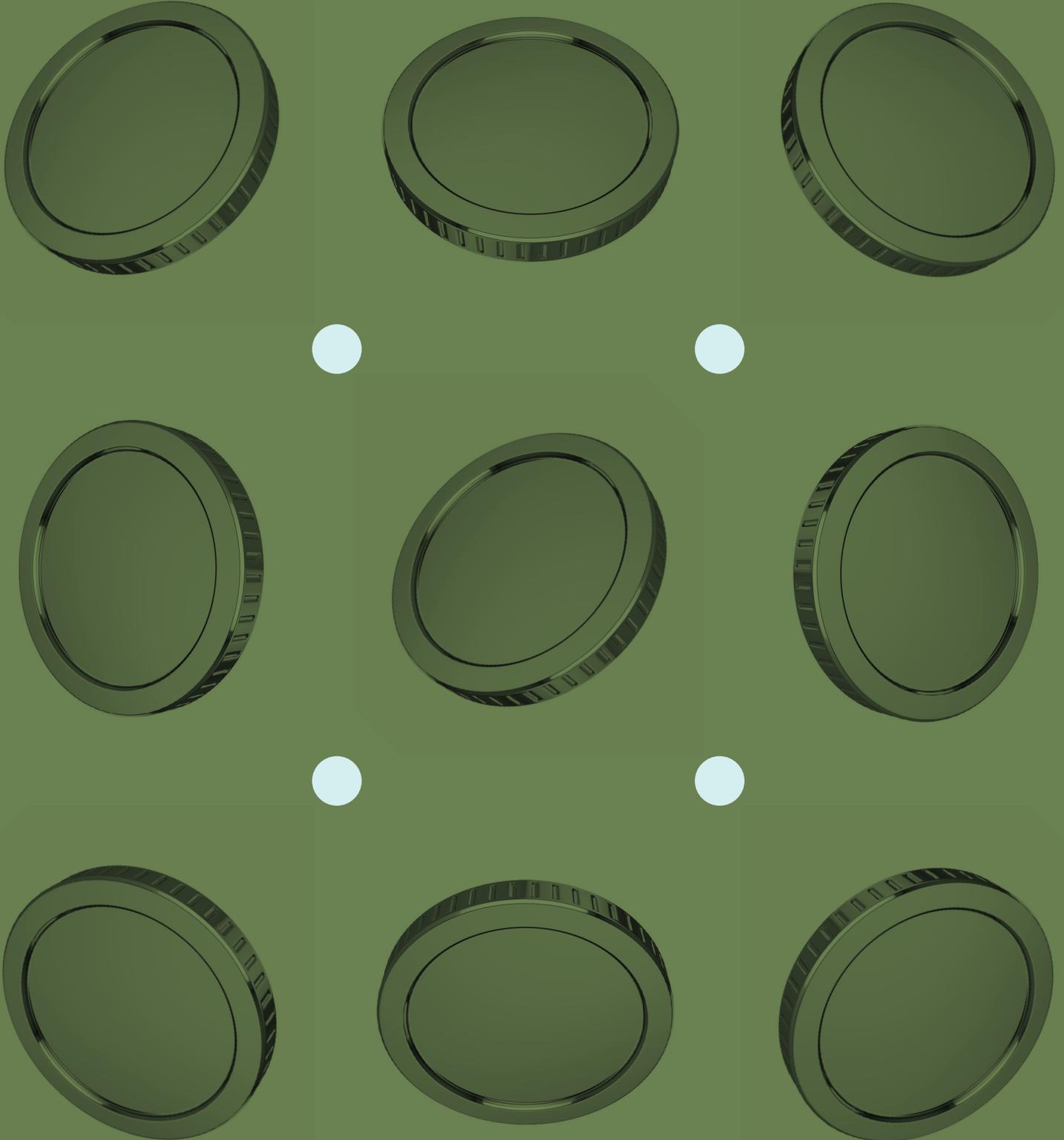


# Stablecoins

03/10/21

Bridging the Network Gap Between  
Traditional Money and Digital Value

Commissioned by:  
**GMO-Z.com**  
Trust Company, Inc.



Bridging The Network Gap  
Between Traditional Money  
and Digital Value

## RESEARCH BY



## THE BLOCK RESEARCH

The Block is an information services company founded in 2018. Its research arm, The Block Research, produces research content that covers the digital asset, fintech and financial services industries.

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## GMO INTERNET GROUP

GMO Internet Group, based in Tokyo, is a global market leader in the Internet infrastructure, Internet finance and the digital asset space since its inception in 1991. It operates the world's largest online FX trading platform, an Internet bank, a cryptocurrency exchange, a cryptocurrency mining operation, a payment gateway and a regulated stablecoin. GMO Internet, Inc. (TSE: 9449) is headquartered in Tokyo, Japan. For more information, please visit <https://www.gmo.jp/en/>

GMO-Z.com Trust Company (GMO Trust), based in New York, is a Limited Purpose Trust Company, regulated by the New York Department of Financial Services. Issuing the World's First regulated JPY stablecoin, GMO-Z Trust also offers a USD stablecoin "ZUSD" and a stablecoin-as-a-service technology and custody product suite. GMO-Z Trust is on a mission to bring traditional finance into the digital age with blockchain services. For more information on GMO-Z Trust, visit <https://stablecoin.z.com/>

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## LIQUID

Founded in 2014, Liquid is one of the world's largest cryptocurrency-fiat exchange platforms serving millions of customers worldwide. Liquid is consistently ranked among the top 10 regulated cryptocurrency exchanges globally based on daily traded spot volume with deep BTC/JPY liquidity, offering one of the best user experiences in service levels & security in the industry. Liquid proudly serves its customers from all around the world. Since we hit our first milestone of 100,000 users on 08 December 2017, we have continued to grow ever since. For more information on Liquid, visit <https://www.liquid.com>.



## BINANCE

Binance is the world's leading blockchain and cryptocurrency infrastructure provider with a financial product suite that includes the largest digital asset exchange by volume. Trusted by millions worldwide, the Binance platform is dedicated to increasing the freedom of money for users, and features an unmatched portfolio of crypto products and offerings, including: trading and finance, education, data and research, social good, investment and incubation, decentralization and infrastructure solutions, and more. For more information, visit: <https://www.binance.com>



## SHIFT MARKETS

*“People call them stablecoins, but what they really are to Shift is FX [Foreign Exchange]. Our partnership with GMO is strategic, as we both come from an FX background. By putting FX on the blockchain with stablecoins, we are taking the largest financial market and making it accessible to the world in a new way.”*

—  
Ian McAfee, Shift

Shift Markets is committed to building the crypto ecosystem and promoting equality in foreign trade by improving global access to cryptocurrency through use of its technology services and turnkey solutions. Shift Markets runs a proprietary exchange network called NEXUS, which provides connectivity to its 70+ exchange partners. Shift offers a variety of technology services in digital asset markets, including white label cryptocurrency exchanges, payment gateways and tokenization platforms. For more information on Shift Markets, visit <https://www.shiftmarkets.com>

## PARTNERS

**zero#**

*"We are excited to be deepening our partnership with GMO and proud to be a partner with GMO Trust. Creating a mechanism for instantaneous settlement in JPY and USD has immense value given that current settlement times are t+2."*

—  
Edward Woodford, Zero Hash

## ZERO HASH

Zero Hash's mission is to empower innovators by delivering access to the financial system 2.0. Zero Hash enables developers and businesses to focus on building experiences and products. We power your favorite brokerage app or neo bank to offer BTC, provide the rails to the 2.0 payment processors, give platforms the ability to facilitate instantaneous cross border payments and eliminate complexity for moving assets for the world's largest liquidity providers.

[Zero Hash](#) is a FinCen-registered Money Service Business as well as a regulated Money Transmitter that can operate in 51 US jurisdictions. Zero Hash also holds a virtual currency license from NYDFS. In Canada, Zero Hash is registered as a Money Service Business with FINTRAC.

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Finally, we thank our talented designer Aleksander Hamid, without whom the presentation of this report would be bland.

This research report first lays out the foundational principles of modern money, including its three defining functions, the importance of third-party commitment power, the three primary categories of money, and each category's relation to economic groups in a two-tier monetary system. These principles serve as a framework for understanding alternative forms of value and exchange, most notably electronic money (e-money), which first came to prominence during the years of Web 1.0 (1990s to early 2000s).

A review of major stakeholders' e-money interpretations from that era provides a scope for pragmatically viewing digital money innovations of the next Web: stablecoins. Next, an introduction to stablecoins outlines the three main categories that exist today — collateralized by fiat, overcollateralized by crypto-assets, and non-collateralized (algorithmic). From there, the current approach to stablecoin regulation, as well as compliance, is examined. Stablecoin issuers are required to maintain rigid anti-money laundering (AML) / know your client (KYC) onboarding processes, use on-chain monitoring services for possible violations (to create Suspicious Activity Reports), and cooperate with law enforcement agencies when needed.

