

Crypto: Paradise Lost?

In the past year, banks have been scrambling to launch crypto services. Some high-profile institutions such as Tesla and Bridgewater have trumpeted their holdings of crypto assets, mainly bitcoins. In May, the skyrocketing cryptocurrency prices experienced a sudden collapse. Banks and funds who rushed to share a piece in the crypto market found themselves caught on the horns of a dilemma.

It brought us back to a few classic questions about cryptocurrencies. Are they real money? What are the fundamental properties of cryptocurrencies? Are cryptocurrencies, as virtual assets, risky assets or safe assets? Where are the crypto markets heading? Although we are still full of doubts about bitcoin, its future is becoming clearer.

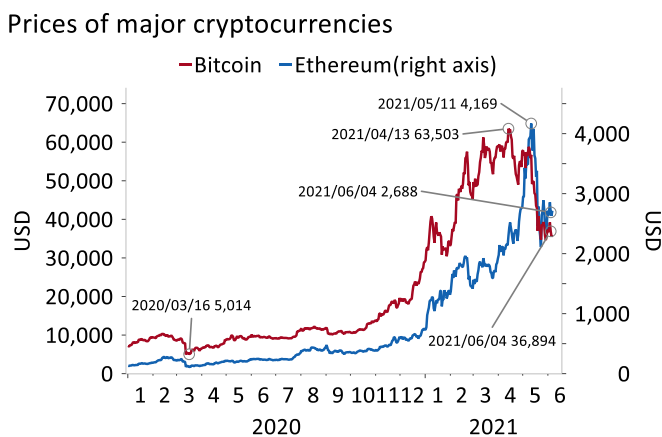
- **First, there is no possibility that bitcoin or other cryptocurrencies will replace sovereign fiat money.** Meanwhile, the development of digital currencies by central banks (CDBC) is accelerating. Even technically, bitcoin's de-centralized payment system is not as efficient as existing mobile payment systems. Bitcoin as payment medium is likely to be sidelined, evolving towards dark web transactions and underground economic activities as an alternative for cross-border payments. In this regard, governments across the world are bound to crack down on illegal transactions involving cryptocurrencies.
- **Second, we see crypto's future in becoming a new type of risky asset legally.** Following this trend, crypto will be favored by more institutional investors and have its place in the market portfolios. Becoming legal risky assets means crypto will be subject to proper regulation. As such, regulation is not a threat to bitcoin, but rather an opportunity for bitcoin to survive in the long run.
- **Third, the blockchain technology on which cryptocurrencies rely has broad development prospects.** However, the key to understanding this is to "disenchant", i.e. to rip off the mystery, sacredness, and charm attached to blockchain, and abandon the fantasy of anarchy and decentralization. Moreover, according to economics, financial intermediaries are born to solve the problem of trust and reduce transaction costs. Although blockchain technology has proven that decentralization can solve the trust problem, so far it has not reduced transaction costs.

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Since the beginning of the year, Wall Street's top banks have been scrambling to launch crypto products and services. Some high-profile institutions such as Tesla and Bridgewater have trumpeted their holdings of crypto assets, mainly bitcoins.

In May, the skyrocketing cryptocurrency prices experienced a sudden collapse (Figure 1). On May 11, Elon Musk announced Tesla has suspended vehicle purchases using bitcoins. The prices of bitcoin and other cryptocurrencies then plummeted by one third within a week. In China, given the extremely active mining and speculation activities, three industry associations including the National Internet Finance Association of China issued a joint announcement on May 18, prohibiting member institutions from carrying out virtual currency-related businesses. On May 21, the Financial Stability and Development Committee under the State Council asserted “crackdown on bitcoin mining and trading” at its 51st meeting. Since then, the price of bitcoin has fallen by as much as 50% from its historical high in April.

Figure 1: Plunge of cryptocurrency prices



Source: Macrobond, China Merchants Bank Institute

May has been an eventful month for cryptocurrencies. Banks who rushed to offer crypto services found themselves caught on the horns of a dilemma. It brought us back to a few classic questions about cryptocurrencies. Are they real money? What are the fundamental properties of cryptocurrencies? Are cryptocurrencies, as virtual assets, risky assets or safe assets? Where are the crypto markets heading? All these questions are worth thinking about in depth.

