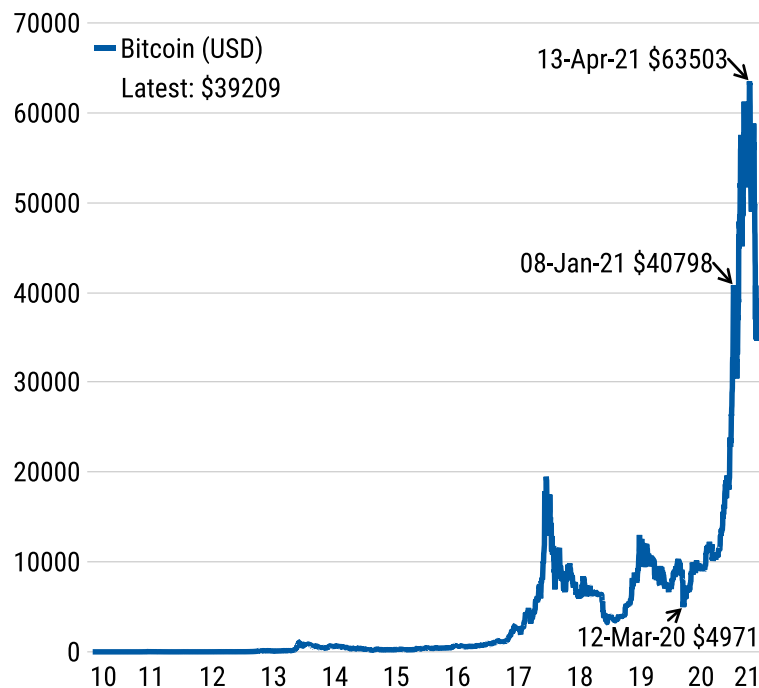
- **May 24: China announces crackdown on bitcoin mining**
  - On the surface, China's crackdown seems tied to China's newly stated efforts to reduce carbon emissions, with approximately two-thirds to three-quarters of bitcoin mining thought to be done in China, a substantial portion of which uses electricity from coal-powered plants.
  - China's concerns may also be tied to ongoing drought conditions in the Three Gorges Dam drainage region, which could limit availability of electricity.
- **May 26: Iran announces ban on bitcoin mining for the summer**
  - Authorities said they were proactively banning mining to help to prevent summer blackouts when usage soars and because droughts are limiting generating capacity.
  - Estimates put bitcoin mining demand in Iran at approximately 2.5% of the country's typical generating capacity.



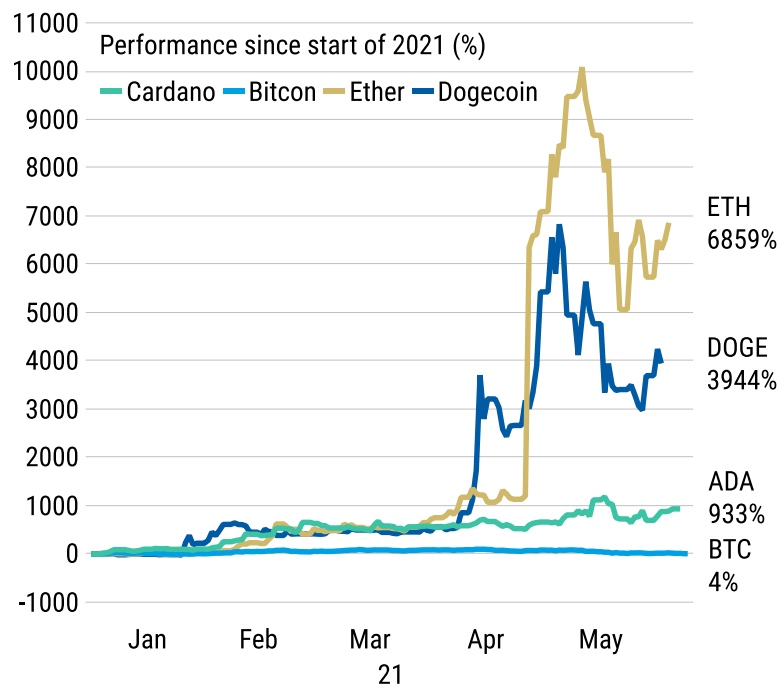
## Prices | Cryptocurrency bear market after a big bull market

Bitcoin peaked around \$65k in April, Ether and others peaked in May

### Bitcoin prices in a bear market



### Alt-coins have outperformed bitcoin as price momentum was sought in lower \$ value assets



Source: Macrobond, Cryptocompare, Morgan Stanley Research

## Prices | Bitcoin bear market in context

### Recent 52% fall is within the typical bear market range

- Updating the original analysis from [Features of a Bitcoin Bear Market \(19 Mar 2018\)](#)
- 52% peak to trough fall since April is within the range of prior bear markets of 28-92%.
- The 2020/early 2021 rally of 972% was the largest since 2013, when bitcoin rallied 1,030%.
- The time taken for the March 2020-January 2021 rally was the longest versus the prior rallies but with the first bearish fall being among the shortest at 14 days.

Dates			Bitcoin Price (\$)			Days		% change	
Start of rally	Peak	Trough	Start of rally	Peak	Trough	Start-Peak	Peak-Trough	Start-Peak	Peak-Trough
09-Apr-11	08-Jun-11	17-Nov-11	0.74	29.6	2.25	60	162	3900%	-92%
02-Oct-13	04-Dec-13	14-Jan-15	110	1240	157	63	406	1030%	-87%
11-Jan-17	06-Mar-17	24-Mar-17	778	1281	927	54	18	65%	-28%
27-Mar-17	10-Jun-17	16-Jul-17	1046	2914	1809	75	36	179%	-38%
14-Sep-17	16-Dec-17	14-Dec-18	3155	19588	3136	93	363	521%	-84%
02-Apr-19	26-Jun-19	18-Dec-19	4126	13571	6437	85	175	229%	-53%
13-Mar-20	08-Jan-21	22-Jan-21	3915	41982	28818	301	14	972%	-31%
22-Jan-21	14-Apr-21	19-May-21	28818	64870	30017	82	35	125%	-54%
			Average			104	168	985%	-59%

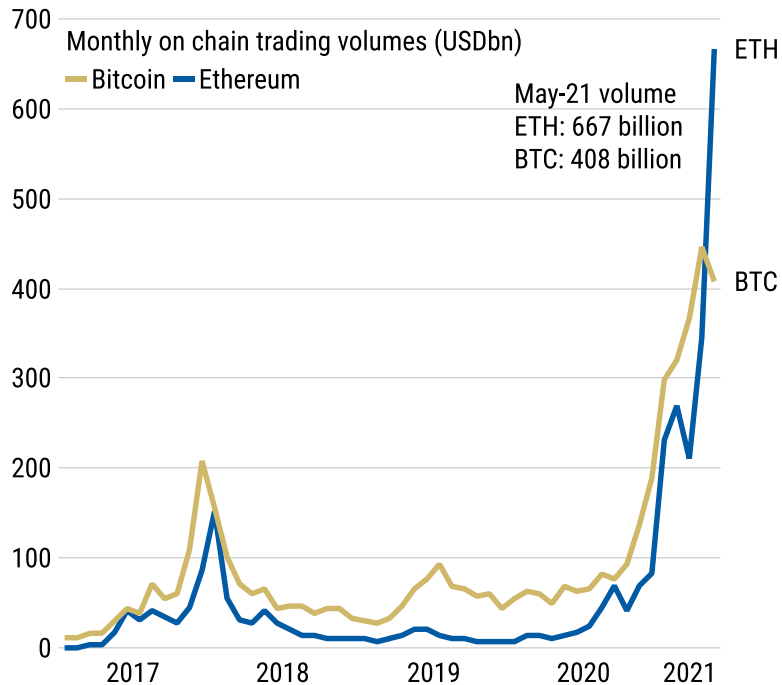
Source: Bloomberg, Cryptocompare, Morgan Stanley Research

Average is calculated to January 2021 trough row.  
Final row assumes if bitcoin troughed on May 19 – we don't know if this is case yet.

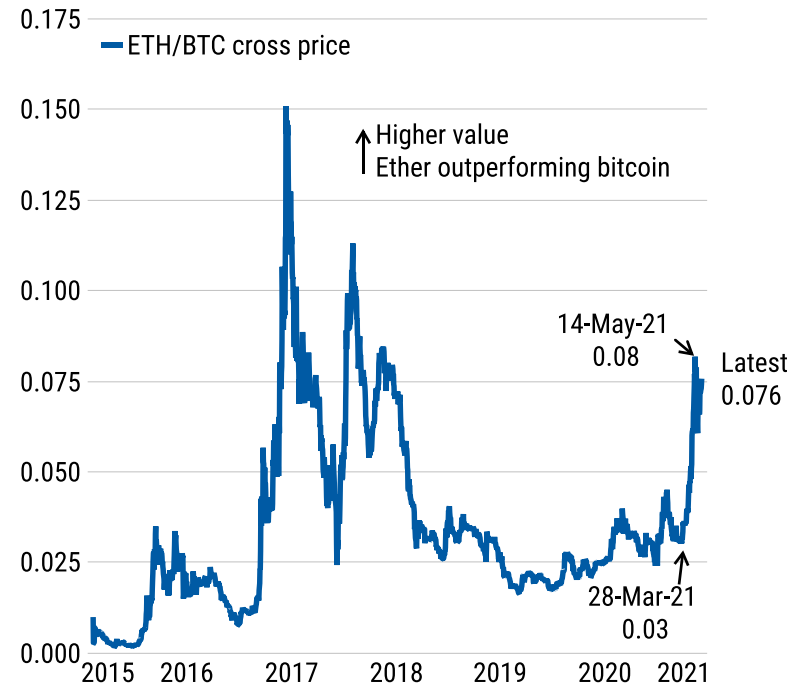
## Prices | Ethereum (ETH) prices and volumes rise more than BTC

Change to Ethereum means coins could be destroyed in the future; ETH is considered more 'green' than bitcoin and decentralized finance still mostly runs on Ethereum