Next, the current state of the stablecoin market is explored by studying data related to existing stablecoin projects — Tether, USDC, PAX — as well as plans for Facebook-initiated Diem. Secondary market stability of listed stablecoins is calculated to determine which stablecoins diverge the least from their pegs. Results show that the majority of stablecoins are used for cryptocurrency trading, but other future use cases are considered. The report concludes with an outlook on future developments and anticipated directions for the stablecoin ecosystem.

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# Stablecoin Events Timeline

2014	2015	2017	2018
<p><b>July</b> The precursor to Tether, Realcoin, is announced</p> <p>The first crypto-collateralized stablecoin BitUSD launches</p> <p><b>September</b> Crypto-collateralized stablecoin NuBits launches</p> <p><b>November</b> Realcoin rebrands to Tether</p>	<p><b>January</b> Bitfinex enables trading of Tether for its customers</p> <p><b>2016</b></p> <p><b>April</b> Crypto-collateralized stablecoin SteemUSD launches</p>	<p><b>April</b> All incoming international wires to Tether are blocked and refused by Taiwanese banks and Wells Fargo</p> <p>Tether breaks peg for the first time because of banking issues and trades at a 10% discount</p> <p><b>August</b> Bitfinex and Tether stop supporting U.S. customers</p> <p><b>December</b> MakerDao launches with a crypto-collateralized stablecoin on Ethereum</p>	<p><b>January</b> First fiat-collateralized stablecoin with regular attestations TrueUSD launches</p> <p><b>April</b> Basis raises \$133M from top VCs to create an algorithmic stablecoin</p> <p><b>June</b> Reserve stablecoin raises \$5M in a seed round</p> <p><b>September</b> Gemini launches fiat-collateralized Gemini dollar (GUSD)</p>
2018	2019		2020
<p>Paxos launches fiat-collateralized Paxos Standard (PAX)</p> <p>Circle announces Centre consortium and launches fiat-collateralized stablecoin USDC</p> <p><b>October</b> Tether trades at a 5%+ discount as concerns over banking relationships increase</p> <p>Coinbase joins Circle and allows buy/sell of USDC</p> <p><b>November</b> DoJ is investigating whether 2017 rally was driven by manipulation involving Tether</p> <p>Tether starts using payment processor Crypto Capital and increases minimum wire fee</p> <p><b>December</b> BitUSD breaks peg after an emergency procedure is triggered and never recovers</p> <p>Basis shuts down and returns investor money blaming regulatory constraints</p>	<p><b>February</b> Bitfinex's payment processor Crypto Capital gets \$850M of Bitfinex's money seized by authorities</p> <p><b>April</b> NY Attorney General sues Bitfinex for losing \$850M and using Tether's funds to secretly cover the shortfall</p> <p>Bitfinex reveals Tether is only 74% backed by cash, says it's 'simultaneously addressing' requests from NYAG, DOJ and CFTC</p> <p><b>May</b> Bitfinex successfully raises \$1 billion in a private token sale and Tether is backed 100% again</p> <p><b>June</b> Terra launches its first algorithmic stablecoin TerraKRW which is 100% backed collateralized on-chain by LUNA</p> <p>Facebook's Diem is announced and 1st whitepaper is published</p>	<p><b>July</b> Facebook announced won't launch until all regulatory concerns have been met</p> <p><b>October</b> PayPal, eBay, Mastercard, Stripe, Visa and Booking.com leaves the Diem Association</p> <p><b>November</b> MakerDao launches Multi-Collateral stablecoin DAI (MCD) and sunsets SAI</p>	<p><b>April</b> Facebook redesigns Diem to comply with regulatory concerns, publishes 2nd whitepaper and starts formal payment system licensing process with FINMA</p> <p><b>September</b> European legislative proposals, the DLT Pilot Regime and the Regulation on Markets in Crypto-assets (MiCA), are leaked online.</p> <p><b>December</b> GMO Trust received approval for the first regulated JPY Stablecoin 'GYEN' and to offer USD stablecoin 'ZUSD.'</p> <p>Discussion Draft for the STABLE Act is published online</p>

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch. 1 · 11-16

# The Principles of Money

Before discussing stablecoins, it's important to first understand the foundational principles of modern money, including its three defining functions, the importance of third-party commitment power, the three primary categories of money, and each category's relation to economic groups in a two-tier monetary system.

# The Principles of Money

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## Three Defining Functions of Money

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Money is an enigma, a social construct at the center of the economy. But its nature has shifted considerably over time. People use money every day to exchange goods and services, receive compensation, and settle liabilities, among other activities — but the majority don't know why money as an instrument is utilized. Part of the answer lies within the three defining characteristics of money: a store of value, a unit of account, and a medium of exchange.

As a store of value, money is expected to hold its worth within an anticipated degree of confidence over time, transferring purchasing power to a future date. As a unit of account, money represents a common standard among economic agents that readily conveys the value for all goods and services. Lastly, as a medium of exchange, money enables economic transactions by serving as a financial conduit between parties.

There is a symbiotic relationship between the functions of money. Money is used as a medium of exchange because parties believe it to be a store of value, particularly during the period between transaction initiation and final settlement. Transaction participants are able to come to this mutual understanding of value due to the general unit of account attribute. If an asset maintains all three attributes, it is thought of as good money by contemporary economists.<sup>1</sup>

## Third-Party Commitment Power

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The adjective “good” is used to describe something that is right or desirable, and, by extension, trustworthy. When it comes to economic exchange, the absence of trust between agents is a major friction or “evil” that impedes transactions. As argued by Nobuhiro Kiyotaki and John Moore in ‘Evil Is the Root of All Money,’ the lack of certain monetary commitment among parties is evil — thus, money was created to address this uncertainty, balancing out the equation by introducing trust.

In essence, money is a unique form of “IOU” that mediates trust over time using the language of commitment. As Kiyotaki and Moore write:

<sup>1</sup> [Money in the digital age: what role for central banks?](#)  
pg. 5 February 6th, 2018.

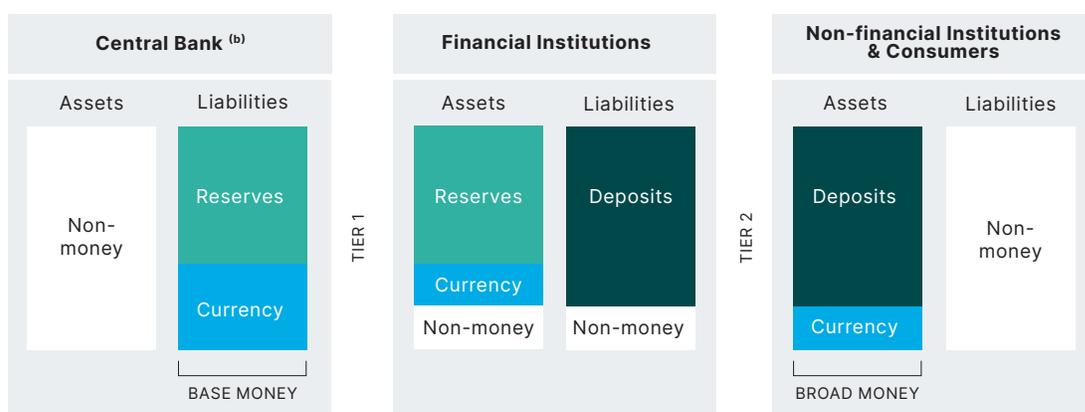
# The Principles of Money

“If two people want to transact who don’t trust each other -- who are unable to commit -- then they can make use of a third party’s ability to commit. The third party’s commitment power acts as a lubricant to the transaction.”<sup>2</sup> The third-party in this case is whichever stakeholder backs the IOU, making money a liability for the third party.

## Three Primary Categories of Money

Figure 1

Stylised balance sheets of different types of money holders and issuers in the economy (a)



<sup>(a)</sup> Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector’s balance sheet.

<sup>(b)</sup> Central bank balance sheet only shows base money liabilities and matching assets. In practice the central bank holds other non-money liabilities. Its non-money assets are mostly made up of government debt.

To further understand the third-party’s role in monetary exchange, one must be familiar with the different forms of money that circulate in an economy. The three primary categories of money include central bank reserves, bank deposits and fiat currency; each form constitutes an IOU from one economic group to another in a two-tier monetary structure. The two-tier architecture consists of central banks transacting with financial institutions (FIs) at Tier 1, and commercial banks transacting with non-financial institutions (NFIs), and consumers at Tier 2.

