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Bitcoin
The new gold rush?



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The basics of Bitcoin

The Bitcoin frenzy seems to have reached new heights lately, spurred by a growing user base, price volatility, and the rapidly evolving network of Bitcoin-related companies.¹ Reports of big investments in “mining” equipment and the expanding ecosystem supporting the protocol remind us in many ways of a gold rush — an analogy made easier by Bitcoin’s other similarities to the precious metal.

It’s hard to say whether this excitement is warranted, but it’s equally hard to deny Bitcoin’s increasing relevance to businesses and the broader economy.

Bitcoin, along with other cryptocurrencies, may have implications not only for the technology industry, where much of the current action is concentrated, but also other industries from retail businesses to financial services.

In this paper, we discuss Bitcoin in the context of the financial services industry, particularly, payment networks and banks. What is it about this cryptocurrency that is inspiring such attention, and what might the future of cryptocurrencies mean for traditional financial services?

Bitcoin fundamentals

Bitcoin is a cryptocurrency, a digital alternative to traditional money relying on cryptography for its operation. The Bitcoin protocol, a system of open source processes, governs the currency and is primarily supported by a peer-to-peer network. This design also makes Bitcoin a payment network, one that exists outside the traditional payments system. Unlike more traditional currencies, there is no principal authority backing Bitcoin. The Bitcoin Foundation, an advocacy group, does help support the use of the currency.²

Terminology and definitions

A variety of terms are used to describe currencies such as Bitcoin:

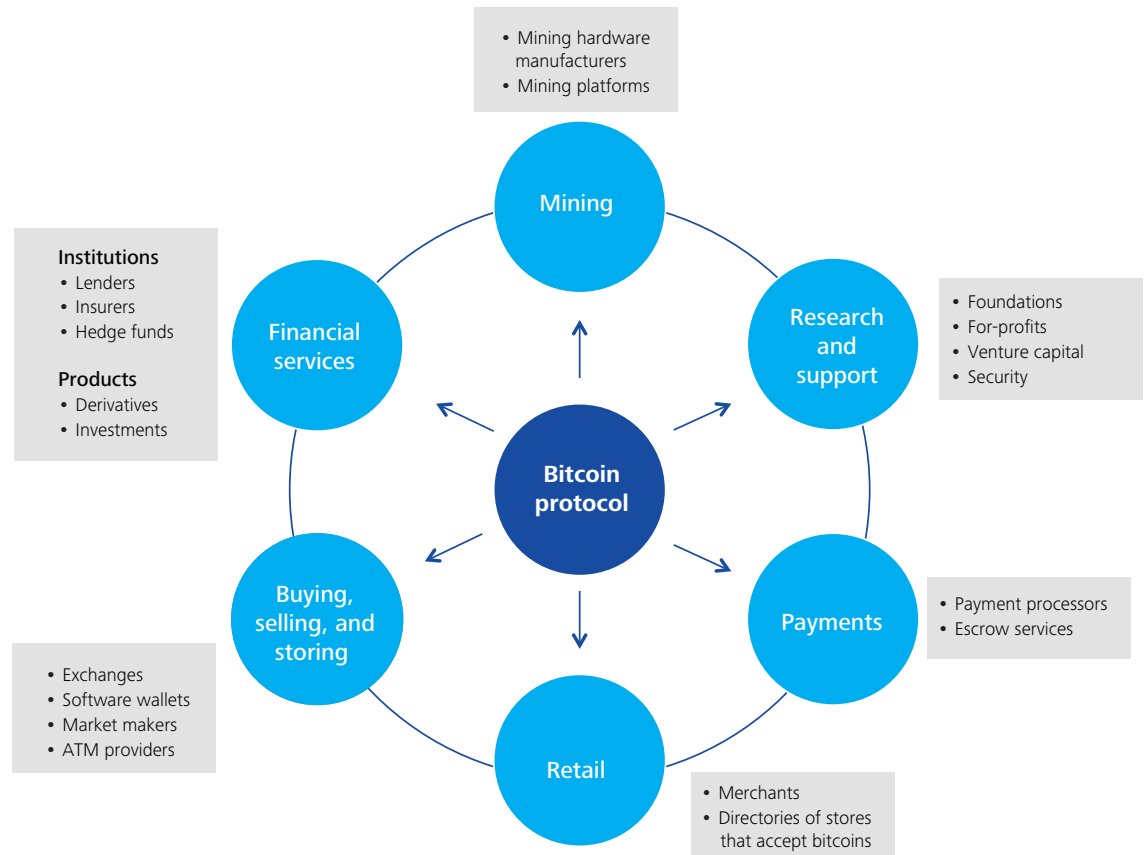
- Alternative currencies: Refers broadly to any currency not backed by a state or an equivalent traditional authority
- Digital currencies: Those that exist only in the digital bitcoin domain
- Cryptocurrencies (like Bitcoin): Those that are based on cryptographic protocols