Crypto as Money: Utopian Imagination

According to the crypto community, bitcoin is originally created to provide a cryptographic digital currency without endorsement by the central bank, and can completely solve the problem of currency trust through so-called blockchain technology. This grand design has aroused widespread and intense curiosity. So, what is money? Why do we need cryptocurrencies?

Money exists because it serves a fundamental economic purpose: facilitating the exchange of goods and services. Without money, people would have to barter, i.e. to directly exchange goods and services for other goods and services. In a barter economy, each exchange requires an exact match of the needs between two parties. For example, a transaction between a butcher who needs rice and a farmer who needs pork can proceed only when they are in exact agreement on time, space, and quantity. Barter greatly constrains economic development. To solve this problem, money was invented. If all

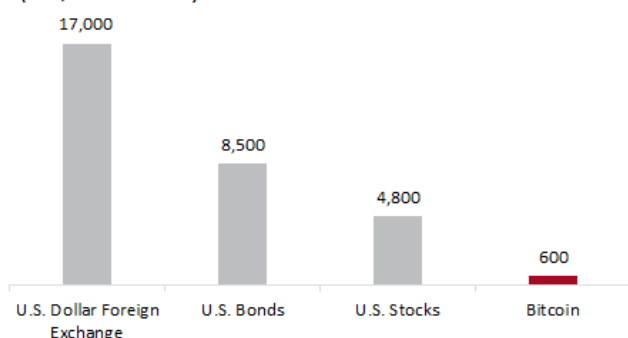
members of the society agree to accept a certain commonly recognized value representative (money) as a medium of exchange, payments can be made immediately and people's needs can be met effectively, which enhances economic efficiency. Therefore, the primary function of money is to serve as a medium of exchange.

What can be used as a medium of exchange? This implies two other functions of money. First, money is used as a unit of account to express prices, which requires the value of money to be relatively stable. Second, to express prices, money needs to be a store of value. In other words, money needs to carry people's trust in value, either "In Gold We Trust", or "In God We Trust".

Bitcoin is named "coin", but can it really serve the functions of money? On the surface, it seems that bitcoin can be used as a medium of exchange, otherwise Elon Musk would not have announced in March that he was considering accepting bitcoin payments. However, bitcoin, as a medium of exchange, encounters many insurmountable problems in reality.

Lack of liquidity is the most important. We all know cash is the most liquid, followed by treasury bonds, and then stocks (Figure 2). The Bitcoin network, subject to storage space and safety considerations, limits the size and generation speed of the blocks used to store transaction records, thus fundamentally limits its transaction processing speed and capacity. This is known as the Bitcoin scalability problem. Currently, the volume of transactions processed by the Bitcoin network is approximately 300,000 per day, which is just a drop in the bucket compared to other electronic payment systems such as credit card, WeChat Pay, and Alipay etc. (Figure 3). Due to its long transaction confirmation lag, customer experience for bitcoin as a medium of exchange is extremely poor.

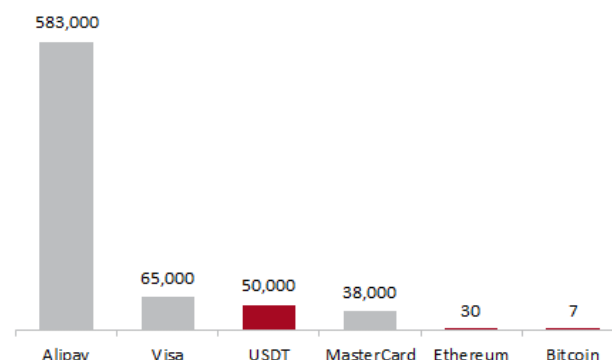
Figure 2: Bitcoin's average daily trading volume is much lower than that of other major assets

 Average trading volume of bitcoin and other assets
 (US\$100 million)


Source: BIS, CBOE, SIFMA, China Merchants Bank Institute

Figure 3: The transaction processing speed of the Bitcoin network is extremely low