Famed economist Hyman Minsky believed that “the alternative to beginning one’s theorizing about capitalist economies by positing utility functions over the reals and production functions with something labeled K (called capital) as a variable is to begin with interlocking balance sheets of the economy.”<sup>3</sup> The Bank of England (BOE)

2 [Clarendon Lectures Lecture 1 EVIL IS THE ROOT OF ALL MONEY by Nobuhiro Kiyotaki London School of Economics](#), pg.11 November 26th, 2001.

3 Minsky, Hyman (1995). Financial factors in the economics of Capitalism. *Journal of Financial Services Research*, 9(3-4), 197- 208.

# The Principles of Money

shared Minsky's appreciation for financial statements when it created stylized balance sheets (**Figure 1**)<sup>4</sup> in a Q1 2014 *Quarterly Bulletin*; these balance sheets were used to illustrate money as IOUs between tiers of the monetary system.

## Monetary Relationships between Economic Groups

Like Kiyotaki and Moore, the BOE also views money as an IOU, noting that “each IOU is a financial liability for one person, matched by a financial asset for someone else. For any individual, their balance sheet simply adds together, on one side, all of their assets — their IOUs from other people and their non-financial assets — and on the other, all of their liabilities (or debt), meaning their IOUs to other people.”<sup>5</sup> By summing the individual agents within each economic group (Central Bank, FIs and NFIs/Consumers), a consolidated balance sheet is created that depicts the IOUs between financial system tiers.

As shown in Figure 1 above, IOUs between tiers are combinations of the three primary categories of money. Each category of money is color-coded, with central bank reserves in teal, currency in sky blue and deposits in dark green. Starting at Tier 1, “Reserves” are issued by the central bank to financial institutions in exchange for other assets on FIs' balance sheets. Since reserves represent an IOU from the central bank to FIs, they are credited as a liability to the central bank balance sheet (increasing reserve liabilities) and debited as an asset on each financial institution's balance sheet (increasing reserve assets).

The other type of money at Tier 1, “Currency” — which includes banknotes and coins — is initially issued by the central bank to financial institutions in exchange for reserves on FI balance sheets. As such, currency is credited as a liability to the central bank balance sheet (increasing currency liabilities) and debited as an asset on each financial institution's balance sheet (increasing currency assets). The combination of central bank reserves and fiat currency is referred to as “base money” by economists, setting the foundation for the monetary system. According to the BOE, the supply of base money “is determined by banks' demand for reserves both for the settlement of

4 The Block Research created a customized version of the BOE's 'Stylised balance sheets of different types of money holders and issuers in the economy' illustration. The original figure can be found on pg. 8 of the BOE's 'Money in the modern economy: an introduction' Q1 2014 Quarterly Bulletin.

5 [Bank of England Quarterly Bulletin 2014 Q1](#) pg. 8.

# The Principles of Money

payments and to meet demand for currency from their customers — demand that the central bank typically accommodates.”<sup>6</sup>

Financial institutions create the primary form of money at Tier 2, called “Bank Deposits.” Bank deposits are predominantly generated when FIs originate new loans to NFIs and consumers. Loans are credited as a liability to NFI/consumer balance sheets (increasing non-money liabilities), while new deposits are debited as an asset (increasing deposit assets). Meanwhile, loans are debited as an asset (increasing non-money assets) and deposits are credited as a liability (increasing deposit liabilities) on FI balance sheets. Thus, bank deposits are an IOU from FIs to non-financial institutions and consumers.

The secondary form of money transferred at Tier 2 is currency, which represents an IOU issued by central banks. Currency enters the economy primarily when NFIs and consumers withdraw banknotes and coins from their bank accounts. During these transactions, currency is credited (decreasing currency assets) on FI balance sheets, while deposits are debited (decreasing deposit liabilities). At the same time, currency is debited (increasing currency assets) and deposits are credited (decreasing deposit assets) on NFI/consumer balance sheets.

The combination of deposits and currency held by NFIs/consumers constitute the “broad money” in an economy. As explained by the BOE, “broad money is made up of bank deposits — which are essentially IOUs from commercial banks to households and companies — and currency — mostly IOUs from the central bank. Of the two types of broad money, bank deposits make up the vast majority — 97% of the amount currently in circulation.<sup>7</sup> And in the modern economy, those bank deposits are mostly created by commercial banks themselves.”<sup>8</sup> **Figure 2<sup>9</sup>** represents a simplified illustration of the effect of new lending on each economic group’s stylised balance sheet in the monetary system.

As noted earlier, new loans are credited as a liability to NFIs’/consumers’ balance sheets (increasing non-money liabilities), while new

6 [Bank of England Quarterly Bulletin 2014 Q1](#) pg. 21.

7 The Block Research notes that this data is from the BOE as of December 2013.

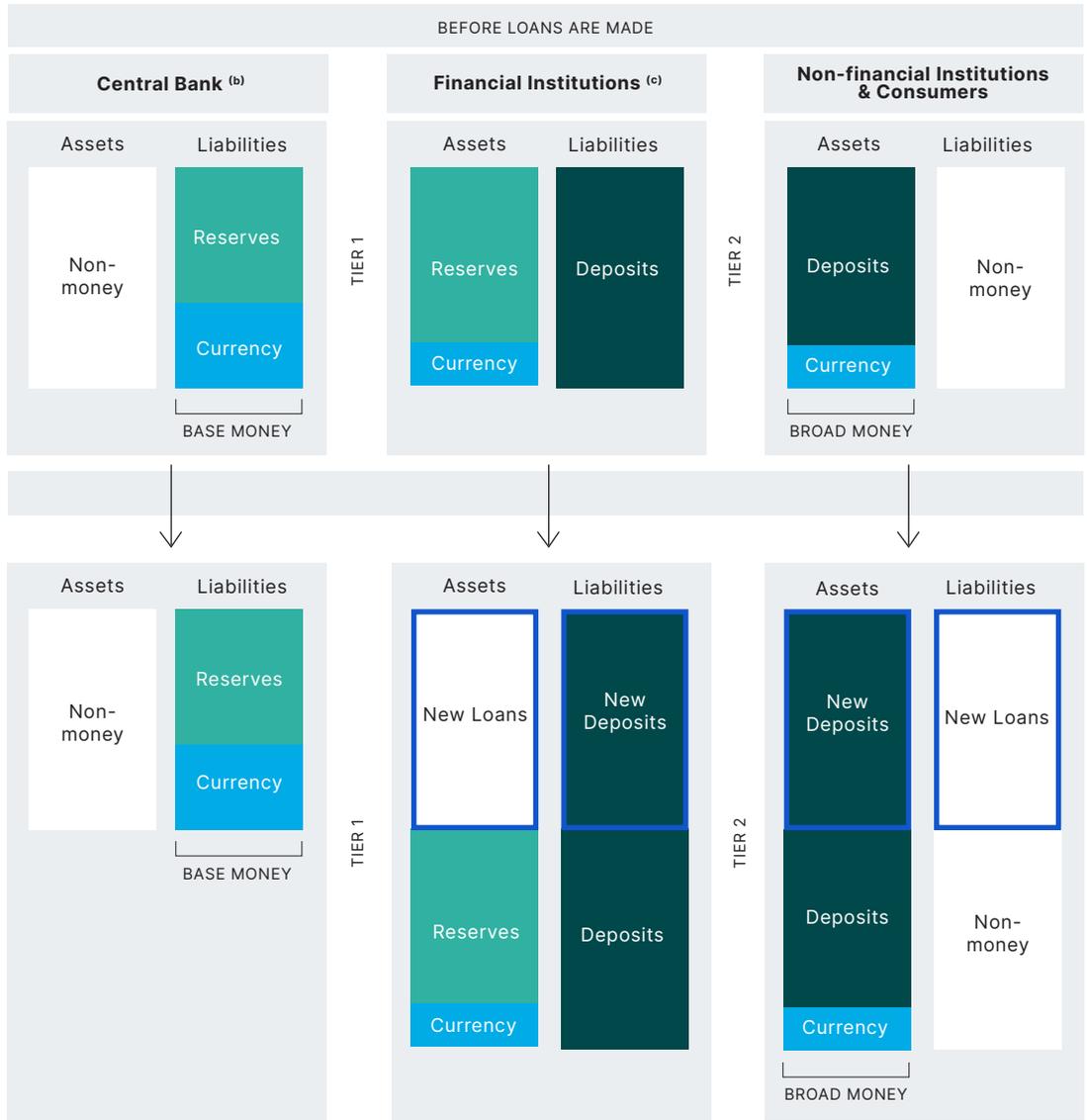
8 [Bank of England Quarterly Bulletin 2014 Q1](#) pg. 15.

9 The Block Research created a customized version of the BOE’s ‘Money creation by the aggregate banking sector making additional loans’ illustration. The original figure can be found on pg. 16 of the BOE’s ‘Money creation in the modern economy’ Q1 2014 Quarterly Bulletin.

