Photo: Rich Wood and Melanie Edwards

New Moneys in the Digital Era

The history of money helps explain the recent turmoil in cryptocurrencies.

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The views expressed in this article are not necessarily those of the Federal Reserve.

Cryptocurrencies such as Bitcoin and stablecoins such as TerraUSD have become enormously popular, triggering a public debate about if and how they should be regulated.[1] Although these private payment instruments are new, we can use standard monetary theory to make sense of them. Bitcoin, for example, is similar in many ways to gold, and stablecoins are like the bank notes provided by state banks in the 19th century. In this article, I explore the problems created by both traditional and digital moneys, and the solutions that have been adopted through years of trial and error. I find that cryptocurrencies have a long way to go before they are as safe and reliable as other moneys have become.

To understand the role of cryptocurrencies in the modern monetary system, it helps to distinguish between two types of money. Outside money is either fiat (unbacked by any asset) or backed by some asset that is not itself a liability for anyone in the private sector.[2] Historically, that asset was either gold or silver. But since 1914 the Federal Reserve has issued fiat money in the form of dollar bills. More recently, cryptocurrencies issued by private agents or firms are an example of unbacked outside moneys that are not issued by a government agency.

Inside money is created when two private parties engage in a transaction that involves the issuance of a liquid debt claim (that is, a claim that can circulate as a medium of exchange). When you deposit dollar bills at your commercial bank, you're creating inside money, because bank deposits can be easily transferred to other people as a means of payment, and because your bank account is an asset for one party (you) and a liability for the other party (your bank),

which has promised to pay you $1 (that is, a specific amount of outside money) for each unit of deposit. What's more, your bank can loan your $1 to someone else, essentially creating two (or more) inside dollars from your one outside dollar. Similarly, a money market mutual fund that offers you a checkable account is supplying inside money to your household. But unlike your bank account at a commercial bank, the value of your fund's share can vary over time because the assets backing the liabilities of the fund may fluctuate in value.

To sum up, in the modern monetary system, central banks control the amount of outside money created in the economy, and private financial firms issue inside money to facilitate private transactions. Inside money is usually a promise to pay outside money, and each dollar of outside money is backing several dollars of inside money. Next, I look at the U.S. experience during the past two centuries and identify the main features of the monetary system that contributed to monetary stability, paying particular attention to the interplay between inside and outside money.

What the U.S. Learned

The history of money in the U.S. has been a process of trial and error, with some hard-won lessons that also apply to cryptocurrencies. This history tells us two important things: First, an inelastic supply of outside money can impose severe constraints on economic growth and stability. And second, inside money is subject to unexpectedly large customer demands.

Outside money—which, in the 18th century, meant gold and silver coins that had to be imported—was scarce in colonial North America. The first settlers possessed the wealth but not the liquidity to run their farms. As business activity rapidly grew, the supply of these coins could not keep pace. In other words, the American colonies needed more money to support a growing economy.

Inside money—specifically, bank notes and, later, bank deposits—emerged as a means of payment to supplement a scarce supply of outside money.[3] As the supply of inside money gradually increased, it expanded aggregate liquidity in the economy and supported the growth of commercial activity during the second and third quarters of the 19th century. However, it became clear that the average growth of aggregate liquidity was not keeping pace with the expansion of the U.S. economy; most importantly, aggregate liquidity fluctuated considerably because of seasonal demand for liquidity and recurrent banking crises.[4]

