

# BITCOINS: THEIR FUTURE IN WORLDWIDE COMMERCE

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## WHAT IS BITCOIN?

- Has been called “digital cash”
- Essentially just a snippet of code based on an algorithm first identified in the “Nakamoto White Paper”
- It is based on an open source computer program that no single person can modify
- It is created by “mining,” which involves downloading and solving bitcoin program

## NAKAMOTO WHITE PAPER

- The self-published paper was authored in 2008 by “Satoshi Nakamoto,” a fictitious name for one or more computer geeks

# CHARACTERISTICS OF BITCOIN

- No central computer, no central office
- Only 21 million bitcoins can ever exist (although can be divided into hundredth millions)
- Since bitcoin is just computer code, it is oblivious to laws and borders
- Pseudonymous: every transaction is recorded in the “blockchain,” but no actual names are used

# KEY TO BITCOIN: THE BLOCKCHAIN

- Blockchain is a data file that tracks creation and history of every bitcoin, time-stamped
- Blockchain cannot be altered, hence no possibility of duplicate bitcoins or double-spending
- Flaw in Blockchain surfaces in February 2014; requires design “tweak”

## LANDMARKS IN BITCOIN DEVELOPMENT

- 2009 — “Bitcoin Network” is established and first bitcoins are issued
- February 2013 — Coinbase (an international digital “wallet”) reports selling one million dollars in bitcoins in one month
- August 2013 – Phoenix Fund invests \$200 million in manufacturer of servers used in mining bitcoin

## MORE LANDMARKS

- February – December 2013: value of one bitcoin rises dramatically from \$22 (February) to \$441 on Mt. Gox exchange (November) to \$1147 (December), then retreats to \$834 on December 6, 2013, after Baidu says it won't accept bitcoin any longer
- January 2014 — Overstock.com and Zynga (game maker) announce they will accept bitcoin

## TWO WAYS TO ACQUIRE BITCOINS

- Create new bitcoins by “mining”
- Trade for existing bitcoins
- Bitcoin miners engage in a set of prescribed mathematical calculations to add “blocks” to the Blockchain
- Miners who succeed in adding a block to the Blockchain automatically receive a fixed number of bitcoins as reward

## MINING FOR BITCOINS: EXTREMELY COMPETITIVE

- Each unique block can only be added to Blockchain from one source, hence all miners are in competition
- Finite limit on ultimate number of bitcoins: can never exceed 21 million (about 12 million now exist): this spurs miners to move quickly
- Miners with greater computer processing power are more likely to succeed
- Investors put millions in high-end computers to mine using state-of-the-art microchips

## THE BITCOIN “ARMS RACE”

- In 2014 it is highly unlikely that a single individual can mine competitively
- Competition has led to formation of mining “pools” in which multiple participants combine their efforts
- Speed at which mining can generate new bitcoins increased by 40 times between January and November 2013

## TRADING BITCOIN

- Anyone can trade; you need only internet access and software program to generate a digital “wallet”
- Trader can then connect to the Bitcoin Network, which memorializes every transaction by means of the Blockchain
- Blockchain avoids duplicate bitcoins
- Each digital wallet has both a “public key” and “private key”: transactions traceable to a computer by public key, but ownership of computer remains anonymous

## THE DIGITAL “WALLET”

- Wallet, which is generated by a bitcoin software program, is analogous to an account for storing a user’s bitcoins
- User can either become a “node” and assist in validating transactions or retain a third-party to create the wallet
- Some free wallet providers include Electrum.org, Multibit.org
- A trader can have unlimited number of wallets

## 2013: EXPANSION OF BITCOIN IN COMMERCE

- BitPay, Inc. by 2013 reported to have signed 8,000 small merchants world-wide
- February 2013: Ginbase reports selling one million bitcoins at \$22 each in a single month
- Baidu, No. 1 website in China, accepted bitcoin for portions of its security/firewall service until December 2013, when People's Bank of China and other governmental ministries prohibited banks and payment companies (but not individuals) from dealing in it
- California auto dealer sells Tesla for 91.4 bitcoins, or about \$103,000 (December 2013)
- WordPress, the giant blogging platform, accepts bitcoins

