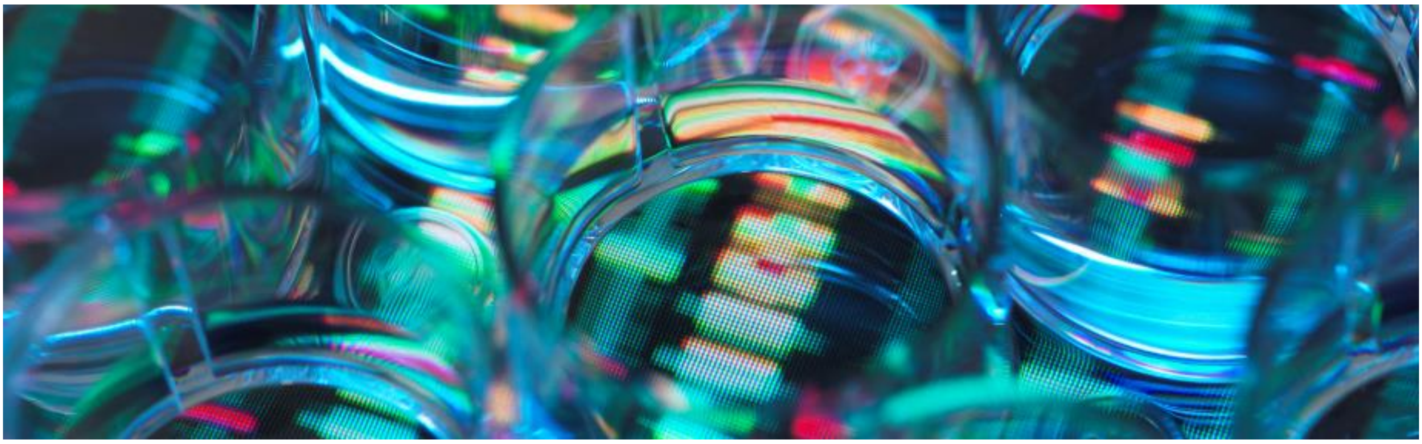
HSBC Private Banking

Market Update

Deep dive into cryptocurrencies: making crypto less cryptic

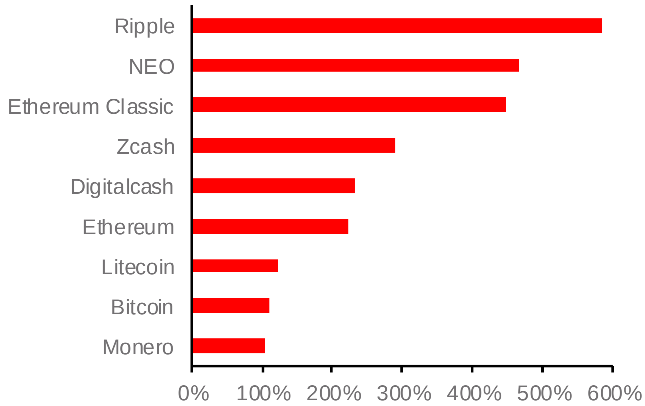
16 April 2021



- Cryptocurrencies have received more attention from institutional investors recently but still face significant barriers to widespread adoption, in our view.
- We introduce an Adoption, Credibility and Environmental sustainability (ACE) framework for evaluating the long-term prospects of cryptocurrencies.
- We also discuss central bank digital currencies, and how they could be introduced alongside cash and bank deposits, without the price volatility of cryptocurrencies.
- For now, we don't see cryptocurrencies as mainstream investment opportunities, although increased ACE may change our views in the future.

- Cryptocurrencies have been gathering momentum, both in terms of adoption and price movements. The Bitcoin price has surged dramatically recently, albeit with high volatility.
- While there are characteristics of cryptocurrencies similar to the traditional investing world – Bitcoin's similarities to Gold as a diversifier, for example - there are also elements at odds with the traditional investing world.
- We have been advocates of new technologies and behaviours for some time now, and the blockchain phenomenon is a significant example of the increasingly digital world around us. We don't think this phenomenon is going away anytime soon.
- In this report, we seek to demystify the world of "cryptos" through the lens of a fundamental investor, and in particular, to help clients formulate a framework to think about the phenomenon today and in the future.