### Ethereum trading volumes record over \$600 billion in May, 60% more than bitcoin volumes



### Ethereum price has doubled versus bitcoin since March

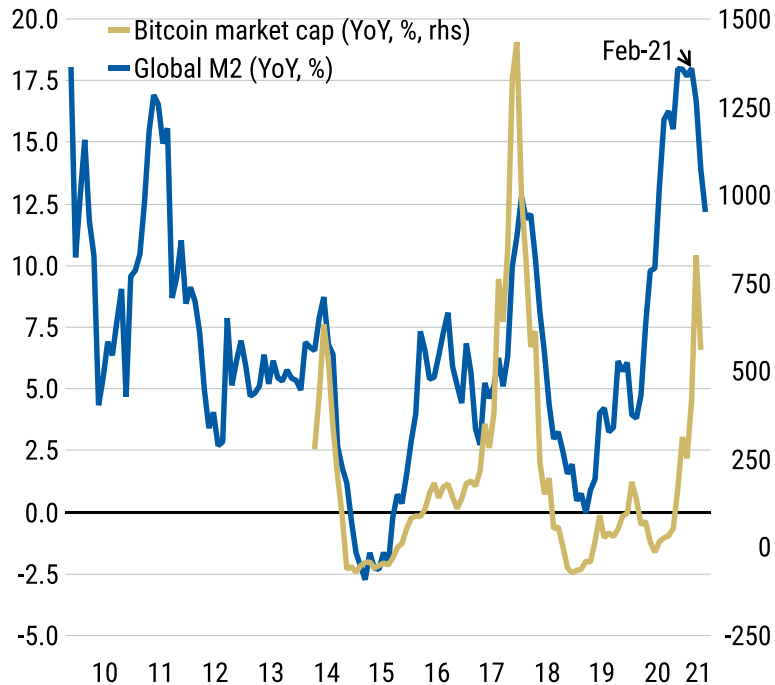


Source: The Block Crypto, Macrobond, Morgan Stanley Research

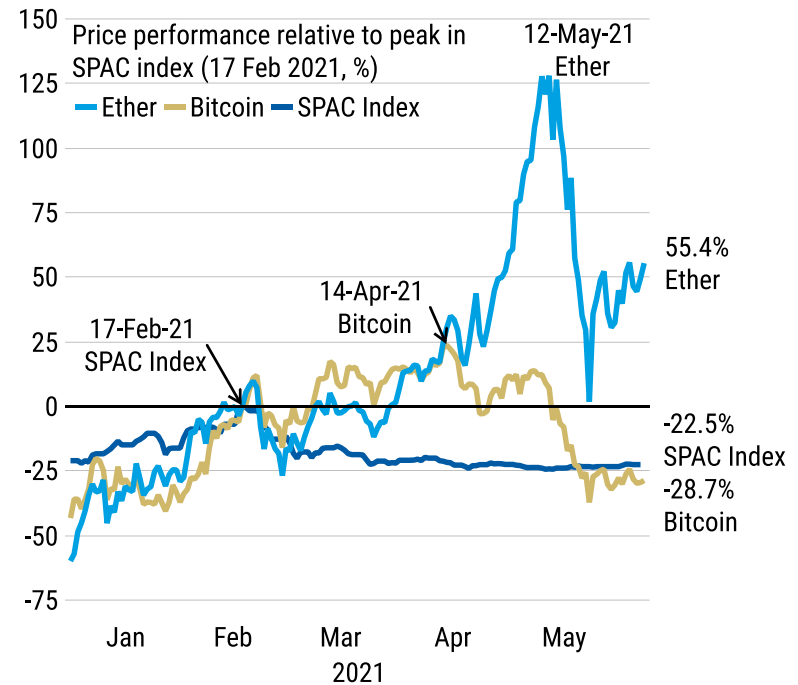
## Prices | Leverage reduction in the riskiest parts of the market

Annual fiat money supply growth has slowed from February. SPACs, a reflection of lots of market liquidity going to risky assets, peaked a month before bitcoin

### Global M2 money supply annual growth peaked in February, not helping bitcoin



### Recent market peaks: SPACs in February, bitcoin in April, Ether in May



Source: Macrobond, Bloomberg, Morgan Stanley Research

# **Energy usage and ESG concerns**

## ESG | Will China's green goals move mining elsewhere?

Bitcoin requires lots of energy to approve transactions, which is done to increase security of the network. ESG has become a bigger focus for the markets recently

- Bitcoin uses 0.5% of all global energy consumption\*, the equivalent of what a small country like the Netherlands consumes (population 17 million) or 1/36<sup>th</sup> of US energy consumption.
- **China's green goals**
  - China hosts 65% of the computers that approve transactions on the bitcoin network, the most of any country.
  - China aims to reduce carbon emissions as a % of GDP by 60% by 2030 (versus 2005 levels).
  - The regions in China hosting bitcoin mining computers mostly use coal to generate electricity. Mongolia is one of those regions and it banned bitcoin mining from April 2021.
  - Scientists in China [published an article in Nature](#) saying that growing energy consumption and carbon emission of bitcoin mining could potentially undermine global sustainability efforts. Some of their analysis is being debated and questioned by some but the messaging is clear that China wants to reduce bitcoin mining.

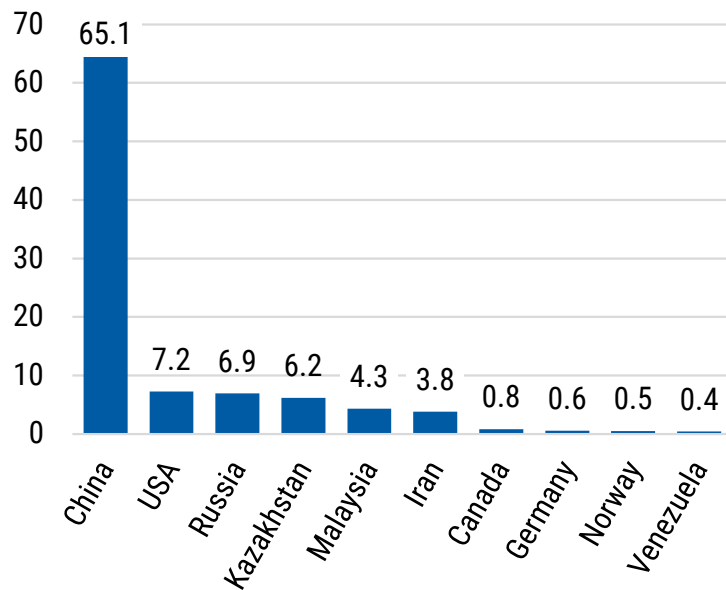
Source: <https://digiconomist.net/bitcoin-energy-consumption>

## ESG | Bitcoin's electricity usage high but can renewables help?

China has been the main location for bitcoin mining equipment due to low costs. The usage of renewable energy instead of coal is being debated as an alternative

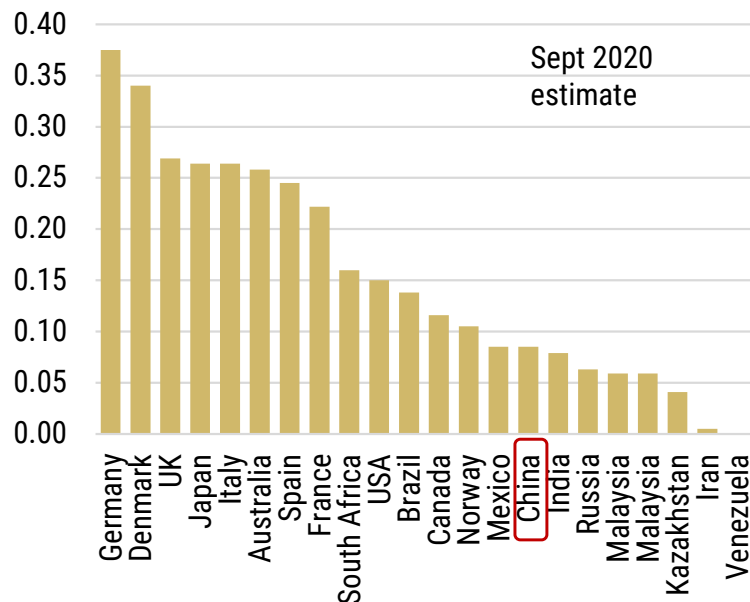
**China is the location for 65% of the computer power for the bitcoin blockchain**

Bitcoin mining share of hash rate (%)



**Electricity costs in China are among the lowest in the world**

Electricity costs (\$/kWh)

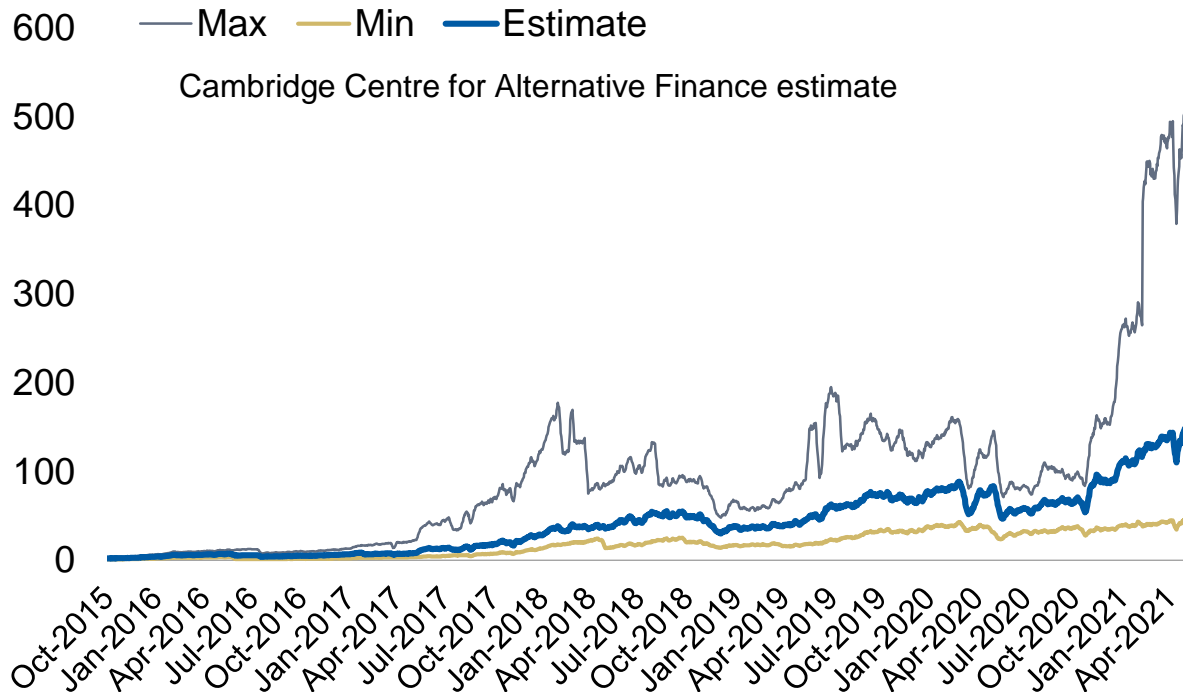


Source: Cbeci.org, globalpetrolprices, Morgan Stanley Research

## ESG | Bitcoin's electricity usage

**Proof of work used to check bitcoin transactions uses a lot of energy, which is a security feature. Could other approaches like proof of stake be more ESG-friendly?**

