Index

Printer: Courier-Westford

Note: Page references in italics refer to figures.

```
ABC Conjecture, 40
Abiodun, Emmanuel, 28, 75-
    84-85
AIG, 35
AirBnB, 174
Airline frequent flier miles, as currency,
Akkoyunlu, A., 50
Alternative currency investment,
     121-137
  alternative cryptocurrencies
    (alt-coins), defined, 88 (See also
    Bitcoin)
  Bitcoin volatility and, 127-129
  exchanges for, 133-135
  growth and, 137
  "Nixon Shock" and, 121-123,
    137
  regulation of, 5, 139-148
  60/40 portfolio model and, 123–127,
     125, 126
```

```
valuation and, 129-133, 131, 132,
     133
  vehicles for, 135-137
American Bankers Association, 150
Andreessen, Marc, 6-7
Andreessen Horowitz, 6-7
Andresen, Gavin, 40
Apple, 11
ARPANET (Defense Advanced
    Research Projects Agency),
     150-151
ASIC (application-specific integrated
     circuit) miners, 21-22, 84-85
ASIC-resistant algorithm, 158
Auroracoin, 141
Austin Global Exchange, 95, 96, 97, 99
Australian, 2
Automobiles, as smart property, 153
Bank for International Settlements, 123
Bank of England, 60-61
```

Trim: 6in × 9in

Printer: Courier-Westford

Barter system, 63 Bitcoin Magazine, 156 BCG Matrix, 169-171 BITCOIN.ORG, 39 Bear Stearns, 34-35, 45 "Bitcoin P2P E-Cash Paper" Bernanke, Ben, 35, 65-66 (Nakamoto), 36-37 Bitcoin Bitcoin protocol, 45 Bitcoin and bitcoins, defined, Bitcoin-QT, 27 22 - 23bitcoins blockchain, defined, 23-24 (See also accepted by merchants, 30-31 Blockchain) defined, 22-23 as bubble, 1-2, 130-133, 132 as incentive for mining, 54 (See also buying, 3-6, 26-29 Miners/mining) Byzantine Generals' Problem and, price fluctuation of, 76 44-45, 52-58 See also Bitcoin Bitcointalk (forum), 98 California gold rush compared to, 19 - 22"Bitcoin time," 150 "Bit gold," 40 as currency, 8-10, 13-18 decentralized financial systems, BitLicense, 144-147 BitPay, 7, 31 defined, 63-69, 64, 68, 73-74 Blockchain as disruption to financial services blocks, 12–13, 25–26, 78 industry, 69-72, 71 early sales of, 2, 16 refined, 11–13, 15, 23–24 expectations for, 31-32 international monetary exchange and, growth of alternative currencies and 72 - 7346-47 security issues of, 11-13, 82 inception of, 34-44 smart property and, 156-157 language of, 22-26 Blockchain.info, 27–28 miners' role in, 25-26 (See also Block halving rate, 83 Bretton Woods Conference, 121-123, Miners/mining) 137 as peer-to-peer network, 6-8, 10-13, 63-64 (See also Peer-to-peer Brokers, for bitcoins, 28-29 Bry, Charles, 39 network(s)) public and private keys, 24-25, Bubbles (financial), 1-2, 130-133, 132. 77-78, 78 See also Great Recession regulation of, 139-148 Business Week, 7 timestamp protocol of, 128 Buterin, Vitalik, 155-156 valuation, 129-133, 131, 132, Byrne, Patrick, 30-31 Byzantine Generals' Problem, 44–45, value transfer and, 33-34, 39 49-58, 62-63 volatility and, 127-129 See also Smart money California gold rush, history of, 19-20, Bitcoin Foundation, 40, 42 Bitcoin Investment Trust, 132-133, Carlson, Dave, 85, 85 *133*, 135–137 Cellphones, as smart property, 152

