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Economic and Business Dimensions

Why Bitcoin Has Value

Evaluating the evolving controversial digital currency.

How can an intangible currency have tangible value? Bitcoin is a currency composed of nothing but bits. Unlike dollars or euros, bitcoins[a] have no physical form, no government backing, and operate with little more than technical regulation. What value can a bitcoin have? If information can be copied or "wants to be free," and bitcoins are nothing but information, why are they not free? As Bitcoin enters popular consciousness,[b] the digital economy offers this interesting question.

Consider four answers. First, Bitcoin's technical value lies in solving the double spend problem. Each bitcoin transaction uses public key cryptography to create a permanent public record that registers a buyer, a seller, and an amount as a tuple. This shows who can and cannot spend a bitcoin. Even someone who observes the transaction cannot forge coin copies. Software keys prevent anyone but the rightful owner from spending them.

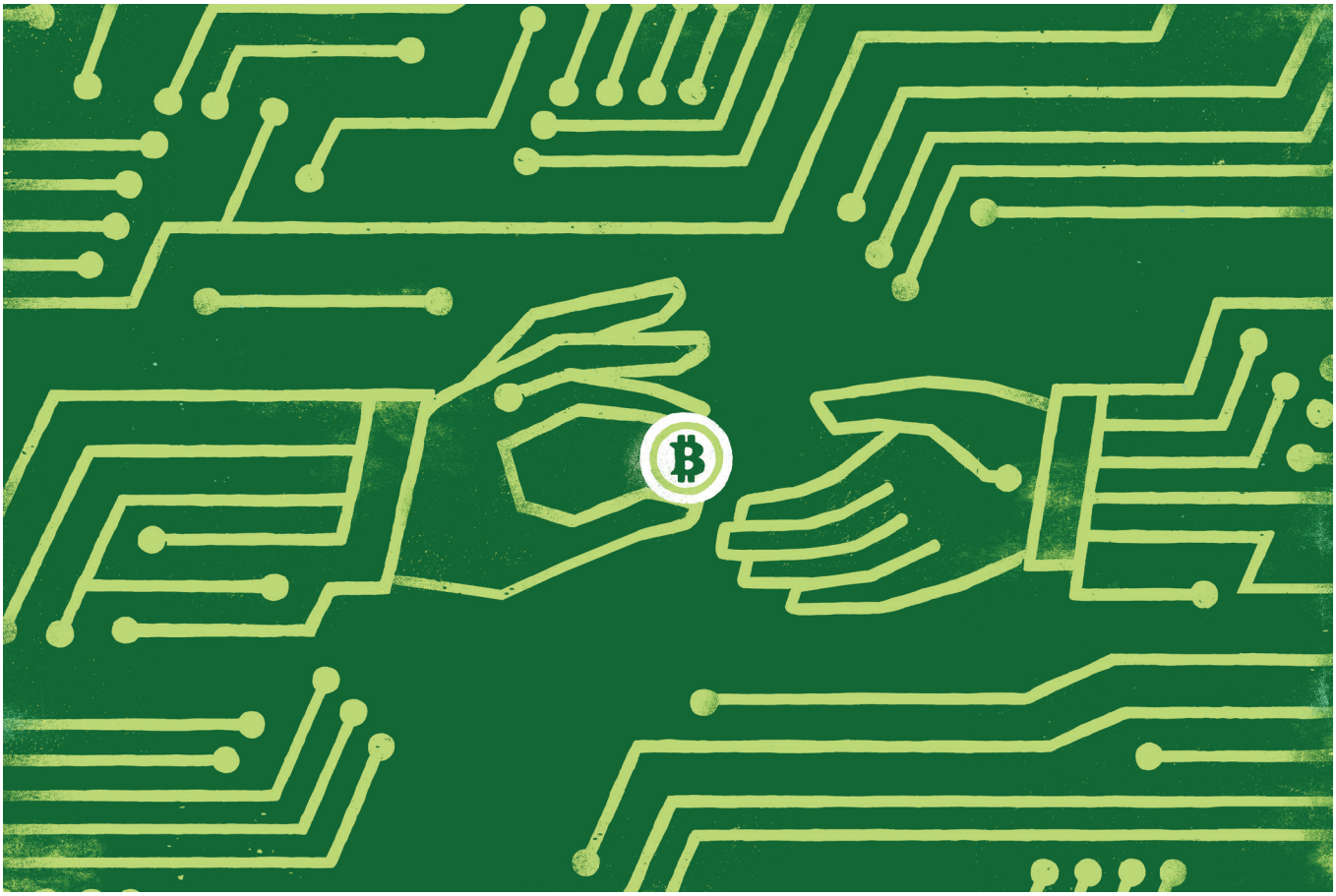
Second, the Bitcoin network enables near frictionless commerce as transaction fees approach zero.[1] Credit card companies and currency exchanges can take a 2%–3% "rake" from the value of each transaction so companies that currently enjoy this rake might oppose Bitcoin.[9] But any merchant competing online and enjoying a 5% margin chafes at losing half that margin to transaction fees. These fees represent friction that discourages trade and the movement of money. Just think of your neighborhood shop that refuses credit cards for small transactions because of high fees. Reduce these fees, people will spend more easily, and the economy will grow faster.

