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Bitcoin: The Future of "Intelligent" Money?

Amid the growing popularity of bitcoin, fears of a bubble have been making headlines, while some experts have described the cryptocurrency as a "fraud'"that will eventually blow up. In this article, which originally featured on Eric Lonergan's *Philosophy of Money* blog, he discusses how it may impact the way we might think about and design money itself.

The most significant innovation in Bitcoin is not blockchain, nor the fact that it is a non-state-backed electronic currency. Nor does it lie in recent price action, which certainly looks "bubble-like". It is truly ground-breaking because it is the first "intelligent" money. Intelligent money is one which self-regulates.

Despite the important technological innovation in blockchain, Bitcoin's "intelligence" involves the application of a very simple rule: the quantity expands to 21 million and then it "grows" at zero percent. I'm less interested in the merits of this rule, which are well-rehearsed, than the possibilities it suggests. The "intelligence" of money could be extended in many interesting ways. From an economic standpoint, the obvious improvement in intelligence

would be to design a currency which expands and contracts in line with demand. Embedding this in the currency's DNA would render central bank decision-making redundant – to everyone's advantage. "Intelligence" could also embed social goals – for example the currency could self-regulate the activities for which it is used, perhaps even rewarding or punishing activities contingent on their social impact. In extremis, I imagine we will have a currency which is fully intelligent, gathers data and evolves its own rules of distribution and growth. In his excellent analyses*, Tony Yates, a professor of Economics at the University of Birmingham in the UK, is pessimistic about the prospect for this sort of innovation, my sense is that it is inevitable – indeed it could be the basis of an edge for digital currency over existing state-backed money.
Those are some of the insights into the future of money which Bitcoin has revealed. What about Bitcoin itself? I think Bitcoin is a money. You can pay for things with it and it has a significantly large number of users. It is also a "currency" in the sense that you can exchange it for other currencies in a market.

As a significant contemporary currency, Bitcoin is also unique because it is designed to have a finite supply. It is also unusual because it has been issued by the non-state sector and the revenue generated by the issuance has been dispersed across many individuals and entities under a decentralised system.
There are two immediate observations: it is an extraordinary phenomenon, and you can learn a huge amount about money from thinking about it.

Bitcoin as money

What does Bitcoin reveal about money? Money is not "backed" by anything – not tax revenues, not gold, not "claims on goods". Money's value resides in a network externality, or more simply, an existing network of people who accept it as money.
Confusion arises because it is extremely difficult to establish a network of users. Typically, this requires either some form of backing or some kind of force – for example, the fiat power of a state. "Fiat" is a government order. But once the network is established, money no longer needs backing, or government decree. In fact, money does have an "intrinsic" value, just no value in alternative use.

Chartalism, the idea that money is only accepted because you are required to use it to pay taxes, conflates this critical distinction. One way to establish a network of users of a currency issued by a state is to require taxes be paid with the currency – but once the network is established, tax payment is the same as any other transaction. In a state, such as Hong Kong, where the government raises revenue mainly through land sales, and taxation is an afterthought, currency still has value.

The best piece of analysis** I have seen of Bitcoin is by Dan Davies, Senior Research Advisor at Frontline Analysts. Dan provides a coherent explanation of how the network was established, and also a rigorous way to value Bitcoin. Bitcoin could establish a network of users because it fulfils a clear economic function: how to finance transactions which, by virtue of being illicit, meant that existing money was at a disadvantage. Now this does not fully explain why Bitcoin succeeded in establishing a network – we need to understand why those in the illegal drugs trade decided to accept it. Its geeky cleverness may have been its original edge – and despite its seedy origins, it may genuinely be the cleverest money ever. Its original adopters may well have reasoned “this is so clever, I have to use it”. Or tell people about it.
Bitcoin reveals what we should already know about money, but is often confused – that money has no “backing”, and that its value simply resides in a critical mass of existing users.

Monetary policy and the money supply
Bitcoin also proves that “base money” is different to deposits – which Friedman and Tobin labelled as “quasi-money”. If banks started to lend bitcoin and take bitcoin deposits, we would have a bitcoin banking system with decentralised electronic base money. Those deposits would have very different properties to Bitcoin itself – not least of which is that banks could default on them.
Bitcoin illustrates very clearly why helicopter drops of money are the definition of monetary policy, and not fiscal policy. So far there has been a US$200 billion or so helicopter drop of bitcoin.
Reserves do not have to be distributed through banks – that is a contingent institutional feature of our current monetary arrangements. And helicopter drops don’t have to be inflationary – so far there has been deflation in Bitcoin prices.

We can also learn about central bank accounting. Base money is clearly not a liability. No one pays interest on the 'reserves' of Bitcoin – which are dispersed beyond the banking sector. And not paying interest on reserves does not cause immediate Bitcoin hyperinflation!

Valuing Bitcoin

In most circumstances, how much money is issued matters. Bitcoin is designed to have a finite supply. Usually when we think of money we think of it in the context of a national or regional economy. We typically value currencies relative to domestic price levels. In consideration of exchange rate valuations we look at real exchange rates which adjust the nominal exchange rate for relative inflation trends across economies. Typically, we compare these 'real' exchange rates against history, and make adjustments for terms of trade etc. The Big Mac index (derived by *The Economist*) is an attempt to do this in reverse – by comparing the exchange rate to the relative prices of a homogeneous product in different economies. In a May 2017 article***, *Financial Times* journalist Izabella Kaminska describes an innovative attempt to do something similar with Bitcoin.

What can we do with Bitcoin? Dan Davies substituted the illegal drugs market for the national economy and looked at the ratio of 'base money' Bitcoin to the gross nominal value of trade in illegal drugs.

The challenge with this very clever approach is that we don't really know the scope of the Bitcoin economy, and we have no idea what 'portfolio' demand for such a unique currency will be. It may well be the case that even if illegal trade provided the initial network effect, the subsequent use of Bitcoin is independent. After all, we don't use a ratio of base money to tax receipts, to proxy the demand for money in national economies. Arguments for and against Bitcoin's portfolio properties can be made. Some will argue not having state backing is an advantage, others a disadvantage. I have no way of assessing our ability to control counterfeit Bitcoin – which must be one of its biggest risks.

The next biggest challenge to Bitcoin, as a money, relates to how it established itself as a network. Why would I ever want to use

Bitcoin to buy and sell goods and services rather than an alternative currency? An obvious line of attack is to make transaction costs lower – but that is far harder than it seems, and near impossible given Bitcoin's price volatility. Price volatility is a cost. This problem is revealed by its limited role as of unit of account. Many merchants may accept Bitcoin as payment – including high profile tech companies – but they price everything in dollars and convert immediately. At best, they may hold some inventory as speculative R&D.

I titled this blog "valuing" Bitcoin. I have no idea what a fair value for it is – there is far too much uncertainty. Assets which generate cash flows are the easiest to value, or at least derive expected returns. That is why currencies are so difficult to assess. Sterling can trade at two dollars (which it did just over ten years ago), or at one dollar – without any material shift in relative prices. Bitcoin is a currency, and we have no well-defined Bitcoin-specific economy. It is as if international dollars started to trade independently – how would we value them?

What I would say is that Bitcoin is extremely important. It reveals an alternative future for money in general. As a specific money, it has unique properties. Its persistence and relevance may surprise.
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