

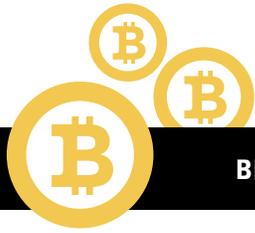


# MAKING CHANGE

## What Bitcoin Could Mean to the Payments Industry

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Imagine that you are at a grocery store, the cashier tallying up your purchase. The cashier asks you, “Will that be cash, card, or bitcoin?” You open the mobile wallet on your phone, hit a button, and transfer your bitcoins to the store account.



## BITCOIN'S ANONYMITY IS AT ONCE AN ADVANTAGE AND A SOURCE OF CONCERN.

That is the dream of a tiny but growing community of enthusiasts. Currently, many major online retailers accept bitcoin, including Expedia, Overstock, and TigerDirect, and some small storefront businesses accept it. The total value of all bitcoins in circulation today exceeds \$7 billion, about seven times the value in 2013. But there's a darker version of this dream, most infamously exemplified by Silk Road, an online black market where people bought and sold illegal items, transacting exclusively in bitcoin. Last November, the FBI shut down Silk Road. Somewhere between these two versions of the bitcoin dream lies a tangled mess of questions, including: Is bitcoin a viable contender in the payments arena? Is its current pace of growth sustainable enough for bitcoin truly to compete with contemporary currencies or payments systems?

Any discussion of bitcoin must begin with the disclaimer that it really is a very small player in the payments system. (This article uses the word bitcoin to refer to the network, technology, concept, and unit of account.) "It is a minuscule dot on the payments spectrum, yet it is receiving an enormous amount of attention," said Doug King, a payments risk expert at the Atlanta Fed. To put it in perspective, bitcoin averages about 60,000 transactions a day, according to the consulting firm Deloitte. By comparison, Visa's electronic payment processing network handles more than 150 mil-

### ECONSOUTH NOW PODCAST

Doug King of the Atlanta Fed's Retail Payments Risk Forum discusses bitcoin. On [frbatlanta.org](http://frbatlanta.org), select "Podcasts."



lion transactions a day from 2.1 billion credit cards and more than 2 million ATMs.

"I think a lot of the interest in bitcoin is because payments are generally pretty dull to the average person, and bitcoin—like mobile wallets—is new and exciting," King said. He added that some of the news stories, including those about Silk Road and the failure of the Japanese bitcoin exchange Mt. Gox, contribute to the conversation because they have elements of mystery and intrigue that would be ripe material for a movie.

### Do cypherpunks dream of electronic currency?

Talk of a decentralized currency has been around at least since 1998, when "cypherpunks" proposed the notion of a decentralized, digitalized medium of exchange. Cypherpunks were members of underground technology groups who advocated the use of cryptography to promote social and political change. (In cryptography, a "cypher" is an algorithm used to perform encryption or decryption.) Believing that the government could not adequately protect their cyberspace privacy, they wanted to take privacy protection into their own hands. (WikiLeaks founder Julian Assange was among the original cypherpunks.) They envisioned that each transaction with this digitalized currency would be authorized through cryptography—hence the term "cryptocurrency."

Ten years after the cypherpunks' conception of cryptocurrency, the white paper that launched the bitcoin network was published under the name of Satoshi Nakamoto. The paper described a decentralized, peer-to-peer electronic payments system, bringing to reality what the cypherpunks had concep-



tualized. (To this day, no one seems to know who, or what, Nakamoto is. The writer of a March 6, 2014, *Newsweek* article—“The Face behind Bitcoin”—claimed to have interviewed him.)

Although the bitcoin technology is itself open source, and therefore public, its use of cryptography ensures the anonymity of the people behind the transactions. This privacy appeals to those consumers who are wary of using their credit or debit cards online.

The merchants on the other end of these transactions like bitcoin’s relatively lower cost and greater security compared to traditional payments. Existing payments systems, like bank wire transfers, are expensive for many reasons, including stringent government regulations. So far, the regulatory environment regarding bitcoin is not entirely clear, but if that changes, the cost of transacting in bitcoins could rise. For now, BitPay and Coinbase, two of the largest bitcoin payment processors, for example, charge at most 1 percent per transaction, compared to the 2 or 3 percent that credit and debit card processors charge.

Officials may be facing something of a conundrum when it comes to regulating cryptocurrencies, not just bitcoin. As BitPay CEO Tony Gallippi told attendees at a conference on finance, “Consumers will demand more security, and that will lead to self-regulation. Regulators don’t want to regulate [bitcoin] because if they do people would see it as safe. Regulators don’t want to relay the message right now....They want to have the attitude ‘buyer beware.’ They can’t do that if they also regulate, so they’re kind of stuck.”

