An Introduction to Bitcoin and Other Cryptocurrencies

A message from the BMO Nesbitt Burns Portfolio Advisory Team: This article is designed to help you speak intelligently about digital currencies, or "cryptocurrencies." As a team, we do not believe in the investment merits of cryptocurrencies at this point in time, given the information we currently have available. The value of Bitcoin and similar cryptocurrencies have increased exponentially in a short period of time, which we see as a flag of caution. Although we do not condone these investments, we believe it is valuable to remain in-the-know as market dynamics continue to be affected by technological change and emerging tech investment themes.

What is a cryptocurrency?

Depending on who you ask, cryptocurrencies can be considered a currency, an asset, or a commodity, similar to gold. Cryptocurrencies, such as Bitcoin, are a form of digital money that can be used to purchase goods and services instead of paying with your local currency. They are not controlled or regulated by any single authority and can be issued without any major approval process. Above all else, cryptocurrencies are a way to access the digital economy.

A cryptocurrency is a digital asset designed to act as a medium of exchange for the digital economy. Standard currencies, like the Canadian dollar, are limited to a certain number of uses, such as being a medium of exchange or store of value, while cryptocurrencies can be used to access exclusive content and services in the online economy. In fact, a cryptocurrency can be similar to a membership card for your local co-op grocery store. While the card doesn't allow you to purchase food at other stores, it provides you with access to particular goods, services and discounts that others would not have if they did not purchase a membership card. In the online economy, for example, a cryptocurrency could allow you access to exclusive content from your favorite music artist, including merchandise and early single releases. There are nearly one thousand available cryptocurrencies, each offering something different. They are bought and sold using blockchain technology, rather than exchanging physical cash or transferring funds through a financial institution. Blockchain technology facilitates and secures transactions between buyers and sellers while controlling the total supply of cryptocurrency. This technology is decentralized, meaning it does not need a central authority like a central bank (i.e., the Bank of Canada). This takes the form of a digital public record book which securely tracks each transaction as they occur, recording them into a chain of "blocks." Unlike using an independent Point Of Sale system, using blockchain leaves a copy of each transaction on a public record book. This can be used to understand supply and demand for services in the online economy. More importantly, the blockchain cannot be tampered with or changed after a transaction is completed, making it secure and reliable.

How does supply work?

Just as a real miner would mine for gold, cryptocurrency miners produce new units of cryptocurrencies, or "tokens." If you were to replace the deposits of gold buried underground with a digital locker of tokens, and replace the pick axe with a powerful computer, you'll find that the two miners act in a similar fashion. The total number of tokens of a cryptocurrency is limited, much like the total available supply of gold. Mining cryptocurrency uses a significant amount of computer power, restricting the amount of cryptocurrency tokens that can be created in a given amount of time. Because the total available supply is limited, it makes

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cryptocurrencies more like gold than currency (gold has an finite supply, whereas a currency does not). The rate at which tokens are mined decreases exponentially as it approaches its total limit. In other words, for every token mined, the next will be more difficult to mine, and require more computer power. Bitcoin, for example, has a maximum supply of 21 million, with roughly 82% mined to date. Thus, the future supply of Bitcoin will grow much slower than the previous supply, and miners can more accurately predict how much it will cost to mine the next token of Bitcoin.

How does demand work?

Cryptocurrencies are used to carry out a transaction in the digital economy. A transaction will state, for example, "John gives 'X number' of Bitcoin to Sarah," and is signed by John's and Sarah's private keys (identification numbers assigned to their particular Bitcoin "wallets"). These transactions are not traceable back to John or Sarah, but they do leave a digital footprint, making this method of payment unattractive for money laundering and other unethical uses. Once the transaction between John and Sarah is complete and verified, the cryptocurrency is exchanged and a record is combined with other similar transaction records to form a block. This block is then recorded on the blockchain and secured by an extremely large network of peer-to-peer connections. **Figure 1** provides an overview of how a cryptocurrency transaction works.

How cryptocurrencies function

Cryptocurrencies aren't simply for speculation, nor are they intended to replace the U.S. dollar as the world reserve currency. In fact, most cryptocurrencies function more like equities. Outside of the few larger offerings, like Bitcoin and Litecoin, which primarily act as methods of payment, most cryptocurrencies have their own unique business plan (usually in the form of a white paper), and are required to gain access to a product or service in the digital economy. Much like how you would buy a stock to profit from a company's success, you may buy a cryptocurrency to profit from the future demand of a digital company's product or service.

For example, let's assume that an entrepreneur decides to launch "RealNews" and allow access through a website. You would be required to buy the new "RealNews Coin" to gain access to their website. The higher the demand for RealNews' service, the higher the value of their coin. Much like an initial public offering ("IPO") for a stock, the initial offering of these coins would be called an initial coin offering ("ICO"), and RealNews would sell their coins to the public while giving a discount to those investors who bought the coin early on. Further, RealNews would rather issue their coins in exchange for other cryptocurrencies instead of a traditional fiat currency. This would require you to exchange your Canadian dollars for a cryptocurrency such as Bitcoin, and then swap that cryptocurrency for the RealNews Coin in order to access their services. In addition, individuals with other cryptocurrencies could exchange their coins for Bitcoin, and then again for the RealNews Coin to gain access to RealNews' services. Intuitively, higher demand for RealNews Coin translates to higher demand for Bitcoin. Since there are so many of these new offerings, we've been experiencing a parabolic movement in the price of Bitcoin and other cryptocurrencies, coupled with mass speculation on the value of Bitcoin itself.

Figure 1: This shows the process Dan would have to take if he wants to access RealNews' website.

Dan exchanges Canadian dollars for Bitcoin → Dan uses his Bitcoin to buy a RealNews Coin → Dan pays for his RealNews subscription using RealNews Coin → Demand for Bitcoin and RealNews Coin increases

Buying Bitcoin and other cryptocurrencies

Individuals do not purchase Bitcoin and other cryptocurrencies from their local bank branch or through their Investment Advisors. Individuals can purchase and trade these coins by creating digital wallets through online providers, like Coinbase. From there, individuals connect their bank accounts and deposit funds. The buying and selling of Bitcoin and other cryptocurrencies from their digital wallets occurs on third party exchanges. While there are many exchanges, the use of blockchain technology ensures there is one decentralized chain of transactions to provide reliable buying and selling prices.

The use of cryptocurrencies continues to grow as the emerging digital economy gains prominence in Canada and worldwide. We encourage investors to stay informed as technological advances that marry currency and the online sphere become more accessible.

! Please contact your BMO Nesbitt Burns Investment Advisor if you have any questions about your investment portfolio.

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