Third, Bitcoin is better than credit cards at detecting fraud because each transaction requires public authentication from buyers and sellers. Years ago, I had the experience of a restaurant putting fraudulent charges on my card. I dined there often, so I assumed meal-sized charges were accurate. But when I moved to a different city and charges from this restaurant kept appearing on my bill, I knew they were fraudulent. This type of fraud is almost impossible using bitcoins. No waiter can pad bills, no proprietor can forge new ones, and no one can delay a refund after both parties authenticate. Not even credit cards, which indemnify you against fraud, offer this protection. Yet public transactions do not mean Bitcoin infringes privacy. The buyer/seller/amount tuple records an account, not the identity of who owns that account. When properly administered, the Bitcoin protocol guarantees unauthorized parties cannot spend from an account while ownership of that account can remain private.

Fourth, and more practically, Bitcoin has value because people accept it—the same reason *any* form of money has value. "Money" is a medium of exchange, a store of value, and a unit of account.[5] Bitcoin has all three properties. Money can be wampum, shekels, yen, euros, dollars, rubles or renminbi. Money can be rock (gold), paper (notes), or scissors as long as people take it in trade, keep it as wealth, and measure it in prices. Overstock.com became the first major retailer to accept bitcoins as payments,

a "Bitcoin" with a capital "B" refers to the network protocol while lowercase "bitcoin" refers to a unit of currency.

b Bitcoin entered the *Oxford English Dictionary* in the summer of 2013.



taking in more than $125,000 the first day. At least 22,000 merchants[3] including Virgin Airlines, Zynga, the Sacramento Kings, and the University of Nicosia accept bitcoins. Accepting money is what gives it value.

Some economists argue that, to have value, money must be backed by a government that has tax and spend authority.[10] Yet, the Iroquois, a confederation of pre-colonial tribes, had no income tax policy and traded with polished shell beads (wampum) to settle debts. The Weimar Republic in Germany had tax-and-spend authority but printed deutsche marks so fast people and countries stopped accepting paper marks and demanded goods such as gold or coal in exchange.

Such an argument confuses fiscal policy, the authority to tax and spend, with monetary policy, the authority to change the volume of currency in circulation. Both affect the value of money and the health of an economy but for different reasons.

I worked with a startup, Barter, that developed a new kind of enterprise software based on people voluntarily sharing knowledge. It failed to gain wide acceptance due to fierce competition from established sellers and a lack of interoperability with existing systems. But running its knowledge exchange taught us a great deal about how money works and why people will hold it as a store of value.

We gave people points for the value of ideas they shared with colleagues. Akin to software games scores, these points initially had no value beyond the indeterminate prestige people felt in having earned them. Points served as units of account, and badges reflected a store of value, but no one could trade them. Without real value, our market would freeze because people would have little incentive to share knowledge.[c]

We solved this problem by adding a companion market where people could spend their points.[2,12] This decision inverted the insight of monetary policy, changing not the currency in circulation but the goods in circulation. We added iTunes gift cards, vacation days, iPads, and lunch with the CIO to this internal economy. People responded by vigorously trying to accumulate points. We even allowed them to offer their own goods, such as unused baseball tickets, in exchange for points. Having a unit of measure, prestige in accumulation, and a place to trade, points naturally took on a value of their own.

Growing an economy makes each currency unit more valuable, while growing a money supply makes each currency unit less valuable. These properties inform responsible monetary controls. Pre-modern currencies had built-in control: gold was rare but could be mined and wampum could be made but only with enough labor. Modern currencies expand under government control to keep prices stable.

Bitcoin has ingeniously engineered non-government control by expanding its supply only at a rate proportional to the technological discovery of prime numbers. It also promises that the total supply will never exceed 21 million bitcoins, though it can be subdivided arbitrarily.[13] This promise of stable supply is stronger than any promise a government has made when it comes to currency targets. As

c Dilbert by Scott Adams (May 19, 2013); http://bit.ly/O2vV1a.