As American economists Douglas Diamond and Philip Dybvig show in their Nobel Prize-winning research, bank runs are endemic to banks that create inside money. To understand why, imagine a simplified banking contract that gives depositors two options: They can either withdraw their funds next month and receive no interest, or withdraw their funds next year and receive interest payments. The bank invests the deposits in a portfolio containing illiquid assets, such as mortgages, and liquid assets, such as short-term government bonds. The bank can quickly sell the liquid assets at a predictable price if some depositors decide to withdraw next month. Meanwhile, the illiquid assets earn the bank interest income, which the bank can then use to make interest payments to the depositors who withdraw their money next year.[5] The bank accepts deposits from many depositors, some of whom will withdraw their money next month and some of whom will withdraw their money next year. Typically, only depositors who need to pay for something on short notice will withdraw their money next month. However, if all the depositors lose confidence in their bank and withdraw their money next month, there won't be enough money invested in the liquid assets to pay them all, and the otherwise stable bank may become bankrupt. This is called a bank run.[6] If many banks suffer a run at the same time, we say it is a *banking crisis*.

See ***The Diamond-Dybvig Theory of Bank Fragility.***

The Spanish milled dollar, minted from silver and worth eight reales, circulated more readily in North America than did British coins. After independence, Congress authorized the minting of U.S. dollar coins, equal to the value of the Spanish milled dollar. MJ0007/ISTOCK

A colonial-era bank note from the James River Bank of Virginia for 12 pounds. MAHER/ISTOCK

A mid-19th century bank note for $10. MAHER/ISTOCK

The Era of Bank Crises

Recurrent bank crises wracked the U.S. throughout the 19th century and into the 20th century. During this era, the international monetary system was based on precious metals (gold and silver until the early 1870s, and then solely gold until 1914). Under this standard, private payment instruments were essentially claims on a quantity of gold or silver, so available gold and silver supplies (that is, outside money) constrained the number of notes private banks could issue and the amount of the deposits they could accept (that is, the number and amounts of banks' inside money). As a result, the (inside and outside) money supply in the U.S. before the creation of the Federal Reserve was determined by the supply of gold. The gold standard provided remarkable price stability in the long run because of the convertibility of the money supply into gold.[7] However, it did not provide an automatic mechanism for expanding the supply of outside money during a banking crisis or any other distress in financial markets. In other words, the gold standard meant an inelastic supply of outside money.

This feature of the gold standard enabled recurrent banking crises.[8] In all these episodes, many banks suffering a run suspended the convertibility of their deposits to prevent further destruction of inside money. Normally, banks can obtain currency only by borrowing from other banks or by selling assets. But borrowing from other banks during a banking crisis was seldom an option because all nearby banks were also suffering large withdrawals from their own depositors. Selling illiquid assets at short notice resulted in severe losses to the distressed bank, which could make things worse. Because the first option was infeasible and the second unattractive, banks often suspended the convertibility of deposits, leaving depositors with no access to their funds—and no ability to pay their employees or bills, or make needed purchases or investments. The result for the aggregate economy was predictably disastrous.

One possible solution to these crises was to create a central bank with the legal authority to create more outside money—specifically, by making temporary loans to distressed banks in exchange for collateral (usually the banks' illiquid assets). This injection of liquidity into the banking system would enable a bank suffering a run to satisfy its depositors' demand for currency without having to sell its assets at fire-sale prices. When the panic was over, the central bank could remove the excess outside money from circulation by returning the collateral to the distressed banks. This form of intervention requires the central bank to have the ability to expand and contract the supply of outside money at short notice or at predictable times without external constraints. Economists refer to this property of the monetary system as an elastic outside money supply.

As previously mentioned, each dollar of outside money can back several dollars of inside money. During a banking crisis, depositors run to their banks to get currency (that is, outside money). As this process intensifies, inside money is destroyed. The central bank can provide emergency liquidity by issuing additional outside money and making temporary loans to the distressed banks. If the banks have enough outside money to pay all depositors who want to withdraw, people will be reassured about the safety of the banking system and will eventually redeposit their currency into the banking system. If everything goes well, all inside money initially destroyed during the crisis is

The Diamond-Dybvig Theory of Bank Fragility

The Diamond-Dybvig model of financial intermediation is a building block of financial economics because it provides a microeconomic account of banking activity that is distinct from other financial institutions. In particular, the model explains why banks issue a type of contract that is different from other financial contracts, such as bonds and equities, and why that contract is useful for households and firms. According to Diamond and Dybvig, the deposit contract offered by banks is inherently associated with the kind of intermediation provided by banking firms.