Year-to-date cryptocurrency performance leaders

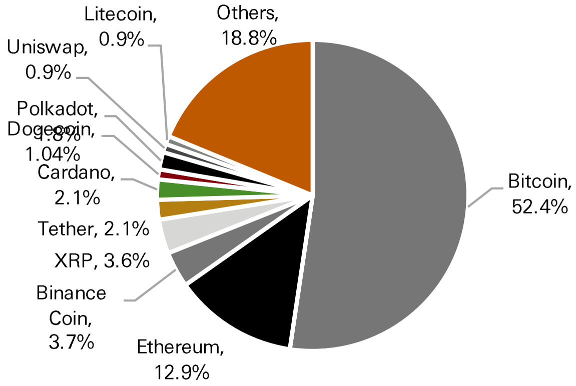


Source: HSBC Private Banking, Barchart, Apr 2021. Past performance is not an indication of future. Investment involves risks. For illustrative purpose only.

Cryptocurrencies in Context: Understanding the Phenomenon

Cryptocurrencies, as we know them today, have been around for over a decade. The concept of Bitcoin, widely regarded as the first "modern" cryptocurrency, was first outlined in a 2008 white paper.

Market capitalization of cryptocurrencies (%)



Source: HSBC Private Banking, Coinmarketcap.com, Apr 2021. For illustrative purpose only.

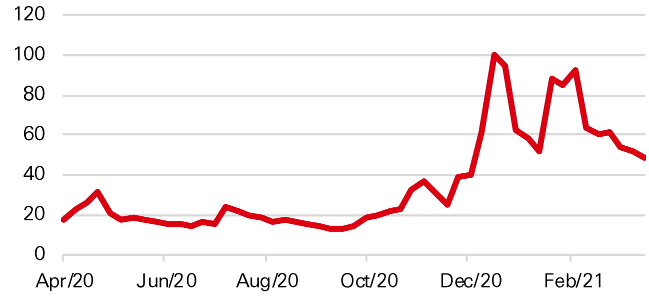
Interest in the concept was fueled, in part, by the aftermath of the Great Financial Crisis (GFC), and the huge increase in global liquidity amid low interest rates. Quantitative easing created concerns around currency debasement and many crypto proponents had issues with the vast powers of central banks to 'print' money. One of the major attractions of most cryptocurrencies is their limited supply. For example, bitcoin is designed to only ever have 21mn units in circulation, with the outstanding amount rising gradually over time. In that sense, cryptocurrencies have at least some resemblance to gold (although there are many differences) and could be seen as portfolio diversifiers (more on this later).

Others find attraction in the anonymity of cryptocurrencies, or like to challenge the hegemony of the US dollar. Still others are intrigued by the technological possibilities of blockchain and see cryptocurrencies as a means to enabling that technology.

While we believe those are the main foundations of a loyal fan base, there are many people who are intrigued by the price momentum. As we have also seen earlier this year with the sharp retail-driven appreciation of some small and medium cap stocks, momentum can create more momentum.

For bitcoin in particular, we have noted that investor interest picks up sharply whenever there is positive momentum. And while the price has seen some very sharp periodic corrections, some investors have been comforted by the fact that, so far, prices have rebounded within a matter of days or months.

Google search on Bitcoin worldwide
Interest over time

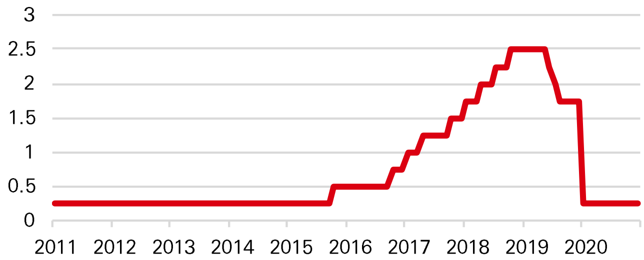


Source: HSBC Private Banking, Google Trends. Data as of week 11 Apr 2021. Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough data for this term.

That, of course, is not guaranteed for the future, but we think that momentum is a big driver of the investor interest. The retail-driven stock moves, and latest boost to bitcoin prices, should, in our view, also be seen in the context of widespread access to financial news, many investors having some time on their hands during the lockdowns and high savings ratios. In our low interest rate environment and following the recent run-up in equity market valuations, investors are looking for other opportunities to create returns (alpha generation).

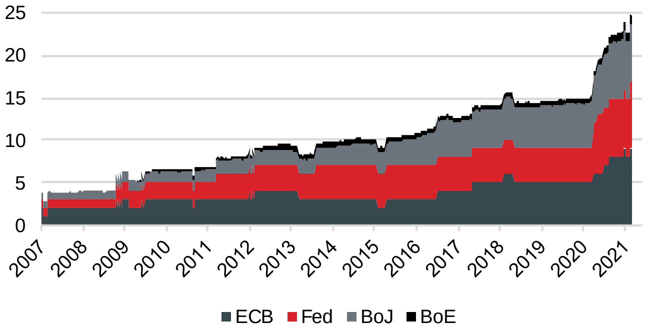
We note that most of the triggers we describe above are unlikely to disappear in the short term, and are structural in nature.