Bitcoin electricity consumption (TWh, annualized)



**Three Gorges Dam –  
98.8TWh**



Source: Cambridge Centre for Alternative Finance, USGS, Wall Street Journal, Morgan Stanley Research



# **What are different types of investors asking?**

## Investors | Key questions

### Thesis-driven investors versus fundamental-driven investors

- **Thesis-driven investors:**
  - What are others asking you about?
  - How much interest are you seeing from hedge funds, pension funds, etc.?
  - What other inflation or yield alternatives are there?
- **Fundamental-driven investors:**
  - What are the ESG implications?
  - How will this impact the financials and payments ecosystems?
  - Where are regulators likely to come out on these instruments?
  - What are the nuanced differences among cryptos?

## Investors | **Wealth and asset managers**

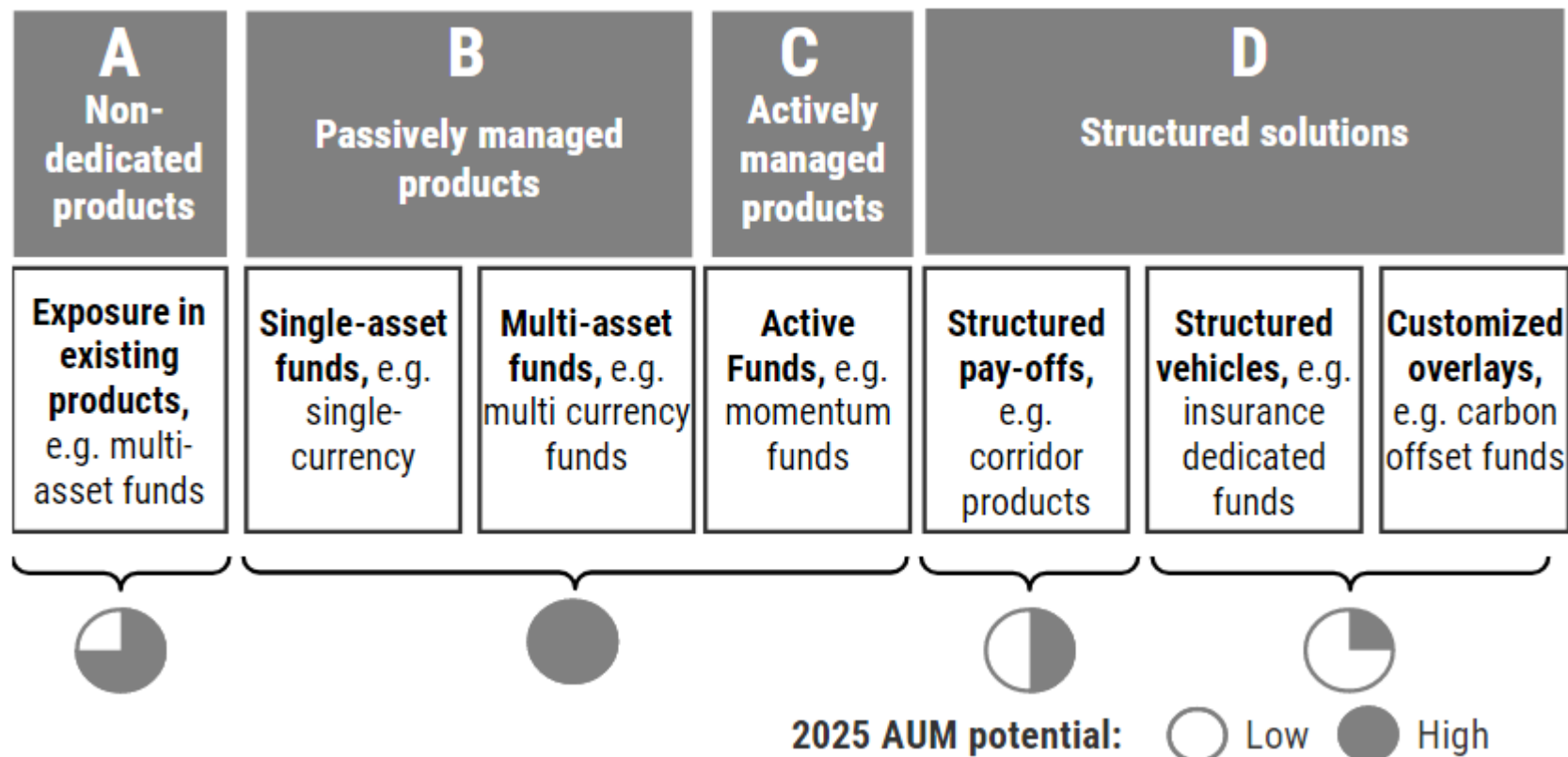
### From our latest **Blue Paper with Oliver Wyman**

- Private investors are currently getting exposure via 'one-stop shop' exchanges or platforms rather than mainstream wealth managers.
- Leading wealth managers are developing offerings to let their clients invest in crypto currencies. They do so by (re)establishing crypto trading desks and providing access across the spectrum of crypto investments, from physical coins to derivatives and investment vehicles, e.g., through joint ventures and partnerships.
- Most wealth managers are still waiting for more permissive regulatory signals, improved liquidity conditions and the development of mutual funds or ETFs. Clients have high risk tolerance.
- If regulators across the globe continue to approve crypto investment products and sustainability concerns are alleviated, we believe crypto could have the potential to generate a base case ~\$1 billion revenue opportunity for asset managers.

Source: [Wealth & Asset Management: Competing for Growth \(10 Jun 2021\)](#)

## Investors | Wealth and asset managers

### Asset manager potential crypto product offerings (Oliver Wyman analysis)

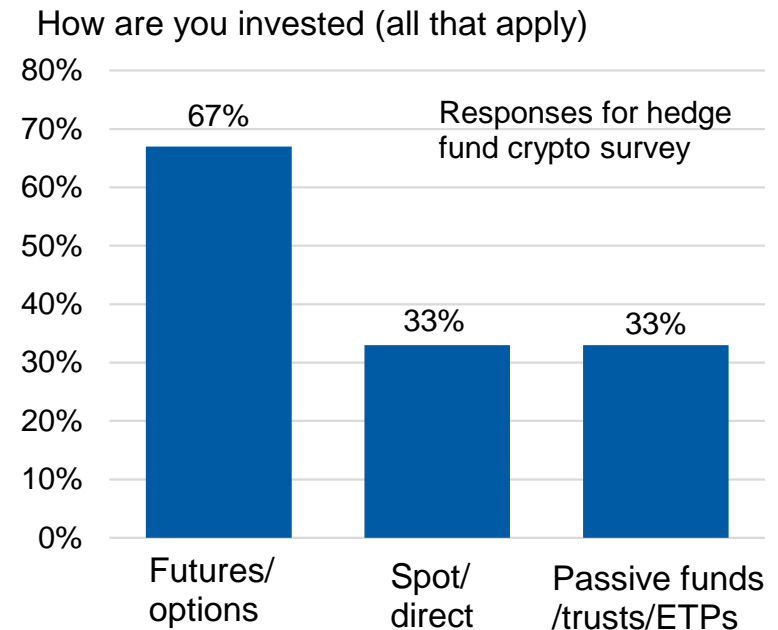


Source: [Oliver Wyman analysis](#)

## Investors | Hedge fund exposure

### Interest is high, investment started but not extremely large

- A recent [PwC-Elwood-AIMA survey](#) of traditional hedge funds showed that around a fifth are currently investing in digital assets with an average exposure of 3%.
- Over half of the respondents (57%) said they were invested in digital assets for diversification purposes. Interestingly, only 14% said it was for an inflation hedge, something which was cited in the press most frequently early during the 2020 bitcoin rally.
- Futures are the main way that the investors have exposure, with over two-thirds saying they use futures or options, while only a third use spot.
- Among the main reasons hedge fund managers were not invested related to regulation, reputational risk or lack of infrastructure.



Source: [PwC-Elwood-AIMA](#)

## Investors | Corporate exposure to BTC

- **Payments, et al.**
  - Networks (Visa, Mastercard) continue to expand ability to execute transactions using cryptos as funding sources.
  - [PayPal rolling out](#) crypto trading, specifically on Venmo brand (April 2020).
  - Square CEO [Jack Dorsey advocates](#) for bitcoin's potential to displace monetary and political regimes in Nigeria, Ghana and India (June 6, 2021): *“Go to Nigeria for one day and see the struggle that people have to put up with, with their government and their money. Go to Ghana that has a bunch of transplants from all over the continent, and you see the same thing every single day. Go to India, and you will see the same.”*
  - [MicroStrategy announced](#) (June 8, 2021) that it is selling \$500 million in bonds at 6.125% to buy bitcoin.
- **Asia/Latin America (a few examples)**
  - Companies such as [MercadoLibre](#), [Nexon](#) and [Meitu](#) have announced over recent months that they bought bitcoin as part of their treasury strategy or to maintain the purchasing power of their cash assets.