Maximum number of transactions per second

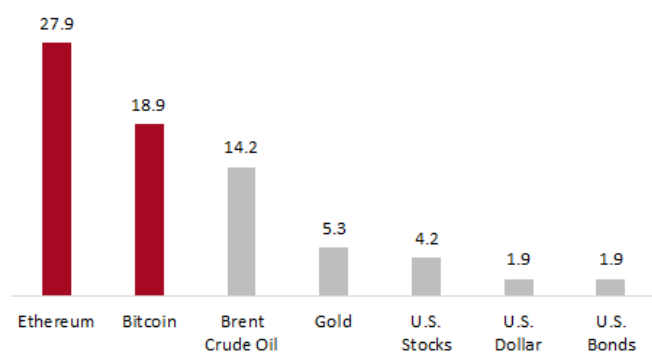


Source: Public information, China Merchants Bank Institute

Similarly, bitcoin cannot meet the requirements of a unit of account and a store of value. Its price is too volatile to be a useful unit of account (Figure 4). Nor is it a credible stored-value product, as it has no actual value and no endorsement by the government or the central bank. However, in the view of the crypto advocates, the government and the central bank themselves are not at all credible. As the central bank prints money without restraint, inflation continues to erode the purchasing power of the fiat money. The controversy will go on. However, challenging the power of a sovereign in money issuance is unlikely to succeed. Therefore, so far, no country has recognized bitcoin or any other cryptocurrencies as a real currency.

Nevertheless, as a medium of exchange, bitcoin and other cryptocurrencies have demonstrated unique possibilities in cross-border payments. Given its characteristics of decentralization, anonymity, and portability without borders, bitcoin is widely used for extortion, drug trafficking, gambling, pornography, money laundering, tax evasion and other illegal transactions. Although it is not easy to measure the volume of illegal transactions conducted in cryptocurrencies due to anonymous encryption, it is foreseeable that cross-border cryptocurrency payments will face increasingly stringent regulatory supervision and law enforcement.

Figure 4: Cryptocurrencies are highly volatile in returns

 Volatility of returns of different assets
 (% , 12-month standard deviation)


Source: Macrobond, China Merchants Bank Institute

Crypto as Assets: Digital Gold?

Crypto, as a tradable asset class, not as money, have been increasingly recognized by the financial market participants. The U.S. Commodity Futures Trading Commission (CFTC) regards Bitcoin as a commodity. China defines bitcoin as a “virtual commodity”, to distinguish it from physical commodities.

Like all financial assets, the price of a cryptocurrency is ultimately determined by supply and demand. The crypto investors believe that due to its limited supply, different from all fiat currencies, the value of bitcoin can withstand inflation. The supply of bitcoin is generated from a process called “mining”, which provides incentives to maintain the entire Bitcoin ecosystem. Mining refers to a process of solving difficult mathematical problems through computer operations. The miner who discovers a solution first will “dig out” a certain number of bitcoins. The rewards for mining initially were 50 bitcoins per block, and then halved every four years, a process known as “bitcoin halving”, to the current 6.25 bitcoins per block. As a result, the total supply of bitcoin is fixed, and its incremental supply gradually decreases. In the end, the number of bitcoins is limited to 21 million. At present, about 18.7 million bitcoins have been created. In fact, taking into account of the “lost” bitcoins, the number of bitcoins in circulation is significantly less than the theoretical value. Thus the supply of bitcoin is even deflationary.

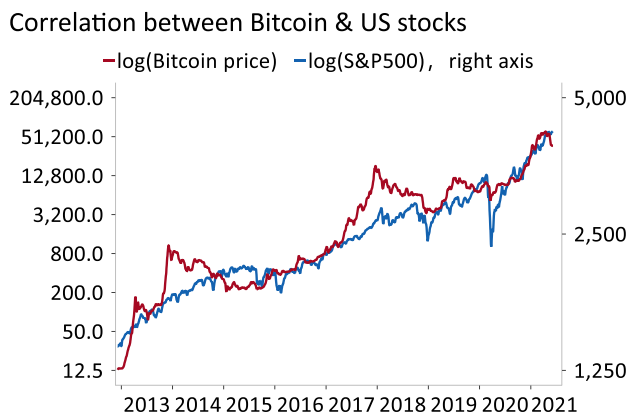
This reminds us of gold. Many cryptocurrency advocates believe that bitcoin is a “digital gold” that can replace real gold as an effective hedge against inflation. Legacy financial institutions, including Goldman Sachs and JPMorgan Chase, believe that bitcoin can be used as a store of value and hedge against inflation in investment portfolios, and hope that “digital gold” would eventually replace traditional gold.