Fed funds rate (%) movements over past 10 years



Source: HSBC Private Banking, Refinitiv Datastream, Data as of 15 April 2021.

Increase in central bank balance sheet since GFC
Total assets in USD, trillions



Source: HSBC Private Banking, Refinitiv Datastream, April 2021.

The Technology and Mechanism Underpinning Cryptocurrencies

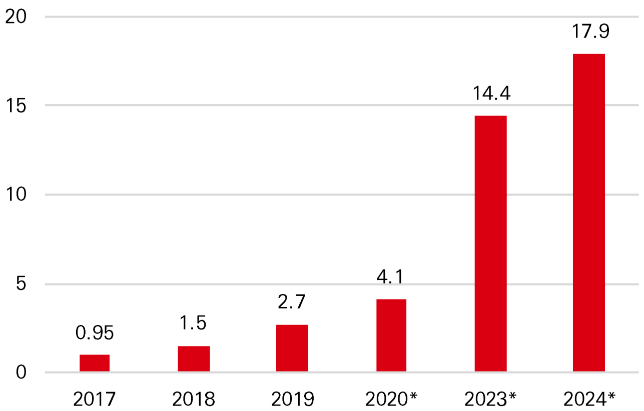
The technology behind cryptocurrencies is fundamental to understanding how cryptocurrencies work. Here's a short primer in 3 parts:

1. Understanding centralised and decentralised ledgers

Blockchain, or the "decentralised ledger", is key to this. An example of a centralised ledger, as opposed to a decentralised ledger, are bank accounts. With bank accounts, transactions like payments or transfers are stored on a centralised server linked to the bank.

With a decentralised ledger like blockchain, transactions and records are stored on all the computers of the participants on the network. There is no central storage facility, hence the term "decentralised".

Worldwide spending on blockchain solutions
in billion USD



Source: HSBC Private Banking, Statista, data as of 17 Sep 2021.2020*, 2023* and 2024* data is forecast. For illustrative purpose only.

2. What is the blockchain and how does it work?

The blockchain is a type of decentralised ledger where "blocks" are used to record transactions made in cryptocurrencies like bitcoin and recorded on all the computers in the cryptocurrency ecosystem.

These computers – also known as "miners" - are used to verify all the transactions on the network. This combined computing power is necessary because of the cryptographic techniques used to secure the cryptocurrency.

In exchange for this computing power, the "miners" are rewarded with new supplies of cryptocurrency. This is how new supplies are created. And as cryptocurrency prices rise, more "miners" join in because of the more attractive rewards on offer.

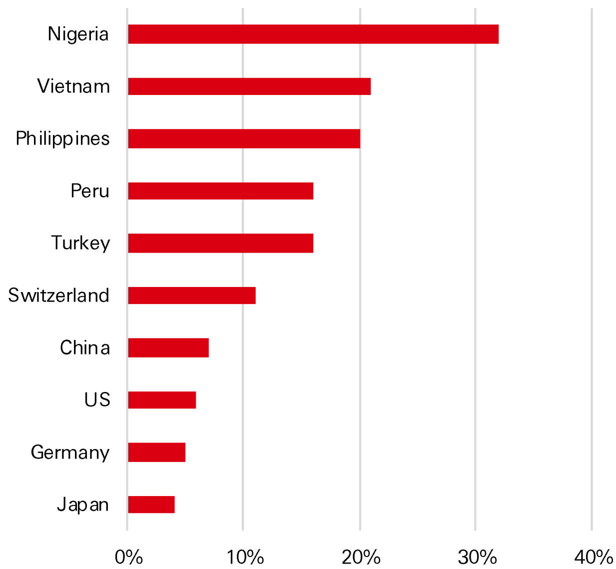
3. What are the theoretical benefits to this?

The theoretical benefits for using a blockchain and cryptocurrencies include increased security because there isn't a single computer that can be hacked to illicitly access information.

Payment times in theory could be faster because the decentralised technology theoretically allows payments to be made peer-to-peer directly, often within minutes. However, today's cryptocurrency networks would be unable to handle the sheer volume of payments that move through the financial system today.

