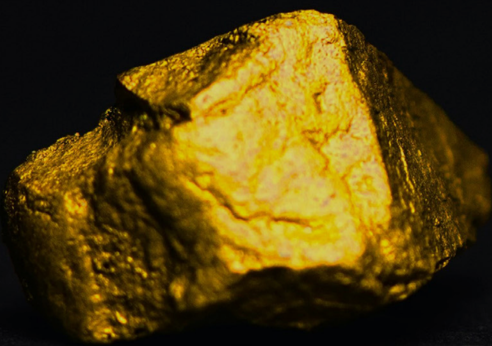
A 'bit' risky

Bitcoins, money and portfolio diversification



Rathbones
Look forward

Foreword

As the price of bitcoin has reached new, much-higher heights so too has speculation about the role it has to play in the future of money and investments. As you might have guessed from the title of this report, we approach this enthusiasm with some scepticism – for reasons we hope will become apparent as you read on. But given how zeal for cryptocurrencies has now spread into the world of institutional investors, and the increasing number of clients that are asking about bitcoin, we thought it would be a good time to see if we could inject some objective analysis into this discussion.

In this report we consider the big existential questions that bitcoin raises: What is money? How is bitcoin different to existing forms of money, and can it supplant them? We also take a look at some of the more pragmatic issues it raises: Is bitcoin a store of value? Is it a safe haven, like gold? Or does it perform best when animal spirits are high? Is there any diversification benefit of holding bitcoin in a multi-asset portfolio? Are investors aware of the environmental impact of mining bitcoin?

We hope this exploration of the philosophical and the practical will help shed some light on the bitcoin debate, and we hope you enjoy reading it.

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Bitcoins, money and portfolio diversification

Bitcoin's gone up again. By a lot. A year ago one bitcoin bought you around $7,770; today it's hovering near $40,000, roughly doubling its prior peak of $19,497 set in 2017. This time institutional investors have joined the frenzy, and an increasing number of individual investors may be wondering if they 're missing out on the next big thing. But what exactly is it, and does it have a place in our clients' portfolios?

Will we all be using bitcoin someday?
The most thoughtful advocates of bitcoin link their expected returns to bitcoin's ability to capture some of the "monetary premium" attached to traditional currency and gold. It is worth starting our discussion, therefore, by asking ourselves, what is money? On the surface, its notes and coins. But what we call money is more than a physical entity, it's a conceptual reality too - a promise, a social convention, if you like, that functions as a readily convertible store of value.

Notes and coins themselves are very different things: a banknote is a promise from the state to pay the bearer on demand; a coin is a physical token issued by the state that does not rely on any claim. Together with the reserves held by banks at the central bank they make up just 3% of UK money. The other 97% of the money we use for transacting and storing wealth is another type of promise, this time from commercial banks. This money - household and corporate claims on banks - isn't physical, it's virtual, existing only on a ledger.

This is worth remembering. Although bitcoin's use of the blockchain and its cryptographic genesis are novel (see Rathbones' excellent 2017 article on what the blockchain is here), some of its most striking features really aren't that new at all.

Although the share of virtual money has risen significantly over the last few decades, private, commercial bank money has been the preference for centuries. Indeed until 1844, banknotes were issued in the UK by commercial banks, not just the Bank of England. Our chief investment officer has one issued by the Bath City Bank in 1791 framed on his desk at home. But despite centuries of inflation, it's probably worth more to him today than it was to the final 18th century bearer: Bath City Bank, founded in 1776, went bankrupt in 1793, the victim of a property market bubble.

In a nutshell, that's why we don't have privately issued banknotes today. And that's why commercial banks and their virtual money have been subject to more and more regulation as their importance has grown and grown. Indeed, as the Bank of England's Deputy Governor for Financial Stability, Sir Jon Cunliffe, reminded us in a recent speech on the future of money, it is the Bank's job to ensure that the UK's money can be readily transferred, accepted and will hold its value through time. Very, very few economists - and in turn policymakers - believe it would be more efficient to return to the era of "free banking" and the de-centralized and relatively unregulated private creation of money. The government monopoly on money also

To bet on bitcoin's future utility is to bet on governments giving up their monopoly on money.

makes it much easier for central banks to stabilise the economy with monetary and financial policy tools.

So investors in Bitcoin who believe that its price will continue to soar because of its utility need to ask themselves, how easily do you think governments are going to give up their monopoly on money?

The future is digital. But is it crypto?

To be clear, we're not Luddites. We believe the future is digital. We're just sceptical that it's crypto. In the mid-1960s, only around 30% of the UK population had a bank account, yet by 2028 just 9% of transactions will be made with cash according to estimates by the industry body UK Finance, and the value of all those transactions will be a much, much lower percentage still. This shift, alongside new technologies, means new ways to transact and new forms of money are highly likely to emerge.

