

The Charter Group Monthly Letter

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Economic & Market Update

Bitcoin – Blockchain – Bitcoin – Blockchain

One of the frustrating aspects of the cryptocurrency mania is the similarity between the two most prominent terms, "Bitcoin" and "Blockchain." Both are two-syllable words beginning with the letter B. After a while, they both begin to sound like the same thing, especially when the media often conflates the two.

The October 2017 issue of *The Charter Group Monthly Letter* attempted to delineate between the two with respect to investment opportunity. As the U.S. dollar price of Bitcoin continues to skyrocket (**Chart 1**), investor attention has soared even higher since then. Perhaps this is a good time to outline some of the astounding potential specific to Blockchain (which I don't think is a good reason to speculate on Bitcoin since it already maximized what Blockchain was able to offer it *seven years ago*).

Bitcoin and Blockchain sound similar enough to cause confusion.



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To a holder of Bitcoin¹, what they see is how much Bitcoin they have in their virtual wallet which can be exchanged for goods, services, or another currency. However, it is Blockchain that certifies the authenticity of that Bitcoin and basically makes it impossible to forge. Blockchain permanently records how the Bitcoin owner obtained the Bitcoin and will permanently record the transaction that removes that Bitcoin from the virtual wallet. The permanence is guaranteed because the recorded information can't be manipulated without causing a break in the Blockchain ledger. The Blockchain can only be re-established if the correct transaction data in the "block" is placed back. Then, that "block" will be able to "chain" with the following "block" again and everyone can get back to business (**Diagram 1**). And in addition to managing Bitcoin, Blockchain establishes the process for "mining", or creating, Bitcoin.

Behind the scenes, it is Blockchain doing the work to make Bitcoin function.

Yet Bitcoin seems to be getting credit for everything judging by its price rise!

**Chart 1:
Bitcoin (U.S. dollars per One Bitcoin)**



Source: Bloomberg Finance L.P. as of 12/5/2017

So, we can see that Blockchain is doing all the work. Yet, Bitcoin is getting all the credit judging by its recent parabolic price rise!

Where does Blockchain get all these fantastic powers? There are two sources. First, its software allows it to be communicated via a massive number of scattered or "distributed" networked nodes. It's impossible to block its communication. If one tried, the communication would just select from the list of limitless alternative paths using other nodes in order to get to the destination. It was specifically designed to withstand thermonuclear war.

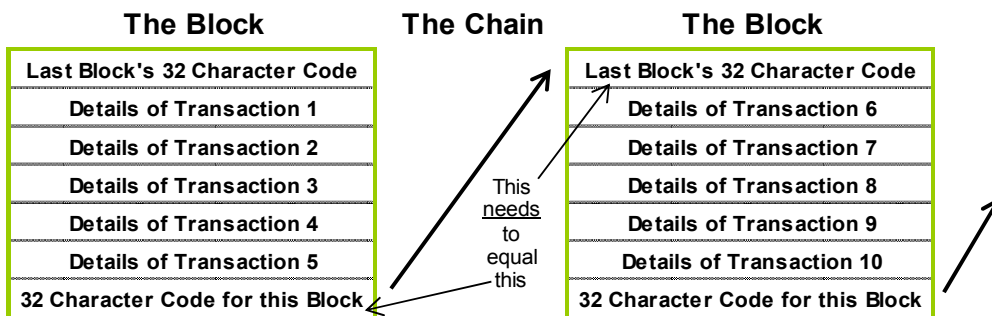
¹ I am using the word "Bitcoin" here in the same way one would use the word "money." A "Bitcoin" alternatively refers to the main denomination and is what is quoted in terms of its price per U.S. dollar. And, a Bitcoin is very divisible. For example, a "Satoshi" (a pseudonym for Bitcoin's inventor) is equal to 0.00000001 Bitcoins. Or, it is the same as saying a Bitcoin consists of 100,000,000 Satoshi's.