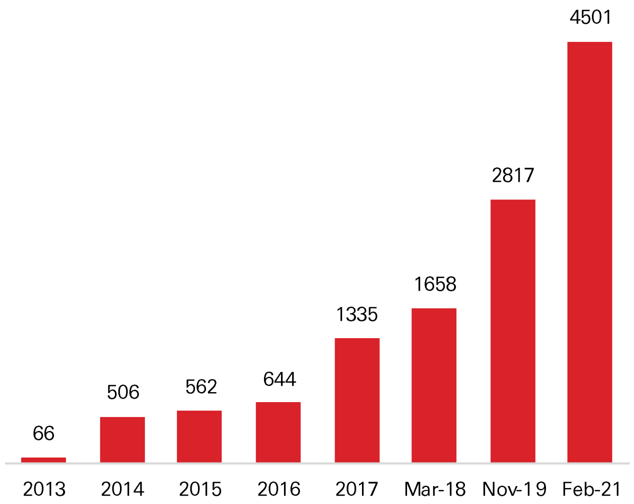
The technology also potentially disintermediates traditional players like banks, payment companies, merchant services – all of which contribute to a complex financial ecosystem.

How common is crypto?
Share of respondents who said that they used or owned cryptocurrency



Source: HSBC Private Banking, Statista Global Consumer Survey. Data as of 31/12/2020. 1000-4000 respondents per country. For illustrative purpose only.

Number of cryptocurrencies worldwide



Source: HSBC Private Banking, Statista, April 2021. For illustrative purpose only.

Why Central Banks are Looking at Cryptocurrencies and their own Digital Currencies

One recent development linking cryptocurrencies to the mainstream financial world has been central bank interest in the phenomenon, both for negative and positive reasons.

The Negatives: Concerns Over Crypto

Central banks and other regulators have expressed concerns around the anonymity of cryptocurrency use, in the context of anti-money laundering and illicit financing. Others are worried about 'speculative mania' where a tweet can lead to a sudden jump in price.

And of course, if cryptocurrencies remain very volatile, and investor interest continues to grow, authorities will get increasingly worried about consumer (investor) protection and market stability. Many investors could lose significant amounts of money during corrections, and a sell-off could trigger volatility in other parts of the market.

As a result, some regulators are also looking at licensing of crypto exchanges, while others are looking at more regulation to safeguard investor assets. Regulation is evolving, and differs from one country to the next, making it hard for financial institutions. Many therefore are taking a very conservative approach, limiting their activity in crypto, although client interest is driving many others to enter the market.

A final concern from regulators may be the carbon footprint of cryptocurrencies. This is in part because of the verification of transactions by parties around the world, which uses a lot of energy (and delays – see later). Some have suggested a carbon tax on cryptocurrencies.

The Positives: Central Bank Interest in Digital Currencies

Authorities are very interested for several reasons. As the digital revolution rolls on, and countries compete with each other to take market share in the growing tech sector (including fintech), governments and central banks want to be seen as being innovative.

Another reason of interest is more practical. The use of cash has been dropping very sharply in recent years, and this process has accelerated even further during the COVID-19 crisis due to health concerns over handling notes and coins. Yet, it is important for the financial system to provide a means of payment that is accessible to all.

So if cash is less widely accepted, central banks are looking for an alternative to cash, that runs as a complement to the bank-sector led payment system. Ideally, that alternative should also address the existing weaknesses of cash – i.e. the fact that anonymity can lead to potential tax evasion and fraud.

Many central banks would love a type of digital currency that is not anonymous, as it would give them a lot of real time information about transactions and a detailed view of what is going on in the economy. That could help them make their monetary policy more effective.

Central banks are therefore looking at developing their own central bank digital currencies. In most cases, the plans are based on the blokchain technology, and aim to provide 1) a stable value vs the country's fiat currency notes and bank deposits, 2) access to all and 3) very quick and cheap transactions.

A comparison of central bank digital currencies (CBDC) with cryptocurrencies and other payment tools

Payment method	CBDC (e.g. e-CNY, mainland China's digital currency)	Alipay/WeChat pay	Diem (formerly known as Libra)	Bitcoin	Cash
Anonymity	Optional	No	Yes	Yes	Yes
Efficiency	High	High	High	Low	Low
Decentralization	Maybe (at the second layer)	No	Yes	Yes	Yes
Price volatility	Low	Low	Low	High	Low
Portability	High	High	High	High	Low
Security	High	Medium	High	High	Low
Offline payment	Yes	No	No	No	Yes
Technology	Blockchain, QR Codes & Cryptographic technology	Network technology, QR codes, cryptographic technology	Consortium Blockchain	Public blockchain	N.A.
Programmability	Yes	No	Yes	No	No
Progress & Status	Pilot stage	>1bn users each	Development Stage	In Circulation	In Circulation

Source: Bloomberg, Boxmining.com, Sina, HSBC Private Banking, April 2021

The Investor Perspective on Cryptocurrencies

How should a traditional investor think about cryptocurrencies?