# The Principles of Money

deposits are debited as an asset (increasing deposit assets). The resulting balance sheet growth for NFIs and consumers is shown in row 3 of Figure 2, which also displays an increase in broad money from new loan origination.

Figure 2  
Money creation by the aggregate banking sector making additional loans (a)



<sup>(a)</sup> Balance sheets are highly stylised for ease of exposition. The quantities of each type of money shown do not correspond to the quantities actually held on each sector's balance sheet.

<sup>(b)</sup> Central bank balance sheets only show base money liabilities and the corresponding assets. In practice

the central bank holds other non-money liabilities. Its non-monetary assets are mostly made up of government debt.

<sup>(c)</sup> Financial Institutions' balance sheets only show money assets and liabilities before any loans are made.

# The Principles of Money

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Notice that neither the central bank balance sheet or the amount of base money is directly affected by new loan creation. The BOE asserts that “demand for base money is therefore more likely to be a consequence rather than a cause of banks making loans and creating broad money. This is because decisions by banks to extend credit are based on the availability of profitable lending opportunities at any given point in time.”<sup>10</sup>

Indirectly, the increase in liabilities from new deposits could cause FIs to request more central bank reserves in order to meet reserve requirements; these reserves are supplied on demand by the central bank in exchange for other assets of financial institutions, allowing FIs to transact with other banks and meet withdrawal requests from NFIs and consumers.

One can see the importance of a central bank’s commitment power, as it directly establishes confidence for bank reserves and currency — the very foundation of modern money. Since base money provides credibility to Financial Institutions’ IOUs, NFIs and consumers are willing to accept bank deposits, which are denominated in the central bank’s unit of account. Therefore, money in today’s economy is an interdependent chain of IOUs between economic groups in the monetary system that stems from the central bank’s promise to provide each money bearer with the unit of account. A social contract emerges within which everyone trusts money to maintain a store of value, serve as a medium of exchange and provide a unit of account. These three functions compose a monetary vine from which all economic fruit grows.

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<sup>10</sup> [Bank of England Quarterly Bulletin 2014 Q1](#) pg. 21.

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch. 2 · 18-20

# E-Money Evolution

The principles of money serve as a framework for understanding alternative forms of value and exchange, most notably electronic money (e-money), which first came to prominence during the years of Web 1.0 (1990s to early 2000s). A review of major stakeholders' interpretations of e-money throughout that time period provides a scope for pragmatically viewing e-money innovations of the next Web: stablecoins.

# E-Money Evolution

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## E-Money Evolution

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One should use the principles of money outlined in the previous section as a framework for interpreting alternative forms of value and exchange, most notably electronic money (e-money), which rose to prominence alongside widespread internet adoption. According to [internetworldstats.com](http://internetworldstats.com), internet users as a percentage of the world population increased from 0.4% in December, 1995 to 55.6% in December, 2018.<sup>11</sup> During this timeframe, electronic money usage experienced exponential growth around the globe, a trend that continues to this day.

[The Appendix](#) of this report tracks the evolution of electronic money, starting with two monetary authorities' formal definitions of e-money. It's noteworthy that both descriptions focus on the store of value and medium of exchange functions of money, but specifically leave out the unit of account. Next, a review of major stakeholders' interpretations of e-money throughout the years of Web 1.0 (1990s to early 2000s) provides a scope for pragmatically viewing e-money innovations of the next Web: stablecoins.

Two examinations of e-money from that time period — a 1996 Bank for International Settlements (BIS) report and a 2000 London School of Economics (LSE) working paper by British economist Charles Goodhart — document potential implications that electronic money developments will have for central banks. Rapid information technology (IT) advancements led some to suggest that e-commerce growth and associated computerisation would attenuate demand for base money. Proponents of “free banking” monetary arrangements, through which banks could issue their own banknote currencies under lax regulation, were highly supportive of this theory.

Professor Goodhart's paper made two fundamental arguments countering the IT revolutionist's assumptions about the future of money. First, electronic money doesn't possess essential characteristics of currency, particularly anonymity and legal tender status, to incentivize certain users to switch to e-money. Second, he made note of central banks being the governments' bank; unlike private institutions,

<sup>11</sup> [Internet Growth Statistics 1995 to 2019 - the Global Village Online.](#)

# E-Money Evolution

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central banks can leverage the taxing power and lawmaking ability of governments to absorb losses and set policies indefinitely.

[The Appendix](#) concludes with a look at how some eerily predictive monetary statements made 20 years ago in Charles Goodhart's LSE working paper are playing out today. He discussed a scenario in which the central bank could optimize the Treasury Department's ability to absorb fiscal costs, drawing parallels to current ideas of Modern Money Theory (MMT). Goodhart also wrote that the debate on central bank independence would stay muted as long as inflation targets were hit. Fast forward to the decade following the global financial crisis, and the Federal Reserve struggled to consistently meet its 2% inflation target.

**“I believe that CBDCs and stablecoins can co-exist. Local stablecoin issuers can collaborate with monetary authorities to facilitate safe, secure and transparent digital asset transfers.”**

—  
Marisa Mcknight, Liquid

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One is left to wonder what can be done to reduce disinflation today, as the global economy currently finds itself in another recession that resulted from the COVID-19 Pandemic and the economic shut-downs pursued in response. With the central bank policy rate firmly in the “zero lower bound” for the foreseeable future and quantitative easing (QE) well under way, unconventional measures — including digital forms of money — are being more openly discussed among international decision makers.

Two of the leading forms of digital money shaping the financial system of the future are central bank digital currency (CBDC) and stablecoins. The Block Research conducted a series of interviews for this report with practitioners from both the public and private sector. The majority of interviewees viewed CBDCs and stablecoins as complementary instruments within the digital financial system of tomorrow.

Such a future arrangement could be similar in concept to the International Monetary Fund's (IMF) “synthetic CBDC” (sCBDC) proposal. sCBDC is essentially a public-private partnership where e-money providers are given conditional access to central bank reserve accounts to effectively distribute CBDC. As the IMF has noted: “The

# E-Money Evolution

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central bank would merely offer settlement services to e-money providers, including access to central bank reserves. All other functions would be the responsibility of private e-money providers under regulation.”<sup>12</sup>

CBDC was extensively covered in The Block Research’s [‘A Global Look at Central Bank Digital Currencies’](#)<sup>13</sup> white paper. It is highly recommended that readers review the CBDC paper to understand base money innovations occurring worldwide.

The rest of this research report contains a thorough examination and analysis of the current market for stablecoins.

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12 [The Rise of Digital Money](#)  
pg. 14 July 2019.

13 [A Global Look at Central Bank Digital Currencies](#) |  
Full Research Report  
August 2020.

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch. 3 · 22-24

# Introduction to Stablecoins

The interplay between novel forms of digital money and the two-tier banking model is back at the top of global stakeholder's agendas as the stablecoin market expands. Similar to e-money from Web 1.0, the exact definition of a stablecoin is currently in the eye of the beholder, mainly due to the lack of formal laws and standards for stablecoins today.

While targeting cryptocurrency enthusiasts and speculators was the initial go-to-market strategy, most stablecoin issuing entities now have ambitions to expand into payments, remittances, and serve as the on- and off-ramps for banks and financial institutions.

# Introduction to Stablecoins

“I don’t see central banks ever completely handing over currency creation to the private sector. Sometimes people dramatize the currency wars as the battle between fiat currencies and private sector currencies. Competition is healthy for the economy as a whole and forces central banks to evolve, but the idea that states will lay down and let stablecoin issuers run away with money creation is erroneous.”

—  
Garrick Hileman, [Blockchain.com](#)

## Introduction to Stablecoins

The interplay between novel forms of digital money and the two-tier banking model is back at the top of global stakeholder’s agendas. With e-money offering consumers a convenient and personalized means of payment, technology companies are starting to challenge financial institutions at the monetary unit level.

If current trends continue, the potential implications for payment systems, monetary systems and ultimately the global financial system could be quite dramatic. The IMF’s ‘The Rise of Digital Money’ paper

argues that “the two most common forms of money today will face tough competition and could even be surpassed. Cash and bank deposits will battle with e-money, electronically stored monetary value denominated in, and pegged to, a common unit of account such as the euro, dollar, or renminbi, or a basket thereof. Increasingly popular forms of e-money are stablecoins.”<sup>14</sup>

## What is a Stablecoin?

Similar to e-money in the 1990s, the exact definition of a stablecoin is currently in the eye of the beholder, mainly due to the lack of formal laws and standards for stablecoins today. The European Central Bank (ECB) views stablecoins as “digital units of value that differ from existing forms of currencies (e.g. deposits, e-money, etc.) and rely on a set of stabilisation tools to minimise fluctuations in their price against a currency, or basket thereof.”<sup>15</sup> However, the ECB, like many others, finds the term used to describe this digital payment innovation to be confusing and even misleading. In fact, the Financial Action Task Force (FATF) “considers that the term ‘stablecoin’ is not a clear legal or technical category, but is primarily a marketing term used by promoters of such coins.”<sup>16</sup> In an effort to unintentionally endorse these claims, monetary authorities like the BIS now use the term “so-called stablecoins.”