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Weimar Germany showed, politicians can manipulate their currencies during a crisis. Citizens of Zimbabwe and Ecuador use U.S. dollars as their national currencies precisely to reign in such irresponsible behavior.

The decentralized nature of Bitcoin also means that no central bank can intervene to manipulate or stabilize its value when large demand fluctuations occur. Examiners for the U.S. central bank, the Federal Reserve, object to Bitcoin because this makes it volatile and a risky store of value. Bitcoins traded for approximately $1 in April 2011 but above $1,000 in November 2013. In February 2014, they dipped below $550.[d] If Bitcoin had a central bank, it could have stepped in to buy or sell bitcoins as needed. An honest central broker can calm a panicked market. The failure of central banks to step in led to the great depression of 1929. The success of central banks stepping in avoided a greater recession than that of 2008.

Volatility alone is not a reason a commodity *cannot* function as currency, only a reason why risk averters avoid it. People use put and call options as a medium of exchange, a store of value, and a unit of account all the time. The real question is whether markets can hedge against volatility. Fluctuations also fall as a technology gains wider acceptance. The larger the user base, the less any single user can affect prices. Overstock.com limits bitcoin risk by trading in and out of bitcoins immediately.

Critics have raised two other objections. The first is that Bitcoin promotes illegal activity. Every transaction is public, but the buyers and sellers listed are simply Bitcoin addresses. The FBI recently shut down Silk Road, a popular market that accepted bitcoin, for facilitating illegal drug sales and other illicit transactions.[6] But this is guilt by association. Note that the other preferred currency of criminals is cash. Over time, law enforcement will use the public record of bitcoin transactions to track down crooks in ways they never could for dollar bills.

Critics also point to theft as a risk for Bitcoin, highlighting Mt. Gox, a bitcoin exchange, robbed of $350 million.[11] This problem is not new. Jesse James has just gone digital. Wikipedia lists a history of bank robberies by country. The biggest is nearly $1 billion. In just 10 hours last year, cyber criminals stole $45 million in real currency from real banks.[7] As a startup, PayPal experienced fraud rates more than five times that of established credit cards before developing robust systems of control.[8] The real surprise from the Mt. Gox robbery is that anyone thought "Magic: The Gathering Online eXchange"—a place launched to trade game cards—was the best place to store large sums of money.[e]

Will bitdollars, biteuros, bityen, or bitminbi become the new global reserve currency?

Bitcoin is currently liable to hoarding. With rising values, people refrain from trading it in hopes its value will rise further. Critics argue this deflation limits Bitcoin as a medium of exchange. Ironically, this critique highlights its use as a store of value and undermines the almost opposite critique that Bitcoin is too volatile. It cannot only go up if it frequently fluctuates down.

As I see it, Bitcoin faces only one serious threat: concerted opposition by the world's central banks. On December 5, 2013, China's central bank banned trading in bitcoins or converting it to renminbi. The ban greatly reduced demand, cutting bitcoin prices 25% just that week. Prices recovered a bit, but then Russia's Central Bank banned it on February 7, 2014, dropping the price 10%. If no one could move bitcoins into any other currency, then the only economy bitcoins could support would be an internally limited bitcoin exchange. Such a market could exist, but it would be tiny.

A ban by all major central banks, however, seems highly unlikely. Recent U.S. Senate hearings concluded that the Federal Reserve should not act to impede development of digital currencies. The I.R.S. will now tax bitcoins as property.[f] The German Finance Ministry specifically endorsed Bitcoin as "a unit of account" and allows it to be used for tax and trading purposes.[4] If bitcoins can be converted into dollars and euros, they can be converted into rubles and renminbi regardless of whether Russia's or China's central banks approve.

The question is not whether Bitcoin has value; it already does. The question is whether the efficiencies of a cyber-currency like Bitcoin can be merged with the certainties of an honest central bank. I believe they can and will. At some point, a country will step forward and offer its currency as the cyber-currency of choice. Will bitdollars, biteuros, bityen, or bitminbi become the new global reserve currency? The first country to fully embrace what Bitcoin offers will do its own economy and the world a favor.

d See bitcoincharts.com or coinbase.com/charts.

e My thanks to David de la Fuente for this observation.

f Press release March 25, 2014. http://www.irs.gov/uac/Newsroom/IRS-Virtual-Currency-Guidance.

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