Arguably, the closest asset class that Bitcoin has similarities to is Gold, on the basis of the finite supply of both, and their potential diversification aspects.

Indeed, when we look at monthly returns over the past 3 years, Bitcoin's price movements bear almost no relationship with returns of US Treasuries, the S&P500 or gold (the R-squared of the regressions are, respectively, 0.3%, 9% and 7%).

This is typical for new asset classes. For example, emerging market bonds showed low correlation with other assets before they became more mainstream. We have noted that bitcoin has started to become somewhat more correlated with equities in the past year compared to the past 3 years.

Are cryptocurrencies a mainstream investment asset?

Like Gold, the question many are asking is whether cryptocurrencies are an asset. To be a separate asset class, the low correlation is a good starting point. But to include it in a strategic asset allocation or benchmark index, we would want to know the future return profile. It would be dangerous to simply assume that Bitcoin's price rise would simply continue into the future.

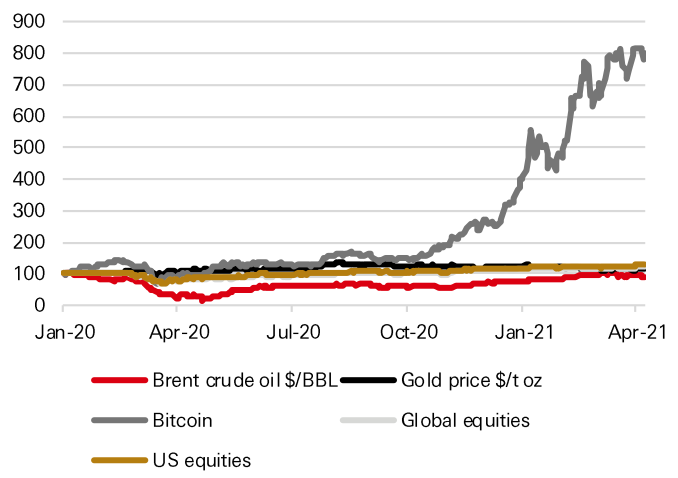
We would like to base any return estimate on fundamentals, which are still hard to pin down. Supply is well known, but demand is still difficult to estimate, though use in commercial transactions is starting to rise, and investor demand is rising quickly too. In any case, whatever the future return profile is, any allocation to crypto in an optimised multi-asset portfolio would probably be quite small at this stage, given the very high level of volatility.

Could they be a currency?

To qualify as a currency, investors usually require it to be a means of payment, a store of value and a stable price. Volatility seems too high at this point to fit with the 'stable price' definition.

The question is whether cryptocurrencies can become a widely used means of payment. Some companies now accept crypto for goods and services. But – given the volatility – the price tends to be set in the fiat currency (e.g., USD, GBP, RMB) and converted on a daily or other basis to bitcoin. So, until prices are actually set in bitcoin in the first place, it is de facto the fiat currency that remains the reference.

Performance of Oil, gold, Bitcoin and equities
Rebased to 100



Source: HSBC Private Banking,Refinitive Datastream. Index: Europe Brent Spot FOB USD/BBL Daily, Gold Billion LBM USD/t oz, Bitcoin to 1000USD, MSCI World USD, and MSCI USA USD. Investment involves risks. For illustrative purpose only. Apr 2020.

The price volatility of Bitcoin
Bitcoin price in USD

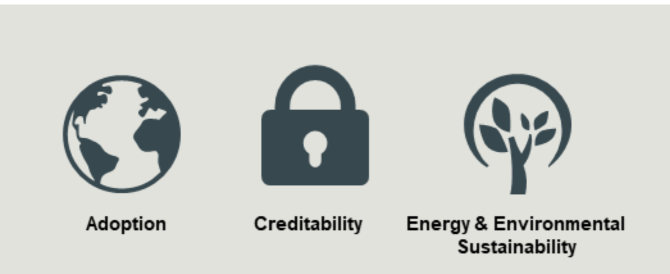
Source: HSBC Private Banking, Refinitiv Datastream, data as of 15 Apr 2021. For illustrative purpose only.

The ACE Framework for Evaluating Cryptocurrencies

With the increased adoption of cryptocurrencies among institutional investors, could this be the seminal moment where cryptocurrencies are finally acknowledged as mainstream investments and stores of value?