#### **“Come over to the dark side”**

The very anonymity that appeals to some consumers and privacy advocates—and to the cypherpunks—is what worries risk experts like the Atlanta Fed’s King as well as Gary Warner, who developed and runs the Center for Information Assurance and Forensics Research at the University of Alabama at Birmingham.

“Criminals are using bitcoin to purchase items they don’t want their identity attached to—drugs, porn, weapons—just as they’ve always used cash,” he said.

When the FBI shut down Silk Road last fall, it confiscated some 175,000 bitcoins. The U.S. Marshals Service recently auctioned off 30,000 of these coins, worth almost \$18 million. The fate of the remaining coins—144,336, taken from Silk Road’s alleged proprietor Russ William Ulbricht—is undecided. (Ulbricht recently filed a motion demanding that a federal judge dismiss money laundering charges against him because of the Internal Revenue Service’s guidance, issued in March this year, that bitcoin is property, not currency.)

It turns out that bitcoin may not be as anonymous as criminals would like to believe, said Warner. Each bitcoin transaction in a block chain carries with it “a very large swath” of previously validated transactions. “Everything is public there, and everyone can follow the transactions in real time,” said Warner. “So if I can find any transaction from any merchant that I can tie to your ID—say, through a package shipped to you or an e-mail address associated with the transaction—then I can mark that coin” and trace it back to the originator.

#### **Innovation in payments**

In a March 2014 research note, Goldman Sachs interviewed a number of financial and technology experts about bitcoin’s growing popularity and the possibility of the currency gaining mainstream acceptance. The panel featured both skeptics and believers. The overwhelming conclusion from both sides was that “bitcoin likely can’t work as a currency. But [there’s] some sense that the ledger-based technology that underlies it could hold some promise.”

Atlanta Fed president and CEO Dennis Lockhart echoes that sentiment. “I’m still skeptical about bitcoin...but as a payments



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platform that is basically a file transfer technology, it may have legs," he said. King agrees. "While I wonder if the currency aspect of virtual currencies will last, the technology itself holds promise as a way to transfer ownership of funds or assets."

King also pointed out that bitcoin faces tremendous hurdles before it could become a contender. For one, unlike traditional currency, bitcoin's value can fluctuate wildly. In December 2013, the value of a bitcoin jumped from about \$100 to \$1,240 per "coin," and then dropped back down to an average of \$400. As of this writing, one bitcoin is worth about \$580. (A bitcoin is divisible to the millionth, so it can theoretically be used for small transactions.) For many, this volatility adds to the allure of bitcoin as a speculative commodity. Moreover, because of the limited number of bitcoins, some regard bitcoin as a commodity market that is easily manipulated, making it an easy target for fraudulent market maneuvers.

The very technology that offers efficiencies for online transactions makes it difficult for storefronts to accept bitcoin payments. Bitcoin transactions take about 10 minutes to authenticate, King explained. "When you now walk into a store and buy a \$500 television, you swipe your card and that transaction is authorized or declined immediately. Would merchants want to slow down the checkout process? Probably not," he said.

The Internal Revenue Service dealt bitcoin payments hopefuls a serious blow when it ruled that bitcoin will be taxed as an asset. "The accounting could be a nightmare for consumers who want to transact in bitcoin," King said.

### There's bitcoin in them thar hills

In some superficial ways, bitcoin resembles gold. It is scarce, people often go to great lengths to uncover it, and many people hoard it. Users are even said to "mine" for new coins. And like mining for gold, mining for bitcoins requires intensive tools. Because mathemati-

cal proofs form the basis of the bitcoin network, it takes powerful computers to solve these math challenges to produce additional bitcoins. With every bitcoin mined, the math problems and computing power needed to solve them become incrementally harder, which slows down the flow of new bitcoins. That's because the original design by Nakamoto limited the total amount of bitcoins to 21 million. That scarcity is largely what gives bitcoin its value. So far, miners have unearthed about half of that number and are expected to hit the money supply limit around 2030.

As the work to mine bitcoins has increased, so has the cost. No one seems to have precisely pegged the cost of the electricity to run—and cool—the computers that solve the algorithms, but estimates run up to \$15 million a day. *Forbes.com* blogger Tim Worstall contends that this figure is unproven and overestimates the cost, but concedes that the electricity consumption is still astonishing.

Whether the bitcoin dream will ever be fully realized remains to be seen. The cryptocurrency has an enormous image problem to overcome. And consumers will have to be confident that their identities are protected and the value of their cryptocurrency is safe from wild fluctuations, which will likely require some combination of a broader market base and public regulation. However, as Lockhart and King have noted, the technology that underlies bitcoin may have a future. With that technology's advantage of protecting consumer privacy and making transfers comparatively fast and secure, the potential payments systems of the future based on block chain technology may be more flexible, cost-effective, secure, and accessible—with or without bitcoin. ■

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