The first bitcoins entered the market in 2009, valued at next to nothing in dollar terms. The protocol's complexity limited use to those with software expertise and a special interest in alternative digital currencies. Yet as the currency has matured, an ecosystem of service providers has developed to facilitate transactions so that anyone can participate, even those without a technical understanding of the currency. This still-growing global ecosystem includes merchants, payment processors, banking and e-wallet solutions, trading platforms, and currency exchanges (Figure 1).

The developing ecosystem and growing media attention have increased general interest in Bitcoin, spurring new demand (some of it speculative) and driving up the price of a single bitcoin to more than \$1,000 by December 2013 (Figure 2). More recently, the price has moderated in response to regulatory developments and operational issues at several leading Bitcoin exchanges.

Figure 1: The Bitcoin ecosystem

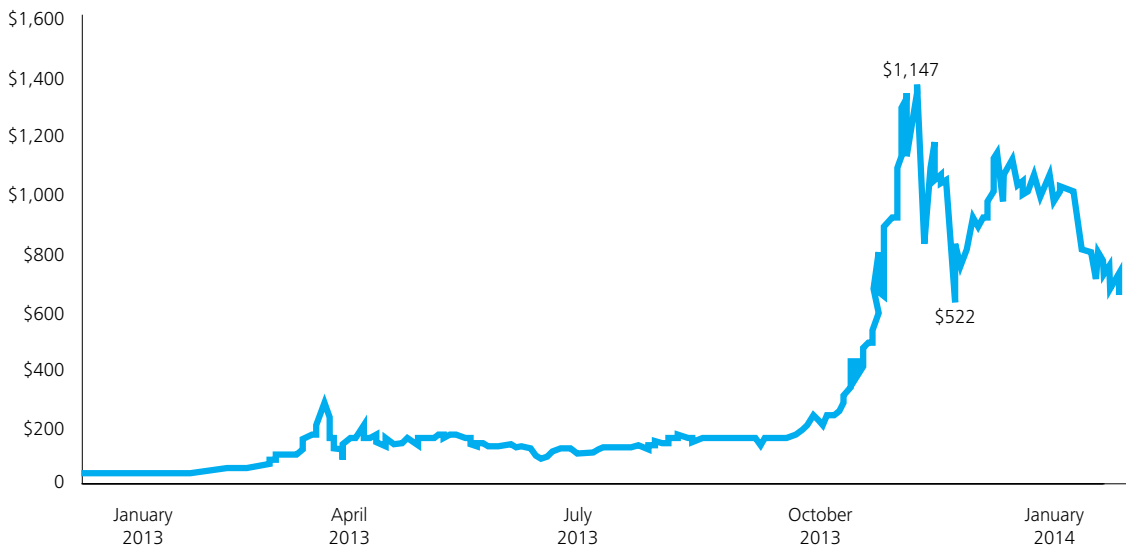


Source: Deloitte Center for Financial Services

Each Bitcoin wallet is associated with an "address," or a unique series of numbers and characters. However, the identity of the user is not known to others, allowing participants to be pseudonymous, if not totally anonymous. While all transactions are recorded publicly (discussed in detail on the next page) users have combined this basic trait with some anonymity software to engage in hard-to-trace and illegal activities.