When thinking about this, we consider 3 factors that help us asses the answer to this question.

The ACE framework for evaluating cryptocurrencies



Source: HSBC Private Banking, April 2021

A is for Adoption, particularly in the developed world. Statistically, the proportion of cryptocurrency and stablecoin adoption is significantly higher in emerging counties like Nigeria, Vietnam, Philippines where they are used to make remittances and peer-to-peer transfers, than developed markets like the US, Europe or Japan. In the developed world, cryptocurrencies are starting to climb up the adoption curve, with an increasing number of retail and institutional investors starting to adopt them for various use cases (for e.g. as a mode of payment, a store of value or for enterprise solutions like smart contracts on the blockchain). Still, we believe that they are only at a very early stage of their adoption cycle.

Today, only a small number of companies are accepting cryptocurrencies to settle transactions and this is certainly not in the mainstream. In order to achieve a step-change in cryptocurrency adoption, we would want to see more mainstream corporates and institutions adopt cryptocurrencies as alternatives to traditional currencies. In such a scenario, shops would accept cryptocurrencies as payment for everyday items like food & drink, groceries and the like. However, high level of transaction fees and time taken to settle a normal transaction are big hinderances in the day to day use of crypto currencies as a mode of payment. Until scalability solutions are introduced to reduce these transaction fees and the transaction settlement time, prevelant use of cryptocurrencies as a mode of payment appears limited.

Another factor holding back widespread adoption is the high levels of daily volatility in cryptocurrencies. This makes it difficult to effect payment for day-to-day items because of the fluctuations in the value being transferred .

Greater adoption on the corporate side would call for a sizeable number of corporates to accept cryptocurrencies as credible treasury solutions for their cash and liquidity management. Tesla and Micro Strategy have recently adopted Bitcoin as a store of their cash reserves, but these are certainly exceptions rather than the norm.

As far as the 'store of value' argument goes, Bitcoin is normally referred to a 'digital gold'. However, whilst gold normally acts as a hedge against equity volatility in a multi asset portfolio, Bitcoin has tended to trade in close positive correlation to equity markets in recent times. It may therefore not provide the same diversification benefits as gold (or a longer observation period is needed to confirm this).

C is for Credibility. Unlike currencies, which are backed by governments, the value of a cryptocurrency is entirely dependent on what its holders perceive its value to be. Cryptocurrencies like bitcoin are also created in a way that supply of the currency is bound by strict rules.

In essence, cryptocurrencies do not have an intrinsic value the way some precious metals might have – for example, silver or platinum are used in catalytic converters in cars, and gold is used to make jewelry that is used in everyday life.

This lack of an intrinsic value could be one reason reason why we see some of the large swings and volatility in the price moments of cryptocurrencies. It's very difficult for investors to imply a fundamental value to cryptocurrencies, in the same vein that one would value a company or a bond price.

To some extent, cryptocurrencies' credibility is linked to the different types of applications and how widely it is adopted. We would want to see further applications of cryptocurrencies, including broader adoption in society.

Another factor working against the credibility of cryptocurrencies is the fact that governments and central banks are naturally inclined to make sure that their fiat currencies (or their own cryptocurrencies for that matter) remain the basis of most transactions. Otherwise, the use of a parallel currency in their economies would make monetary policy less effective.

E is for Energy and Environmental Sustainability. As discussed, new supplies of cryptocurrency are created by computers on its network as transactions are verified. This means that the energy footprint of a cryptocurrency's network is significantly large, and gets bigger as adoption increases and more transactions have to be verified.

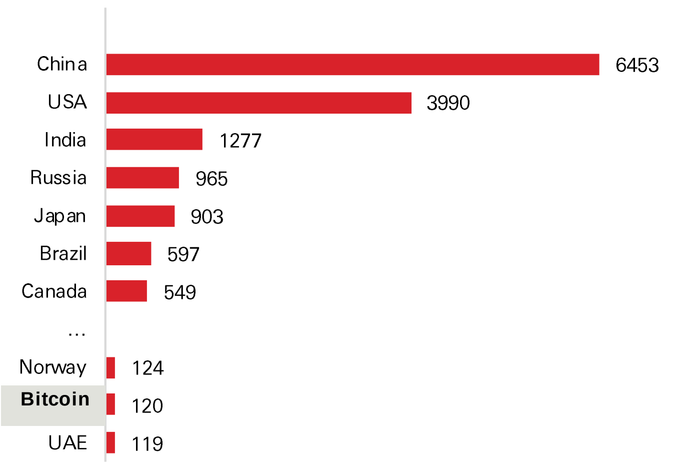
According to the University of Cambridge, the total energy consumption related to Bitcoin is estimated at around 141.6 terrawatt hours (Source: Cambridge Bitcoin Electricity Consumption Index). To place this into context, the Netherlands consumed 111 terrawatt hours in 2019, indicating that Bitcoin's energy consumption is already comparable to the energy consumption of a small-medium sized country.

