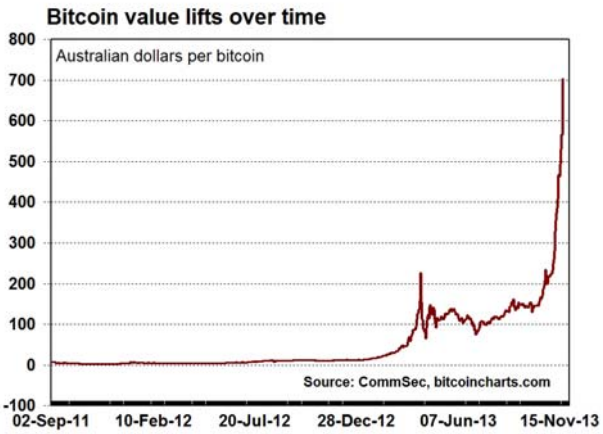
The rise of and rise of bitcoins (revisited)

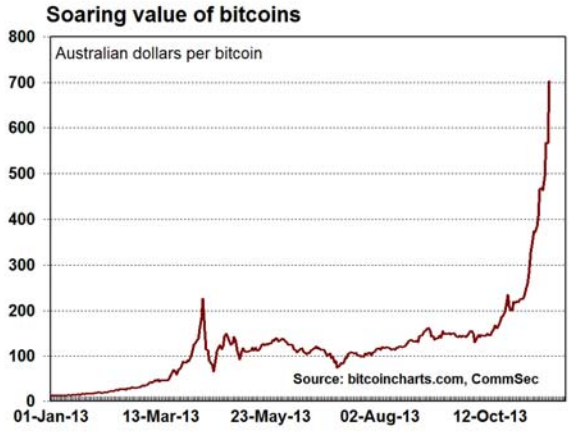
Economic and financial market perspectives

- **Bitcoin price continues to soar: On April 8 we wrote a report discussing the emergence of "bitcoins" – a digital currency – effectively electronic cash that enables payments to be made without going through financial institutions like banks. When we wrote the report a bitcoin was worth A$135.19. Since then, the bitcoin price has hit a high of A$940 and is currently near A$658.**
- **US Senate investigates: The Senate Homeland Security Committee held hearings on bitcoins on Tuesday *"Beyond Silk Road: Potential Risks, Threats and Promises of Virtual Currencies"* and the generally balanced comments, including those from Federal Reserve Chair Ben Bernanke, have supported recent price gains.**
- **Value of bitcoins: The value of all bitcoins in circulation is US$7.2 billion.**

What is a bitcoin?

- In simple terms money is anything that is acceptable, divisible, durable and portable; can be used as a store of value; and can used as a payment device to buy or sell goods or services. Those attributes are clearly apparent in paper currencies like the Aussie dollar and the US dollar but they are also apparent in many respects for a physical asset like gold.
- But in recent years, "money" has manifest in ways other than paper currencies such as "virtual" or "digital" currencies, the most celebrated representation being bitcoins. And in many respects bitcoins have much in common with gold.
- So what actually is a bitcoin? Well, according to the official website, *"Bitcoin is an experimental, decentralized digital currency that enables instant payments to anyone, anywhere in the world. Bitcoin uses peer-to-peer technology to operate with no central authority: managing transactions and issuing money are carried out collectively by the network.*"
- "Paper" currencies (actually more plastic than paper nowadays) are produced by note printing businesses on behalf of central banks. The central banks determine how much money needs to expand in relation to demand to





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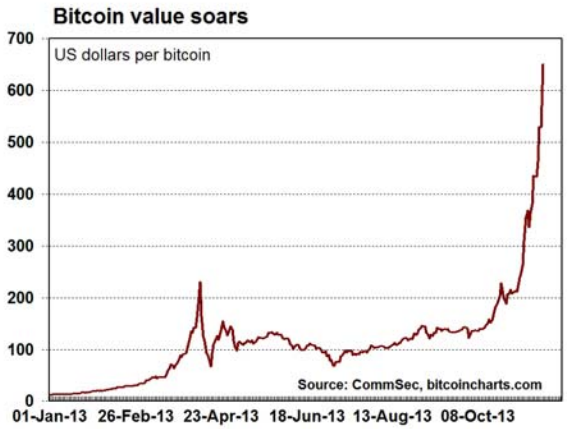
ensure that economies continue to expand but that inflation doesn't become a problem. Bitcoins are also "produced", but digitally via cryptography – rigorous, mathematical models that provide high levels of security like those used by online banking sites.