Contrarily, if a real-world identity is linked to an address, it is possible to view all of the user's transaction history — akin to having one's checkbook posted on the Internet. So while Bitcoin may provide a sense of anonymity, it also has the potential to jeopardize privacy by making transactions far more transparent than traditional systems.

Figure 2: Price of a bitcoin in U.S. dollars



Source: Coindesk.com Bitcoin Price Index, February 2014

Mining, buying, and using bitcoins

Bitcoin has become the most popular alternative currency in part because of features solving key theoretical problems of digital money.

- **Verification and double payment:** Bitcoins are released via a process called “mining,” which involves solving increasingly difficult cryptographic problems, and requires progressively more powerful computers for productive mining. The problems being solved register and validate Bitcoin transactions on the “blockchain,” a public ledger recording all transactions. The public nature of the blockchain and the system of confirming transactions by consensus allow for bitcoins to be verified during exchanges and prohibit users from spending the same bitcoin twice, key technical solutions that are major aspects of a viable alternative digital currency.
- **Supply:** As with gold, mining’s difficulty has increased over time. It will continue to become more difficult as miners near the 21 millionth bitcoin, the maximum allowed under the protocol. This feature ensures a controlled supply of bitcoins, essential for a functioning digital currency. This inflexibility of Bitcoin supply has led some experts to observe that typical monetary policy interventions, such as adjustments to the money supply to moderate macroeconomic shocks, would be impossible in a cryptocurrency-oriented monetary system.³

Despite these advances, Bitcoin doesn’t solve all potential problems. The transaction system leaves users with limited protections and recourse in cases of fraudulent transfers, unauthorized transactions, or lost bitcoins. Further,

the security, stability, and operational resiliency of the protocol and exchanges may be challenged as Bitcoin matures. Ensuring the protocol and ecosystem can handle larger transaction volumes and protecting them against cybersecurity threats are among the top priorities for many market participants.⁴

So far, roughly 12 million bitcoins have been mined.⁵ The last bitcoin is expected to be mined in 2140, though most will be mined well before then.⁶ Effective mining is beyond most users’ ability, meaning most gain access to bitcoins via an exchange or marketplace, again, much like gold.

Once mined or purchased, bitcoins serve purposes similar to gold: they are an alternative store of value; a source of asset diversification; a possible hedge against inflation; and may offer independence from political control.

As a store of value, one of the primary purposes of money, Bitcoin’s utility is currently limited. High volatility and an uncertain regulatory climate keep it from having the benefits of a currency like the dollar, yen, or euro. Moreover, almost half of bitcoins are reportedly held by fewer than 1,000 individuals, a market power concentration that casts doubt on the robustness of Bitcoin pricing.⁷

But Bitcoin may have clearer utility in the way it differs from gold: use as a direct means of exchange. For certain types of payments, such as international person-to-person transfers, Bitcoin’s low transaction costs, international reach, speed-of-transfer, and ease-of-use could make it a popular alternative among some segments.

Pros:	Cons:
Low transaction costs	Currently volatile value
International transferability and convertibility	Limited adoption by retailers
Protection from some political risk and inflation (if not rapid price changes)	Combined with other software, anonymity can be used for illegal purposes
Basic alternative digital currency problems of supply growth and double payment/verification solved	Lack of trusted intermediaries to challenge unauthorized transactions and fraud Potential to expose a user’s transaction history to the public
Operation is outside the banking system — immune to bank failures, but not protected by deposit insurance	Uncertainty about the cryptocurrency’s security and operational resiliency Inadequate mass-market understanding

Can Bitcoin enter the mainstream?