## Investors | Crypto ETF and ETP fund flows

New ETP and ETF products continue to be launched, especially in Europe and Canada. As of March 2021 they had about \$50 billion of assets, mostly in bitcoin

Branding Name	Fund	Prospectus Benchmark	Domicile	Mgmt Fee	Inception Date	AUM - Mar '21 (\$M)	2020 Flows (\$M)	1Q21 Flows (\$M)
Grayscale	Grayscale Bitcoin Trust (BTC)	Bitcoin Market Price PR USD	United States	2.00	25-09-13	\$38,423.2	\$4,730.7	\$1,901.3
Grayscale	Grayscale Ethereum Trust (ETH)	Ethereum	United States	2.50	14-12-17	\$5,852.9	\$1,000.9	\$427.9
XBT Provider	XBT Provider Bitcoin Tracker EUR ETN	Bitcoin USD	Sw eden	2.50	15-09-15	\$2,034.8	\$48.3	(\$348.2)
XBT Provider	XBT Provider Bitcoin Tracker One ETN	Bitcoin USD	Sw eden	2.50	18-05-15	\$1,304.4	(\$61.3)	(\$99.8)
ETC Issuance - Hanetf	BTCEtc - Bitcoin Exchange Traded Crypto	n.a.	Germany	2.00	n.a.	\$1,302.7	\$157.4	\$498.0
XBT Provider	XBT Provider Ether Tracker Euro ETN	Ethereum USD	Sw eden		09-10-17	\$821.7	\$16.0	(\$10.4)
Purpose Investments	Purpose Bitcoin CAD ETF Non-Currency Hdq	Bitcoin Market Price PR USD	Canada	1.00	17-02-21	\$665.7	n.a.	\$618.9
XBT Provider	XBT Provider Ether Tracker One ETN	Ethereum USD	Sw eden		09-10-17	\$410.7	\$6.6	\$23.7
WisdomTree	WisdomTree Bitcoin ETC	CME CF Bitcoin Reference Rate USD	Jersey	0.95	02-12-19	\$375.2	\$86.6	\$40.4
CoinShares	CoinShares Physical Bitcoin (BTC)	XBTUSD Cross Rate Currency TR USD	Jersey	0.98	19-01-21	\$370.3	n.a.	\$238.2
Osprey	Osprey Bitcoin Trust	CMBI Bitcoin USD	United States	0.49	11-02-21	\$166.1	n.a.	\$56.9
Grayscale	Grayscale Ethereum Classic Trust (ETC)	ETC Index Price TR USD	United States	3.00	24-04-17	\$164.6	\$22.6	\$2.7
CoinShares	CoinShares Physical Ethereum (ETH)	N/A	Jersey	1.25	23-02-21	\$76.6	n.a.	\$65.3
Evolve Funds	Bitcoin ETF CAD	Bitcoin Market Price PR USD	Canada	1.00	18-02-21	\$73.3	n.a.	\$64.1
Galaxy Digital	CI Galaxy Bitcoin ETF CAD	Bloomberg Galaxy Bitcoin TR USD	Canada	0.40	05-03-21	\$50.5	n.a.	\$49.7
Bitcoin Capital	15 FICAS Active Crypto ETP	N/A	Sw itzerland	2.00	28-07-20	\$12.3	\$3.5	\$5.4
ETC Issuance - Hanetf	ETHetc - ETC Group Physical Ethereum	XET USD Cross Rate Currency	Germany	1.49	05-03-21	\$11.2	n.a.	\$11.2
XBT Provider	XBT Provider Litecoin Tracker One	n.a.	Sw eden	n.a.	n.a.	\$2.9	\$1.1	(\$2.1)
XBT Provider	XBT Provider Litecoin Tracker Euro	n.a.	Sw eden	n.a.	n.a.	\$2.6	\$0.5	\$0.5
Amun	21Shares Bitcoin Suisse ETP	Amun Bitcoin Suisse Crypto CHF	Sw itzerland	2.50	04-10-19	\$0.8	n.a.	n.a.
Amun	21Shares Bitcoin ETP	Bitcoin	Sw itzerland	1.49	26-02-19	\$0.7	(\$0.1)	n.a.
Amun	21Shares Ethereum ETP	Ethereum	Sw itzerland		05-03-19	\$0.7	(\$0.1)	n.a.
Amun	21Shares Bitwise Select 10 Lrg Cp Crypto	Bitwise Select 10 Large Cap Crypto	Sw itzerland	2.50	03-07-19	\$0.5	n.a.	n.a.
Amun	21Shares Polkadot ETP	N/A	Sw itzerland		04-02-21	\$0.2	n.a.	\$0.1
Amun	21Shares Tezos ETP	Tezos	Sw itzerland	2.50	14-11-19	\$0.2	n.a.	n.a.
Amun	21Shares Ripple XRP ETP	Ripple	Sw itzerland	2.50	02-04-19	\$0.2	n.a.	n.a.
Amun	21Shares Bitcoin Cash ETP	Bitcoin Cash	Sw itzerland	2.50	04-07-19	\$0.1	n.a.	n.a.
Amun	21Shares Short Bitcoin ETP	21Shares Crypto Basket PR USD	Sw itzerland	2.50	22-01-20	\$0.0	\$0.1	n.a.
				1.84	<b>Total</b>	<b>\$52,125</b>	<b>\$6,013</b>	<b>\$3,544</b>
				\$2.01	<b>Americas</b>	<b>\$45,396</b>	<b>\$5,754</b>	<b>\$3,121</b>
					<b>Europe</b>	<b>\$6,729</b>	<b>\$258</b>	<b>\$422</b>

Source: Morningstar, [Morgan Stanley Research](#); data as of March 31, 2021. Note that new ETPs have been released in Europe since this update.

# Crypto market specifics



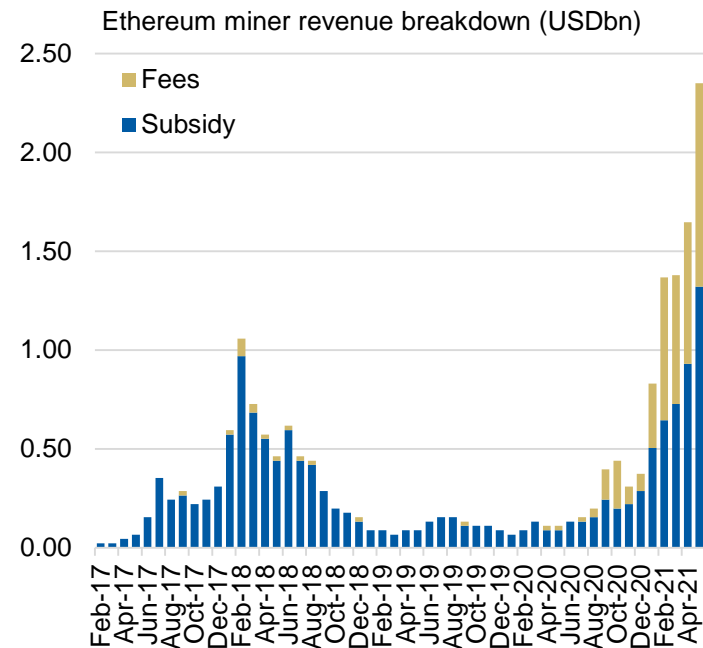
## Crypto | Why is Ethereum outperforming bitcoin? ETH/BTC up

Change to Ethereum means coins could be destroyed in the future, ETH is considered more 'green' than bitcoin and decentralized finance still mostly runs on Ethereum

Ethereum is planning a change to the way its miners are paid. In July an upgrade to the protocol is expected (called [EIP-1559](#)) where the fees that miners are currently paid (in ETH) will be 'burned' instead of being given to miners. **ETH money supply** will be destroyed, increasing its scarcity. Miners received over half their revenue via fees in May 2021 (see chart).

The Ethereum blockchain is transitioning its process for approving transactions to using **proof of stake (PoS)** instead of proof of work (PoW). Increasing worries about bitcoin's energy usage made Ether relatively more attractive as PoW doesn't use as much energy to run, at the expense of the security of the transaction.

### Ethereum miners have received about half their reward in fees recently



Source: The Block Crypto, Morgan Stanley Research

## Crypto | Decentralized blockchains reaching limits?

**Ethereum transaction fees reached an all-time high in mid-May (\$69), so is it a problem for future growth or a sign of success? Could centralized blockchains grow instead?**

Blockchains are competing for market share as smart contracts or new coins can run on a newly created blockchain or on an existing one.

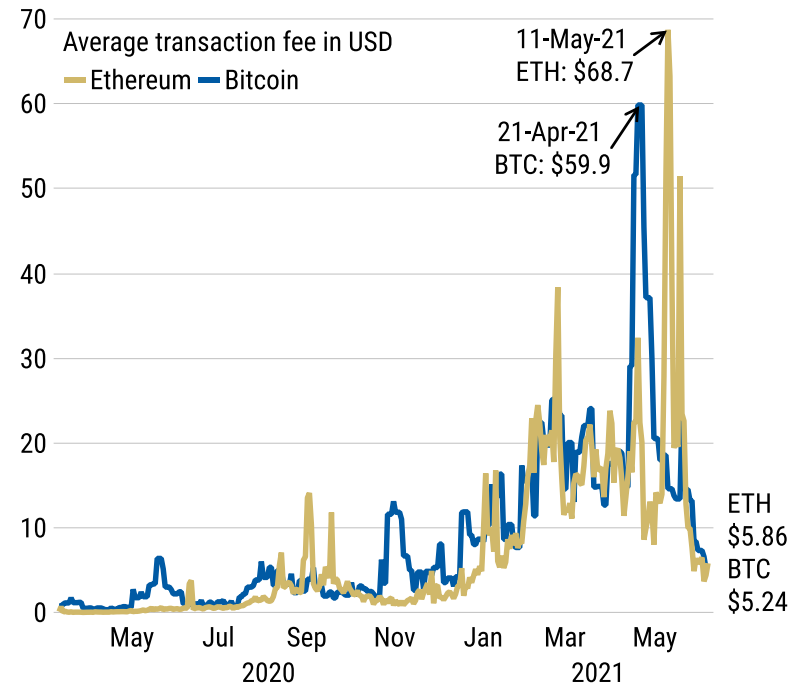
Most new coins opted to use an existing blockchain, which until a year ago was mostly Ethereum.

