

October 7, 2014

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GOLD VERSUS BITCOIN AS A STORE OF VALUE

Of the 118 known elements, how did #79 become a store of value? Why not #78, platinum, #80, mercury, or some other element? There have been many explanations over the years:

- Gold was the first metal to be discovered (circa 3500 BC). Unlike other metals which had to be mined and processed, gold was found in nugget form in stream beds.
- Supplies are scarce, but not rare enough to be impossible to find.
- Gold's unique color allowed it to be easily identified.
- Gold is the most malleable and ductile of all known metals and does not decay, corrode, or tarnish when exposed to air, making it a preferred medium for decoration and jewelry dating back to prehistoric times.
- Gold is unreactive, a desirable characteristic for physical currencies.
- High density makes transportation easy and counterfeiting difficult, as simple weight and volume calculations can determine authenticity.
- Fungibility allows for a standard and uniform basis for currency.
- It has a sufficiently low melting point that it can be inexpensively made into uniform and divisible units.
- Compared with other early potential stores of value, like livestock or foodstuffs, gold is relatively inexpensive to store and maintain.

Precious metals were used in commerce in Mesopotamia since the Bronze Age, but coins originated much later, during the 6th century BC, in Anatolia (present-day Turkey). Gold eventually became a primary form of money, falling into disuse in the early 20th century. Most of the world stopped making gold coins by 1933, as countries switched from the gold standard due to hoarding during the Great Depression.

"Economics is often a contentious subject, but economists agree about the gold standard – it is a barbarous relic that belongs in the dustbin of history. As University of Chicago professor Richard Thaler points out, exactly zero economists endorsed the idea in a recent poll. What makes it such an idea non grata? It prevents the central bank from fighting recessions by outsourcing monetary policy decisions to how much gold we have – which, in turn, depends on our trade balance and on how much of the shiny rock we can dig up. When we peg the dollar to gold we have to raise interest rates when gold is scarce, regardless of the state of the economy. This policy inflexibility was the major cause of the Great Depression, as governments were forced to tighten policy at the worst possible moment. It's no coincidence that the sooner a country abandoned the gold standard, the sooner it began recovering."

Matthew O'Brien, *The Atlantic*, August 26, 2012

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Inflation (and deflation) was much worse under the gold standard than it has been since. In fact, there has only been 4% of the variance in U.S. CPI since the Fed started quantitative easing than there was under the gold standard. For example, CPI fell from 23.7% in June 1920 to -15.8% one year later, in June 1921. Under quantitative easing, CPI has ranged from 3.9% in September 2011 to 1.0% in October 2013. In fact, CPI growth was higher in each of the 11 months (November 2007 – September 2008) prior to the beginning of quantitative easing than in any month since.

What makes the belief that the gold standard leads to price stability so odd is that the Austrian school of economics, the most prominent group advocating the gold standard, is actually quite notable for its criticism of the very idea of “price stability”.

What Underpins Gold’s Value Today?

While there have been extended periods of underperformance, gold prices increased at 4.62% CAGR in the 80 years between July 1934 and July 2014, almost a percentage point better than the 3.66% CAGR of U.S. CPI – little wonder that people have a high regard for gold as protection against inflation.

So far this decade, only 9% of gold demand has come from industry. Jewelry (48%) has been the most important use, followed by private investments (34%) and official holdings (8%).

Gold Demand

| | Metric Tons | | | | | |
|----------------------------|--------------|--------------|--------------|--------------|---------------|-------|
| | 2010 | 2011 | 2012 | 2013 | Total | Pct. |
| Jewelry | 2,034 | 2,030 | 1,999 | 2,361 | 8,424 | 48.0% |
| Investment | 1,607 | 1,758 | 1,626 | 886 | 5,877 | 33.5% |
| Industry | 420 | 415 | 377 | 373 | 1,584 | 9.0% |
| Dentistry | 49 | 43 | 39 | 36 | 167 | 0.9% |
| Central Bank Net Purchases | 77 | 457 | 544 | 409 | 1,487 | 8.5% |
| Total | 4,187 | 4,702 | 4,585 | 4,065 | 17,539 | |
| India | 1,006 | 864 | 864 | 975 | 3,710 | 21.2% |
| China | 667 | 818 | 818 | 1,120 | 3,452 | 19.7% |

Source: World Gold Council

Gold has retained its value as an investment asset largely because of India and China, although demand has increasingly reflected prices, one explanation for the dip in 2013 and so far in 2014.