Trim: 6in × 9in

Index

Printer: Courier-Westford

Central banks centralized systems, defined, 62, 62-69, 72-73 history of, 46, 59-61 (See also Federal Reserve) money supply and economic growth, 111, 111-112 Nautiluscoin Stability Fund as "central bank," 94, 95-100 Challenge, defined, 80 Chile, currency of, 130, 131 China Bitcoins banned by, 5 digital currency regulation in, 141 Hong Kong economy and, 67-68 Qing Dynasty monetary system, 60 Clear, Michael, 38 CloudHashing, 75–77 CNBC, 2, 124 Coinbase, 4, 27-28, 28-29 "Coincidence of wants," 62 CoinDesk, 70, 71 Coingen.io, 95, 96, 97 Cold wallets, 134–135 Collision resistant, defined, 80 Colored Coins, 17, 151-152 Committee on Uniform Securities Identification Procedures (CUSIP), 150 ConAgra, 69 Continental currency, history of, 91-92 Counterfeit, avoiding, 11–12 Credit cards Bitcoin as competition of, 29, 30 processing fees of, 31, 70 security issues of, 71-72 Crypto 2011, 38 Cryptoequities, 160–161 Cryptography Bitcoin creation and, 38 Bitcoin mining techniques, 78-82, 81 cryptographic hash functions, 79-82, 81, 156

cryptographic key pair, 24-25, 77-78, defined, 23-24 encryption and, 51-58, 70, 81, 81, 88 SHA-256 (Secure Hash Algorithm), 53, 81, 81 See also Cryptonomics Cryptography Mailing List, 35 Cryptonomics, 163–178 DAOs and, 166-169, 173-174 decentralization and, 163-166 defined, 166-169 Experience Curve and, 171, 171-172 future of, 176-178 Growth Share Matrix and, 169–170, 170 sharing economy concept of, 174-176 Three Ceneric Strategies and, 172 173, 173 Currency Ditcoin as, 8–10, 13–18 Bitcoin currency exchanges, 21 fiat currency for bitcoins, 28-29 growth of alternative currencies, 46-47 history of, in U.S., 91-92 pegged currency failures, 91-94 trust in, 8-10, 45 See also Alternative currency investment (DAOs) Byzantine Generals' Problem and Bitcoin technology, 57-58

Davis, Joshua, 38

Decentralized autonomous organizations
(DAOs)

Byzantine Generals' Problem and
Bitcoin technology, 57–58
cryptonomics and, 161–162,
163–166, 173–174

DAOs, defined, 18, 86
decentralized financial systems,
defined, 63–69, 64, 68, 73–74

Defense Advanced Research Projects
Agency (DARPA), 150–151

INDEX

Printer: Courier-Westford

Denationalization of Money, The (Hayek), Fast Money, 4, 96 92-93, 104-105, 108 Federal Reserve Denmark, digital currency regulation in, Great Recession and, 34–35, 45, 47, 141-142 Department of Finance (New York), quantitative easing by, 2 143-147 regional Federal Reserve Banks, DigiByte, 97 66 - 67DigiShield, 97, 98, 102 Fees Digital Asset Transfer Authority credit card processing fees, 31, 70 (DATA), 147 miners' revenue and, 82 Digital signature, 79 Fiat currency, for bitcoins, 28-29 Digital wallets, 4, 21, 134. See also Field-programmable gate arrays Wallets (FPGAs), 84, 84-85 Distributed financial systems, 63-69, 64 51 percent attack, 55–57, 86 Dividends, programming into Financial Crimes Enforcement Division transactions, 16-17 (FINCEN) (U.S. Treasury), Dixon, Chris, 7 142-143 Financial services industry Dual encryption, credit cards and, 70 Dutch East India Company, 165 Bitcom as disruption to, 69–72, 71 centralized systems, 62, 62-69, 72-73 EBay, 4 necentralized systems, 63-69, 64, 68, Ekanadham, K., 50 73 - 74Electricity, used for mining, 87 distributed systems, 63-69, 64 history of, 59-61 Encryption Byzantine Generals' Problem 2013, Financial Supervisory Authority (FSA) 51 - 58(Denmark), 141-142 dual encryption and credit cards, 70 Fitch, Jon, 101-103 scrypt, 88 SHA-256 (Secure Hash Algorithm), Gambling, Bitcoin and, 142 53, 81, 81, 88 Garzik, Jeff, 41-43 See also Cryptography Geithner, Tim, 65 Eshet, Mary, 30 Ghash.io, 86, 87 Ethereum, 155-160 Gold "gold rush" history, 19-20, 22 Ethereum Virtual Machine (EVM) code, 158 as medium of exchange, 107-108 Exchange Rate Mechanism (ERM), Nautiluscoin as alternative to, 93 - 94115-116, 116 Exchanges, for digital currency, 28-29, "Nixon Shock" and gold standard, 133-135 121-123, 137 Experience Curve, 171, 171–172 stable purchasing power and, 88-89 "Gold Standard, Deflation, and Financial Facebook, 49 Crisis in the Great Depression, Fast Company, 39 The" (Bernanke), 65-66

