

The End of Money

*The story of bitcoin, cryptocurrencies and the
blockchain revolution*

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Fifty ideas

This section gives you ways you can explore the subject in greater depth. It's more than just the usual reading list.

Six cryptocurrency facts

- 1 **Digicash.** This was the first usable virtual currency, founded in 1990. It ceased to exist just eight years later, when the company that created it folded.
- 2 **From spam to money.** In 1997, cryptographer Adam Back came up with an idea for reducing spam email called ‘hashcash’, a computing system that set hard limits on the number of emails that could be sent over a set period of time. He emailed the idea as a whitepaper to the Cypherpunks mailing list, but it was never implemented on a large scale. Bitcoin uses aspects of Back’s hashcash concept.
- 3 **First bitcoin owner.** US computer scientist Hal Finney was the recipient of the first bitcoin transfer. He received ten coins from Nakamoto in early 2009, back when they were essentially worthless. There were also suspicions that Finney might actually be the enigmatic bitcoin founder himself.
- 4 **Power hungry.** Since 2011, the bitcoin network has harnessed so much processing power that it is thought to be more powerful than the top 500 supercomputers in the world combined. This means that, theoretically, even if the top 500 supercomputers were used at the same time to try and alter the bitcoin blockchain network, they could not do it.
- 5 **Dunning-Krugerrands.** William Gibson, author of cyberpunk novel *Neuromancer*, jokingly referred to bitcoin as ‘Dunning-Krugerrands’. He derived the term from Krugerrands, a South African gold coin, and the

Dunning-Kruger Effect, a cognitive bias in which amateurs have an inflated sense of their own abilities.

- 6 **Bitcoin taxes.** Zug in Switzerland has become the first city in the world to accept the cryptocurrency bitcoin for government services. The pilot scheme, which started on 1 July 2016, will allow citizens to use bitcoin to pay taxes, fines and fees – as long as the amount is less than 200 Swiss francs (\$205).

Seven real-world locations related to cryptocurrencies

- 1 **Tokyo, Japan.** Home of Mt. Gox, the now defunct bitcoin exchange.
- 2 **Keflavik, Iceland.** Home of the servers of Silk Road, the online dark net marketplace.
- 3 **Beijing, China.** Home of OKCoin, one of the largest bitcoin exchanges by volume.
- 4 **Hong Kong.** Home of Bitfinex, one of the largest USD/bitcoin exchanges by volume.
- 5 **Baar, Switzerland.** Home of Ethereum, the public blockchain-based computing platform.
- 6 **New York State.** Home of the BitLicense, the first financial licence specifically for cryptocurrency companies.
- 7 **Arnhem, The Netherlands.** One of the most ‘bitcoin friendly cities’, in 2016 the municipality claimed it had over 100 merchants accepting bitcoin directly for goods and services.

Six strange things bought with cryptocurrency

- 1 **Multi-million dollar pizza.** In April 2010, bitcoin aficionado Laszlo Hanyecz convinced someone to send a couple of pizzas to his home in exchange for 10,000 bitcoins. At the time bitcoin wasn't traded publicly, but a few months later when Mt. Gox opened for business, the price of one bitcoin settled at 6 cents, making Hanyecz's pizzas cost \$300 a piece (as an early miner, Hanyecz's stash would have been quite large). At the end of 2016, when bitcoin was trading above \$700 each, those same pizzas would be worth \$3.5 million a piece.
- 2 **Bitcoin in space!** Virgin Galactic is not taking passengers to space just yet – but they are selling tickets. To join the line costs \$250,000. But you can pay in bitcoins (at current exchange rate).
- 3 **Cryptocurrency on ice.** Because of its small value, dogecoin was lauded as a good coin to raise money for charity. At only a few fractions of a cent per coin, it was easy to earn, and easy to give a few thousand at a time to a worthy cause. Dogecoin supporters put this claim to the test in 2014, when they raised over \$30,000 to help send the Jamaican bobsled team to the Sochi Olympics.
- 4 **Crypto-whoppers.** While new bitcoin debit and credit cards on the market might make everyday purchases using bitcoin seem less exciting, bitcoin users were in for a deal when the Burger King of Arnhem, The Netherlands began accepting bitcoin directly in 2016. Anyone buying the signature Whopper sandwich with bitcoins received a second one free.