Some have gone even further, choosing to use entirely different terms all together, such as the increasingly popular “crypt-

<sup>14</sup> [The Rise of Digital Money](#)  
pg. 1 July 15th, 2019.

<sup>15</sup> [Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area](#)  
pg. 3 September 2020.

<sup>16</sup> [Virtual Assets – Draft Fatf Report To G20 On So-Called Stablecoins](#)  
pg. 2 June 2020.

# Introduction to Stablecoins

“Cryptodollars [Stablecoins] combine the low volatility characteristics of sovereign currencies with the settlement assurances of public blockchains, allowing fiat currency to be transferred and settled anywhere over the internet with less interferences than the traditional banking system.”

—  
Nic Carter, Castle Island Ventures

odollars.” This phrase is further explained in Castle Island Venture’s ‘Cryptodollars the story so far’ report by Nic Carter and Matt Walsh. According to Carter and Walsh: “though initially dubbed ‘stablecoins,’ due to their emergence as a response to volatile ‘native’ cryptocurrencies, they are increasingly being referred to as cryptodollars (in the etymological tradition of their conceptual cousin, eurodollars).

Put simply, cryptodollars are cryptographic tokens which circulate on public blockchains and aim to track the return of sovereign currencies. The vast majority of extant cryptodollars are redeemable for actual dollars in bank accounts – this makes them cryptographic bearer assets.”<sup>17</sup>

For the purposes of this report, stablecoins are mostly viewed as bearer monetary assets designed to mimic the price of fiat currencies by utilizing a stabilization mechanism. Essentially, stablecoins are a digital representation of fiat currency that lives on blockchains. They are mainly issued by private institutions today.

## Purpose of Stablecoins

Stablecoins were initially created as an instrument for cryptocurrency traders to safely exit inherently volatile cryptocurrencies, such as Bitcoin and Ethereum. By entering a more stable cryptocurrency, traders were able to protect profits and capital during periods of intense drawdowns. Stablecoins were also used by those that wanted to transfer money across exchanges without leaving the cryptocurrency ecosystem. Exiting cryptocurrency to fiat currency has consequences in many jurisdictions, from regulatory concerns to tax implications.

Stablecoins have been especially important for unregulated exchanges that don’t have access to the fiat banking system. USD-denominated stablecoins are also important for people in countries with restricted access to foreign currencies.

<sup>17</sup> [Cryptodollars](#) pg. 4 July 2020.

# Introduction to Stablecoins

While targeting cryptocurrency enthusiasts and speculators was the initial go-to-market strategy, most stablecoin issuing entities now have ambitions to expand into payments, remittances, and serve as the on- and off-ramps for banks and financial institutions. The goal of stablecoin issuers is to maximize the nominal amount of bank deposits and therefore earn the highest interest income, which can only be achieved by onboarding non-cryptocurrency retail participants.

## Stablecoin Benefits & Challenges

Stablecoin proponents hold that they are faster and more cost effective when compared to using fiat currency in the traditional banking system. Depending on the underlying blockchain that each stablecoin operates on (currently, most use the Ethereum network), settlement with probabilistic finality occurs within a minute, with exception, and fees are a function of existing network use— but generally fees fall below a dollar per transaction.

The biggest challenges for widespread stablecoin adoption are monetary sovereignty risk, Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) compliance, regulatory uncertainty, blockchain guarantees and customer protection. Potential benefits and challenges of mass stablecoin usage are shown in the following table.

BENEFITS	CHALLENGES
Interoperability	Monetary Sovereignty risk
Cost	AML/CFT compliance
Speed	Regulatory Uncertainty
	Blockchain Guarantees
	Customer Protection

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

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# Stablecoin Categories

There are three main stablecoin categories that exist today — collateralized by fiat, overcollateralized by crypto-assets, and non-collateralized (algorithmic). Each type's stabilization mechanism has benefits and challenges. Case studies explore Reserve, Terra, Basis and Ampleforth.

# Stablecoin Categories

## Stablecoin Categories

There are currently three main types of stablecoins based on the different stabilization mechanism: **(i) collateralized by fiat**, **(ii) over-collateralized by crypto-assets**, and **(iii) non-collateralized**. The risks and benefits of each category are presented in the table below.

	RISKS	BENEFITS
<b>Fiat-collateralized</b>	<ul style="list-style-type: none"> <li>• Counterparty risk</li> <li>• Government/regulatory intervention</li> <li>• Freezable for unknown reasons</li> </ul>	<ul style="list-style-type: none"> <li>• The most stable</li> <li>• The most scalable</li> <li>• By far the most traction</li> </ul>
<b>Crypto-collateralized</b>	<ul style="list-style-type: none"> <li>• Robustness in large-drawdown environments</li> <li>• Less stable and harder to peg at \$1</li> <li>• Problematic to scale the supply</li> <li>• Incentivizing governance participation</li> </ul>	<ul style="list-style-type: none"> <li>• Decentralized</li> <li>• Censorship resistant</li> </ul>
<b>Non-collateralized</b>	<ul style="list-style-type: none"> <li>• Highly theoretical and not tested out in practice</li> <li>• Hard to avoid security regulations</li> <li>• Hard to bootstrap confidence early on</li> </ul>	<ul style="list-style-type: none"> <li>• Potentially decentralized, scalable and censorship resistant</li> </ul>

## Collateralized by fiat

Fiat-collateralized stablecoins are issued by a centralized third party and backed by one fiat currency (or alternatively, short-term treasury bonds) or by a basket of multiple fiat currencies. The vast majority of fiat-collateralized stablecoins are backed 1:1 by USD. One unit of a USD-backed stablecoin is redeemable for the USD.

The underlying USD is held in bank accounts and can be redeemed at any time by either distributors, or in some cases, by retail customers directly. Bank reserves should always be equal to the amount of the issued supply of each stablecoin. If a party redeems a stablecoin for fiat, the supply should theoretically decrease. But since in practice this process happens in batches and the demand for stablecoins keeps increasing, the supply rarely decreases as deposits trump withdrawals.

Fiat-collateralized stablecoins remain stable as long as people have confidence that the stablecoin issuer actually has all of the necessary reserves in their bank account and third parties can redeem

# Stablecoin Categories

“The Seigniorage Shares model experiments [algorithmic stablecoins] today place too much emphasis on the mechanism, as if the mechanism alone creates stability. Ultimately the ingredients for stability require an incentive-compatible mechanism, but you also need an ecosystem of usage, meaning organic demand that wants the stablecoin: no mechanism alone is going to bootstrap that. So there is more to it than the mechanism. I’ve seen a lot of white papers written that treat the problem as if it’s purely a mechanism design and engineering issue, but in my view, that is only half of the problem.”

—  
Robert Sams, Clearmatics

whenever they please. To increase confidence, some stablecoin issuers hire independent accounting firms to periodically check whether the amount of reserves matches up with the circulating supply. In some extreme examples, which will be covered in the later sections of this report, fiat-collateralized stablecoins can remain stable even when they are partially backed but only if users’ expectation of future purchasing power remains the same.

## Overcollateralized by crypto-assets

Stablecoins overcollateralized by crypto-assets are issued by decentralized credit facilities, which allow users to borrow stablecoins that are soft-pegged to a fiat currency. The stablecoin essentially serves as tokenized debt.

Users that want to create the stablecoin have to lock up more than 100% of supported crypto-assets in a smart contract as collateral. Most users who create stablecoins this way are essentially taking a leveraged long position on the underlying collateral. Some users also want to borrow against their cryptocurrency rather than selling their position because of the tax burden.

The loans can be liquidated if there isn’t enough collateral in the system to guarantee the value of all outstanding stablecoins. Each loan must maintain a minimum collateralization ratio and if the value of the collateral falls below said ratio, the position is automatically liquidated. The collateral is then auctioned or sold to cover the guaranteed value of all outstanding stablecoins. Thus, most users maintain a ratio that’s significantly higher than their liquidation ratio.

The peg in such stablecoins is maintained through the combination of arbitrage and monetary policy (through interest rates). When the peg is below the desired value, the protocol’s interest rate can be increased, and borrowers are incentivized to buy back the stablecoin at a discount to repay their debt below cost. When the peg is

# Stablecoin Categories

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above the desired value due to increased demand, the protocol can decrease the interest rates. Some credit facilities now also allow users to collateralize with fiat-backed stablecoins rather than with just crypto-assets, which incentivizes arbitrageurs to push the price down.