Printer: Courier-Westford

221

Index

Goodman, Leah McGrath, 41 Great Depression, 65-66, 177-178 Great Recession Bitcoin creation and, 10, 34-35, 45, 47 centralized financial systems and, 65 impact on Iceland, 140-141 Growth Share Matrix, 169-170, 170 Hash value, 80-81 Hayek, Friedrich, 92-93, 104-105, 108 Henderson, Bruce, 169-172 Hong Kong, monetary system of, 67-68 Hot wallets, 134–135 Huber, R. V., 50 Iceland, digital currency regulation in, 140-141 "Idea of Smart Contracts, The" (Szabo), 153-154 Interest rates, purchasing power and, 112-113, 113 Internal Revenue Service (IRS), 141. See also Taxes International monetary exchange central banks and, 72-73 currency peg failure example, 93-94 free-floating exchange rates, 122-123 International Monetary Fund (IMF), 119, 121 Internet Byzantine Generals' Problem and, 51 - 52inception of, 73, 150-151 IOU enforcement, 8 IrishCentral, 38 ITunes (Apple), 11 Japan, Mt. Gox and, 3 JPMorgan, 34 Kickstarter, 175

Kimoto Gravity Well (KGW), 96

King, Neal, 39 Kinney, Alva, 69 Lamport, Leslie, 44-45, 50 Lawsky, Benjamin, 144 Lawson, Nigel, 93 Ledgers. See Blockchain Lee, Charles, 87 Lehman Brothers, 35 Lerner, Sergio, 42 Litecoin, 87-88, 96 Little, Frank, 69 "Losing positions," 5 Major, John, 93-94 Malkiel, Burton, 124 Markowitz, Harry, 123, 124 Marshall James, 19 MasterCard, 30 Mastercoin, 17, 151-152 McCaleb, Jed, 39–40 Medici Bank, 60 Medium of exchange, Bitcoin as, 13, 127 Merchants, bitcoins accepted by, 30-31, 130, 132 Merkle, Ralph, 156 Mind Candy, 43-44 Miners/mining, 75–89 affordability of large mining operations, 157 ASIC (application-specific integrated circuit) miners, 21-22 Bitcoin transactions, 77, 77-78 Byzantine Generals' Problem and, 49-58 cryptography techniques for, 78-82, 81 (See also Cryptography) defined, 12-13, 14, 21 examples of operations, 75-77, 84, 84–85, 85, 86, 87 field-programmable gate arrays

(FPGAs), 84, 84-85

INDEX

Printer: Courier-Westford

Miners/mining (Continued) Nautiluscoin Stability Fund and, 94, impact of, on Nautiluscoin, 98-99, 95-100, 113-114 104 pegged currency issues and, 91-94 miners as "middlemen," 78 proof-of-stake (PoS), method, 100, mining pools, 85–88, 86, 114–115 103-104, 110-113, 111, 113 network difficulty, 82-83, 83 proof-of-stake (PoS), multipool, role of miners, 25-26 114-115 stable purchasing power and, 88-89 purchasing power and, 116–117, 117 Mintpal, 99–100 Special Drawing Rights (SDRs) and, Mobile phones, as smart property, 152 119 Mochizuki, Shinichi, 40 transparency of, 119-120 Modern Portfolio Theory, 123-127, Nebraska Consolidated Mills, 69 125, 126 Network difficulty, 82-83, 83 Money, functions of, 127 Newsweek, 41 New York Department of Finance, Money supply, 5 Money transmitters/money transmission 143-147 services, 143 New Yorker, 38 MPEx, 142 Nixon, Richard, 122 Mt. Gox "Nixon Shock," 121-123, 137 Node 51 failure of, 14, 15–16 Nonce, 81 founding of, 39 as largest exchange, 3 security of, 134-135 Oksman, Vladimir, 39 Musk, Elon, 7 Open source, digital currencies as, 137 Options Clearing Corporation, 159 Nakamoto, Dorian S., 41, Overstock, 30 Nakamoto, Satoshi Bitcoin inception and, 6, 26 Parker, Sean, 11 "Bitcoin P2P E-Cash Paper," 36-37 Paulson, Hank, 35, 65 identity of, 3, 20-21, 37-44 PayPal, 4, 7 Napster, 11 Pease, Marshall, 44-45, 50 National Banking Acts (1863, 1864), 92 Peer-to-peer network(s) Native Americans, wampum of, 9 Bitcoin as, 6-8, 10-13, 63-64 Nautiluscoin, 91-105, 107-120 P2P lending, 154 creation of, 94-104 Western Union as P2P network, 61 cryptonomic decision-making process Penenberg, Adam, 39 People's Bank of China, 141 and, 167 developing economy of, 107–110 Perplex City (Mind Candy), 43-44 financial market integration of, Peso (Chile), 130, 131 117-118 Popeil, Ron, 149 as gold alternative, 115-116, 116 Porter, Michael, 172 Hayek's theory and, 92-93, 104-105, Pound sterling, currency peg failure and, 108 93-94