In my view, the term “digital gold” seems more like a marketing slogan, and is therefore questionable. As a precious metal, gold has practical uses, such as making jewelry and chips, while bitcoin has no intrinsic value. Even as an investment, gold has proved to be a safe-haven asset in the period of high uncertainty due to its high market value, good liquidity, low volatility, and low correlation with stocks.

Crypto behave more like risky assets. The market volatility in May fully demonstrates that bitcoin is no haven against risk. Historically, the price trends of bitcoin are highly similar to those of stocks, especially small-cap ones, which are also risky assets (Figure 5).

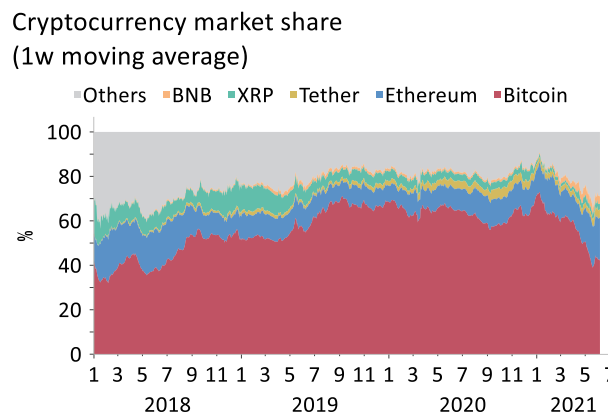
Also, bitcoin’s function as an inflation hedge seems to be exaggerated, or at least not empirically verified. Crypto enthusiasts often emphasize that bitcoin supply is limited to 21 million, to prove that its value will not depreciate like fiat currencies as inflation rises. However, this argument remains vulnerable, because cryptocurrencies are springing up like mushrooms. A small team of programmers can easily develop a new cryptocurrency. In fact, we have seen various emerging cryptocurrencies which are more novel and advanced in terms of technology. Essentially, there is no upper limit for the aggregate supply of cryptocurrencies. It is difficult to count how many types of cryptocurrencies there are. A rough estimate is over 6,000, of which at least 1,600 have disappeared. The emergence of new cryptocurrencies has brought down the market share of bitcoin from its 90% peak before 2017 to about 50% now (Figure 6).

Figure 5: Bitcoin behaves more like risky assets



Source: Macrobond, China Merchants Bank Institute

Figure 6: Bitcoin’s market share in cryptocurrencies declined



Source: Macrobond, China Merchants Bank Institute

My conclusion is that bitcoin, as a tradable virtual asset, is highly risky. It resembles gold in that it can hedge against inflation, although this argument remains doubtful. It is different from gold in that it is a high-risk asset rather than a safe-haven asset. So the idea of replacing gold with bitcoin may not happen, as evidenced by the divergence between bitcoin and gold prices since late May.

Bitcoin in China: Paradise Lost

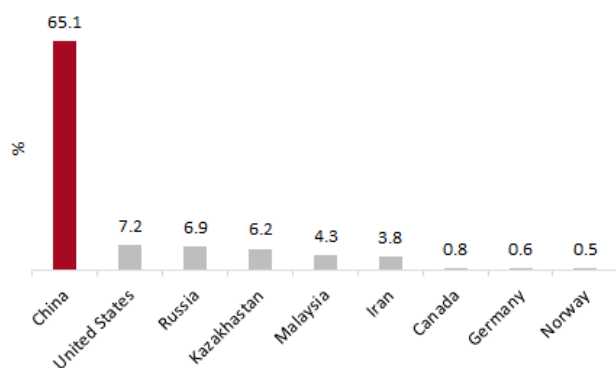
During my visit to the United States in 2015, a professor at a prestigious university once said to me “Thanks to the Chinese fervor, bitcoin becomes hot”. He was not joking. In fact, miners and investors in China are the main drivers for the development of the Bitcoin network for over a decade.

According to the Centre for Alternative Finance of the University of Cambridge, miners located in China take up 65% of global mining capacity, which means every 2 out of 3 bitcoins are dug out in China (Figure 7), and the ratio was even higher five year ago at 75%. During 2013 and 2017, Renminbi-denominated transactions accounted for over 80% of the total trading volume. Once this ratio was as high as 95%. Bitcoin speculators are, without exaggerating, mostly Chinese. (Figure 8).