The deposit contract provides a solution to a simple problem. Investors want to earn the highest possible return on their savings and preserve their ability to tap into their savings to cover unexpected expenses. The assets that provide the highest rate of return are usually those that take a long time to mature and yield income. They are also hard to sell to other investors before maturity. Consider an entrepreneur with an excellent idea for a new product but with no funds to implement it. This person needs a loan to get started and won't be able to repay it until sales from the project start at a future date. This loan requires the lender to properly evaluate the borrower's business project and estimate its future income stream. Because the entrepreneur's project requires expertise to evaluate its profitability, and because it will be hard to find other investors who can properly evaluate the project so that the loan can be sold at a predictable price, the loan to the entrepreneur is an illiquid asset for the lender.

Investors can buy liquid assets to provide them with easy access to their funds. Liquid assets can be easily sold at a predictable price because the income stream associated with them can be easily evaluated by other investors. Precisely because liquid assets provide investors with convenient access to their funds, their yields are considerably lower than that of illiquid assets. (In fact, many liquid assets, such as short-term government bonds, yield a negative real rate of return for investors.)

Individual investors can directly invest in a portfolio containing both liquid and illiquid assets (assuming that they have the expertise to evaluate the income stream of these assets). They can sell their liquid assets if they need money at short notice and still earn a higher return on their illiquid assets. There is a problem with this investment strategy, though. Investors will end up holding a disproportionately large fraction of their portfolio in liquid assets to make sure they can cover larger-than-expected expenses under most scenarios. In other words, to insure against uncertainty, they sacrifice a higher return on their overall portfolios. Because investors are risk averse (that is, they avoid risk unless there is some advantage to be gained from accepting it), they tend to hold more liquid

An illustration of the Panic of 1873 outside the old New York Stock Exchange building on Broad Street. KEITH LANCE/ISTOCK

assets when they invest on their own. Diamond and Dybvig show that they can do better by depositing their money in a bank.

The bank's deposit contract allows investors either to withdraw their funds before maturity and earn a certain return or to withdraw their funds at maturity and earn a higher return. Because the bank collects funds from many investors, it can construct a portfolio of assets that pays a higher return to depositors who need to withdraw before maturity than can a portfolio of just liquid assets, provided the bank can confidently estimate the fraction of depositors who will not withdraw their funds until maturity. The return paid at maturity is lower than that of the illiquid assets, but the deposit contract offers insurance against uncertainty for all depositors, which is highly valuable to risk-averse investors who make their deposit decision without knowing the exact timing of their future disbursements. Thus, the deposit contract makes everybody better off. The bank attracts depositors and earns a profit, and the investors can readily access their funds without sacrificing too much of the higher return of the illiquid assets.

Diamond and Dybvig then show that this contract also implies that the bank is subject to runs. Recall that the bank gives all depositors the choice to withdraw before maturity if they need their funds early. What if a larger-than-expected fraction of depositors withdraw before maturity? Will the bank have enough funds left to pay out all depositors who wait until maturity? The bank can make good on the promised payment to depositors who wait until maturity only if it does not have to sell too many of its illiquid assets at a large discount to serve depositors who withdraw early. If it sells a large fraction of its illiquid assets to make good on a larger-than-expected number of early withdrawals, the remaining assets of the bank will not allow it to pay the promised return at maturity (because too many illiquid assets have been sold at a large discount). In fact, it is possible that the return paid at maturity is lower than that paid on early withdrawals.

