Wealth Management
PH&N Investment Counsel

# Counsel Views

May 2021

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## Decrypting crypto – *caveat emptor*

Bitcoin is a potentially transformative technology whose impacts may extend beyond its use as an investment. For its most ardent advocates, a belief that Bitcoin will change society is close to an article of faith. Conversely, there are many decided non-believers who view the current enthusiasm for Bitcoin as a speculative phenomenon. The financial world is starkly divided on this issue.

Please note that RBC PH&N Investment Counsel does not currently provide any recommendations or solutions related to Bitcoin or other cryptocurrency assets. The following is our effort to summarize and clarify the many questions about what Bitcoin is and how it may be relevant to investors today, and is for information purposes only. In our view, any investment in Bitcoin should be considered speculative and volatile, meaning that investors should be prepared to lose all of their investment.

### Part 2: Bitcoin – risks and role in a portfolio

In this two-part series, we provide our views on one of the most hotly debated investment topics today – cryptocurrency. In part one, we considered whether the leading cryptocurrency, Bitcoin, is the real deal or whether it's a Ponzi scheme, concluding that at this point it's more of a speculative investment than a traditional store of value or medium of exchange (such as a traditional government-issued fiat currency). In part two, which follows, we discuss specific risks and opportunities, and ask: "Do you even need to invest in Bitcoin?"

### What are some of the key risks in Bitcoin/cryptocurrencies?

There are a number of risks associated with investing in Bitcoin beyond the degree of speculative activity and resulting bubble risk.

**High degree of volatility:** There has been significant volatility associated with owning Bitcoin over the past decade. The following table shows some of the larger corrections in Bitcoin over its short trading history, including the number of days the correction took, the percentage decline in the correction phase, and the number of days it took to recover and reach a new high.

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| Correction Dates | # Days in correction | Bitcoin High (USD) | Bitcoin Low (USD) | % Decline | % Return to New High | # Days to New High |
|---|---|---|---|---|---|---|
| April 13/21 to May 19/21 | 36 | $64,863.00 | $31,913.00 | -51% | - | - |
| Jan 8/21 to Jan 21/21 | 13 | $41,962.00 | $28,845.00 | -31% | 45% | 18 |
| Dec 17/17 to Dec 15/18 | 363 | $19,783.00 | $3,122.00 | -84% | 534% | 1,079 |
| Nov 8/17 to Nov 12/17 | 4 | $7,879.00 | $5,507.00 | -30% | 43% | 8 |
| Sept 2/17 to Sept 15/17 | 13 | $5,014.00 | $2,951.00 | -41% | 70% | 40 |
| June 11/17 to July 16/17 | 35 | $3,025.00 | $1,837.00 | -39% | 65% | 55 |
| Mar 10/17 to Mar 24/17 | 14 | $1,326.00 | $892.00 | -33% | 49% | 48 |
| Nov 30/13 to Jan 14/15 | 410 | $1,166.00 | $170.00 | -85% | 585% | 1,181 |
| April 10/13 to July 7/13 | 88 | $266.00 | $63.00 | -76% | 323% | 211 |
| June 8/11 to Nov 17/11 | 162 | $32.00 | $1.99 | -94% | 1504% | 631 |
| May 13/11 to May 21/11 | 8 | $8.45 | $5.58 | -34% | 51% | 12 |
| Feb 10/11 to Apr 4/11 | 53 | $1.10 | $0.56 | -49% | 96% | 66 |
| Nov 6/10 to Nov 10/10 | 4 | $0.50 | $0.14 | -72% | 257% | 86 |
| Sept 14/10 to Oct 8/10 | 24 | $0.17 | $0.01 | -94% | 1600% | 40 |
| **Average** | **88** | **$10,380.44** | **$5,379.16** | **-58%** | **402%** | **267** |
| **Median** | **30** | **$1,246.00** | **$531.00** | **-50%** | **96%** | **55** |
| **Max** | **410** | **$64,863.00** | **$31,913.00** | **-94%** | **1600%** | **1,181** |
| **Min** | **4** | **$0.17** | **$0.01** | **-30%** | **43%** | **8** |

Source: Bloomberg (Bitcoin price reference used was XBT USD Currency), RBC PH&N Investment Counsel. All amounts are in USD, time weighted returns, before fees, transaction costs and taxes. Past performance does not guarantee future results. See required disclosures for indices referenced.

