

**Subject: File No. SR-CboeBZX-2021-019**

**From: SAM AHN**

This is my 15<sup>th</sup> comment on bitcoin. All my writings on bitcoin, including this, are about intrinsic value. My previous comments can be found at these links:

Link 1: <https://www.sec.gov/comments/sr-cboebzx-2018-040/srcboebzx2018040-4206251-172835.htm>

Link 2: <https://www.sec.gov/comments/sr-nysearca-2017-139/nysearca2017139-4221685-172898.htm>

Link 3: <https://www.sec.gov/comments/sr-cboebzx-2018-001/cboebzx2018001-4226785-172988.htm>

Link 4: <https://www.sec.gov/comments/sr-nysearca-2018-02/nysearca201802-4240462-173003.pdf>

Link 5: <https://www.sec.gov/comments/sr-cboebzx-2018-040/srcboebzx2018040-4274529-173133.pdf>

Link 6: <https://www.sec.gov/comments/sr-cboebzx-2018-040/srcboebzx2018040-4530331-176071.pdf>

Link 7: <https://www.sec.gov/comments/sr-cboebzx-2018-001/cboebzx2018001-4581773-176242.pdf>

Link 8: <https://www.sec.gov/comments/sr-cboebzx-2019-004/srcboebzx2019004-4934624-178449.pdf>

Link 9: <https://www.sec.gov/comments/sr-cboebzx-2019-004/srcboebzx2019004-5180412-183546.pdf>

Link 10: <https://www.sec.gov/comments/sr-cboebzx-2019-004/srcboebzx2019004-5318047-183890.pdf>

Link 11: <https://www.sec.gov/comments/sr-nysearca-2019-01/srnysearca201901-5524009-185228.pdf>

Link 12: <https://www.sec.gov/comments/sr-nysearca-2019-01/srnysearca201901-5706832-185947.pdf>

Link 13: <https://www.sec.gov/comments/sr-nysearca-2019-01/srnysearca201901-5717064-186027.pdf>

Link 14: <https://www.sec.gov/comments/sr-nysearca-2019-39/srnysearca201939-5810618-187451.pdf>

The purpose of this one is to help the SEC think of what an approval can entail. What triggered this writing is Quote 1 below, comprising the text and its footnote, in Page 3 of Link 15 hereunder:

Link 15: <https://www.sec.gov/rules/sro/cboebzx/2021/34-91326.pdf>

(Quote 1) It's generally understood that the combination of these two features – a systemic **hard cap** of 21 million bitcoin and the ability to transact **trustlessly** with anyone connected to the Bitcoin Network – gives bitcoin its value.<sup>7</sup>

For additional information about bitcoin and the Bitcoin Network, see

Link 16: <https://bitcoin.org/en/getting-started> ;

Link 17: <https://www.fidelitydigitalassets.com/articles/addressing-bitcoin-criticisms> ; and

Link 18: <https://www.vaneck.com/education/investment-ideas/investing-in-bitcoin-and-digitalassets/>

As the value of bitcoin, the applicant avoided its own opinion by saying “it's generally understood” and referring to Links 16, 17 and 18 above. According to the applicant's understanding, the value of bitcoin looks coming from (1) **hard cap of 21 million bitcoin** and (2) **the ability to transact trustlessly**. These two features can look profound if you are comparatively new to bitcoin debates. I would like to help clarify the meaning of these two concepts, and you see if they are deep or shallow.

What is called **hard cap** has been implemented by using just two simple measures:

The first measure is to limit the number of starting zeros (0) required to pass between 16 and 18 so that mining success occurs approximately every 10 minutes. For example, in a game where the number of starting zeros is set to 16, if someone succeeds in mining in 7 minutes, the next step gets designed to create 17 starting zeroes for a succeed mining. In such a setting, if the next successful mining is gets done 15 minutes, then the required number of zeroes gets reduced back to 16 the next time.