Compared to fiat-backed stablecoins, the crypto-asset overcollateralized stablecoins are more decentralized but harder to scale because there has to be new demand to increase the nominal value of loans. As long as the system functions as designed, the stablecoins are permissionless.

## Non-Collateralized

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Non-collateralized stablecoins, sometimes also called algorithmic stablecoins, have a flexible supply, which is governed by an algorithm that incentivizes market participants to buy or sell in order to maintain price stability of the intended currency.

The stabilization mechanism usually relies on a dual-token design and the secondary market. The non-collateralized stablecoin concept was originally proposed by Robert Sams in 2014. Sams' 'A Note on Cryptocurrency Stabilisation: Seigniorage Shares' paper describes a structure with two tokens - stablecoins and shares<sup>18</sup>. When the price of the stablecoin goes above the peg, the algorithm automatically issues new stablecoins and auctions them to shares token holders who can only bid with shares tokens. When the price of the stablecoin drops below the peg, the algorithm does the opposite and issues new share tokens that are auctioned for stablecoins.

The vast majority of the attempts to create non-collateralized stablecoins have either failed or remain theoretical — mainly because of the design complexity in the bootstrapping phase. Additionally, shares tokens are often considered securities in a number of jurisdictions.

18 [A Note on Cryptocurrency Stabilisation: Seigniorage Shares](#)  
October 24, 2014.

**Reserve Protocol is a stablecoin project, which takes a novel approach. In its current phase, Reserve is backed by a small number of USD stablecoins (USDC, TrueUSD, and Paxos), which are all held in a smart contract.**

Reserve Protocol is a stablecoin project, which takes a novel approach. In its current phase, Reserve is backed by a small number of USD stablecoins (USDC, TrueUSD, and Paxos), which are all held in a smart contract.

In the next phase, Reserve wants to create a currency with a stable purchasing power that is no longer pegged to the U.S. dollar and thus doesn't expose users to inflation and geopolitical risk. The goal is to peg the value to a basket of tokenized assets (combination of fiat currencies, securities, and commodities) with multiple internationally dispersed issuers.

The Reserve stablecoin will generate revenue through a variable transfer fee, which is initially set to 0%. Reserve has its own token called Reserve Rights (RSR), which is used to facilitate the stability of the stablecoin. RSR will eventually participate in the protocol's governance.

If, at any time, the collateral depreciates below the targeted amount, Reserve will issue new RSR tokens and auction them off for additional collateral to add to the backing. If the price of the stablecoin's collateral falls and there is no demand to purchase RSR tokens for more than the minimum auction price, the protocol would allow stablecoin holders to redeem for collateral at a lower price in order to prevent a bank run. If the collateral appreciates above the targeted amount, the protocol will issue new stablecoins and sell them for more collateral. If the protocol already has an excess pool of stablecoins, then the protocol will sell stablecoins for RSR.

Reserve thinks that none of the existing three stablecoin types can scale to global use while maintaining stable purchasing power and remaining censorship resistant.

**The Terra protocol is an independent Proof of Stake blockchain on Tendermint. TerraKRW is its first algorithmic stablecoin. Launched in June 2019, TerraKRW is pegged against the Korean Won. It maintains an on-chain stability reserve and is currently the only algorithmic stablecoin with substantial traction.**

The Terra protocol is an independent Proof of Stake blockchain on Tendermint. TerraKRW is its first algorithmic stablecoin. Launched in June 2019, TerraKRW is pegged against the Korean Won. It maintains an on-chain stability reserve and is currently the only algorithmic stablecoin with substantial traction. In contrast to most other stablecoins, it is heavily focused on retail merchant market usage. Hence, its usage in capital markets and outside its native market, South Korea, is negligible. While Terra has recently launched new stablecoins pegged against other fiat currencies, e.g. TerraUSD - UST, its highest activity can be observed on TerraKRW.

TerraKRW is created by swapping 1 KRW worth of LUNA, Terra's native token, for 1 TerraKRW. TerraKRW relies on the LUNA token for its price stability. Within its ecosystem, LUNA is used for several purposes. Holders can deposit their LUNA token into the on-chain stability reserve and earn transactions fees from the Terra protocol usage. Hence, LUNA is essentially a non-dilutable

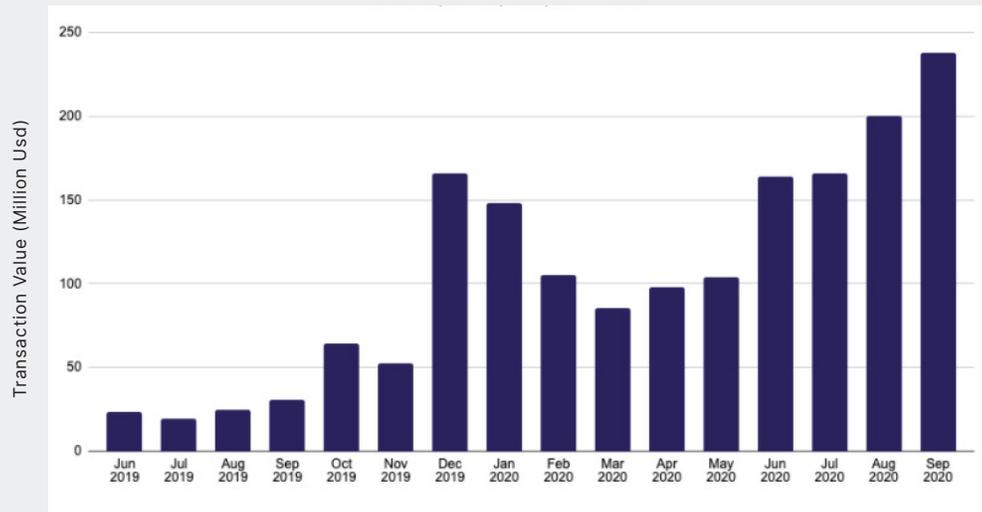
share of future transaction fees accrued on the Terra protocol. Staking is permissionless, with anyone able to participate by delegating LUNA token to one of the 60 node operators that are currently available.

The peg is supposed to be maintained via an explicit arbitrage loop and broad based adoption. If TerraKRW trades above 1 KRW, traders are incentivized to purchase 1 TerraKRW and sell it for LUNA worth more than 1 TerraKRW. In turn, they can then create more than 1 new TerraKRW - arbitraging the difference away over time. If TerraKRW trades below 1 KRW it is an implicit purchase "discount" for users - hence users should watch the peg. Merchants can swap received TerraKRW to Terra or its market making partners in exchange for an equivalent fiat amount. The received TerraKRW are in turn liquidated on exchanges (currently Coinone and GoPax). The possibility of black swan events is supposed to be reduced via broad real merchant adoption.

## TRANSACTION VOLUME TERRA KRW - KRT (IN USD)

Source: skew

JUNE 2019 (GENESIS) TO SEPT 2020



The TerraKRW stablecoin is currently utilized by three main payment providers - CHAI, iamport and Memepay. CHAI is self operated by Terra and has over 2.1 million active users with a total annual transaction volume of \$2.1 billion. In May 2020, Terra acquired iamport, which currently supports over 1600 merchants with a total annual transaction volume of \$3 billion. MemePay, a payment entity of MemeChat, supports over 35,000 active users and offers a full-stack payment experience. Together, CHAI and iamport support about \$5 billion in annual transaction volume, ranking Terra third in terms of processed annual payment transaction volume in South Korea.

Terra's two main merchant use cases include platform services, which require swift access to working capital, as well as regular merchants, which are more sensitive to fees than settlement time. In this regard, CHAI out-competes the average settlement speed of 7 days in South Korea, 10 days in Japan and

14 days in general South East Asia, with its ability to settle every six seconds. On CHAI, merchants are able to either withdraw TerraKRW directly or withdraw in KRW the next day.

Terra wants to achieve broad adoption via e-commerce platforms while keeping its fees competitive. For this, Terra plans to expand into neighbouring countries soon in order to create cross-country synergies. Yet, so far its expansion plans have been slowed by regulatory protectionism in its target markets. Furthermore, Terra may find it difficult to compete if zero-fee stablecoins prove popular. Lastly, it also faces an uphill battle against established payment platforms WePay, Alipay, LINE Pay and GrabPay in Asia.

**Basis, the stablecoin project that popularized non-collateralized stablecoins, raised an eye-popping \$133 million in April 2018 from Bain Capital Ventures, Google Ventures, Andreessen Horowitz, Stan Druckenmiller, former Fed Governor Kevin Warsh, and others.**

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Basis worked in a triple token system - stablecoin, “bond” and “share” tokens. Basis wanted to adjust the stablecoin supply and therefore stabilize the price through auctions of “bond” and “share” tokens. If the price of the Basis stablecoin fell below the peg, the contract would automatically create new “bond” tokens and then sell them in an auction. The Basis stablecoins collected through the auction would then be burned reducing the total supply, which should theoretically push the price of the stablecoin up to the peg.