If depositors believe that there will be a large number of withdrawals before maturity, they will run to the bank to withdraw their funds, even if they don't need the money. For this reason, a bank run can occur because investors believe that a sufficiently large number of other depositors will not wait until maturity to withdraw their funds, which will force the bank to sell its illiquid assets at a large discount, reducing the actual payment the bank can make to depositors who wait until maturity. This provides a perfectly rational explanation for a bank run, which is tied to the very nature of the deposit contract.

reissued. Because the banks did not have to suspend the convertibility of deposits or sell their illiquid assets at fire-sale prices during the crisis, economic activity is likely to return to its precrisis level. This requires that the central bank is not constrained by the quantity of gold in its vaults. In other words, the central bank must be able to create unbacked outside money in large quantities at short notice to prevent the collapse of inside money.[9]

The New Federal Reserve Confronts Major Challenges

The classical gold standard could not adjust quickly enough to respond to banking crises and other sudden fluctuations in financial markets, but outside money issued by the Federal Reserve could. Congress created the Federal Reserve in 1913 to provide an elastic supply of outside money that would smooth out fluctuations in short-term interest rates, and to serve as a lender of last resort for the banking system. Other advanced economies already had central banks, and economists understood the benefits of an elastic money supply provided by a central bank. However, although the Federal Reserve had the legal authority to provide liquidity to the financial system, it did not use this power to stop the collapse of the banking system during the early 1930s.

Without Federal Reserve intervention, widespread bank failures led to the contraction of inside money in the U.S. economy. In documenting the severe decline of the money supply at the outset of the Great Depression, American economists Anna Schwartz and Milton Friedman showed that the bank failures and the ensuing destruction of inside money accounted for the unprecedented decline in aggregate liquidity. From 1929 to 1933 the money supply declined by a third.

This severe contraction of the money supply was a painful learning experience for the Federal Reserve. As Schwartz and Friedman pointed out, had the Federal Reserve issued outside money at short notice by purchasing the illiquid assets of the banking system (that is, by making widespread loans to struggling banks), it could have prevented the destruction of inside money associated with bank runs.

Depositors run on American Union Bank early in the Great Depression in the aftermath of the stock market crash in 1929. GL ARCHIVE/ALAMY

The Federal Reserve learned its lesson: Since the Great Depression, it has been careful to provide emergency liquidity to failing banks.[10]

Therefore, the monetary system was remarkably stable until the 1960s. However, shadow banks (that is, financial institutions that operate outside of the federal regulatory framework but engage in the same activities as traditional banks) have blurred the boundaries between investment and commercial banking. Financial innovations and the deregulation of the financial system have changed the landscape of the monetary and banking systems, and new forms of inside and outside money have emerged.[11] Cryptocurrencies are one of those new forms.

What's New in Money

No matter what specific form they take, cryptocurrencies are either outside or inside money.

New Outside Moneys

Digital instruments such as Bitcoin and Ethereum have become enormously popular in recent years. Indeed, the market capitalization of just these two cryptocurrencies was $634 billion as of January 23, 2023. What makes cryptocurrencies like Bitcoin and Ethereum unique in monetary history is that they are unbacked (that is, fiat) outside money not issued by a government agency.

Can a cryptocurrency evolve into a currency system in which privately created outside money plays the same role as government-issued outside moneys in the existing payment systems?[12] In this scenario, the same relationship between outside and inside money would inevitably develop. For instance, we would expect to see crypto banks 1) issuing deposits that are a promise to pay Bitcoins to their depositors, and 2) holding Bitcoins as reserves to make good on their promises. In other words, each Bitcoin held by a crypto bank would be backing several Bitcoins of deposits. But if the supply of Bitcoin is inelastic, it will likely destabilize the monetary system, and that will severely limit its adoption by market participants worldwide and its development as a viable monetary standard. (Although I use Bitcoin as an example, my argument holds for other existing cryptocurrencies.)