- Currently, 25 bitcoins (BTC) are generated every 10 minutes. This will be halved to 12.5 BTC within the year 2017 and halved continuously every 4 years after until a hard-limit of 21 million bitcoins is reached within the year 2040. According to Bitcoin Block Explorer, 12.013 million of the 21 million bitcoins have so far been produced (http://blockexplorer.com/q/totalbc).
- So how do bitcoins stack up in terms of the traditional attributes of money? Bitcoins are *divisible* – one bitcoin is subdivided into 100 million smaller units called satoshis, defined by eight decimal points. And bitcoins are becoming *more acceptable* as a means of payment by web-based businesses. Other qualities such as durability and *portability* don't really apply given the fact that bitcoins are largely digital currencies (although some physical representations have been made).

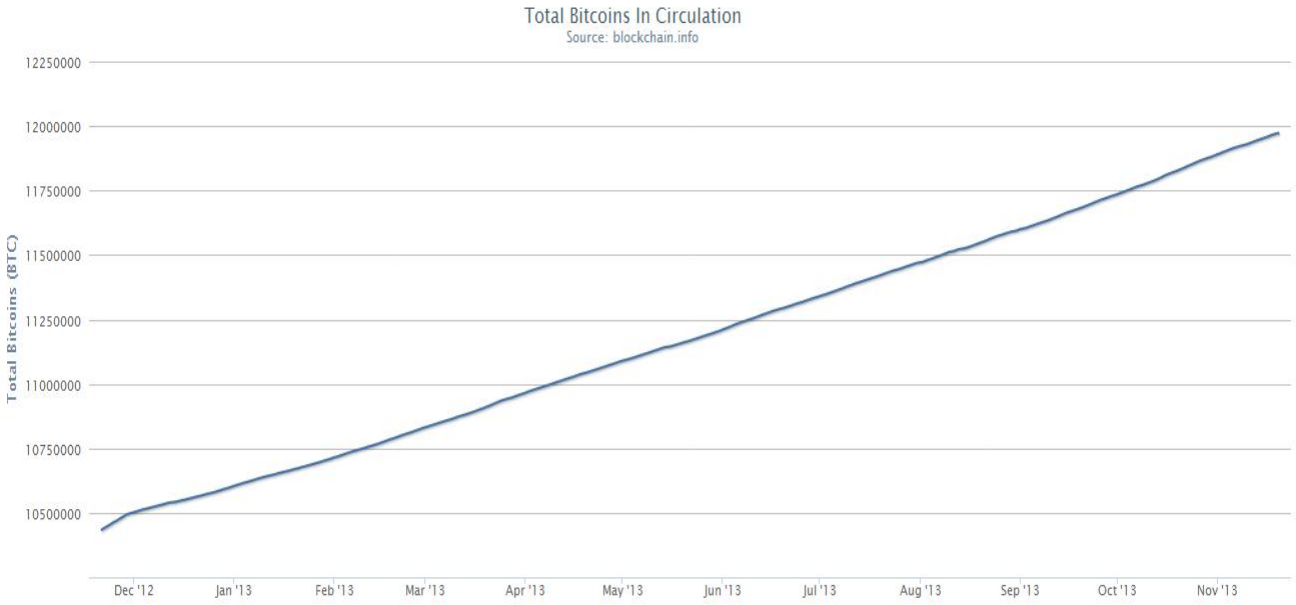


Like gold

- It is important to remember that the gold standard existed up until World War II with governments pegging the value of their paper currencies to the amount of gold they held. And indeed the direct convertibility of gold to the US dollar existed up until 1971 when the US government ended the link.
- Just like gold, bitcoins can only be regarded as "money" if consumers and businesses have confidence that the currency can act as a store of value and that they are widely acceptable. And much of this acceptability is dependent on the relative scarcity of the asset.
- If gold was abundantly available and essentially could be dug up anywhere, then it would have little value. But according to Gold Fields Mining Services only 171,300 tonnes of gold has been mined in human history. And each year around 2,660 tonnes are mined every year. Supply is modest and there is no shortage of willing buyers so the gold price has been rising – lifting for each of the past 12 years.
- The architects of the bitcoin system have also been conscious of restricting supply to ensure that the currency is regarded as a good store of value.