- 5 **Degree in person, paid online.** The University of Nicosia in Cyprus, Greece accepts bitcoin to pay for tuition. But, perhaps this only makes sense, given that they offer a Master of Science degree in Digital Currency.
- 6 **Consume at own risk.** While the online marketplace Silk Road had a reputation as a market for illegal goods, particularly drugs, the anything-goes attitude provided for some odd products on offer. Computer parts, poker lessons, designer fashion, and rare coins were all sold for bitcoins on the site. But perhaps there was nothing weirder than the offer of dried reindeer meat, direct from Finland.

Five quotes

- 1 'People have been defending their own privacy for centuries with whispers, darkness, envelopes, closed doors, secret handshakes, and couriers. The technologies of the past did not allow for strong privacy, but electronic technologies do.' *Eric Hughes, Cypherpunk Manifesto*
- 2 'What is needed is an electronic payment system based on cryptographic proof instead of trust.' *Satoshi Nakamoto*
- 3 'Satoshi Nakamoto is not really a man; he is a manifestation of public acclamation, an entity made by technology, and a myth.' *Andrew O'Hagan, The Satoshi Affair.*
- 4 'I'm reasonably confident ... that the blockchain will change a great deal of financial practice and exchange.' *Larry Summers, former US Secretary of the Treasury*
- 5 'Bring paper money into a country where this use of paper is unknown, and everyone will laugh at your subjective imagination.' *Karl Marx*

Five literary references

Perhaps it is no surprise that science fiction is rich source of storylines about digital money.

- 1 *Neuromancer* (Ace Books, 1984). William Gibson's formative 1984 novel describes a virtual world where power is held by whoever can control the technology and where wealth moves in digital form.
- 2 *Cryptonomicon* (Avon Books, 1999). The 1999 novel by Neal Stephenson tells two intertwined stories – one set in the golden age of cryptography, during the Second World War, and the other in the late 1990s involving a plot of digital currencies and data havens.
- 3 *Reamde* (William Morrow, 2011). Another of Stephenson's novels contains a convoluted scam involving digital currency within a virtual world, but this was more like the virtual currency of a massive online role-playing game like World of Warcraft.
- 4 *Neptune's Brood* (Ace Books, 2013). This 2014 book by Charles Stross features a fictional universe where there are different types of money termed 'fast, medium and slow'. They involve cryptographic signatures to verify transactions, with the slower ones requiring digital signing beams by laser from a distant star (the additional time constraints make the money more secure). Stross is a widely known critic of bitcoin.
- 5 *Down and Out in the Magic Kingdom* (Tor Books, 2003). One of the most unique fictional explorations into virtual currency comes from writer Cory Doctorow. In this 2003 novel, he creates a currency called 'whuffle', a currency based on social reputation.

Twenty-one places to find out more

- 1 Bruce Sterling's *The Hacker Crackdown* (Bantam Books, 1992)
- 2 Steven Levy's 'Crypto Rebels'. *Wired*. May/June 1993.
- 3 Eric Hughes' 'Cypherpunk Manifesto'.
- 4 Joshua Bearman's 'The Rise and Fall of Silk Road'. *Wired*. April 2015
- 5 Adam L. Penenberg's reporting for *Fast Company* and other publications.
- 6 Andy Greenberg's reporting for *Wired* and other publications.
- 7 Nathaniel Popper's *Digital Gold*, and his reporting for the *New York Times*.
- 8 Felix Martin's *Money: The Unauthorized Biography* (Vintage Books, 2013).
- 9 David Graeber's *Debt: The First 5,000 Years* (Melville House Publishing, 2011).
- 10 Andrew O'Hagan's 'The Satoshi Affair'. *London Review of Books*. June 30, 2016.
- 11 Satoshi Nakamoto's *Bitcoin: A Peer-to-Peer Electronic Cash System*.
- 12 Sunny King and Scott Nadal's *PPCoin: Peer-to-Peer Crypto-Currency with Proof-of-Stake*.
- 13 Joseph Poon and Thaddeus Dryja's *The Bitcoin Lightning Network*.

- 14 David Schwartz, Noah Youngs, and Arthur Britto's
The Ripple Protocol Consensus Algorithm.
- 15 The Ethereum 'White Paper'.
- 16 Best source of historical price data:
www.Bitcoincharts.com
- 17 The oldest bitcoin forum:
www.Bitcointalk.org
- 18 For statistics and info on mining and blocks:
www.Blockchain.info
- 19 A news hub for all things cryptocurrency:
www.coindesk.com
- 20 Another cryptocurrency news hub
www.cryptocoinsnews.com
- 21 For more cryptocurrency news:
www.Bitcoinmagazine.com

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