The problem is that, to avoid major fluctuations in value, Bitcoin (and other cryptocurrencies) would have to fluctuate in value within a narrow band relative to a basket of major sovereign currencies. This would require frequent adjustments in the supply of Bitcoins in response to major events in financial markets. Every other currency that has evolved into a stable monetary system has necessarily developed mechanisms to provide sufficient elasticity to avoid major fluctuations in value.[13] But so far, no concrete steps have been taken to ensure that Bitcoin (or any other major cryptocurrency) operates as an elastic currency as defined in this article.

Can Bitcoin or any other cryptocurrency ever have this elasticity? Although a developer can predetermine certain features of a cryptocurrency, it is not clear how this elasticity can be programmed into a cryptocurrency protocol.[14] It appears that decentralization on the one hand, and the control of the supply of cryptocurrency in light of aggregate economic conditions on the other, are contradictory features of cryptocurrencies. These two features might never be reconciled within a unified framework.

Based on the accumulated experience and the theoretical research in monetary economics, it is hard to believe that any existing cryptocurrency will soon emerge as a sound monetary system, as opposed to a speculative investment vehicle.[15] Many issues need to be resolved before cryptocurrencies can revolutionize the international monetary system. After all, it took the incumbents many years to develop solutions for these problems. Why should it be any different for cryptocurrencies?

New Inside Moneys

As I have argued, one of the key functions of money is to be a store of value, which requires that the money have a relatively stable value. But cryptocurrencies have been quite volatile, making them more like a speculative investment than a stable source of value. To address this issue, stablecoins—a crypto inside money—were designed to provide a stable, temporary investment vehicle in the crypto environment as investors shifted their values from one cryptocurrency to another. Stablecoin issuers have learned that investors value this investment vehicle because its convertibility seems to promise stability. For this reason, stablecoins have emerged as an alternative to traditional investment vehicles. Indeed, some stablecoin issuers offer attractive interest payments on balances transferred to their stablecoins.

Because stablecoins work in such a simple way, their issuers can pitch them as being like another popular inside money: traditional bank deposits. Currently, the two major stablecoins according to their market capitalization are Tether and USD coin.[16] Tether is pegged to the U.S. dollar; its value has fluctuated within a narrow band around $1. Its issuer, Tether Limited, constantly manages the supply of Tether by creating and destroying tokens according to predetermined rules, and it publishes its reserves at a public web site, which enhances the credibility of the convertibility of Tether tokens into U.S. dollars.[17] USD coin is also pegged to the U.S. dollar. Its issuer, a consortium founded by Circle (a peer-to-peer payments technology company), claims that it is fully collateralized by U.S. dollars. Like Tether, USD coin had—until the recent collapse of Silicon Valley Bank, where USD coin had deposited its reserves—maintained its value within a narrow band around $1.

Stablecoin issuers report that the assets backing their tokens include deposit accounts at financial institutions, government bonds, and even some risky financial assets such as commercial paper. They report that these assets are held in custodial accounts at partner banks. In reality, it is not clear what types of assets stablecoin issuers hold as collateral for their tokens. Many stablecoin issuers claim that their tokens are fully backed by U.S. dollars, but the issuers do not specify the types of dollar assets it holds, so it is not clear whether all dollar assets backing stablecoins are safe assets, such as bank deposits and government bonds, or risky assets, such as commercial paper. No regulatory mechanism verifies the types of assets and corresponding balances in custodial accounts.

To sum up, stablecoins are digital tokens that promise to be

fully convertible into U.S. dollars, just like bank deposits. Stablecoin issuers use the proceeds from the issuance of tokens to buy dollar-denominated assets to serve as reserves. The issuers manage the supply of tokens so as to maintain a value of around $1 in secondary markets, which they believe makes the convertibility of their tokens into dollars credible. Issuers can then market stablecoins as being as safe as bank deposits.