Now, the second measure. During the first four years (2009-2012) from the year the bitcoin was created (2009), 50 bitcoins were awarded for one successful mining. It is regulated to halve the number of bitcoins per a successful mining every four years. The reward was 25 bitcoins during 2013-2016, 12.5 bitcoins during 2017-2020. Now in 2021, one successful mining gets 6.25 bitcoins.

The average time for one successful mining event to occur is 10 minutes, and the number of bitcoins mined in the first 4 years is calculated as follows:

$50 \text{ bitcoins/mining success} \times 6 \text{ mining successes/hour} \times 24 \text{ hours/day} \times 365 \text{ days/year} \times 4 \text{ years} = 10,512,000 \text{ bitcoins.}$

In the next four years, a half of 10.512,000 bitcoins were mined. When continued forever in this way, the number of all bitcoins that can be mined is limited to double the above 10,512,000, or 21,024,000.

To verify this calculation, you only need a piece of copy paper. First, fold the paper in half and tear it up, and write "a = 10,512,000" on only one side. Fold the side with nothing written on it again in half, tear it in half, and put it on the piece of paper bearing "a=10,512,000." Tear the remaining half in half and repeat the same action.

If you repeat this until you are bored, the paper on the side with "a" is piled up, and the paper on the other side keeps getting smaller. The smaller paper does not disappear, and the sum of all the pieces piled up can never reach the size of whole paper at the beginning.

The whole paper at the beginning is exactly twice as many as it half bearing "a = 10,512,000," which 21,024,000. The bottom line of the saying that the number of bitcoins that can be mined is 21 million is roughly like this.

**The word "trustlessly" means you can make bitcoin transactions without a medium, like a bank, whom you trust.**

Most bitcoin investors around me use a transaction platform at Coinbase to buy and sell bitcoins. If they do not trust Coinbase, they would not use its platform. Therefore, in my view, the "trustlessly" argument in Quote 1 is false and misleading.

Trustless-ness means bank-less-ness. But you cannot borrow money and buy house without a bank. You cannot borrow bitcoin from anywhere. You a house with borrowed bitcoin. One important function, important but seldom mentioned, is lendability. Bitcoin is not lendable. It is a deficiency, but bitcoin advocates (unknowingly) take pride in it by saying "bitcoin does not require a bank."

The nature of money is not known well.

In the meantime, bitcoin is about to be claimed as money.

The applicant did not say it is money, but provided Links 16, 17 and 18 as in Quote 1 above.

Link 18 takes us nowhere. At Link 16, it is asserted that bitcoin is money, but there is little theoretical development there. At Link 17, we can find something serious about the value of bitcoin, as in Quotes 2 and 3 below:

(Quote 2) Bitcoin is not backed by cash flows, industrial utility, or **decree**. It is backed by code and the **consensus** that exists among its key stakeholders.

The writer at Link 17 wants to contrast **decree** and **consensus** for comparison of fiat currencies. The reason why a consensus makes value is not well explained. Generally, in the market, a consensus of buyers and sellers make value, but this value is market price. The consensus in Quote 2 does not mean market price. The consensus mentioned here is confirmation by "key stakeholders" of bitcoin. Specifically, the confirmation said here is recognition of a successful mining. I explained what mining means in detail at Link 8 above.

Instead of clarifying why a consensus make value, the writer at Link 17 argued how empty a decree is, Quote 3:

(Quote 3) **Fiat exists by decree**. The argument for fiat currencies is that they (fiat) are backed by the full faith and credit of the government. However, in many situations, **faith in the ability of governments and central banks to appropriately manage fiat currencies has been misplaced (see Venezuela and Lebanon for recent examples)**. Multiple central banks and governments have exhausted monetary and fiscal policies as a lever, leading to notable losses in the purchasing power of their currency over time.

**Decree** is not empty. It is a declaration of "I owe you." Payment of tax is settlement of two debts in the directions opposite to each other. Tax is what you owe to the government and your money is what the government owes to you. Money is a debt instrument under 12 USC 411.