Ethereum transaction fees were rising quickly this year as more and more digital assets used the blockchain, hitting the limits of the way Ethereum is currently set up to handle transactions.

Along came competitors. Binance Smart Chain (BSC), created by the biggest cryptocurrency exchange and set up an easy way for creators of existing Ethereum coins to port their coin to the BSC.

Source: Etherscan, Blockchain.com, Morgan Stanley Research

### Bitcoin and Ethereum transaction fees rose when demand picked up with prices



## Crypto | Decentralized blockchains reaching limits?

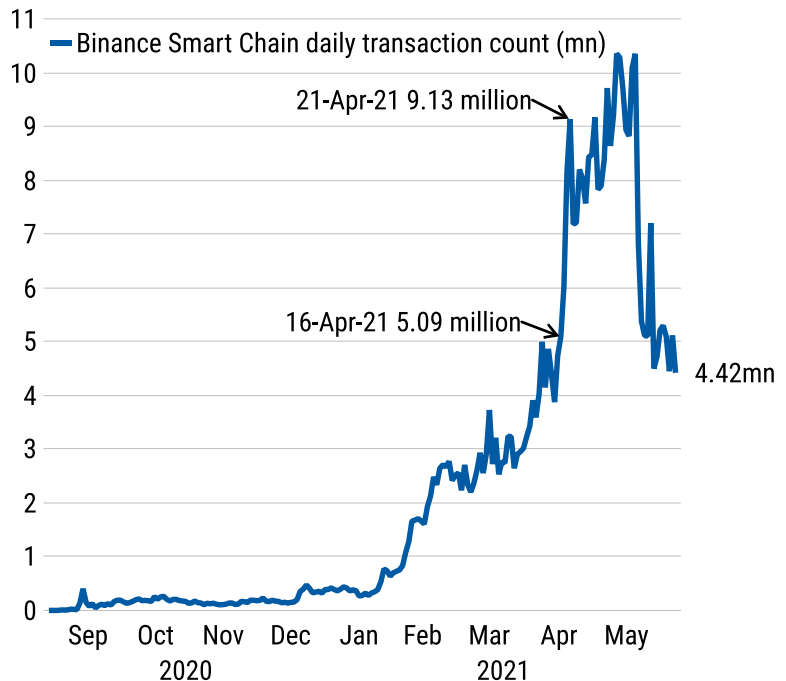
**Centralizing blockchains may lower the transaction fees but reduces the security around the transaction**

Binance was able to offer much lower transaction fees, in most part because its user base was much smaller than Ethereum but also because it has fewer validators when checking transactions.

Higher fees are related to demand and to account for the work required to check the transactions. So it appears there are competing forces. The want for a blockchain to gain market share of the trading assets (with low fees) versus the security of the transactions on the blockchain.

Recently there have been a [pick-up in hacks on the Binance Smart Chain](#). This isn't new to blockchains but a reflection of the trade-off we describe above.

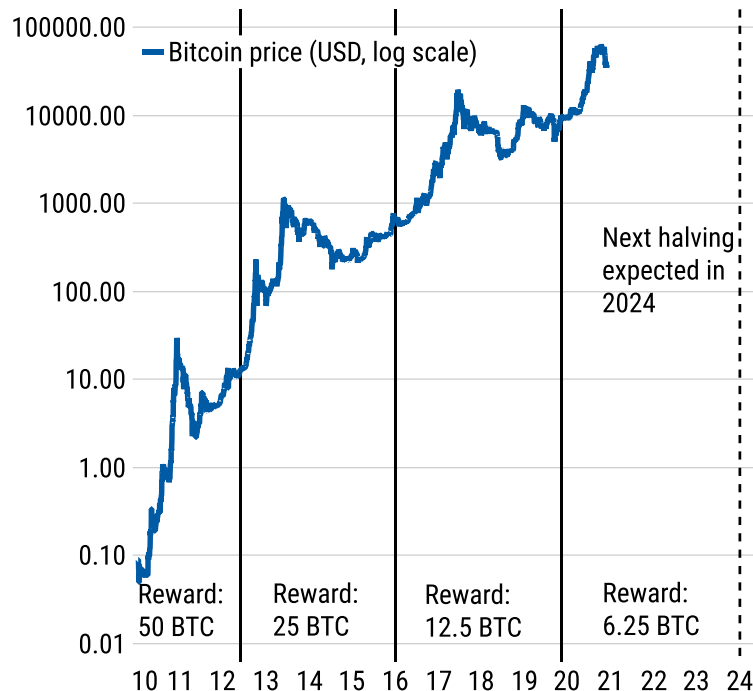
### Binance smart chain transaction count accelerated in April



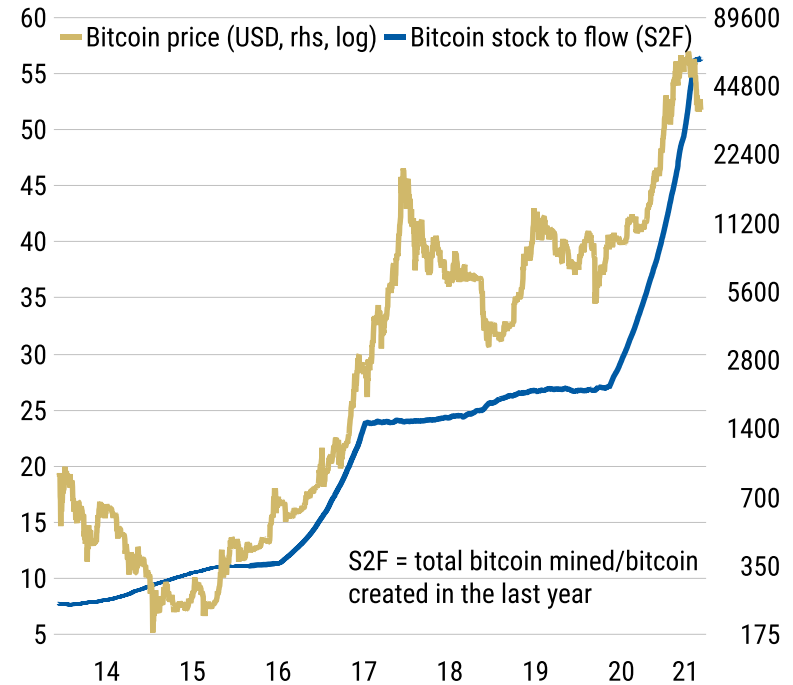
## BTC | Bitcoin valuation model most discussed in the market

Very difficult to model a speculative asset. Stock to flow (S2F) model is the most widely cited and assumes bitcoin is valued on its scarcity alone. S2F: how long would it take to create all bitcoin ever mined if growth continues at the current pace?