The historical example of state banks in the antebellum U.S. can help us understand stablecoin issuers.[18] These early banks issued bank notes to finance their assets. Bank notes are a liability for the issuing bank, and antebellum banks were required to post state government bonds to secure their bank notes. Because state bonds fluctuated in value considerably in the antebellum period, bank runs could occur when the value of state bonds collapsed and depositors lost confidence in their bank.[19] Early banks did not have access to a lender of last resort, nor were their liabilities guaranteed by any federal insurance scheme. The same is true for stablecoins today.

The recent run on two major stablecoin issuers demonstrates the problems associated with creating inside money outside of the regulated financial system. TerraUSD is a stablecoin hosted by the Terra Network and created by South Korea's Terraform Labs. Investors were attracted to TerraUSD because they could earn returns of nearly 20 percent annually by lending their TerraUSD holdings via Anchor Protocol, a decentralized bank for crypto investors. Until May 2022, TerraUSD's value remained very close to $1, as intended by its issuer, and it was the third-largest stablecoin, with a market capitalization of $18 billion. But on May 9, its value declined suddenly to 90 cents following large withdrawals from Anchor Protocol. As in a typical bank run, the initial withdrawals on May 9 led to further withdrawals, and within a few days TerraUSD was trading at approximately 20 cents. TerraUSD has not recovered from that crisis and, as of the writing of this article, was trading at roughly 2 cents.

Recent crypto bank runs demonstrate that we can learn a lot from the existing banking system. Pointing to the history of the U.S. banking system, Yale University professor of economics Gary Gorton and Georgetown University law professor Jeffrey Zhang argue that only regulation can turn stablecoins into a stable form of inside money. They point out the similarities between stablecoins and the antebellum banking system, and they argue that we should expect stablecoins to be unstable stores of value subject to runs unless the government provides some form of regulation. If stablecoin issuers are not forced to fully back their tokens with short-term government bonds, they conclude, then stablecoins will likely suffer runs as investors test the implicit peg associated with the stablecoin contract.

Another possibility is to bring stablecoins under the banking regulatory framework, created after 1913. This would allow stablecoin issuers to back their tokens with a portfolio of assets, including privately issued assets such as commercial paper. Critics of this proposal argue that the regulation of stablecoins along the lines of traditional banks will stifle innovation. However, they do not provide a solution to the inherent instability of inside money that takes the form of demand deposits.

Final Remarks

It is likely that in the not-so-distant future, our money will be entirely digital, and cryptocurrencies will likely play an important role in this new monetary system. However, this transition will inevitably be slow and bumpy, requiring both experimentation and prudence. At the very least, a stable cryptocurrency standard requires that unbacked digital tokens—which are, despite their novelty, just another outside money—acquire the properties of an elastic currency, as defined in this article. And without government regulation, such as a requirement that stablecoins be fully backed by short-term government bonds, digital tokens that take the form of demand deposits via currency pegs—which, despite their novelty, are just another inside money—are likely to suffer runs. EI

Notes

1 Cryptocurrencies are digital tokens created in a network of computers. Network participants can trade these tokens without needing a central authority. This is possible because tokens use cryptography to validate these transactions. I provide a detailed description of the protocol behind Bitcoin in my *Economic Insights* article "Bitcoin vs. the Buck: Is Currency Competition a Good Idea?"

2 This is how Ricardo Lagos defines outside money in his article "Outside and Inside Money" in *The New Palgrave Dictionary of Economics*.

3 A bank note was a negotiable debt instrument issued by a private bank. It was a promise to pay a certain amount of gold on demand to whoever presented the bank note for redemption at the issuing bank. This redemption option was exercised infrequently, so bank notes remained in circulation for a considerable period. For more on bank notes and the banks that issued them, see my *Economic Insights* article "The Free-Banking Era: A Lesson for Today?"

4 Anna Schwartz and Milton Friedman provide a rigorous analysis of the evolution of the U.S. monetary system in *A Monetary History of the United States, 1867–1960*.