No government will take bitcoin as means of such a settlement, because bitcoin is not a debt instrument. What is neither a debt instrument nor a commodity cannot be a money. It is often said that "bitcoin is a commodity because it is money." The word "money" in the preceding sentence must be either a debt instrument money or a commodity money. As it is not a debt

instrument, bitcoin can be said to be only commodity money. Saying "bitcoin is a commodity because it is a commodity money" is a circular argument.

As fiat currency is a debt instrument, a weak issuer of a fiat ruins the value of the fiat. Monies of Venezuela and Lebanon went wrong because the issuers were incompetent. It is not that those monies failed simply because they were fiat.

This confusion continues because pivotal money authorities failed to explain well about fiat money. One example is Modern Money Mechanics at Link 19 below:

Link 19:

[https://upload.wikimedia.org/wikipedia/commons/4/4a/Modern\\_Money\\_Mechanics.pdf](https://upload.wikimedia.org/wikipedia/commons/4/4a/Modern_Money_Mechanics.pdf)

On its Page 3, the explanation under "What Makes Money Valuable?" is wrong and insufficient. I wish it to be revised, for example, as follows:

Blue ink: the text at Link 19

Black ink: Sam Ahn's draft for revision

In the United States neither paper currency nor deposits have value as commodities. Intrinsically, a dollar bill is just a piece of paper, deposits merely book entries. Coins do have some intrinsic value as metal, but generally far less than their face value.

In the United States, both paper currencies and bank deposits are debt instruments. Intrinsically, the value of a non-money debt instrument depends upon many factors including (1) maturity date, (2) stated interest rate, (3) present market interest rate, (4) expected future market interest rate, (5) the debtor's credit standing and (6) the value of money in which the instrument is written. The value of money, which is a debt instrument with neither interest nor maturity, depends upon (7) the issuing bank's credit standing and (8) prices of goods and services being traded in terms of the money in question.

Myth has it that a dollar bill is just a piece of paper and deposits merely book entries. When bills and deposits are recognized as debt instruments, however, neither the value of a dollar bill nor the value of a line of deposit record deserves such derogatory a word as "just" or "merely."

Coins are being treated as commodities in the current accounting of the Fed and US Mint. In truth, they are also debt instruments. The value of coins depends upon the same (7) and (8) above. Coins are not commodities because the value of coins has nothing to do with the value of metal therein. Accounting for coins is destined to evolve accordingly.

What, then, makes these instruments - checks, paper money, and coins - acceptable at face value in payment of all debts and for other monetary uses? Mainly, it is the confidence people

have that they will be able to exchange such money for other financial assets and for real goods and services whenever they choose to do so.

Myth has it that confidence of the users empowers money to command financial assets and real goods and services, insinuating that people's confidence in money comes from authoritative mandate and/or social consent alone. Said confidence, however, comes from something much more concrete than mandate or consent. As said above, people's confidence in money comes from the fact that money is a debt instrument. 12 USC 411 reads, "The said notes shall be obligations of the United States." What is meant by "obligation" in the preceding sentence is debt. In the Balance Sheets of Federal Reserve System, outstanding Federal Reserve Notes are treated as debt.

Money, like anything else, derives its value from its scarcity in relation to its usefulness. Commodities or services are more or less valuable because there are more or less of them relative to the amounts people want.

Myth has it that money, like anything else, derives its value from its scarcity in relation to its usefulness, insinuating that money is a commodity. Modern money, however, is not a commodity and ceased to represent a commodity in 1971. Modern money is a debt instrument, of which value has nothing to do with quantities of its supply and its demand.

Money's usefulness is its unique ability to command other goods and services and to permit a holder to be constantly ready to do so. How much money is demanded depends on several factors, such as the total volume of transactions in the economy at any given time, the payments habits of the society, the amount of money that individuals and businesses want to keep on hand to take care of unexpected transactions, and the foregone earnings of holding financial assets in the form of money rather than some other asset.