Money supply growth slows after 'halving' events, adding to perceived scarcity



Bitcoin stock to flow estimate (blue) versus bitcoin price history

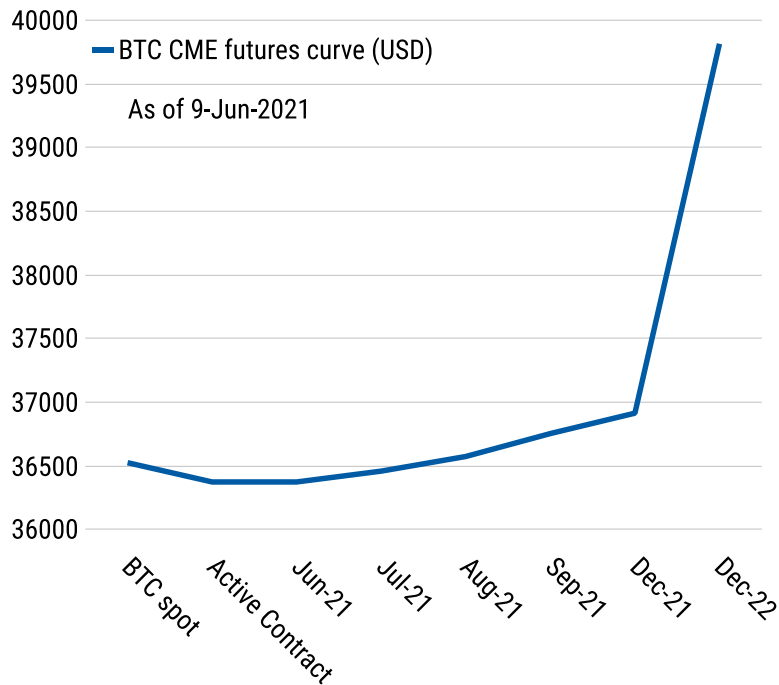


Source: Macrobond, Morgan Stanley Research

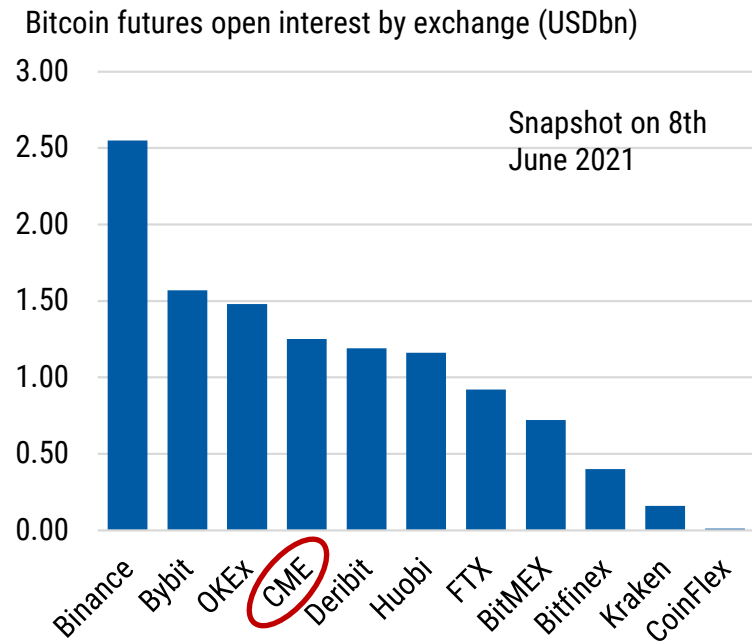
## BTC | Bitcoin futures

Most bitcoin futures trading is done outside the CME

### Bitcoin futures curve pricing on the CME



### Most bitcoin futures traded outside the CME, with some offering 100x leverage

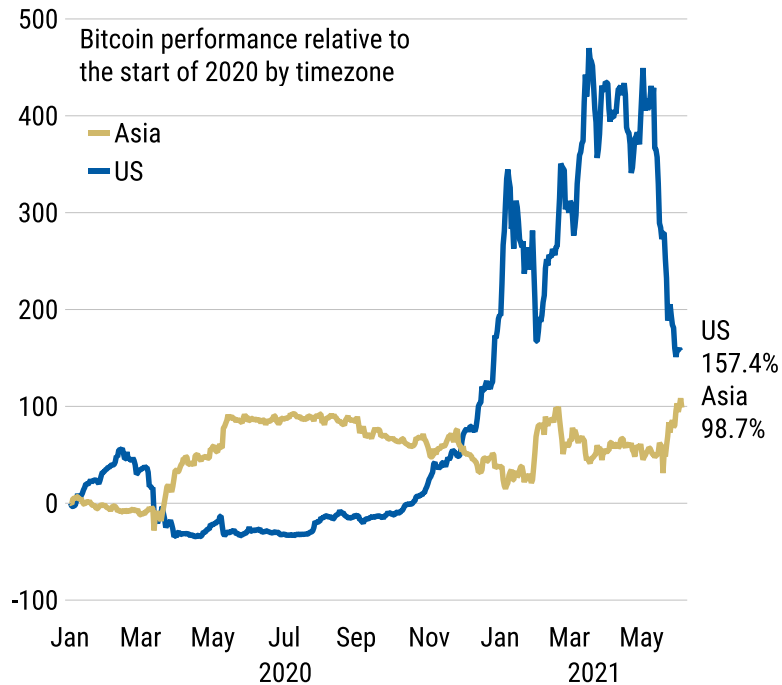


Source: Bloomberg, Skew, Morgan Stanley Research

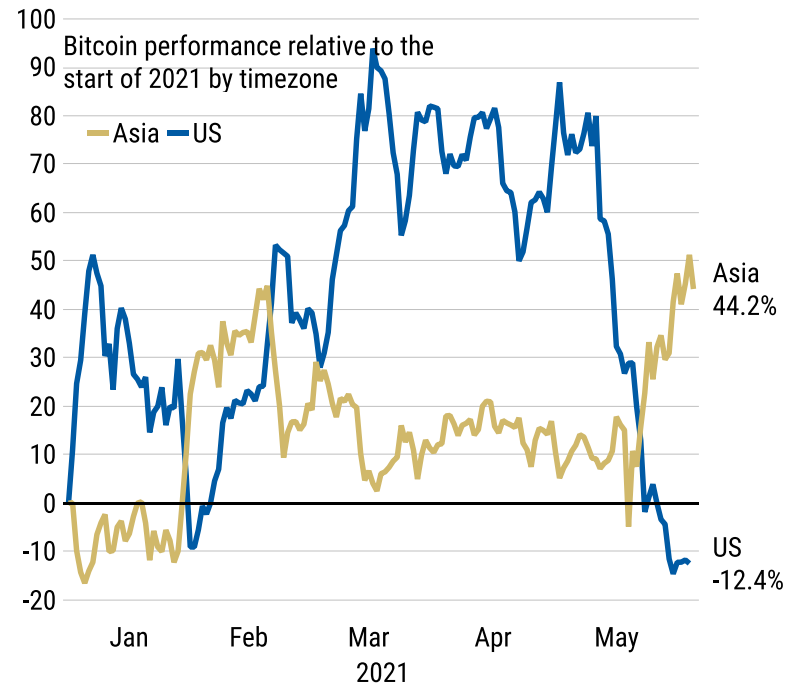
## BTC | Bitcoin prices by timezone

The bitcoin bear market has seen prices fall most in the US timezone, while go up in the Asia timezone – a reversal of 2020 when prices went up most in the US timezone

### Timezone price analysis (Asia up, US down)



### Asia timezone has seen 44% bitcoin appreciation in 2021

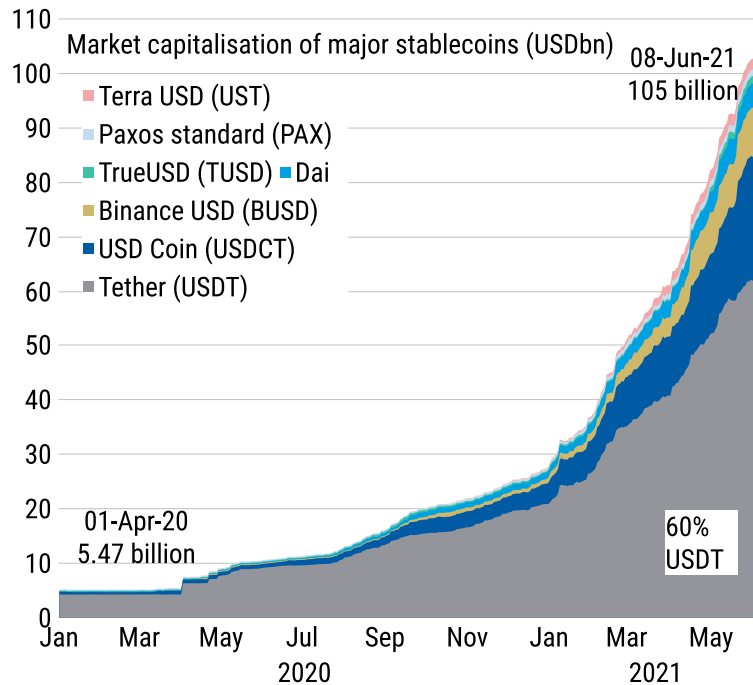


Source: Binance pricing, cryptodatadownload, Macrobond, Morgan Stanley Research

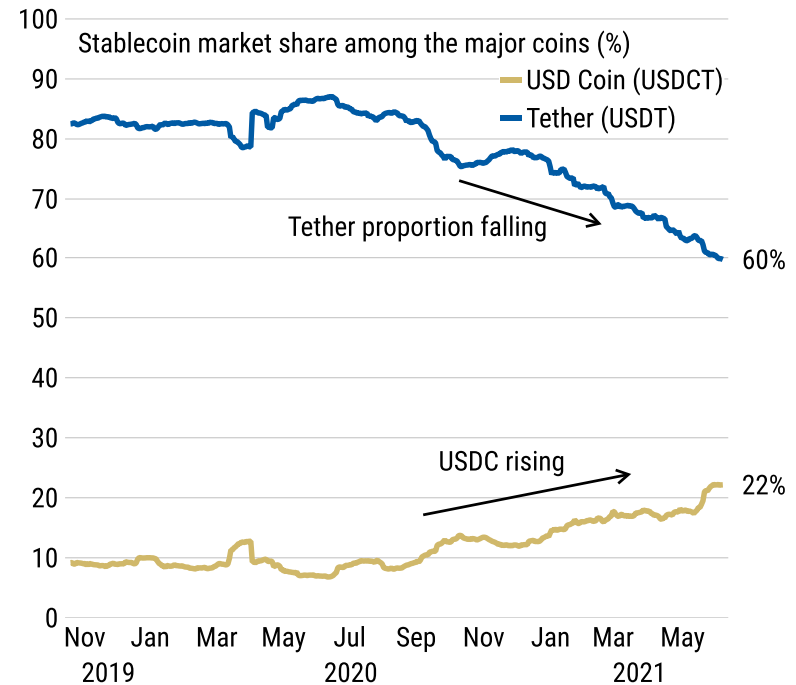
## Crypto | Stablecoins issued over \$100 billion, grown 18x since 2020

The most liquid crypto crosses are versus USD like stablecoins as they can trade without touching the fiat banking system. Used a lot in DeFi. Should investors consider them to be as trustworthy as the US dollar?