In its prime, nodes located in mainland China made up more than half of total nodes in the global Bitcoin network. Since 2017, however, as the Chinese government started to crack down on bitcoin trading, the share of nodes in China declined rapidly, to about 3% now. Nevertheless, bitcoin mining in China remains active. As for trading, most mainland China investors either open accounts abroad or conduct point-to-point OTC transactions in China. At present, four out of the world’s five largest cryptocurrency exchanges are comprised of mainly Chinese investors.

Figure 7: China accounts for 65% of current Bitcoin's nodes

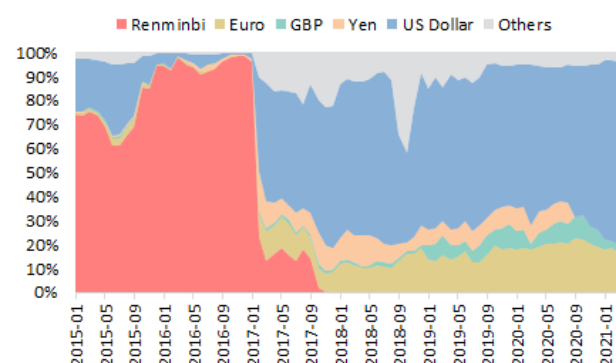
Distribution of Bitcoin's hash rate (%) in April 2021



Source: CCAF, China Merchants Bank Institute

Figure 8: Bitcoin transactions moved out of China after 2017

Percentage of Bitcoin transactions by currency type



Source: bitcoin.org, China Merchants Bank Institute

As Chinese fervor for bitcoin prevails, negative externalities spill over and China's social welfare is harmed. First of all, the Bitcoin network, as a financial innovation, does not improve financial efficiency. The decentralized payment system does not contribute to China's mobile payment sector. Secondly, energy consumption for bitcoin mining has been going up rapidly. It is estimated that the carbon emissions from bitcoin mining in China would rank ninth among all cities in mainland China. Without regulation, annual carbon emissions associated with bitcoin mining in China would peak in 2024 at 130 million tons, surpassing the total annual emissions of the Czech Republic, which now ranks 39th in the world. This obviously contradicts China's 2060 climate pledge. The negative externalities of bitcoin may also be the reason why Elon Musk broke his promise. After all, Tesla Inc., the world's biggest vehicle producer, labels itself as an innovative environmental-friendly company.

Besides the harm on social welfare, growing bitcoin transactions also impose risks on financial stability and investor protection. As bitcoin price hits new highs, transactions become more and more leveraged, volatile bitcoin price can affect other financial markets more easily. Moreover, the opaque and irreversible nature of bitcoin transactions makes it difficult to protect the rights and legitimate interests of investors.

The Fate of Crypto: Regulation is Coming

Although we are still full of doubts about bitcoin, its future is becoming clearer. In my view, we may draw the following three conclusions:

First, there is no possibility that bitcoin or other cryptocurrencies will replace sovereign fiat money. Meanwhile, the development of digital currencies by central banks (CDBC) is accelerating. Even technically, bitcoin's de-centralized payment system is not as efficient as existing mobile payment systems. However, due to its anonymous and credible payment mechanism, bitcoin is likely to become an alternative for cross-border payments evolving towards dark web transactions and underground economic activities. In this regard, governments across the world are bound to crack down on illegal transactions involving cryptocurrencies.

Second, as a new type of risky asset, with the proper regulation, crypto will be favored by more institutional investors and have its place in the market portfolios. In the history of bitcoin, there were two major crashes, with its price falling by over 90%, but it still survived and thrived. In fact, enhancing regulation is conducive to the healthy development of

bitcoin and other cryptocurrencies. It is not a threat to bitcoin, but rather an opportunity for bitcoin to survive in the long run. Crypto themselves are not demons.

Third, the blockchain technology on which cryptocurrencies rely has broad development prospects. However, the key to understanding this is to “disenchant”, i.e. to rip off the mystery, sacredness, and charm attached to blockchain, and abandon the fantasy of anarchy and decentralization. Moreover, according to economics, financial intermediaries are born to solve the problem of trust and reduce transaction costs. Although blockchain technology has proven that decentralization can solve the trust problem, so far it has not reduced transaction costs.

The fate of cryptocurrencies is more like a paradise lost. Come on, welcome to the real world.

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