Bitcoin's potential impact is significant though widespread acceptance may seem an unlikely scenario. For Bitcoin to enter the mainstream, at least three conditions would have to be met.

- **Stability:** First and foremost, bitcoin volatility would have to moderate. Prices have gone through multiple cycles of attention-driven boom and bust.⁸ A bitcoin's dollar value grew 100 percent from December 2012 to June 2013, fell nearly 50 percent from June to July, and shot up another 100 percent in November before crashing in December, and recovering somewhat in 2014.⁹ A currency's adoption for day-to-day use likely depends on price stability, which consumers and businesses need when planning consumption and savings decisions. In this way, Bitcoin is like an unstable conventional currency — nobody expects it to become the standard for international transactions anytime soon. As long as the currency is subject to speculation and wild swings in value, its utility as a medium of exchange, unit of account, and store of value will be limited.
- **Acceptance:** A second necessary condition is widespread acceptance. An increasing number of businesses accept bitcoins, but the currency still

remains a niche phenomenon. If more major retailers begin accepting bitcoins, the currency's credibility and popularity might increase significantly. But without more price stability, widespread adoption appears unlikely. Similarly, the current lack of acceptance by traditional financial institutions limits Bitcoin's use. Overall near-term acceptance may also be limited given the current size of the Bitcoin market. As of late February 2014, there are approximately \$7 billion worth of bitcoins in circulation, a drop in the bucket if one considers the more established currencies. Payment transaction volumes, in February approximately \$100 million each day, are also still low relative to volumes through traditional providers.¹⁰

- **Trust:** The final, and vital, condition for Bitcoin's adoption is trust. Gaining businesses', governments', and individuals' trust is no easy hurdle, given the cryptocurrency's complexity, decentralized system, recent operational issues, volatility, and association with illicit uses. Bitcoin's lack of protection, which consumers have grown accustomed to from traditional financial providers (including fraud protection, deposit insurance, dispute resolution, and safeguards from theft) may further inhibit the development of trust.

Regulatory oversight

One of the major uncertainties facing Bitcoin and other alternative digital currencies is the regulatory environment. Clear regulations, especially in areas such as tax, accounting, and anti-money laundering, may increase Bitcoin's acceptance and provide a measure of stability and trust.¹¹

Until now, regulators' main focus has been on illegal transactions.¹² For instance, U.S. officials have investigated anti-money laundering compliance and the purchase of illicit substances; one online marketplace, Silk Road, was shut down in October 2013 for allegedly enabling such activity.¹³

Instituting a comprehensive regulatory architecture for alternative currencies such as Bitcoin might not be as straightforward as cracking down on illicit use. The complex interactions between U.S. state and federal guidelines may stymie these efforts, possibly pushing business outside the country.

But there are signs that regulators at the federal and state level are keen to offer regulatory guidance. In fact, the New York Department of Financial Services has stated that it will "begin considering proposals and applications" for virtual currency exchanges in the state.¹⁴ Furthermore, it has also indicated that there would be regulatory guidance before the end of the second quarter of 2014.¹⁵ Meanwhile, the Conference of State Bank Supervisors has formed an emerging payments task force to "coordinate oversight and protect consumers."¹⁶

On the international front, the responses of various countries' regulators has been inconsistent. U.S. authorities have taken a more restrained approach to the broader use of Bitcoin.¹⁷ On the other hand, Chinese regulators have severely restricted the use of Bitcoin, which is very popular in China: a third of Bitcoin trading happens on a China-only Bitcoin exchange.¹⁸

Implications for financial services

Regardless of whether these conditions are met, Bitcoin could potentially inform innovation for a wide range of institutions, including those in the traditional banking sector.