**USDT is 60% of all stablecoins in circulation, followed by USDC and Binance USD**



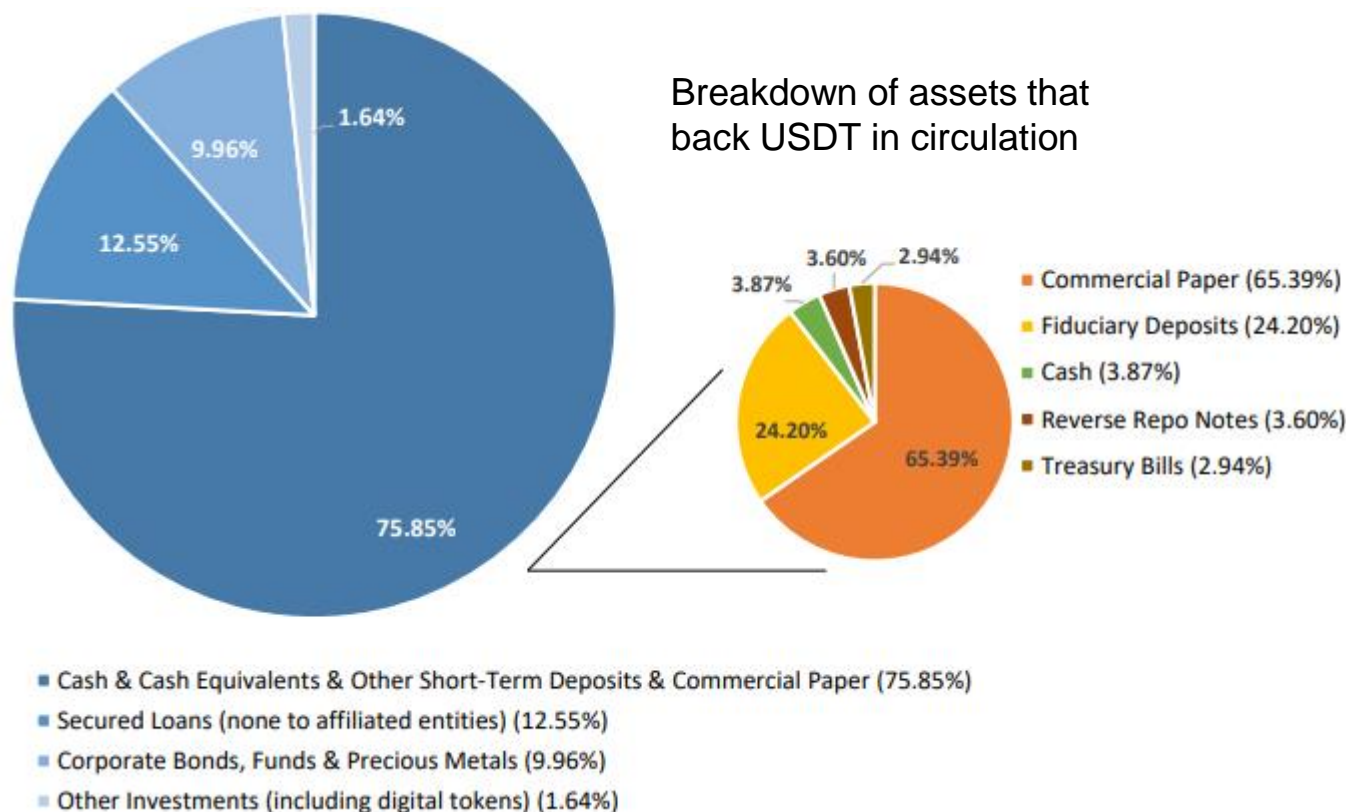
**USDC is growing quickly, backed by US companies with almost \$30 billion coins issued**



Source: Cryptocompare, Morgan Stanley Research

## Crypto | US Dollar Tether (USDT) reveals the reserves that back it

Of the \$60 billion USDT in circulation, not everything is backed by cash USDs in a bank. ~50% is held in commercial paper and 9.9% in corporate bonds/funds/precious metals. Only 3.8% is held in cash and 2.9% in T-bills. Some is even held in crypto



Source: [Tether](#) reporting for March 2021.



## Crypto | Market volumes in the month of May

### Cryptocurrency exchange volumes (in USD)

- Total 2.3 trn
  - On exchanges that only trade crypto 2.1 trn
  - On Binance 1.52 trn

### Bitcoin futures volumes (in USD)

- Total 2.56 trn
  - On Binance 1.06 trn
  - On the CME 77.3 bn

### Bitcoin options volumes (in USD)

- Total 27.66 bn
  - On Deribit 24.67 bn

### Ethereum options volumes (in USD)

- Total 16.51 bn
  - On Deribit 14.88 bn

### Bitcoin transactions on the network

- Total 7.79 mn
- On chain USD volume 407.26 bn

### Bitcoin miner revenue (in USD)

- Total including fees 1.45 bn
- From new BTC (subsidy) 1.32 bn

### Ethereum transactions on the network

- Total 45 mn
- On chain USD volume 666 bn

Source: The block crypto, blockchain.com, Morgan Stanley Research

## Crypto | What stops Dogecoin being used as a currency?

### Marketing of the coin, regulation and availability

- Dogecoin rallied 175x vs. the start of the year to the May 8 peak and is still up over 80x this year.
- Tesla's Elon Musk is a big promoter of Dogecoin, which helped the rapid price rise. Tesla stopped accepting bitcoin for car transactions recently, citing energy usage of the bitcoin blockchain, but did also say that it is looking for alternative coins that use less than 1% of bitcoin's energy per transaction. Musk has not yet revealed which coins it may accept instead.
- A currency is a unit that many are willing to accept in exchange for goods and services. Typically the unit is also widely and easily available (liquid).
- Dogecoin is now being promoted as a good unit of exchange, especially because of its small value versus the US dollar relative to bitcoin, which is over \$30,000.
- Dallas Mavericks owner and frequent Dogecoin promoter Mark Cuban reported that he holds 3,250 Dogecoin (~\$1,000 worth). He has previously said DOGE could trade around \$1.
- What stops Dogecoin being used as currency? Regulation could limit many crypto assets being accepted as a legal means of exchange or the promotion of central bank digital currencies that provide alternative fast means of payment. The users of Dogecoin also need to trust in the management and creation of Dogecoin (where the money supply growth path has changed over the years), relative to the current trust they have in central bank systems (like the Fed).

# Decentralized Finance (DeFi)

## DeFi | Crypto lending – competing with banks?

Some are earning 5-15% interest (annualized) on a USD-like crypto deposit

- **Crypto lenders** are growing fast, offering
  - those who own crypto the chance to earn income by lending it out
  - those who want to fund crypto trading the chance to leverage up and borrow from the market.
- 4Q20 lending was worth \$40 billion, rising 100% from the prior quarter, but still only a fraction of the USD fiat bank lending ([Credmark](#)).
- Among the fastest-growing regulated lenders are BlockFi, Celcius, Voyager and Nexo. However, these are centralized (CeFi) not decentralized (DeFi).
- Some DeFi platforms are lenders with no ‘middle entity’; the computer-based smart contracts match lenders and borrowers, adjusting the interest rate instantly based on supply and demand. Some of the largest are Aave and Compound. There isn’t defined regulation for these platforms.
- **Who is borrowing?** Mainly retail traders who are unable to get enough leverage from a traditional bank (say in USDs) so are willing to pay high interest rates as they believe they can earn more by investing in other crypto assets. **Exchanges, hedge funds** and **OTC (over the counter)** trading desks also borrow in this market.
- The growth of such lending thus relies on a crypto bull market.

## DeFi | Crypto lending – competing with banks?

Lots of growing companies related to crypto lending: centralized and decentralized.  
Many are offering or hope to offer services that are similar to banks

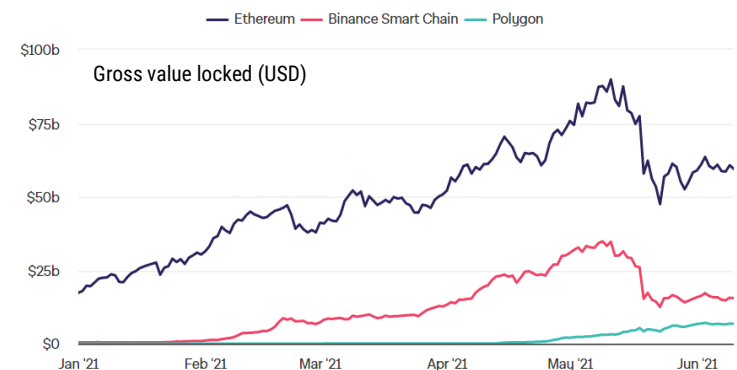


Source: [Jump Capital](#)

## DeFi | Stablecoins mostly lent

DeFi coins representing the DeFi platforms total market cap is around \$90 billion

- **DeFi offerings** for decentralized exchanges and lending platforms have been growing.
- **What coin is lent?** Mostly stablecoins like USDC and Dai. Bitcoin has been less popular to borrow due to rising prices.
- **What rates are offered?** <https://defirate.com/lend/> provides a real-time summary. As crypto prices have fallen, so have borrowing rates (demand fell), while collateral valuations fell too.
- **Flash loans** have become the most popular on the DeFi platforms. An example is a contract to lend out crypto assets with the contract only completing if the borrower returns the asset. If not, all the borrower's future trades are cancelled. These are instantaneous and quick versus the current time it takes to borrow for say a mortgage or a company looking for funding.
- **Total value locked** represents the size of activity in the DeFi market: currently around \$65 billion on Ethereum and \$15 billion on Binance Smart Chain. Around half of that is for lending only, with the rest for decentralized exchanges and other digital asset activity.

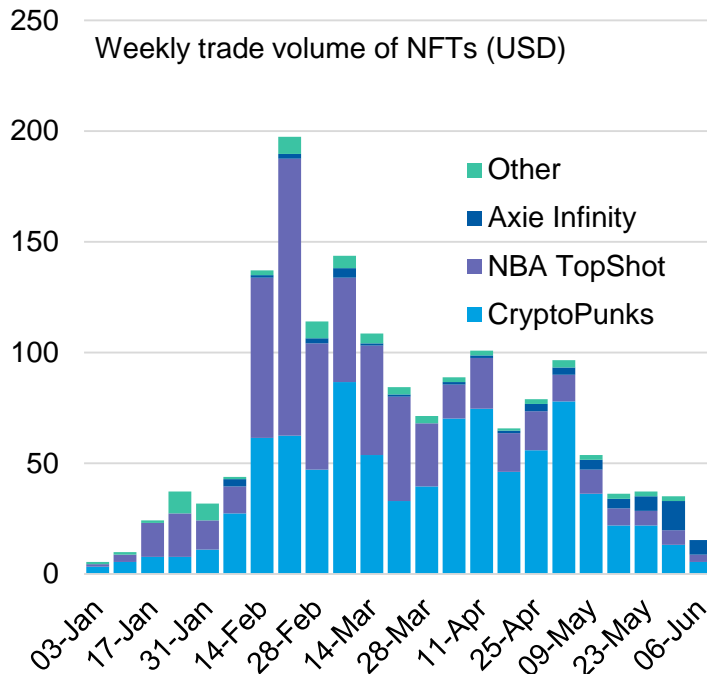


Source: The Block Crypto, Morgan Stanley Research

## NFTs | Non-fungible tokens

>\$2.5 billion of NFTs sold in 2021 as artists and creators add a digital signature on an item to prove it is a one of a kind or the first one

**NFT weekly trading volumes peaked in mid-February at around \$200 million**



Source: Dappradar, The Block Crypto, Morgan Stanley Research

- **NFT digital house** sells for over \$500 million, equivalent to 288 ETH in mid-March 2021.
- **NFT digital art** (Beeple) sells for \$69.3 million in March 2021 ([source](#)).
- Almost all NFT transactions and new users are for the **NBA** TopShot platform, where basketball cards and video footage are sold.
- Largest \$ transaction values occur on CryptoPunks, where pixel images are sold.
- Track on <https://dappradar.com/>
- This new type of product is gaining traction but public companies that announce their plans to launch an NFT had short-lived rallies.