The Kansas City branch of the US Federal Reserve (Fed) estimates that retail payment costs currently absorb 0.5-0.9% of annual economic output. The system is ripe for change. The UK is developing a unified 'New Payments Architecture' programme, which will replace BACS, etc. and should reduce the cost of payments in a digital age. But it's likely that transaction costs, especially increasingly common cross-border retail transactions, could be reduced the most by using blockchain and similar technologies, and this will likely mean new forms of money. But it doesn't necessarily mean bitcoin.

So-called stablecoins are a prime competitor. The most high-profile of these is the Facebook-led Diem – recently rebranded from Libra – which will launch this month. Stablecoins have all the technological advantages of bitcoin but ensure a stable value by pegging to another asset, most commonly the dollar (as Diem will at launch), a basket of currencies (similar to how China manages its exchange rate) or government bonds. They don't satisfy the libertarians or those who think doomsday is coming for fiat money (government-issued money that isn't backed by a physical commodity, such as gold) and their issuers. But the libertarians' philosophies don't offer a sound reason for investing either in our opinion, which you can read more about in our recent Investment*Updates* on inflation and government debt.

> Central banks are developing their own digital currencies too. So-called CBDCs have plenty of attractions.

Central banks in on the action

Another group of competitors is the central banks themselves. Thirty-six of them are developing central bank digital currencies (CBDCs), nine have piloted them and Sweden and China are likely to launch limited experimental versions this year. The US, UK, European, Canadian, Japanese, Swedish and Swiss central banks have recently joined forces with the Bank for International Settlements (BIS) to produce a report on them.

Like some stablecoins they could take advantage of the same revolutionary technology that will lower transaction costs while linking their value (directly or indirectly) to currencies – the national unit of account. Unlike stablecoins they will be a direct liability of the central bank. Policymakers are attracted to CBDCs for a number of other reasons. Any system requires a back-up and, should the electronic payments system fail (due to a cyberattack, for example), cash is supposed to be it. But if cash is becoming increasingly marginalised, we need a new backup.

Figure 1

Foundational principles of central bank digital currencies

1. Coexistence with cash and other types of money in a flexible and innovative payment system
2. Any introduction should support wider policy objectives and do no harm to monetary and financial stability
3. Features should promote innovation and effeciency
4. Resilient and secure to maintain operational integrity
5. Convenient and available at a very low or no cost to end users
6. Underpinned by appropriate standards and a clear legal framework
7. Have an appropriate role for the private sector, as well as promoting competition and innovation

Source: HSBC, from BIS report

The payments system itself is also very uncompetitive. Recent research from the New York Fed has shown that the monopoly of payment provision comes at a large social cost. The BIS report also emphasised this and, indeed, policymakers have been concerned about this for years. The New York Fed's conclusion is that, despite the social cost, breaking up the monopoly wouldn't be beneficial for consumers. But introducing an alternative digital money such as a CBDC would force the monopolists to improve their pricing behaviour.

If consumers had access to CBDCs, fiscal policy could be delivered more effectively and at lower cost. Take for example the US stimulus cheques given to households last year (with potentially more to come if President-elect Biden's plans come to fruition). Mailing them is a costly and slow process, and 1.1 million of them ended up being sent to the recently deceased because the database the government uses is also slow to update. We also know that only about 40% of these cheques were spent; CBDCs could involve 'expiration dates' that force consumers to spend them.

Interest-bearing CBDCs could also enable central banks to channel their policy decisions (e.g. changes in official rates) more efficiently into economic activity. Better control over policy transmission is particularly helpful in a world of negative rates (see our recent *InvestmentUpdate* on the subject). But herein lies the huge risk that CBDCs pose. Disintermediate the banking system too much and encourage too many people to withdraw and convert their deposits at commercial banks - responsible for 97% of today's money, remember - and the whole financial system runs into some very big problems because banks rely on deposits as a source of funding for making loans.

It's unlikely we'll all be using bitcoin in 10 years' time.

Taking on the money monopoly

The debate about CBDCs among policymakers is a key reason why we don't believe that they will permit bitcoin to become a systemically significant part of the financial landscape as its advocates predict. The financial stability risks are even greater. And if these non-banked private coins became dominant a central bank's ability to provide contingent liquidity to placate a financial crisis (to be the 'lender of last resort') would also be compromised. The joint BIS-central bank report promoted some "foundational principles" that CBDCs must have (figure 1 shows HSBC's summary of them). This could be read easily as the features that the authorities would require of any

Figure 2

Is bitcoin a store of value?