# BITCOIN EXCHANGES

- Among largest exchanges are:
  - BTC China (the largest before People's Bank and other ministries in December prohibited banks from dealing in bitcoin)
  - Mt. Gox, previously the largest, located in Japan
  - BitBox in U.S.
  - Bitstamp in Slovenia
  - Bitcurex in Poland

## REGULATORY CLIMATE BECOMES MORE ACCEPTING

- U.S. Financial Crimes Enforcement Network (FinCEN) issues regulatory “guidelines” for “decentralized virtual currencies,” and classified bitcoin miners as “money service businesses,” not regulated by federal authorities (March 2013)
- Department of Justice and Securities and Exchange Commission tell the Senate Committee on Homeland Security and Government Affairs that bitcoins are legitimate financial instruments (November 2013)
- Senate hearing had been prompted by shutdown of the “Silk Road” website, an online marketplace where millions of bitcoins were allegedly swapped for drugs and black market products (October 2013)

## VENTURE INVESTMENTS IN BITCOIN

- April 2013, group led by Andreessen Horowitz invests more than \$2 million in OpenCoin, Inc.
- May 2013, Union Square Ventures leads \$5 million “A” round investment in Coinbase (online service that facilitates buying and storing of bitcoin)
- Lightspeed China invests \$5 million in BTC China (the exchange)
- Andreessen group reports \$50 million investments

## WINKLEVOSS BITCOIN TRUST

- July 2013, the Winklevoss Twins file S-1 Registration Statement with SEC for an ETF called “Winklevoss Bitcoin Trust”
- Almost 18 pages of “Risk Factors”
- Negative reactions from commentators:
  - Chuck Jaffe: “more like a fund that specializes in stocks from Bulgaria than one that has mainstream applications”
  - Steven Pikelny of Morningstar: “a total gimmick”

## LEGAL STATUS: FEDERAL CRIMINAL LAWS

- Not drafted with bitcoin in mind.
- Law against interstate transportation of stolen property applies only to “goods, wares and merchandise.” In *Dowling v. U.S.*, Supreme Court limited this to physical items, not intangibles like virtual currency. While “money” is covered, query whether privately issued virtual currency is “money.”
- Computer Fraud and Abuse Act outlaws use of a computer with intent to defraud in obtaining anything of value from victim, but not clear whether stealing bitcoins from an owner’s account constitutes “fraud.”

## OTHER U.S. FEDERAL CRIMINAL LAWS

- Wire Fraud Statute could apply since it does not require misuse of a computer and covers both tangible and intangible property.
- But money-laundering violations only apply to “financial transaction” involving a “monetary instrument,” defined as “coin or currency *of the United States or any other country.*” Bitcoin has no connection to any government.

## THE FUTURE (I)

- Strategies to avoid price fluctuation problems:
  - 1) Stimulate wider usage of bitcoin, which would improve bitcoin image and help it become “mainstream”
  - 2) Link an account that contains dollars, euros or other major currency to a bitcoin wallet and convert to bitcoins only in connection with an online transaction. (See David Wolman, *How to Save Bitcoin*.) Coinbase (in San Francisco) offers free conversion of bitcoin into other currencies (up to \$1 million)
  - 3) Empower a central authority to establish guidelines for digital currencies. Digital Asset Transfer Authority, a self-governing industry group, was established in mid-2013 with this objective
- Bitcoin can lower payment processing costs significantly: zero to less than 2% compared with up to 3% for credit cards.

## THE FUTURE (II)

- Paul Krugman: “Unlike gold or paper size currencies bitcoin derives its value solely from a self-fulfilling expectation that others will accept it as payment”
- Robin Harris: “Bitcoin or something like it is not going away”; compares with end of dollar gold convertibility in 1971 after which floating exchange rates prevailed
- Timothy Lee: “Judging bitcoin by its current applications is making the same mistake as dismissing the early Internet because Usenet and FTP were clunky” (Dec. 3, 2013)
- Still Unanswered:
  - 1) Is bitcoin an investment?
  - 2) How will it be taxed?
  - 3) Can it become a viable currency?
  - 4) Can other “cryptocurrencies” compete with or supplant bitcoin?

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