When the price was at or above the peg, the protocol would create new stablecoins and pay off outstanding “bond” tokens 1:1. When

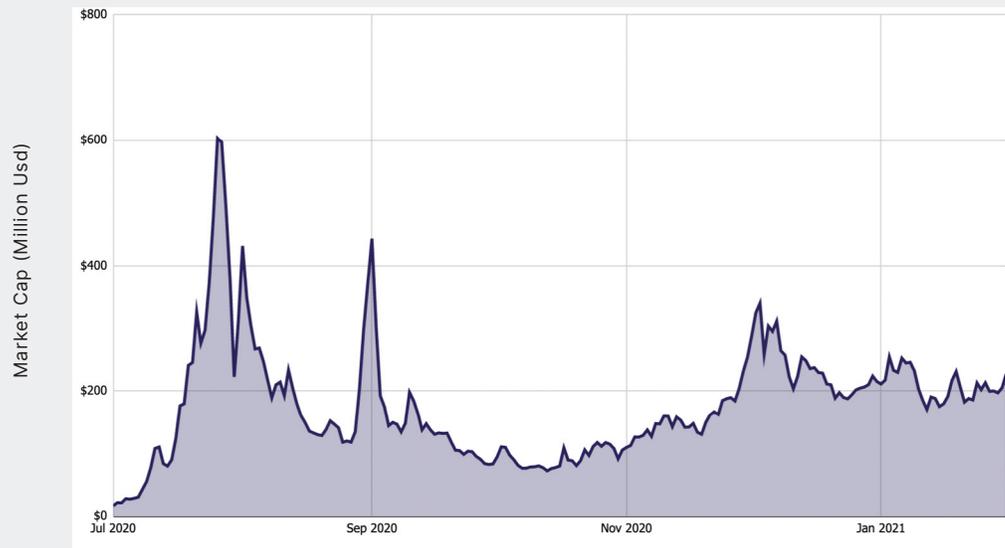
there were no more “bond” tokens, the new stablecoins would then be distributed to the “share” token holders. If the stabilization mechanism were to misbehave, Basis would have also used fiat reserves to buy on the secondary in order to protect the peg early on before the project matured.

Basis did not survive because of design complexities and since lawyers determined the “bond” and “share” tokens would be considered securities in most jurisdictions. The project returned the remaining capital to investors and stopped development in December 2018.

Fragments, which later rebranded to Ampleforth, also initially branded itself as an algorithmic stablecoin (which could relate to an earlier design of the system). Since then the team has later explicitly stated that AMPL is not a stablecoin.

#### MARKET CAPITALIZATION OF AMPLEFORTH

Source: skew



Fragments, which later rebranded to Ampleforth, also initially branded itself as an algorithmic stablecoin (which could relate to an earlier design of the system). Since then the team has later explicitly stated that AMPL is not a stablecoin. In June 2019, Ampleforth was the first token sale held on Bitfinex. During the offering, the company sold \$5 million of tokens in just 11 seconds, which was the hard cap for the fundraiser. Ample-

forth's original goal was to create money that is "inflation-proof, sovereign free and capable of storing both near and long-term value."

The design of Ampleforth works as follows - when the price of 1 AMPL is above \$1, the AMPL supply will be inflated until the desired price equilibrium of \$1 is reached. If the AMPL price goes below \$1, the supply

deflates until price parity has been restored. In practice, this effect is smoothed and adjustments are made every 24 hours. The protocol automatically adjusts the supply using the previous day's average price.

The supply adjustment is made by inflating or deflating the holdings of every AMPL wallet. This is crucial because it means that the value of a user's holdings fluctuates with the market capitalization of AMPL. Users' holdings remain just as volatile as before because the choice between price stability and unit stability is a trivial one. If all users are inflated and deflated at the same rate, that is the same as no supply changes existing at all.

The supply changes are algorithmic and well-known ahead of time, and presumably, the market knows what the market capitalization is at any given moment. Changing the supply of user holdings to compensate for price changes is an accounting trick. Ampleforth encourages a stable unit price by moving volatility from price to supply.

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## Stablecoins:

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# Stablecoin Regulation & Compliance

Twenty-Four years after the G-10 started studying e-money developments, the G7 Working Group on Stablecoins released a landmark report on global stablecoins. The Financial Stability Board (FSB), US Office of the Comptroller of the Currency (OCC) and the Financial Action Task Force (FATF) have also weighed in over the past few years.

As for regional specific regulation, the Regulation on Markets in Crypto-assets (MiCA) and the STABLE Act Proposal bring plenty to the stablecoin oversight debate.

## Stablecoin Regulation & Compliance

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The G-10 started studying e-money developments and discussing policy issues in 1995, culminating with the release of the ‘Implications for central banks of the development of electronic money’ report in October 1996. Twenty-Four years later, the Group of Seven (G-7) administration set up a stablecoins working group in response to financial firms and technology companies —most notably Facebook — sponsoring stablecoin initiatives. The working group was tasked with documenting potential opportunities, risks and difficulties that global stablecoins might pose to the global financial system.

In October 2019, the G7 Working Group on Stablecoins released its ‘Investigating the impact of global stablecoins’ report. The report initially acknowledged challenges with cross-border retail payments and remittances, and how crypto-assets were originally viewed as a potential solution. However, given the volatile price nature of this speculative asset class, among other limitations, stablecoins emerged as a more viable alternative.

The G7 found that “stablecoins have many of the features of crypto-assets but seek to stabilise the price of the ‘coin’ by linking its value to that of a pool of assets. Therefore, stablecoins might be more capable of serving as a means of payment and store of value, and they could potentially contribute to the development of global payment arrangements that are faster, cheaper and more inclusive than present arrangements.”<sup>19</sup> Once again, similar to the e-money initiatives of Web 1.0, authorities focused on the store of value and medium of exchange function. In their mind, stablecoins are mostly viewed as an innovation to the current payments system, as opposed to a monetary innovation. The future of stablecoins remains uncertain, mainly due to the nascency of distributed ledger technology (DLT) and smart contracts; other initiatives are currently tackling payments using more proven technologies.

The G7 identified the following areas of concern<sup>20</sup> for all stablecoin projects:

19 [Investigating the impact of global stablecoins](#)  
pg. ii October 2019.

20 [Investigating the impact of global stablecoins](#)  
pg. ii October 2019.

# Stablecoin Regulation & Compliance

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- Legal certainty
- Sound governance, including the investment rules of the stability mechanism
- Money laundering, terrorist financing and other forms of illicit finance
- Safety, efficiency and integrity of payment systems
- Cyber security and operational resilience
- Market integrity
- Data privacy, protection and portability
- Consumer/investor protection
- Tax compliance

Institutions from the private sector designing stablecoins need to take into account these legal and regulatory risks. Maintaining strict adherence to the laws and regulations of each operating jurisdiction around the world is paramount. Additional concerns related to monetary policy, financial stability, the global monetary system and equitable competition were raised for so-called “global stablecoins” (GSCs).

GSCs are “initiatives built on an existing – large and/or cross-border – customer base that may have the potential to scale rapidly to achieve a global or other substantial footprint.”<sup>21</sup> Analogous to e-money from the 1990s, fiat currency substitution risk is one of the main issues in the eyes of monetary authorities. More unique to the platform era, policymakers are wary of potential monopolies forming where social media giants leverage user information for payments data. The G7 firmly deems that GSC projects should postpone operations until additional regulatory and legal clarity are provided by international decision making bodies.

## Recommendations of the Financial Stability Board

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The Financial Stability Board (FSB) is one such organization, which is tasked with monitoring potential threats to the global financial system. Established in 2009 after the Global Financial Crisis (GFC), the FSB was both hosted and funded by the BIS. All of the Group of Twenty (G20) participants are members of this organization. G20 finance

21 [Investigating the impact of global stablecoins](#)  
pg. iii October 2019.

# Stablecoin Regulation & Compliance

ministers take the FSB's recommendations into consideration when creating laws and regulations for their respective financial systems.

In response to a June 2019 call from the G20 to investigate and advise on regulatory issues related to global stablecoins, the FSB released a consultative document in April 2020. The report matched stablecoin vulnerabilities to the corresponding regulatory authorities and international standards, examined potential financial stability risks and provided a checklist of 10 high-level suggestions for effective oversight.