	Correlation with… Inflation (CPI), %yoy	Gold, %yoy
Since inception	0.03	**-0.43**
Last 3 years	0.28	-0.04

Source: Refinitiv ; Rathbones; inception date for Bitcoin pricing is 18/08/2011 from Refinitiv database.
Correlation in bold font is statistically significant (1.0 = perfect correlation).

These figures refer to past performance, which isn’t a reliable indicator of future performance.

digital currency before it is permitted to be used at any systemically significant scale. How many does bitcoin satisfy?

We expect digital currencies to become an increasingly larger part of the payment landscape. For now, bitcoin will participate in that. But as with commercial bank money, which is also virtual and has been for centuries, policymakers will want to ensure that digital currencies don’t destabilise the financial system. We believe that means they will use regulation to retain their monopoly and prevent bitcoin from being used too widely. If it’s unlikely that we will all be using bitcoin in ten years’ time, it will remain too volatile and not liquid enough to capture that “monetary” premium on which investors’ theses rest.

It is also worth considering why we use our sovereign currencies, or why the whole world doesn’t all use the dollar. Austrian School economists of the late-nineteenth century gave us the answer. The tendency to gravitate to one global unit of exchange is countered by the fact that domestic fiscal authorities demand that taxes be paid in their own currency, and in which recipients of government welfare and government jobs have no choice but to take payment. Unless a sufficient number of firms and households believe the pound (or the dollar or any other western currency) is about to fall through the floor, it’s again difficult to see a huge role for bitcoin or other cryptocurrencies.

Having weighed bitcoin in the scales of existential theory and found it wanting, what are some of the more practical uses that could fuel continued demand for bitcoin?

A store of value?

One such argument for investing in bitcoins is its potential as a store of value. First we looked at the correlation of bitcoin’s price with inflation. During the last 10 years, it has had none. In the last three years, although weakly positive at around 0.3 (where 1.0 is a perfect correlation), this isn’t statistically significant (figure 2). Furthermore, to see whether it could possibly be an equivalent to gold in its ability to maintain purchasing power, we plotted its relationship with gold price movements, and again, the result appears questionable. Gold and bitcoin has a historical correlation of -0.43 in the past decade, and that is statistically significant too (figure 2). Of course bitcoin doesn’t have a long enough history to prove its resilience, but based on what we know, investing in it as a store of value is a leap of faith.

A safe haven?

When COVID-19 spread around the world, triggering lockdowns everywhere, bitcoin

Figure 3

Is bitcoin a safe haven?

	Bitcoin	MSCI World (local currency)
Maximum drawdown in the last 3 years	-81%	-33%
Performance during 2020 equity market drawdown period (Feb-Mar)	-32%	-33%

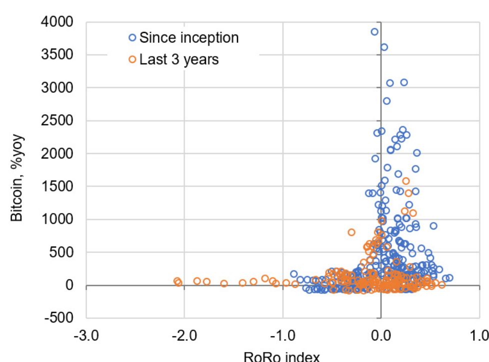
Source: Refinitiv; Rathbones
Past performance isn't a reliable indicator of future performance.

fell in line with global equity markets during the violent February to March selloff (see figure 3). In comparison, traditional risk-off assets were rather resilient during the same period. For instance, gold was down by just 4%, 10-year US Treasury yields fell by 0.81 of a percentage point (prices rose), and the yen (widely perceived as a safe-haven currency) was up by 0.1% against the dollar, while the dollar rose nearly 13% against sterling (which tends to be more sensitive to economic cycles).

Indeed, you might have come to the conclusion that bitcoin is just a risk-on asset. When the mood is high, people become more speculative. But according to our own risk-on/risk-off (RoRo) indicator, bitcoin is only a marginally risk-on asset. Its all-time correlation with the Rathbones RoRo indicator is just 0.17 (figure 4). As a result, we don't think bitcoin can be categorised as either a

Figure 4

A neutral relationship with RoRo



Source: Refinitiv, Rathbones
Past performance isn't a reliable indicator of future performance.

safe-haven asset or a reliable play on an economic recovery.

A diversifier?

First and foremost, diversifiers are meant to smooth portfolio performance by lowering overall volatility. That requires that the added asset is not only negatively correlated with the rest of the portfolio, but that it also doesn't add volatility that would overwhelm the diversification this negative correlation provides.

We tested bitcoin's diversification benefit in two cases, one for a traditional 60/40 portfolio of equities and government bonds, respectively, and the other for a 50/50 portfolio of inflation-linked bonds (linkers) and gold (see the results in figure 5).