Business implications

- **Payments:** Transfers between individuals via Bitcoin, especially internationally, are faster, simpler, and less expensive than those offered by many financial services companies. Further, processing Bitcoin transactions is far cheaper for businesses than the cost of processing card transactions. As competitors emerge within the Bitcoin ecosystem, traditional banks and payments processors may see an increased threat, forcing them to innovate to retain their traditional dominance.
- **Retail and investment banking:** The emergence of Bitcoin raises many questions for both retail and investment banks, including the acceptance of bitcoins as deposits, the use of bitcoins as collateral, and the pursuit of business with Bitcoin-related companies. Firms may also have to decide whether or not they should actively participate in Bitcoin trading for themselves or their clients, provided this is within the bounds of current financial regulations. A crucial question will be the optimal investment: a heavy bet will be inappropriate for many institutions, but there could also be risks to avoiding the Bitcoin and cryptocurrency sector entirely.

- **Hedging and investment services:** Bitcoin, like other assets such as gold, can create demand for peripheral products. Institutions are already starting to offer financial instruments, including insurance and derivatives, to help hedge clients' risks. They may also create new investment offerings focused on Bitcoin, such as index funds and exchange-traded funds. Building competence and expertise will be a key part of this development. Investment in new talent and training may be required.

Institutional implications

- **Tax and accounting:** The adoption of Bitcoin may carry numerous tax and accounting implications, among them revenue recognition, mark-to-market valuation, the characterization of profits and losses for tax purposes, the applicability of barter transaction rules, basis tracking, and hedging considerations. Financial providers should consider necessary reporting and withholding for cross-border transactions. Further, firms must ensure they can properly reconcile the transactions within their institutional Bitcoin e-wallets to the entries reflected in their general ledger. These implications have provoked intense debate, making it vital to remain keenly aware of future developments.

Bitcoin could potentially inform innovation for a wide range of institutions.

- **Risk and compliance:** Bitcoin raises many concerns from a compliance and risk perspective, especially fulfilling anti-money laundering requirements, adequately safeguarding against cyber threats, and properly assessing counterparty risk when a new or existing customer begins using cryptocurrencies. Risk governance and internal controls may need to be developed or updated to account for Bitcoin and other cryptocurrencies. For instance, new risk tools might be necessary to assess and manage market, credit, and operational risks associated with cryptocurrencies. As these issues emerge, proactive and transparent collaboration with regulators will be essential.
- **Operations and technology:** Depending on the decisions firms make and the state of their systems, software and other IT investments may be needed to integrate alternative digital currency platforms into infrastructure and product offerings. Given the fast pace of change, adopters must continually assess the need for new investments to safely integrate alternative currencies.

Establishing a strong brand in the early stages of the alternative digital currency trend may bring substantial competitive advantage in years ahead, but firms may need to carefully consider the range of outcomes. Moving too fast may result in over-exposure — and embarrassment — if Bitcoin does not enter the mainstream.

Financial consumer implications

Bitcoin and other alternative digital currencies' popularity also carry important implications for financial services consumers. In addition to the natural education involved in adopting a new currency, customers will have to become comfortable with the use of their digital wallets, learn best practices for maintaining the security of their holdings, and adjust to the inability to challenge transactions.

Tax treatment will also be an issue for individuals. Differing treatments of Bitcoin by jurisdiction may expose users to additional complexity, legal issues, and double taxation. As consumers wrestle with these issues, they may turn to traditional financial institutions for help.

Setting an example

Immediate responses aside, the real impact of Bitcoin may be in its example. While it is not clear what aspects of Bitcoin will endure — the protocol, the public ledger and transparency of transactions, the distributed peer-to-peer network, or others — Bitcoin has demonstrated that payment systems based on open cryptographic networks and decentralized trust can work in practice.¹⁹

It has also increased awareness of cryptocurrencies and alternative digital currencies in general, opening the door to numerous Bitcoin imitators purporting to improve on the original.²⁰

As is typical of most new technologies, such as the Internet in the 1990s or mobile technology over the last decade, new and advanced features are being developed on top of the Bitcoin protocol and infrastructure. Emerging open-source projects might represent what HTML became for the Internet: the trigger for massive adoption.