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Second, Blockchain uses an algorithm (or puzzle solver) created by the U.S. National Security Agency (or NSA as we often hear in the news) that generates a 32-character code² for *any* document regardless of size. For instance, the word "dog", if inserted into the puzzle solver, will generate a unique 32-character code. The King James Version of the Bible will also generate a unique 32-character code. And, if one were to remove the last phrase of this Version of the Bible (which is "Amen."), the unique 32-character code would be completely different! How crazy is that?!?

Blockchain relies on cryptography created by the U.S. National Security Agency.

Diagram 1:
Simple Illustration of "The Blockchain"



If the contents of the 1st block are changed in the slightest, the 32 character code at the bottom of the 1st block will no longer equal the 32 character code at the top of the 2nd block. The result is the changes won't be permitted.

Source: The Charter Group. For illustrative purposes only.

Now, if someone were to give me one of these 32-character codes at random, I would have no idea initially whether it represented the word "dog", or the Bible, or the novel *War and Peace*, or the contents of a Blockchain block, or whatever. And, how would I be able to reverse engineer an exact copy of the King James Version of the Bible, for example, from this anyway? I could try to solve it through trial and error using a computer. However, the number of iterations would likely be greater than all the atoms in the known universe. To have any chance, I would need to acquire billions of dollars' worth of computer processing capability and to rack up an electricity bill of a few hundred million dollars with B.C. Hydro. And even then, I still might not be successful!

The cryptography is so effective that billions of dollars of computers might still not be enough to reconstruct coded documents.

The mining of a Bitcoin is also related to this 32 character code structure. The successful miner needs to guess the correct code which must meet certain pre-

² This is referred to as a "SHA256 hash" which uses a 256 byte combination of ones and zeros but is shown as a 32 bit hexadecimal string. SHA stands for Secure Hash Algorithm. Hexadecimal means that it uses numbers as well as the first six letters of the alphabet in lower case. There are longer SHA strings, but the cryptography at that stage just gets a little too ludicrous to provide any measurable additional security. In the tech industry, the hexadecimal string is referred to as a "hash" (completely unrelated to a Twitter hashtag), but I use the term "32-character code" since it is a little more descriptive.

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established targeted guidelines. While not as difficult as trying to reverse engineer the Bible, this still requires considerable processing power and electricity usage.

Because of the advances in cryptography provided by Blockchain, it could transform the way secure communication is conducted in the future. Clients communicating with banks, accounting firms, law firms, etc., might use an app that instantly creates the 32-character codes for any document. Even if the codes are intercepted, it is very unlikely that there will be the computing power available to reverse engineer the documents.

One can already do this using a clumsier method like Twitter. If two parties have the 32-character codes representing confidential documents, they can communicate via Twitter (which is like broadcasting it to the world) and no one except for those two parties will know what is being communicated. Wikileaks used this method to forewarn the U.S. government that they were going release sensitive documents to the public. Departments of the U.S. government keep many of their documents' 32-character codes on file, so when one of them was tweeted out, they knew with certainty that Wikileaks had the exact document. Meanwhile, everyone else on Twitter just saw the crazy-looking 32 character code and had no idea what it meant.

Apart from secure communications, the real disruption from Blockchain may be in financial payments. If two sides of a transaction can verify each other instantly, small and cost-effective deals can be made all over the place. Let's say a company wants to place its ads on your web browser or to be sent to your personal email inbox and is willing to pay you \$10 a month. Blockchain should be able to facilitate that. For a minor irritation, you are ten bucks ahead. But wait. Isn't this is how Facebook currently makes almost all of its revenue? In the future, you might be able to capture what Facebook now captures through online ad sales. Goodbye Facebook? Maybe.