Rising value of bitcoin

- At the start of 2013 the value of a bitcoin was A$13.30 according to the Mt.Gox bitcoin exchange and the website, bitcoincharts.com. By April 9 the value had soared to A$230. After a correction in April, the price stabilised but over November the bitcoin price has soared from A$213 to A$658. Looking further back, at the start of the data series in September 2011, the value of a bitcoin was A$7.61.
- The spike in the value of bitcoins over November has been variously attributed to increased demand for the virtual



currency from Chinese investors/speculators. And more recently, favourable comments on bitcoins by US government officials, before and at a Senate hearing on the currency, have been cited as reasons supporting and boosting demand for the digital currency.

How does it work?

- The mechanics are quite complicated, but for those wanting to get more details on how it works – especially those interest in cryptography – the official website is http://bitcoin.org. The academic paper that introduced the concept was *"Bitcoin: A Peer-to-Peer Electronic Cash System"* and can be found at http://bitcoin.org/bitcoin.pdf
- For an individual to begin making transactions, they first need a bitcoin wallet. The wallet then produces the first "address" or public key of around 33 characters in length. The address is disclosed to others to enable bitcoin transactions to take place. And just as you protect your traditional wallet, full of cash, safeguards are required to ensure your electronic wallet is protected, such as encrypting your wallet with a password.
- To purchase bitcoins in order to make payments, individuals can go to bitcoin exchanges such as Mt.Gox (https://mtgox.com). The company claims to handle 80 per cent of all bitcoin trades.
- A transaction occurs when there is a transfer of value between bitcoin addresses. This relies on the "block" being verified in the "blockchain" – the public record of all Bitcoin transactions, in chronological order.

What are risks, opportunities and considerations?

- There are a number of concerns with the use of bitcoins. Some highlight the potential for black market transactions while others claim that bitcoins could be used to avoid taxation or regulatory scrutiny. Indeed, while all transactions can be viewed online, it is harder to trace these transactions to identify the individuals or businesses making the transactions. Still the same problem exists in the cash economy.
- There have also been a number of instances of theft, fraud or hacking affecting wallets and exchanges. Clearly as with all things held or transacted online, there is a degree of risk involved.
- While the original purpose of bitcoins was to facilitate online transactions, the recent sharp increase in the value of the currency has attracted the interest of investors and speculators.
- Just like gold mining, bitcoins can be "mined". And just like gold, with the soaring value of bitcoins some people believe their path to richness lies in bitcoin mining. Some companies like Avalon and Butterfly Labs are marketing computers with Application Specific Integrated Circuits (ASICs) that could profitably mine for bitcoins at current exchange rates. Of course if the value of bitcoins falls, all bets are off.
- Then there is the risk of attacks on the verification system of bitcoin transactions – either by criminal or unscrupulous businesses or individuals or even by governments or government agencies.

What are the implications?

- Whenever the value of an asset grows at a parabolic rate, serious questions are asked about the sustainability of the high prices. In short, is there a bitcoin bubble? And as we have seen in the past with events like the dot.com bubble, there is never a definitive answer.
- Clearly people are buying bitcoins because they believe the value will at least be maintained or indeed may grow over time given the relative shortage. But this is a new currency – introduced in 2009 – so the true value will only be determined as the integrity of the system is tested and there is growth in the acceptability of bitcoins as a payment device. Clearly if there is further turmoil in the traditional global financial system then alternative currencies will gain greater acceptance.
- While there remain concerns about the use of bitcoins and other digital currencies in unlawful or unsavoury activities, there is also support for new currencies. Current Federal Reserve Chair, Ben Bernanke, wrote in a letter tabled by the Senate committee (https://www.documentcloud.org/documents/835843-virtual-currency-hearings.html) that virtual or digital currencies *"may hold long term promise, particularly if the innovations promote a faster, more secure and more efficient payment system."*
- The emergence of digital currencies like bitcoins will provide further tests for the global economy. As was demonstrated with the near default of Cyprus in early/mid 2013, the importance doesn't lie with the size of the economy or financial system but the fear of contagion. With greater acceptance of digital currencies, there is a greater risk of contagion across the traditional financial system.

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