While the protocol and public blockchain have been used to facilitate Bitcoin transactions in this instance, the features enabling digital transfer of assets could have a wide range of other applications, such as exchanging land deeds, automobile titles, or securities holdings.

Despite its recent momentum, it is possible Bitcoin might give way to other followers more adept at dealing with the challenges facing cryptocurrencies and other alternative digital currencies. Conversely, like other pioneers, it may have greater impact than many skeptics imagine. Making concrete predictions about such a fledgling phenomenon is difficult, but regardless of Bitcoin's trajectory we can expect to see its influence live on in challenges and opportunities posed by other cryptocurrencies to traditional financial services.

The real impact of Bitcoin may be in its example.



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End notes

- ¹ Ashlee Vance and Brad Stone, "The Bitcoin-Mining Arms Race Heats Up," Bloomberg BusinessWeek, January 9, 2014.
- ² Maria Bustillos, "The Bitcoin Boom," Elements (blog), New Yorker, April 2, 2013.
- ³ Jean-Pierre Landau, "Beware the Mania for Bitcoin, the Tulip of the 21st century," Financial Times, January 26, 2014.
- ⁴ Robert McMillan, "Exchange Halts Payouts as DDOS Attack Pummels Bitcoin," Wired, February 11, 2014.
- ⁵ Sarah E. Needleman and Spencer E. Ante, "Bitcoin Primer: What You Need to Know About the New Virtual Currency," Digits (blog), Wall Street Journal, May 8, 2013.
- ⁶ Ashlee Vance and Brad Stone, "The Bitcoin-Mining Arms Race Heats Up," Bloomberg BusinessWeek, January 9, 2014.
- ⁷ Rob Wile, "927 People Own Half of All Bitcoins," Business Insider, December 10, 2013.
- ⁸ Felix Salmon, "Waiting for Bitcoin to Get Boring," Reuters, November 30, 2013.
- ⁹ Prices reflect Coindesk index values.
- ¹⁰ Blockchain.info statistics on daily transaction volume as of February 2014.
- ¹¹ Jennifer Isom, "As Certain as Death and Taxes: Consumer Considerations of Bitcoin Transactions for When the IRS Comes Knocking," University of New Mexico School of Law, December 9, 2013; Richard Rubin and Carter Dougherty, "Clear Bitcoin Tax Rules Needed, Taxpayer Advocate Says," Bloomberg, January 9, 2014.
- ¹² Gerry Mullaney, "China Restricts Banks' Use of Bitcoin," New York Times, December 5, 2013.
- ¹³ Brett Wolf, "U.S. Treasury Cautions Bitcoin Businesses on Legal Duties," Reuters, December 17, 2013.
- ¹⁴ Paul Vigna, "Bitcoin Firms Will Get 'Regulatory Framework' in 2014, NY's Lawsky Says," Wall Street Journal, January 28, 2014.
- ¹⁵ Saumya Vaishampayan, "New York Opens Door to Regulated Bitcoin Exchanges," MarketWatch, March 11, 2014.
- ¹⁶ "State Regulators Form Task Force to Study Changing Landscape in Payment Systems," Conference of State Bank Supervisors press release, February 20, 2014.
- ¹⁷ Nathaniel Popper, "Regulators See Value in Bitcoin, and Investors Hasten to Agree," Dealbook (blog), New York Times, November 18, 2013.
- ¹⁸ Rebecca Falconer, "World Powers React to the Bitcoin Boom," Al Jazeera America, December 7, 2013.
- ¹⁹ Andreas Antonopoulos, "Bitcoin Security Model: Trust by Computation," Forbes.com, February 20, 2014.
- ²⁰ Nathaniel Popper, "In Bitcoin's Orbit: Rival Virtual Currencies Vie for Acceptance," Dealbook (blog), New York Times, November 24, 2013.

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