## What are the takeaways?

Over the last decade, the average correction in Bitcoin lasted 88 days and saw an average decline of 58%. The longest correction lasted 410 days, while the shortest correction was just four days and saw a decline of 30% during that short period. The most severe correction was in June 2011 when Bitcoin declined 94% over 162 days. It then took another 631 days to reach a new high. All of this to say it's understandable that given a short history, limited supply and high demand that price volatility would be extremely high. Since inception returns from Bitcoin have been very impressive, but the journey to get from there has not been a smooth ride by any means. We do not know what the volatility for Bitcoin will be going forward, but potential investors need to pay close attention to the ups and downs.

## Environmental concerns related to energy consumption used in crypto-mining

In contrast to the low carbon intensity of central bank digital currencies, Bitcoin investors have to pay attention to the environmental costs. The Bitcoin blockchain relies heavily on specialized computers racing to solve increasingly complex equations, making quintillions of attempts a second to verify transactions (known as "crypto-mining"), resulting in a very energy intensive process by design. Various studies have been conducted on energy consumed by crypto-mining, with best estimates suggesting energy consumption is on par with the needs of Switzerland or Argentina. In some ways, the rising complexity that underpins Bitcoin is its biggest asset, but in another, rising complexity is a flaw of the entire system. Despite faster and more energy efficient computer technology to solve these complex equations, the Bitcoin protocol automatically adjusts the degree of difficulty based on the number of computers in the network. Therefore, Bitcoin miners may not necessarily benefit from advancements in energy-efficient technologies due to the offsetting effect of increased complexity.

The growing network complexity pushes up the hash rate (number of calculations) and ultimately the energy consumption of the entire system. Bitcoin mining activities are concentrated in a handful of jurisdictions: close to 50% of mining pools operate in China. This is because miners are looking for cheap electricity sources, and China has some of the lowest electricity costs in the world. It is estimated that nearly 60% of Chinese electrical generation is from coal-fired power plants during the offseason. During the on-season, we note that 100% of the power in the target regions comes from hydroelectricity.

Yet this is not the end of the Bitcoin story. If society as a whole values Bitcoin as an enduring medium of exchange and/or store of value, either the energy dilemma is solved through innovation, or society accepts the energy consumption/ store of value trade-off. To that end, there are entrepreneurs and companies focused on bringing green energy sources to the crypto-mining industry. It is possible that Bitcoin and cryptocurrencies help to accelerate the global energy transition to renewables (e.g. solar, wind energy). Bitcoin miners could also act as a flexible load option to help solve the intermittency problems with renewable energy. Investment by Bitcoin miners in green renewables could further drive down the cost of some of these technologies.

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Finally, it seems unfair to call out Bitcoin's environmental impact without making the same inferences to gold. After all, when it comes to gold mining, there hasn't been as much push back on the environmental impact of wedding bands, necklaces and gold bars as there has been with crypto-mining.

## Regulatory – loss of privacy, competition from central banks

It's still unclear at this time what appetite or ability policymakers have to regulate cryptocurrencies. Encrypted private digital wallets are able to efficiently transfer digital assets across borders which doesn't sit well with many central banks and government bodies. Restrictions or banning Bitcoin and other cryptocurrencies has taken place in many countries around the world, including China, India, Iran, Saudi Arabia, Qatar, Pakistan and Vietnam. But despite the restrictions or outright bans, it has been impossible to fully eradicate cryptocurrencies from society given their decentralized nature.