Bitcoin is linked to high levels of consumption of fossil fuels. Due to the carbon emissions associated with Bitcoin mining, corporations are now facing pushback from public and shareholders over Bitcoin investments (Source: Bloomberg). As adoption expands, greater regulatory scrutinity and a potential crackdown on mining activity due to some countries' climate goals may hinder further adoption.

This calls into question how scalable cryptocurrencies are. The adoption of cryptocurrencies that require a significant increase in energy consumption just to validate transactions, appears to run contrary to a world trying to reduce its fossil fuel consumption and become more sustainable.

Bitcoin energy consumption alongside other countries

Annual energy use in terawatt hours (rounded)



Source: HSBC Private Banking, Cambridge Bitcoin Electricity Consumption Index, April 2021

Conclusion

So how do we think investors should think about cryptocurrencies?

Our starting point in evaluating any investment opportunity is to focus on the fundamentals and less on the noise.

We acknowledge that momentum and trend are investors' friends when things are going up. But things can very quickly unravel when interest diminishes or when the cycle turns.

That being said, there are good and fundamental reasons why cryptocurrencies, and more specifically blockchain technology, will be around for some time yet. Central banks are trialling their own versions CBDCs (or "e-currencies") and blockchain technology is being looked at for a multitude of uses including in the financial sector.

We continue to study the behaviour of cryptocurrencies towhat weight they should eventually carry.

An important factor to take into account is the high levels of daily volatility an investor can experience. This currently makes it difficult for us to include in our multi-asset framework in a meaningful way.

Secondly, because of cryptocurrencies' lack of an intrinsic value, it is practically impossible for us to apply a fundamental valuation framework to drive an investment strategy. Any investment strategy today would be based solely on technical measures such as trend and momentum, which we are not comfortable with.

The ACE factors of adoption, credibility and environmental sustainability are factors that may well cause us to change our views on the topic in the future, should there be any compelling changes in the outlook and the landscape of the crypto currency space.

Risk Disclosures

Risks of investment in fixed income

There are several key issues that one should consider before making an investment into fixed income. The risk specific to this type of investment may include, but are not limited to:

Credit risk

Investor is subject to the credit risk of the issuer. Investor is also subject to the credit risk of the government and/or the appointed trustee for debts that are guaranteed by the government.

Risks associated with high yield fixed income instruments

High yield fixed income instruments are typically rated below investment grade or are unrated and as such are often subject to a higher risk of issuer default. The net asset value of a high-yield bond fund may decline or be negatively affected if there is a default of any of the high yield bonds that it invests in or if interest rates change. The special features and risks of high-yield bond funds may also include the following:

• Capital growth risk - some high-yield bond funds may have fees and/ or dividends paid out of capital. As a result, the capital that the fund has available for investment in the future and capital growth may be reduced; and

• Dividend distributions - some high-yield bond funds may not distribute dividends, but instead reinvest the dividends into the fund or alternatively, the investment manager may have discretion on whether or not to make any distribution out of income and/ or capital of the fund. Also, a high distribution yield does not imply a positive or high return on the total investment.

• Vulnerability to economic cycles - during economic downturns such instruments may typically fall more in value than investment grade bonds as (i) investors become more risk averse and (ii) default risk rises.

Risks associated with subordinated debentures, perpetual debentures, and contingent convertible or bail-in debentures

• Subordinated debentures - subordinated debentures will bear higher risks than holders of senior debentures of the issuer due to a lower priority of claim in the event of the issuer's liquidation.

• Perpetual debentures - perpetual debentures often are callable, do not have maturity dates and are subordinated. Investors may incur reinvestment and subordination risks. Investors may lose all their invested principal in certain circumstances. Interest payments may be variable, deferred or canceled. Investors may face uncertainties over when and how much they can receive such payments.