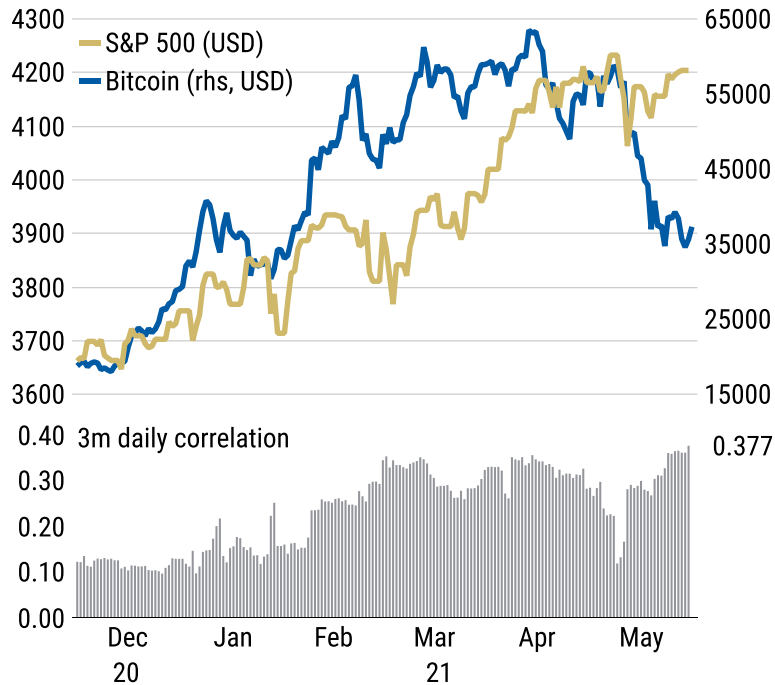
# Broader market correlations



## Equity market correlation to bitcoin

Risk assets and bitcoin often traded in the same direction in recent months, but not always. Software & services the most correlated sector in the S&P 500 correlation

### Bitcoin-S&P 500 3m correlation has risen recently



### S&P 500 sectors recent correlation with bitcoin

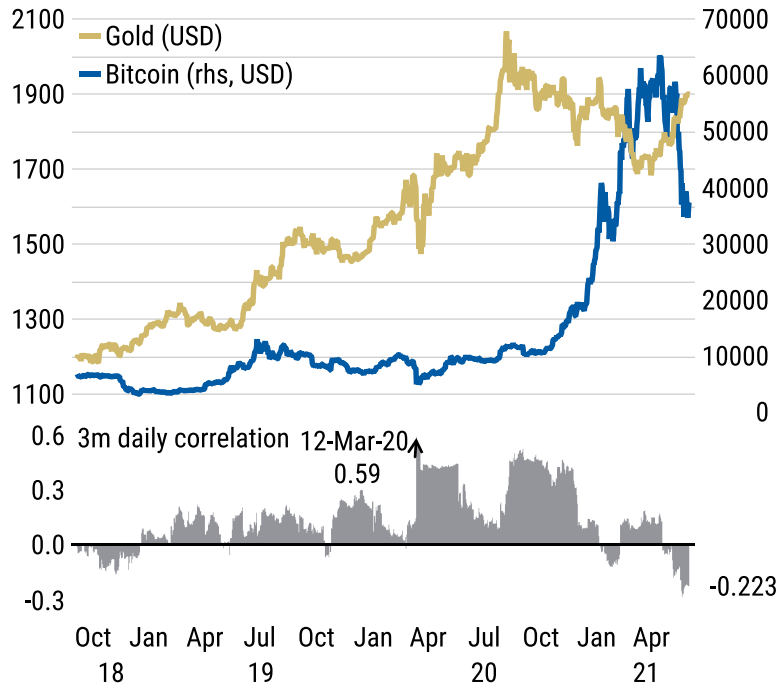


Source: Macrobond, Morgan Stanley Research

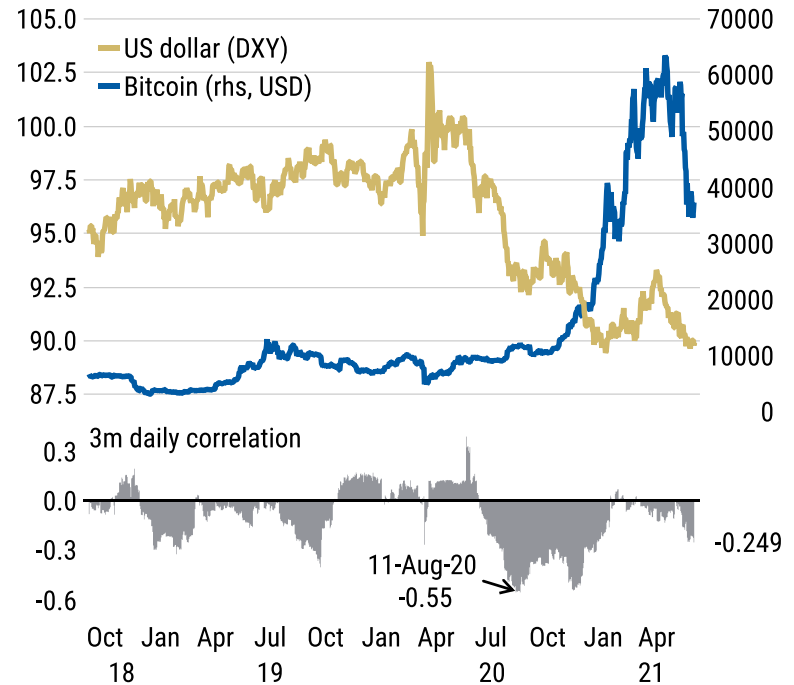
## Bitcoin correlation with macro/risk markets

Gold and bitcoin prices have moved in opposite directions recently

**Bitcoin-gold 3m correlation was high in April-November 2020 but recently flipped to inverse**



**Bitcoin-USD correlation is low versus a year ago**



Source: Macrobond, Morgan Stanley Research

# Regulation and Central Banks

## Regulation | Yellen's comments important in the US

### SEC chair suggests stronger regulation for crypto exchanges

- Gary Gensler, the chair of the SEC, [speaks frequently](#) about the risks posed to investors in the cryptocurrency markets, suggesting [stronger regulation around crypto exchanges](#). He highlights that crypto investors don't have the same protections as stock investors.
- Treasury Secretary Janet Yellen has said that the US framework isn't "[up to the task](#)" of regulating cryptocurrencies. Her views should be particularly watched as much of the new regulation may be shaped from the administration, and it works with the SEC.
- The acting comptroller of the currency, Michael J. Hsu, said in an [interview](#) that he hoped that US agencies would co-ordinate to create a regulatory perimeter for cryptocurrencies, while supporting banking innovation. The group of three agencies have started to meet.
- The US and other country governments are emphasizing the need for cryptocurrency investors to declare and pay taxes on any gains. Cryptocurrency was included in the 2022 US budget, stating: "expanding broker information with respect to cryptocurrency assets" ([p100 here](#)).

## CBDC | Central bank digital currencies

**China has issued a CBDC and its testing is growing. The ECB is to announce work on a CBDC soon. The Fed's Powell said it will release a paper in the coming months**

- **Global:** Our economists wrote a foundation report on [Digital Disruption: The Inevitable Rise of CBDC \(12 Apr 2021\)](#).
- **China:** Hong Kong will test connecting its domestic payments network with China's digital yuan, an indication that the currency is being tested by use in other currency regions outside China. Over \$6 million worth of digital CNY will be given via lottery to Beijing residents in a third trial of the technology.
- **Euro area (ECB):** Will formally announce its development of a digital euro soon, with implementation expected in 2026. The ECB is worried about the declining use of physical cash. The ECB plans to limit the amount of digital euros that can be held with a cap of around €3,000 per individual. The focus will be initially on residents rather than international usage. We wrote about this in more detail in [Digital Euro: Rationale and Implications \(7 Jun 2021\)](#).
- **US:** The [Fed plans to publish a paper](#) on digital payments in the coming months, including the considerations around a digital central bank currency. Fed Chair Powell used a video to set out its initial views on May 20, 2021, in what seemed to be a response to the rising use of stablecoins, recent cryptocurrency volatility and continued developments around the digital yuan.
- **UK:** The Bank of England [set out](#) the financial stability risks around stablecoins and new forms of money.

## Research reports

[Cryptocurrency research reports \(collection\)](#)

[Blockchain research reports \(collection\)](#)

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Stock Rating Category	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
<b>Overweight/Buy</b>	<b>1517</b>	<b>44%</b>	<b>420</b>	<b>48%</b>	<b>28%</b>	<b>673</b>	<b>44%</b>
<b>Equal-weight/Hold</b>	<b>1430</b>	<b>41%</b>	<b>361</b>	<b>41%</b>	<b>25%</b>	<b>648</b>	<b>42%</b>
<b>Not-Rated/Hold</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>Underweight/Sell</b>	<b>530</b>	<b>15%</b>	<b>91</b>	<b>10%</b>	<b>17%</b>	<b>209</b>	<b>14%</b>
<b>Total</b>	<b>3,477</b>		<b>872</b>			<b>1530</b>	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

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