Similar to the debate in the early days of the internet around lack of governance and the need for compliance in a decentralized and global environment, there are some who believe regulation of cryptocurrencies could pose a threat to their sustainability. Anti-money laundering and anti-terrorist financing are legitimate issues facing entities on the boundaries of the blockchain. There are workarounds currently in place to solve for these issues for some blockchains using smart contracts that verify addresses without intermediaries. Some of these solutions may cost blockchain technology some loss of privacy, as the internet did over the course of its journey from the early 1990s to today. Yet despite those restrictions, there is no single entity that oversees the internet and, for the most part, it remains permission-less.

## Ownership distribution

As of the time of writing, approximately 95% of Bitcoins in existence are held by approximately 2% of digital addresses (including exchanges). To be fair, estimating breadth of ownership using digital addresses to approximate individual ownership is subject to error. One individual can control multiple addresses, and one address can hold funds from multiple individuals. But directionally, the majority of large blocks of Bitcoin's float reside with a minority of individuals/entities. The risk here is that narrow breadth of ownership can lead to heightened volatility (upside and downside) given limited liquidity. Improvements with breadth of ownership would be considered a positive for the long-term value of Bitcoin, all else equal.

## How could Bitcoin fit into a portfolio?

Of course, that depends. You have to first take into consideration all of the preceding discussion, your investment time horizon, and your tolerance and capacity for risk. We've talked about a goals-based investing approach in previous articles, and how the goals-based process begins with some discovery about what your goals/objectives are. Once we establish your goals/objectives, we can customize a portfolio for you which takes into account the required return to reach those goals/objectives, while taking into consideration time horizon, risk profile and liquidity needs. By using a goals-based approach, your specific benchmark becomes the required rate of return to reach your goals. Success is measured by how well your portfolio is tracking against a stated goal, and in the end being more relevant to your current and future needs.

This approach reduces behavioural tendencies that come with speculative investments like Bitcoin, and could end up derailing your wealth plan. Herding, fear of missing out, overconfidence, anchoring, availability and representativeness are a few examples of biases and mental shortcuts associated with Bitcoin and cryptocurrencies. By focusing on the required rate of return and risk parameters for you to achieve your goals, you do not need to chase higher returns for the sake of it. You can be measured in your approach and avoid subjecting your portfolio to inappropriate risks at inappropriate times.

With perfect hindsight, your entire portfolio may have been Bitcoin for the last several years, and all would be right with the world. Even with that perfect hindsight, the journey along the way would not have been smooth to say the least. In the table (next page) we provide historical return, risk and drawdown statistics for Bitcoin, T-bills, bonds, stocks and a simple balanced portfolio that is 40% weighted in U.S. bonds and 60% weighted in U.S. large cap stocks.

## Take-aways

Despite the volatility over this period (standard deviation = 78.6%, max drawdown -71.7%), Bitcoin's risk/reward ratio (Sharpe Ratio) is quite impressive at 1.5 when compared to other asset classes in the table. Impressive as this is, when we construct portfolios, we also need to take into consideration the correlations amongst portfolio constituents. We show the correlation with these assets and Bitcoin over this period in the last column. When we break down this period into shorter time horizons, we've observed that correlations amongst Bitcoin and other asset classes has been changing. More recently correlations between Bitcoin, U.S. and international equities, and some currencies, has been increasing, which may impact the degree of portfolio diversification you get with Bitcoin today. Either way, results to

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date have been impressive. However, with a short trading history to observe correlations, we cannot have a high degree of confidence in sizing the weight of Bitcoin in a portfolio. Bear in mind that RBC PH&N Investment Counsel does not invest in Bitcoin.