• Contingent convertible or bail-in debentures - Contingent convertible and bail-in debentures are hybrid debt-equity instruments that may be written off or converted to common stock on the occurrence of a trigger event. Contingent convertible debentures refer to debentures that contain a clause requiring them to be written off or converted to common stock on the occurrence of a trigger event. These debentures generally absorb losses while the issuer remains a going concern (i.e. in advance of the point of non-viability). "Bail-in" generally refers to (a) contractual mechanisms (i.e. contractual bail-in) under which debentures contain a clause requiring them to be written off or converted to common stock on the occurrence of a trigger event, or (b) statutory mechanisms (i.e. statutory bail-in) whereby a national resolution authority writes down or converts debentures under specified conditions to common stock. Bail-in debentures generally absorb losses at the point of non-viability. These features can introduce notable risks to investors who may lose all their invested principal.

Changes in legislation and/or regulation

Changes in legislation and/or regulation could affect the performance, prices and mark-to-market valuation on the investment.

Nationalization risk

The uncertainty as to the coupons and principal will be paid on schedule and/or that the risk on the ranking of the bond seniority would be compromised following nationalization.

Reinvestment risk

A decline in interest rate would affect investors as coupons received and any return of principal may be reinvested at a lower rate.
Changes in interest rate, volatility, credit spread, rating agencies actions, liquidity and market conditions may significantly affect the prices and mark-to-market valuation.

Risk disclosure on Dim Sum Bonds

Although sovereign bonds may be guaranteed by the China Central Government, investors should note that unless otherwise specified, other renminbi bonds will not be guaranteed by the China Central Government.
Renminbi bonds are settled in renminbi, changes in exchange rates may have an adverse effect on the value of that investment. You may not get back the same amount of Hong Kong Dollars upon maturity of the bond.
There may not be active secondary market available even if a renminbi bond is listed. Therefore, you need to face a certain degree of liquidity risk.
Renminbi is subject to foreign exchange control. Renminbi is not freely convertible in Hong Kong. Should the China Central Government tighten the control, the liquidity of renminbi or even renminbi bonds in Hong Kong will be affected and you may be exposed to higher liquidity risks. Investors should be prepared that you may need to hold a renminbi bond until maturity.

Alternative Investments

Investors in Hedge Funds and Private Equity should bear in mind that these products can be highly speculative and may not be suitable for all clients. Investors should ensure they understand the features of the products and fund strategies and the risks involved before deciding whether or not to invest in such products. Such investments are generally intended for experienced and financially sophisticated investors who are willing to bear the risks associated with such investments, which can include: loss of all or a substantial portion of the investment, increased risk of loss due to leveraging, short-selling, or other speculative investment practices; lack of liquidity in that there may be no secondary market for the fund and none expected to develop; volatility of returns; prohibitions and/ or material restrictions on transferring interests in the fund; absence of information regarding valuations and pricing; delays in tax reporting; - key man and adviser risk; limited or no transparency to underlying investments; limited or no regulatory oversight and less regulation and higher fees than mutual funds.

Risk disclosure on Emerging Markets

Investment in emerging markets may involve certain, additional risks which may not be typically associated with investing in more established economies and/or securities markets. Such risks include (a) the risk of nationalization or expropriation of assets; (b) economic and political uncertainty; (c) less liquidity in so far of securities markets; (d) fluctuations in currency exchange rate; (c) higher rates of inflation; (f) less oversight by a regulator of local securities market; (g) longer settlement periods in so far as securities transactions and (h) less stringent laws in so far the duties of company officers and protection of Investors.

Risk disclosure on FX Margin

The price fluctuation of FX could be substantial under certain market conditions and/or occurrence of certain events, news or developments and this could pose significant risk to the Customer. Leveraged FX trading carry a high degree of risk and the Customer may suffer losses exceeding their initial margin funds. Market conditions may make it impossible to square/close-out FX contracts/options. Customers could face substantial margin calls and therefore liquidity problems if the relevant price of the currency goes against them.

Currency risk – where product relates to other currencies

When an investment is denominated in a currency other than your local or reporting currency, changes in exchange rates may have a negative effect on your investment.

Chinese Yuan ("CNY") risks

There is a liquidity risk associated with CNY products, especially if such investments do not have an active secondary market and their prices have large bid/offer spreads.

CNY is currently not freely convertible and conversion of CNY through banks in Hong Kong and Singapore is subject to certain restrictions. CNY products are denominated and settled in CNY deliverable in Hong Kong and Singapore, which represents a market which is different from that of CNY deliverable in Mainland China.

There is a possibility of not receiving the full amount in CNY upon settlement, if the Bank is not able to obtain sufficient amount of CNY in a timely manner due to the exchange controls and restrictions applicable to the currency.

Illiquid markets/products

In the case of investments for which there is no recognised market, it may be difficult for investors to sell their investments or to obtain reliable information about their value or the extent of the risk to which they are exposed.

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The following is subject to local requirements (if any)

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