Money's usefulness is its perfect liquidity. As a broken metal hoe can be forged into a metal hammer only through liquid state of the metal, your asset in the form of land parcels can be transformed to another asset in the form of treasury bonds only through the liquidity of money. Demand for money is demand for liquidity.

Demand for money increases in support of economic changes, such as inflation, a boom, a change in industrial structure and an economic crisis. Demand for money also increases when the government increases its debt.

Control of the quantity of money is essential if its value is to be kept stable. Money's real value can be measured only in terms of what it will buy. Therefore, its value varies inversely with the general level of prices. Assuming a constant rate of use, if the volume of money grows more rapidly than the rate at which the output of real goods and services increases, prices will rise. This will happen because there will be more money than there will be goods and services to

spend it on at prevailing prices. But if, on the other hand, growth in the supply of money does not keep pace with the economy's current production, then prices will fall, the nation's labor force, factories, and other production facilities will not be fully employed, or both.

Myth has it that control of the quantity of money is essential if its value is to be kept stable. There are two fatal errors in this myth. First, as money is supplied passively in most cases, no central bank has enough tools to control quantity of money as effectively as it intends. When Congress decides to spend, the central bank must follow. When FDIC loosens lending guides, the central bank must acquiesce. The only tool, as to quantity of money, in the hands of the central bank is interest rate. Before the central bank's decision to interest rate, it must take employment status into consideration.

Second, controlling quantity of money will not influence prices as imagined under quantity theory of money. Short supply of goods and services, not quantity of money, moves the price up. And then increased prices demand more money. Money will be supplied passively in respond to demand.

Line 20: <https://www.kansascityfed.org/publicat/econrev/pdf/3q07kahn.pdf>

Money supply depends on money demand, not on interest rate. Interest is decided by the word of the Fed. Quantity theory of money is fundamentally erroneous in that supply of money is meaningless.

Link 21: [http://www.federalreserve.gov/faqs/money\\_12845.htm](http://www.federalreserve.gov/faqs/money_12845.htm)

The value of a unit of money is determined by prices of goods and services, not vice versa. Quantity theory of money is based on confusion of causality between money and prices.

Inflation always involves increase of money, but the locomotive of price increase is not money but shortage of supply. The value of money changes depending on (7) and (8) above. Inflation stops when goods are amply supplied. The best example of this truth is what happened to Weimar Republic in 1924.

Just how large the stock of money needs to be in order to handle the transactions of the economy without exerting undue influence on the price level depends on how intensively money is being used. Every transaction deposit balance and every dollar bill is a part of somebody's spendable funds at any given time, ready to move to other owners as transactions take place. Some holders spend money quickly after they get it, making these funds available for other uses. Others, however, hold money for longer periods. Obviously, when some money remains idle, a larger total is needed to accomplish any given volume of transactions.

It is true that one person's spending makes funds available for other users, but this way of thinking can erroneously support quantity theory of money.

Creation of money is not creation of commodities, but creation of a pair of positions: of a debtor and of a creditor. The two positions are of equal amount in the opposite directions. The sum of those positions remains zero, no matter how much money is created.

It is true that money is created out of thin air, but it stays thin air after the creation, because the sum of two positions created remain zero all the time. It is not that something is created out of nothing. Creation of money is creation of liquidity, which is not a thing but a state. Creation of liquidity is like melting a metal piece.

Therefore, the truth that one person's spending makes funds available for other users is not important and deserves nobody's attention. If you have non-money assets, you can borrow money from the bank by committing it as collateral. No spending of anybody is involved here. If Congress decides government spending, money will be created right there without anybody's spending. As far as the government has enough assets to support its debt, there is no problem with issuance of money.

The value of USD varies according to its location. When abroad, the value of USD varies according to the local money's value, which depends on (7) and (8) above of that specific locality, and exchange rate between the USD and the local money. The best of historical events showing how exchange rates change is Plaza Accord of 1985.