| Time Period: Since Common Inception (1/1/2015) to 4/30/2021 | Return | Std Dev | Sharpe Ratio | Max Drawdown | Correlation witih Bitcoin |
|---|---|---|---|---|---|
| U.S. T-bills (90-day) | 1.9% | 8.7% | 0.2 | -13.5% | 100% |
| U.S. T-bonds (5-10 yr) | 4.0% | 11.1% | 0.3 | -16.3% | 92.0% |
| S&P/TSX Composite | 7.5% | 12.9% | 0.6 | -22.3% | -50.0% |
| S&P 500 Index | 15.2% | 12.2% | 1.2 | -13.4% | 2.0% |
| 60/40 U.S portfolio | 10.9% | 8.2% | 1.2 | -7.3% | 52.0% |
| | | | | | |
| **Bitcoin** | 133.5% | 78.6% | 1.5 | -71.7% | 100% |

Source: Morningstar Direct. RBC PH&N Investment Counsel. All amounts are in USD, time weighted returns, before fees, transaction costs and taxes. Past performance does not guarantee future results. Indices used include: USTREAS Stat US T-Bill 90 Day Total Return, S&P/TSX Composite Total Return, S&P 500 Total Return, Fidelity Bitcoin Total Return USD. Sharpe Ratio measures the performance of an investment compared to a risk-free asset, after adjusting for its risk. It is defined as the difference between the returns of the investment and the risk-free return, divided by the standard deviation of the investment. For Sharpe Ratio we've used FTSE Canada 91 Day T-bill rate over the since common inception period Jan 1/15 through Apr 30/21. See required disclosures for indices referenced.

## How might Bitcoin fit into a portfolio?

Portfolio construction is both an art and a science. When we construct portfolios we take into consideration various factors to determine the right mix of different asset classes, known as your strategic asset allocation. These various factors include historical and expected returns, risk, and the correlation of various asset classes with one another. We subject various strategic asset allocation combinations to scenario analysis, including testing portfolio performance and risk across past market regimes to better understand how that portfolio might react to, say, inflation, deflation, a financial crisis, a global pandemic, etc. Optimizing a portfolio to have the best risk-reward ratio has its downsides as well, and optimal is not always best when it comes to individual investor preferences and needs.

As previously discussed, the short trading history of Bitcoin is problematic for portfolio construction. This is likely why most institutional investors and some private clients have indicated they would include Bitcoin at 1-2% in the portfolio. The view here is that such a small allocation won't materially impact portfolio performance if Bitcoin were to go to $0, but it also provides a degree of hedging should Bitcoin continue to appreciate as it has (i.e. have no regrets). While there is some degree of validity with this strategy, it should be considered speculative and limited to one's own risk tolerance and capacity. Even with a very small percentage allocated to Bitcoin, one has to ask themselves without the benefit of 20/20 hindsight: how would you have reacted to the historical drawdown periods highlighted in this article? Would you have sold and taken profits/losses, or would you have been able to hold on?

## Where could we be wrong?

Questions around anti-money laundering, anti-terrorist financing, energy consumption, scalability and regulatory threats may one day be resolved, providing a degree of comfort in the proposition of Bitcoin as a currency or a commodity. It's entirely possible that Bitcoin is not in a speculative bubble, and that the market has been completely rational in bidding up prices accordingly. It's entirely possible that much like the dot-com bubble, there will be viable business models that survive and continue on as quality, growth or even value investments in the future. And even if Bitcoin and other cryptocurrencies are in a speculative bubble, it doesn't mean it will deflate, or burst any time soon. In fact, despite severe drawdowns in the past to the tune of 80-90%, Bitcoin has managed to come back and move on to new all-time highs.

But given the arguments and questions we still have, we caution clients about putting money to work in Bitcoin today.

## In summary

Bitcoin presents an interesting proposition for speculative investors. There are likely applications and derivatives of Bitcoin that may endure over time irrespective of any financial market bubble bursting. We have highlighted in this article a number of important questions that we believe investors and holders of Bitcoin should understand. We understand that speculation is quite different from investing and this article has been written with the investor in mind. We always strive to separate the signal from the noise in these articles with a goal of building more resilient investment portfolios that thrive in any market environment.