5 Illiquid assets usually earn a higher yield than liquid assets, but they cannot be easily sold before maturity. Even if the bank finds a buyer for its illiquid assets, the latter will usually agree to purchase them only at a large discount.

6 Bank runs can also occur when bank deposits are backed by assets that fluctuate in value. Because the value of a bank's assets is likely to decline if aggregate economic output declines, a bank may suffer a run simply because the economy is struggling. (Gary Gorton and, subsequently, Franklin Allen and Douglas Gale developed theories of financial intermediation that formalize the view that financial crises can be the result of severe economic downturns, as opposed to a random event in which depositors withdraw from the banking system because they believe other depositors will do the same.) Although here the cause is different, the result is the same: the destruction of inside money and the ensuing credit contraction in the economy.

7 Michael Bordo provides a statistical analysis of the main properties of the gold standard in the U.S. and the UK. His key finding is that the gold standard provides remarkable long-run price stability compared to other monetary arrangements.

8 American economist Gary Gorton documents the real effects of all U.S. panics during this period, with the most severe crises occurring in 1873, 1893, 1896, and 1907.

9 Although the banks pledge their illiquid assets to receive a temporary loan during a banking crisis, the value of their assets is certainly lower than the loan amounts.

10 However, the short-term solution to bank fragility came from another branch of the Federal government: It was the Federal Deposit Insurance Corporation (FDIC) that prevented further widespread commercial bank failures in the U.S. But if the federal government were to insure deposits, it needed to guarantee banking stability by regulating and supervising commercial banks and other related financial institutions. So the FDIC required commercial banks to pay a premium proportional to the value of deposits issued. The proceeds from premium payments formed a fund that could be used to guarantee the deposits of any insolvent bank. In a systemic crisis, many banks could become insolvent at the same time, and the guarantee fund could not be sufficient to make good on the deposits of all insolvent banks. Consequently, banks were regulated to ensure that the value of their assets was, under most scenarios, sufficient to pay depositors. Otherwise, the FDIC would become insolvent.

11 For instance, Gary Gorton and Andrew Metrick argue that repurchase agreement contracts (or repos) were the inside moneys that played a central role in the collapse of aggregate liquidity during the 2008 Global Financial Crisis.

12 Minneapolis Fed economist Warren Weber developed this idea in his article "A Bitcoin Standard: Lessons From the Gold Standard."

13 Gaetano Antinolfi, Elisabeth Huybens, and Todd Keister show that a central bank can provide an elastic currency by running a discount window, which allows for adjustments in the money supply to smooth out fluctuations in short-term interest rates and to prevent a liquidity crisis in the banking system. Their theoretical analysis demonstrates that an elastic supply of outside money is a stabilizing force in the monetary system, effectively ensuring its future existence. In other words, by providing a stable store of value to households and firms, an elastic currency is likely to increase its adoption and prevail as a viable monetary system.

14 The idea of programming the path of the supply of government currency as a way of achieving a stable monetary framework was proposed by Milton Friedman. Although his idea was widely acknowledged in the academic community, his critics doubted its feasibility.

15 Three other problems will likely prevent Bitcoin from playing a major role in the broader monetary system. First, it is extremely costly and time-consuming to update the public ledger. Indeed, the environmental costs associated with the mining of Bitcoin are not negligible. Second, the blockchain technology is vulnerable to hacker attacks. And third, there is a stigma associated with Bitcoin because some people use it to trade in banned goods (such as narcotics) and evade taxes.

16 Source: CoinGecko's web site: https://www.coingecko.com.

17 The web site is currently at URL https://tether.to/en/transparency.

18 Gary Gorton and Jeffery Zhang have pointed out the similarities between stablecoins and antebellum banks in their recent article "Taming Wildcat Banking."

19 Arthur Rolnick and Warren Weber have argued that fluctuations in asset values accounted for the bulk of banking failures during the Free Banking (pre-1863) Era in the U.S.

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