So, considering it can do all these potentially incredible things, what's the current price of Blockchain? It's \$0.00. For instance, you can download the 95GB Blockchain file that runs Bitcoin on to your personal computer *for free*. There's no money to be made directly from Blockchain. Instead, the opportunities will be investments in companies that effectively leverage Blockchain in pursuing a whole host of new business models.

And Bitcoin? Bitcoin is an old idea that used Blockchain seven years ago. It represents nothing with respect to where Blockchain might lead us in the future.

Blockchain has the potential to provide secure communications between companies and clients.

Blockchain might eliminate companies operating as "middlemen" between two parties.

Facebook earns most of its revenue acting as a "middleman."

Bitcoin represents what has already been achieved using Blockchain, not what could be achieved in the future.

Model Portfolio Update³

The Charter Group Balanced Portfolio (A Pension-Style Portfolio)		
	Target Allocation %	Change
Equities:		
Canadian Equities	15.0	None
U.S. Equities	35.7	None
International Equities	9.3	None
Fixed Income:		
Canadian Bonds	25.5	None
U.S. Bonds	2.5	None
Alternative Investments:		
Gold	7.5	None
Commodities & Agriculture	2.5	None
Cash	2	None

During November the position in Air Canada was sold and replaced with WestJet. Air Canada was initially purchased in early December of last year on the basis of stable long-term labour agreements, low price for oil, and load factors that were being driven higher by Canadian economic growth. After a dramatic appreciation in share price, we believed that the shares more than reflected the potential from all the positives. Also, Air Canada is beginning to hit some operational hurdles with its older domestic fleet while waiting for back-ordered next generation Boeing 737s. Finally, Air Canada might be getting a little too ambitious as it has recently rolled out lounges and services aimed at the very elite international travellers, even suggesting that traffic that originates from the U.S. will be enticed to fly via Canada if the services are premium enough. However, there is some concern regarding the competition they will face in the form of the opulent first class product offered by Emirates, Etihad, and Qatar Airways, who are the global leaders in this segment and already have plenty of service to and from North America.

Air Canada was replaced by WestJet in the Balanced Model Portfolio during November.

Otherwise, no changes were made to the overall asset allocation.

³ The asset allocation represents the current *target* asset allocation of the Balanced Model Portfolio as of 12/5/2017. The asset allocations of individual clients invested in this Portfolio will differ because of the relative performance of the asset classes since the last rebalancing and because of differences in the timing of deposits and withdrawals. The Balanced Model Portfolio is part of a sequence of five portfolios ranging from conservative to aggressive: Conservative, Balanced Income, Balanced, Balanced Growth, and Growth.

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WestJet gives us exposure to a stock with an established dividend (Air Canada didn't) while still participating in the airline industry during a period of good overall load factors.

It should also be noted that we did a rebalancing across all of the portfolios we manage during November to bring them back to their asset allocation targets. This effectively takes some of the recent stock gains off the table and reinvests them into bonds.

With respect to U.S. stocks, the positives going forward include the prospects for the passage of federal tax reform and the resiliency of corporate earnings. Negatives potentially include geopolitical issues, especially in Asia and the Mideast. Also, the general level of equity valuations statistically increases the risk of a correction, but there will likely need to be a catalyst factor needed to get investors running for cover.

In Canada, NAFTA negotiations and economic growth through the last quarter of the year could determine the direction of stocks and the Canadian dollar into the New Year.