**As always, if you have any questions about the content and views expressed in this article, please feel free to reach out to your Investment Counsellor at any time.**

S&P 500 Index: The S&P 500 Index includes 500 companies across many sectors of the U.S. economy. The index is weighted by market capitalization so bigger companies make up a larger proportion of the index than smaller companies. The index is designed to measure performance of the broad US economy through changes in the aggregate market value of the largest US companies.

Canada S&P/TSX Composite: Comprises the majority of market capitalization for Canadian-based, Toronto Stock Exchange listed companies. It is a benchmark used to measure the price performance of the broad, Canadian, senior equity market. It was formerly known as the TSE 300 Composite Index.

Bitcoin reference - XBT USD Currency: A Bloomberg CFIX rate fixings are designed as reference points for Cryptocurrencies. As used in this methodology, the term "fixings" refers only to such Cryptocurrency fixing rates and not to any other rate, calculation or other information that may be related to, or associated with, such fixings that are made available by Bloomberg. Based on pricing provided by the Bloomberg Generic Price ("BGN") using Bloomberg's well-known data, technology and distribution platforms, CFIX is made broadly available to the investment community with the objective of providing Cryptocurrency fixings that are reliable, representative, and transparent for the Cryptocurrency markets around the world. Pricing sources are trading platforms that facilitate buying and selling Cryptocurrencies online. Many Pricing Sources refer to themselves as "exchanges," which can give the misimpression that they are regulated or meet regulatory standards of a national securities exchange. Many of the U.S.-based digital Cryptocurrency trading platforms have elected to be state-regulated 'money-transmission services'. Traditionally, from an oversight perspective, these predominantly state-regulated payment services have not been subject to direct oversight by the SEC or the CFTC.

The Nikkei 225, or the Nikkei Stock Average, more commonly called the Nikkei or the Nikkei index, is a stock market index for the Tokyo Stock Exchange. It has been calculated daily by the Nihon Keizai Shimbun newspaper since 1950. It is a price-weighted index, operating in the Japanese Yen (JP¥), and its components are reviewed once a year. The Nikkei measures the performance of 225 large, publicly owned companies in Japan from a wide array of industry sectors.

NDX, the Nasdaq-100 is a stock market index made up of 102 equity securities issued by 100 of the largest non-financial companies listed on the NASDAQ stock market. It is a modified capitalization-weighted index.

Shanghai Stock Exchange: The Shanghai Stock Exchange is a stock exchange based in the city of Shanghai, China. It is one of the two stock exchanges operating independently in mainland China, the other being the Shenzhen Stock Exchange. The Shanghai Stock Exchange Composite Index is a capitalization-weighted index. The index tracks the daily price performance of all A-shares and B-shares listed on the Shanghai Stock Exchange. The index was developed on December 19, 1990 with a base value of 100. Index trade volume on Q is scaled down by a factor of 1000.

NBI Index: The NASDAQ Biotechnology Index is a stock market index made up of securities of NASDAQ-listed companies classified according to the Industry Classification Benchmark as either the Biotechnology or the Pharmaceutical industry. A list of the 213 components of the index is published online.

XAU Currency: A symbol for the Philadelphia Gold and Silver Index, an index of precious metal mining company stocks that are traded on the Philadelphia Stock Exchange.

US housing (S&P Homebuilders Select Industry Index); S5HOME: This index is comprised of stocks in the S&P Total Market Index that can be classified as being part of the GICS (Global Industry Classification Standard) homebuilding sub-industry.

NYSE FANG Index: An equal-dollar weighted index representing a segment of consumer discretionary and technology sectors, made up of highly-traded growth companies such as Facebook, Apple, Amazon, Netflix, and Alphabet's Google.

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