Trim: 6in × 9in

Index

Printer: Courier-Westford

P2P Foundation, 36-37, 43 Profit motive, cryptonomics and, 166-169 Proof-of-stake (PoS) method, 100, 103-104, 110-113, 111, 113 Proof-of-work (PoW) method, 80 Public/private key pair, 24–25, 77, 77-78

Qing Dynasty, 60 Quantitative easing, 2

Regulation, 5, 139-148 Ripple, 39, 151–152

Satoshi (bitcoin denomination), 153 SatoshiDice, 142 Satoshi (name of Bitcoin inventor). See Nakamoto, Satoshi

Scrypt, 88

Search for Extraterrestrial Intelligence (SETI), 159

SecondMarket Inc., 136-137

Securities and Exchange Commission (SEC), 142

Security issues

of bitcoin purchases, 28-29

blockchain and, 11-15, 23-24, 82

(See also Blockchain)

Byzantine Generals' Problem and, 44-45, 49-58, 62-63

credit data and, 71-72

of hot and cold wallets, 134-135

regulation and, 5, 139-148

of revealing personal information,

Sharing economy concept, 174–176 SHA-256 (Secure Hash Algorithm), 53,

81, 81, 88

"Shelling out," 9

Shiller, Robert, 88

Shostak, Robert, 44-45, 50

Silk Road (website), 3

Simple Mail Transfer Protocol (SMTP),

60/40 portfolio model, 123-127, 125, 126

Smart contracts, 17, 40

Smart money, 149-162

Bitcoin as, 17-18

cryptoequities and, 160-161

decentralized autonomous

organizations (DAO) and, 161-162

Ethereum and, 155-160

generally, 149-151

protocols, 151-152

smart contracts and smart property,

150, 152-155

Social networks

Bitcoin as, 17-18

Facebook and, 49

Society for Human Resource

Management (SHRM), 173

Soros, George, 2, 92

S&P 500, 124

SPAM, deterring, 80

S&P Capital IQ, 150

Special Drawing Rights (SDRs), 119

Steffens, Lincoln, 176

Stone, Oliver, 175-176

Store of value, Bitcoin as, 13, 127

Szabo, Nick, 40, 153-154

TARP, 35

Tate, Jared, 97, 98

Taxes

IRS and guidance on digital currency,

New York tax-free zones, 146-147 using digital currency for, 128-129

Thiel, Peter, 7, 156

Thomas, Stefan, 37

Three Generic Strategies, 172-173,

173

Times of London, 38

Two Generals' Problem, 50-52

JWBT1408-Kelly

INDEX

United Kingdom, currency peg failure in, 92–94
United States, digital currency regulation in, 141–148
Unit of account, Bitcoin as, 13, 127
University of California–Berkeley, 159
U.S. Department of Commerce, 70
U.S. dollar early history of, 91–92 gold standard and, 121–123, 137
U.S. Treasury, 35

Valuation, of digital currencies, 129–133, 131, 132, 133 Vault, for bitcoins, 27 Vietnam, digital currency regulation in, 140–141 Volcker, Paul, 45 Voorhees, Erik, 142 Wallets digital wallets, 4, 21, 134 hot and cold wallets, 134-135 public/private key pair, 24-25, 77–78, 78 software wallet and web wallet, defined, 26-29 Wall Street (film), 175-176 Wall Street Journal, 124 Walters, Alan, 93 Wampum, 9 "We Are All Bitcoin" (Garzik), 41-43 Wells Fargo, 21, 30, 61 Western Union, 61, 71 William III (King of England), 60-61 Wilson, Fred, 7 Winkelvoss ETF, 135 World Bank, creation of, 121

October 17, 2014 10:5

ZipCar, 174 Zuckerberg, Mark, 49