- Jewelry in many cases is an investment. The single largest buyers of gold have been Indians, who wear their net worth every day, distrusting or not having access to banks, and China, taking advantage of their recent wealth. Widespread adoption of bitcoin could significantly reduce demand, as rural Indian women would be less willing to wear their household’s entire net wealth when they leave their house.
- Industrial and dentistry have declined in recent years, responding to higher prices.
- Central banks sold 2,260 tons of gold in 2004-09. Since then, they have been net buyers (1,487 tons in 2010-13), primarily to diversify their portfolios, especially from USD-denominated assets. At the end of 2013, there were 31,320 metric tons of gold in official

reserves. Over the last decade, Russia's Central Bank acquired 570 metrics tons of gold, 25% more than China. China, however, is suspected of downplaying its actual gold purchases as it prepared to introduce the Yuan as a reserve currency.

Bitcoin Versus Gold

Bitcoin's superiority over gold lies in its protocol. Bitcoin mining reaps more than just the creation of bitcoins. Mining for gold just adds more gold to the market. The concept of gold's intrinsic value is ultimately misplaced, as gold's value lies not in the material itself but instead in its potential utility. In contrast, Bitcoin's intrinsic value lies in its ability to provide secure, reliable transactions of arbitrary value within an ecosystem that self-strengthens through mining.

There are some similarities between bitcoins and gold, but certain key differences are glaringly important. It is similar in that:

- Speculation causes it to react to surges in consumer sentiment.
- It is not immune to international movements in markets.
- It functions as an intermediary means of exchange-value storage: if you invest X amount in either, at some point in the future you assume the ability to extract the initial X amount invested plus or minus the change in its market worth.

Unfortunately for gold, it is relatively stagnant in terms of its use. It does have a few industrial applications, and generally gold has been a hedge against market fear and fiat-currency inflation. Mostly, gold acts as a crude storage of historically-induced, market-imposed value.

In comparison, Bitcoin, is remarkably different – its market ecosystem is unique compared with all other contemporary forms of value (e.g., gold, fiat money, and barter systems cannot “teleport” arbitrary-sized value between individuals, nor do they come with third-party ledgers). Bitcoin is anything but a crude storage of value, and the “intrinsic value” of bitcoins is readily apparent. In comparing the varied “protocols” inherent to gold and Bitcoin, the key differences become clear:

- Gold as an ecosystem has two parts that rely on each other's output. Gold markets serve as a means for consumers to trade gold, and gold mines serve as a place to find gold and transfer newly-acquired gold to these markets. It is a crude yet functional system with significant value because of the number of players, its market capitalization, its supposed actual value, and the intrinsic relationship between mined gold and gold which has not yet been mined. More important, banks consider gold to be a semi-prime asset.
- In comparison, Bitcoin is an ecosystem that also has two parts; but unlike gold, these two parts are symbiotically integrated as an undeniable and fundamental function of the protocol which underlies Bitcoin. Like gold's provisional system, the bitcoin mine also functions upon a need for efficiency and the potential for profit – bitcoin miners certainly compete against each other because only one miner can earn the right of seigniorage for a given “block”, but they have extremely limited control over the rate of new bitcoin issuance. Gold mining is market-driven, while bitcoin mining is algorithm-driven.

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Yes, both types of miners are rewarded for their hard work. In addition to their award of newly-created bitcoins, bitcoin miners confirm transactions to the rest of the network, providing comprehensive security for the use, transfer, and storage of all bitcoins. For gold to have these traits, it would be analogous to expecting contemporary gold miners to simultaneously act as transaction security for every trade in gold: armed guards, checkpoints, concealed transaction values, guaranteed delivery of every transaction worldwide, and a constantly updated ledger for confirmation.

