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Bitcoin: we warned you

Dr Woody Brock | SED | 13 December 2017

What can be said about Bitcoin? Let me offer a perspective utilising the perspective of endogenous risk.

Bitcoin as a transactions medium

The appeal of Bitcoin to those making financial transactions is great, for it offers a degree of secrecy and transparency many seek in asset market and many other forms of transactions. Is it a problem that the dollar value of this digital currency has proven highly volatile? This is a problem/opportunity for investors intending to hold Bitcoins as an asset over a reasonable amount of time. And it enhances its speculative appeal. But this volatility is unimportant for transactions which take under a minute to perform for volatility is low in the time frame of transactions.

But as time has gone on, the investment (as opposed to transaction) appeal of Bitcoins has grown and will grow. Some say Bitcoin will prove the "new digital gold of a new era". Indeed, the appeal of Bitcoin as a store of secret wealth will increase given the skepticism of many who are witnessing the fiscal morass of an increasing number of democracies whose currencies are only backed up by "paper". What is wrong with this view?

Bitcoin as a store of wealth (i.e. as an asset)

We believe that Bitcoin will be very undesirable as an asset. The reason will be a very high degree of price volatility due to a sky-high level of Pricing Model Uncertainty.

Recall that the magnitude of pricing model uncertainty (PMU) is the degree to which investors don't know the correct value of an asset given news about its "fundamental" drivers. PMU is greatest in the case where there is no knowledge of or agreement on what the fundamental drivers are, much less on how to price news about such drivers. Bitcoin is such an asset.

At the other end of the spectrum, we have credit-risk-free US bonds. Here most all investors know that there is only one main driver - inflation. Moreover, investors agree that a 1% rise in expected inflation should give rise to a 1% reduction in bond yields. That is, PMU is very low.

The fundamental theorem in this regard is that, the greater the level of PMU, then the greater will be price overshoot and volatility. More formally, benchmarked traders and

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investors will overreact to news, and will stick with price trends (overshoot) longer and longer once they take off. I proved game theoretically that it is rational – not irrational – for traders to act in this way.

It is my belief that a very high level of PMU will generate huge ups and downs of Bitcoin prices. We have already witnessed these. These swings will make this new asset class very unsuited to serious investment – while very suited to speculative trading.

In a related manner, the paper-backed currencies of the West possess much lower levels of PMU than Bitcoins do. The reason is that the agreed upon "fundamentals" of the underlying economies form the basis for currency values. Thus when a nation's interest rates are cut, or its growth rate slows, or its inflation rate picks up, the relative value of its currency rate does and should fall, in general. While there may be some overshoot, this usually is and should be modest compared with that of Bitcoins.

AN UPDATE

Last week, I sent out the above analysis to clients, to explain why Bitcoin volatility would continue to be huge. The reason why was the very high level of Pricing Model Uncertainty (PMU) in this new asset class. More formally, the more market participants claim "no one knows what the true value of a Bitcoin is, even when told the latest news" – then the greater upward/downward price overshoot will be.

The reason why is that it will be rational for benchmarked traders to drive prices higher and higher (or lower and lower) the greater the level of PMU. The proof that this is true draws upon advanced game theory. It holds true both in short-term overshoots (like last week's) and in long-term trends.

I received several replies that, once Bitcoins were more accepted, volatility would drop. Then the next day, last Thursday, the Bitcoin's value was its most volatile ever – in a 20-minute period, the price rose $2,000 to over $19,000, only to then drop $4,000 back down to $15,000. This was exactly the kind of volatility I had warned clients about two days before.

The root problem here is that captured by my PMU theorem – the implications for volatility of ignorance by everyone as to what the new currency is really worth. As I explained to clients who wrote in, growing "familiarity" and acceptance of Bitcoins over time will not reduce this ignorance. Analogously, growing familiarity with dot.coms did not prevent the chaos that befell their prices at the start of the 21st century.

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THE IMPACT OF THE ADVENT OF FUTURES MARKETS

This week, the first Bitcoin futures contracts became available. Many claim that the ability of investors to hedge their price bets will reduce Bitcoin volatility. In principle, this might be true.

But the advent of hedging via derivatives creates a new problem which could heighten not reduce volatility. This problem is increased leverage. Recall that when Kenneth Arrow invented the concept of derivatives in 1953 (these were known as Arrow Securities for 30 years), their role was solely to permit hedging and to resolve the great conceptual problem of "incomplete markets". Several decades later, Arrow confessed he had no idea that derivatives would also end up making possible unprecedented levels of leverage that most regulators did not understand.

Accordingly, we are likely to see far greater leverage in the trading of Bitcoins than we have in the past. And unless leverage is properly regulated, this will heighten volatility. In this regard, recall the "Perfect Storm" result published in my 2012 book, *American Gridlock* (Chapter 4). This result demonstrated that endogenous risk (price overshoot) will be greatest when three conditions are satisfied simultaneously: first, investors' forecasting mistakes are highly correlated, as in the housing crisis; second, leverage is great; and third, PMU is great.

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