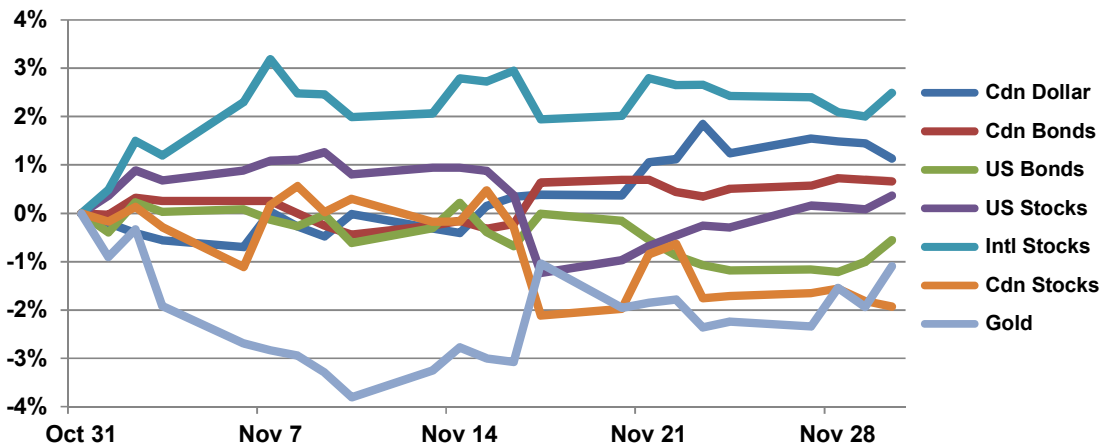
Below is the November 2017 performance of the asset classes that we have used in the construction of The Charter Group Balanced Portfolio (Chart 2).⁴

We rebalanced all portfolios during November to take some of the recent gains off the table.

U.S. tax reform, corporate earnings, and geopolitical issues could impact U.S. stocks.

Canadian stocks will have to navigate NAFTA negotiations and an economy that is a little slower compared to the U.S. economy.

**Chart 2:
November 2017 Performance of the Asset Classes (in Canadian dollars)**



Source: Bloomberg Finance L.P. as of 12/5/2017

⁴ Source: Bloomberg Finance L.P. – The Canadian dollar rate is the CAD/USD cross rate which is the amount of Canadian dollars per one U.S. dollar; Canadian bonds are represented by the iShares Canadian Universe Bond Index (XBB); U.S. bonds are represented by the iShares Core U.S. Aggregate Bond Index (AGG); U.S. stocks are represented by the iShares Core S&P 500 Index (IVV); International stocks are represented by the iShares MSCI EAFE Index (EFA); Canadian stocks are represented by the iShares S&P/TSX 60 Index (XIU); Gold is represented by the iShares Gold Trust (IAU).

Top Investment Issues⁵

Issue	Importance	Potential Impact
1. China's Economic Growth	Significant	Negative
2. Canadian Dollar Decline	Moderate	Positive
3. Long-term U.S. Interest Rates	Moderate	Negative
6. East Asian Geopolitics	Moderate	Negative
4. U.S. Fiscal Spending Stimulus	Moderate	Positive
5. Canada's Economic Growth (Oil)	Moderate	Negative
7. Short-term U.S. Interest Rates	Medium	Negative
8. Massive Stimulus in China	Medium	Positive
9. NAFTA Negotiations	Medium	Negative
10. Japan's Money Printing	Light	Positive

⁵ This is a list of the issues that we currently deem to be the ten most important with respect to the potential impact on our model portfolios over the next 12 months. This is only a ranking of importance and potential impact and *not* an explicit forecast. The list is to illustrate where our attention is focused at the present time. If you would like an in-depth discussion as to the potential magnitude and direction of the issues potentially affecting the model portfolios, we encourage you to email mark.jasayko@td.com and set up a time to talk face-to-face or by phone.

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The Charter Group at TD Wealth Private Investment Advice is a wealth management team that specializes in discretionary investment management. For an annual fee, we manage model portfolios for private clients and institutions. All investment and asset allocation decisions for our model portfolios are made in our Langley, B.C. office. We do not outsource any of the decision-making for our model portfolios – there are no outside actively-managed products or funds. We strive to bring the best practices and the calibre of investment management normally seen in global financial centres directly to the Fraser Valley and are accountable for the results.

Accountability is further enhanced by the fact that we commit our own investable wealth to the same model portfolios in which our clients are invested.





The information contained herein is current as of December 5, 2017.

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