Unlike gold, Bitcoin has embedded transaction security and reliability in its protocol. Bitcoin's security gets more robust as more individuals participate in both the market and the mine. Bitcoin facilitates frequent, secured, and valued transactions of varied amounts between varied individuals, all without person-to-person trust, in a manner that is both globally visible and publicly auditable.

Bitcoin's intrinsic value lies in its ability to provide secure, reliable transactions every time as a protocol (although humans do make mistakes in specific implementations of said protocol, so it's not "perfect"). Bitcoin's embedded security with a lack of central bank manipulation, nearly instantaneous and free transactions, increasingly liquid markets, and accelerating adoption rate is attractive to any contemporary investor that is looking for the new safe haven of exchange-value and the future of technological innovation.

We believe Bitcoin has many advantages over gold:

- Difficult to steal. Unlike in *Goldfinger*, there is no central location holding a significant percentage of bitcoins. Nor can a thug snatch a bitcoin chain from around someone's neck.
- Gold's weight and value make it difficult to ship. The Federal Reserve Bank of New York holds 7,716 metric tons of bullion. Transactions between countries involve a forklift moving gold from one pile to another. Bitcoin's protocol allows value to be quickly moved around the globe.
- Can be used for small purchases, while gold isn't used as currency anywhere in the world.
- Limited supply, while precious metals continue to be mined. The U.S. Geological Survey estimates that there are 52,000 metric tons of gold still in the ground, with more to be discovered.
- Easy to verify. The United States' gold reserves haven't been examined since 1950, and then without outside observers. Three-time presidential candidate Ron Paul isn't the only one wondering whether Ft. Knox's vaults are empty.
- Less wasteful of manpower. With gold at \$1,300 per Troy ounce, the 8,133.5 metric tons of gold in our official reserve are worth \$339.9 billion. This is the equivalent of 12.3 million years of work with U.S. median personal income at \$27,659, 84 times the 146,000 man-years of work estimated to build the Great Pyramid of Giza. At least people can see the pyramids.

Hass McCook has written a thorough comparison of bitcoin and gold costs. Here are some highlights from his [report](#):

- The annual cost of mining gold is \$105 billion vs. \$0.79 billion for Bitcoin.
- Gold mining uses 475 million gigajoules of energy versus 3.6 million for Bitcoin.

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- Gold mining produces 54 million metric tons of CO2 vs. 0.6 million for Bitcoin.
- Gold costs over 100 worker deaths each year versus zero for Bitcoin.
- Gold incurs about \$600 million in corruption, money laundering, and black market costs each year versus a negligible amount for Bitcoin.

Bitcoin capitalization is a fraction of world foreign exchange reserves, official gold reserves, gold bars and coins held for investment, and gold in jewelry, an important store of wealth in countries such as India. What will happen to bitcoin price with widespread adoption?

What Could Bitcoins Be Worth?

| <u>Category</u> | <u>Competition</u> | | <u>Market Capitalization (Billions)</u> | | <u>Price Per Bitcoin</u> |
|-------------------|-------------------------------|-----------|---|-----------|--------------------------|
| Inflation Hedge/ | Privately-held bars and coins | \$ | 1,164 E | \$ | 88,153 |
| Investment | Gold in jewelry | | 3,782 E | | 286,496 |
| Official Holdings | Gold | | 1,309 | | 99,172 |
| Industrial | Gold | | 873 E | | 66,114 |
| Unaccounted | Gold | | 145 E | | 11,019 |
| Gold | All Gold | \$ | 7,273 E | \$ | 550,954 |
| Official Holdings | Foreign Exchange | | 11,434 | | 866,237 |
| Remittances | Western Union, MoneyGram | | 10 | | 480 |
| Payments | Visa/MasterCard | | 341 | | 16,246 |
| World M2 | Governments | | 60,000 E | | 2,857,143 |
| Total | | \$ | 79,058 E | \$ | 4,291,060 |

Source: World Gold Council. Gold at \$1,300 per troy ounce.

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