For illustration purposes, we assume an average investor rebalances their portfolio on a regular basis. Since August 2011, when our bitcoin data begins, the annualised volatility of the traditional equity-bond portfolio would have been 9.2%. Taking 10% weighting away from the bond portion and investing in bitcoin would have almost doubled the portfolio's annual volatility to 16.6%. The huge volatility and the positive correlation between bitcoin and the 60/40 portfolio, disqualifies bitcoin as a pure diversifier.

Total risk and risk-adjusted returns were worse when bitcoin was added to stylized portfolios.

Figure 5

Is bitcoin a diversifier?

	Annual volatility since bitcoin inception in 2011	Last 3 years
60/40 equity/bond portfolio	9.2%	11.4%
60/30/10 portfolio with 10% in Bitcoin	16.6%	16.8%
50/50 linkers/gold portfolio	10.7%	11.0%
45/45/10 portfolio with 10% in Bitcoin	13.7%	13.0%
60/30/10 portfolio with the 10% in the 45/45/10 portfolio	9.5%	11.7%

Source: Refinitiv; Rathbones; bitcoin has an annual volatility of over 92% since inception and around 75% volatility in the past 3 years. Proxies: FTSE 350 Total Return Index for equity, UK 10y Gilt Total Return for bond, Iboxx UK Gilt Inflation-Linked Index Norminal Total Return Index for linkers. Gold is hedged to remove the effect of currency fluxuations.

These figures refer to simulated past performance, which isn't a reliable indicator of future performance.

If you think the enormous absolute return from bitcoin since its inception would have lifted your risk-adjusted return, think again (assuming regular rebalancing). It's 92% annual volatility prevented that. Moreover, you'll have seen the frequent warnings that past returns are no guide to the future, and this is all the more true with an asset this volatile. We also conducted the analysis over the last three years only. Bitcoin's volatility has fallen to a mere 75%! But it's much the same story. Figure 5 shows the results for a sterling investor, but we find similar results if we assume a dollar-based global investor.

For a 50/50 portfolio of gold and UK Index-linked gilts, taking 5% from each of them and putting it into bitcoin would mean the annual volatility of the portfolio jumps from 11% to 14%. While bitcoin does have a negative correlation with such a portfolio, the unimaginable volatility of bitcoin again overwhelms the results. To include a high-volatility asset like bitcoin into a lower-volatility portfolio, you'd risk turning this 50/50 insurance policy into a speculative bet.

Finally we substitute the new 45/45/10 insurance policy portfolio for the 10% bitcoin in our first example. We now have a portfolio with 60% equities, 30% government bonds, 4.5% gold, 4.5% linkers and 1% bitcoin. Again, the addition of bitcoin wouldn't have provided any diversification benefit, only more uncertainty.

A responsible investment?

Bitcoin is said to have a big appeal among younger generations who have grown up in the digital age. But it may be in conflict with the strong interest in social engagement that same cohort is known for (see for example their preference for sustainable brands in our recent *Planet Paper: A brand new world*), and in particular their demand for action on climate change. In an increasingly ESG (environmental, social and governance)-focused world, asset managers may start to avoid bitcoin or other similar assets which are "mined" in a very resource intensive way. And that's in addition to the social and governance issues of bitcoin being used as a vehicle for fraud, theft and organised crime.

The popular Digicominist blog, known for its bitcoin energy consumption index, suggests that bitcoin mining consumes between 48 and 78 terawatt hours (TWh) of energy per year. At 78 TWh, that would

be comparable to the power consumption of Chile and the carbon footprint of New Zealand. In Dec 2020 an article published in the peer-reviewed journal Energy Research & Social Science, the blog's founder suggested that even 78 TWh could be an underestimation of about 20%, as miners often use older hardware to cut down on capital costs and standard estimates don't take into account seasonal or geographic variability in power costs.

Rathbones' Stewardship and Engagement team have also been looking into these questionable sustainability characteristics of bitcoin and will be looking to produce a Planet Paper on the topic later this year.

Evolution not revolution

When bitcoin first burst onto the scene, it's developers may have dreamed of a revolution – taking on the money monopoly of the world's central banks and upending the global monetary system. We've seen why that's highly unlikely, and if it does have a role in the future of money it will be a much more modest one within a larger, evolving landscape of digital currencies. When it comes to investments, we don't see it as either a safe haven or a play on economic recovery – it's neither here nor there.

You can read more about bitcoin from a fund manager's point of view in ***Bitcoin: bearer bonds for the 21st century***, by Rathbone Funds' head of multi-asset investment David Coombs. If you have any further questions about investing in bitcoin you can also speak to your Rathbones contact.

Contact us

If you would like further information or to arrange an initial meeting, please contact us on 020 7399 0000 or email info@rathbones.com

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