The checklist stated that "while such financial stability risks are currently limited by the relatively small scale of these arrangements, this could change in the future ... if widely adopted, however, a stablecoin could become systemically important in and across one or many jurisdictions, including as a payments infrastructure. Ensuring the appropriate regulatory approach within jurisdictions and internationally will therefore be important."<sup>22</sup>

After soliciting comments from authorities for the consultative document, the FSB released a final report in October 2020. Taking into consideration feedback from financial institutions, legal experts, regulators, academics and technology firms, the FSB solidified the following 10 high-level recommendations<sup>23</sup> for GSC arrangements:

1. Authorities should have and utilise the necessary powers and tools, and adequate resources, to comprehensively regulate, supervise and oversee a GSC arrangement and its associated functions and activities, and enforce relevant laws and regulations effectively.
2. Authorities should apply comprehensive regulatory, supervisory and oversight requirements and relevant international standards to GSC arrangements on a functional basis and proportionately to their risks.
3. Authorities should cooperate and coordinate with each other, both domestically and internationally, to foster efficient and effective communication and consultation in order to support each other in fulfilling their respective mandates and to ensure comprehensive regulation, supervision, and oversight of a GSC arrangement across borders and sectors.

22 [Addressing the regulatory, supervisory and oversight challenges raised by "global stablecoin" arrangements Consultative Document](#)  
pg. 1 April 2020.

23 [Addressing the regulatory, supervisory and oversight challenges raised by "global stablecoin" arrangements Final Report](#)  
pg. 4 October 2020.

4. Authorities should ensure that GSC arrangements have in place a comprehensive governance framework with a clear allocation of accountability for the functions and activities within the GSC arrangement.
5. Authorities should ensure that GSC arrangements have effective risk management frameworks in place especially with regard to reserve management, operational resilience, cyber security safeguards and AML/CFT measures, as well as 'fit and proper' requirements.
6. Authorities should ensure that GSC arrangements have in place robust systems for collecting, storing and safeguarding data.
7. Authorities should ensure that GSC arrangements have appropriate recovery and resolution plans.
8. Authorities should ensure that GSC arrangements provide users and relevant stakeholders with comprehensive and transparent information necessary to understand the functioning of the GSC arrangement, including with respect to its stabilisation mechanism.
9. Authorities should ensure that GSC arrangements provide legal clarity to users on the nature and enforceability of any redemption rights and the process for redemption, where applicable.
10. Authorities should ensure that GSC arrangements meet all applicable regulatory, supervisory and oversight requirements of a particular jurisdiction before commencing any operations in that jurisdiction, and adapt to new regulatory requirements as necessary.

The FSB has been commissioned by the G20 to create a roadmap for improving cross-border payment cooperation and information sharing over the next several years. By December 2021, they are expected to have an international standard-setting framework for cross-border payment instruments, including stablecoins.

## The OCC's Interpretive Letters

As for more tangible regulatory updates, the US Office of the Comptroller of the Currency (OCC) has published three interpretive letters related to digital assets since the Summer of 2020.

The first interpretive letter, 'Authority of a National Bank to Provide Cryptocurrency Custody Services for Customers'<sup>24</sup> or OCC Interpretive Letter 1170, was released on July 22nd, 2020. It concluded that national banks were able to custody digital assets on behalf of their customers and that financial institutions could handle cryptographic keys for digital assets.

<sup>24</sup> [Interpretive Letter #1170, Authority of a National Bank to Provide Cryptocurrency Custody Services for Customers](#)  
July 2020.

On September 21st, 2020, the OCC published the second interpretive letter, 'OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Hold Stablecoin Reserves'<sup>25</sup> or OCC Interpretive Letter 1172. The guidance concluded that national banks have legal authority to hold stablecoin reserve accounts in the name of customers.

Within the context of Interpretive Letter 1172, the OCC considered "a 'stablecoin' to be a unit of cryptocurrency associated with hosted wallets that is backed by a single fiat currency and redeemable by the holder of the stablecoin on a 1:1 basis for the underlying fiat currency upon submission of a redemption request to the issuer."<sup>26</sup> It was made clear that the letter did not cover the authorization of un-hosted wallets to support stablecoin transactions, a serious topic of discussion.

The guidance addressed national bank legal authority for holding stablecoin reserve accounts in the name of customers. Such accounts "could be structured as either deposits of the stablecoin issuer or as deposits of the individual stablecoin holder if the requirements for pass through insurance are met."<sup>27</sup> Considering banks and federal savings associations already perform billions of dollars in stablecoin-related activities daily, this letter provided much-needed clarity to the innovators, fintech companies, financial institutions and customers who now have confidence that banking safeguards will apply to these accounts.

One such safeguard requires banks to "have appropriate agreements in place with an issuer to verify and ensure that the deposit balances held by the bank for the issuer are always equal to or greater than the number of outstanding stablecoins issued by the issuer. Such agreements should include mechanisms to allow the bank to verify the number of outstanding stablecoins on a regular basis."<sup>28</sup> The necessity for audit procedures is roughly analogous to when banks enter into agreements with third-party program managers that distribute prepaid cards, which is something that we will delve further into later in this section.

25 [Interpretive Letter #1172, OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Hold Stablecoin Reserves](#) September 2020.

26 [Interpretive Letter #1172, OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Hold Stablecoin Reserves](#) pg. 3 September 2020.

27 [Interpretive Letter #1172, OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Hold Stablecoin Reserves](#) pg. 5 September 2020.

28 [Interpretive Letter #1172, OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Hold Stablecoin Reserves](#) pg. 5 September 2020.

# Stablecoin Regulation & Compliance

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Both letters were cheered throughout the digital assets industry as meaningful progress that would allow the ecosystem to leverage traditional financial services infrastructure, applications and consumers. Furthermore, OCC Interpretive Letter 1170 & 1172 provided long-awaited clarity to those that want to ensure banking safeguards will apply to certain digital assets and services.

Unfortunately, a group of US politicians didn't seem to agree, feeling that the decision to classify digital assets was too important for the future of banking for the OCC to make on its own.

On November 10th, Congressman Stephen Lynch (MA-08), Congresswoman Rashida Tlaib (MI-13), Reps. Jesús G. "Chuy" García (IL-04), Deb Haaland (NM-01), Barbara Lee (CA-13), and Ayanna Pressley (MA-07) sent a letter to the now former Acting Comptroller of the Currency, Brian P. Brooks, criticizing OCC Interpretive Letter 1170 & 1172. It's worth noting that some of these lawmakers are also associated with the STABLE Act proposal, which we cover later in this section.

The letter pushed for the OCC to collaborate with Congress and other regulatory agencies on these issues. It also asked the OCC to answer a set of 8 questions by December 10th, 2020.

Questions from the letter<sup>29</sup> to the OCC included:

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1. With the permission granted to banks to now use bank deposits as reserves against stablecoins, will these reserves be segregated from calculating the capital requirements of banks such as JPMorgan Chase and Wells Fargo or will they be able to lend against these deposits?
2. What consumer protections will the OCC impose on the stablecoin providers themselves?
3. Considering a stablecoin issuer will likely be willing to move large amounts of reserves between different banks, will stablecoin reserves be treated as brokered deposits, subject to applicable restrictions on banks accepting them?
4. Considering mass redemptions of a stablecoin backed by reserve accounts would result in a mass withdrawal of those reserves, what measures will banks and FSAs have to take to ensure that a "run" on a stablecoin does not result, in effect, in a run on deposits.

29 [Letter to the OCC on Fintech-  
Charters\\_Tlaib\\_Lynch](#)  
pg. 2-3 November 10th, 2020.

# Stablecoin Regulation & Compliance

5. If stablecoins are increased as a result of your interpretive letter, will this increase the Digital Divide or negatively impact your Project Reach? Do other agencies and considerations factor into your decision in terms of internet access to stablecoins?
6. How do you plan to protect the notion of the dollar itself, in that this will be private money used for payments digitally, and therefore subject to potential losses should the stablecoin provider go out of business? Is it the bank's, the stablecoin provider's, or the OCC's responsibility to ensure that enough deposits are held at these institutions to protect the consumer?
7. To what extent have you collaborated with your fellow regulators on your decisions? What implications for regulation outside of your sole-jurisdiction do you anticipate as a result of your interpretive letter?
8. Since the Federal Reserve Bank has strategically used its control of the money supply in times of stress to address inflation, what is the OCC's assessment of the likely impact of diluting the FRB's authority and effectively transferring the control of our money supply to stablecoin providers?

It appears that the questions were a mere formality, as the House Financial Services Committee went on the offensive before the OCC could even respond. On December 4th, the Committee sent a letter to then President-elect Joe Biden that criticized the OCC's behavior under the Trump administration, particularly when it came to deregulation disguised in the name of innovation.

The letter included an attachment with a list of executive actions and regulations that were passed by the Trump administration that are under the jurisdiction of the House Committee on Financial Services. Under a header titled 'Digital Banking,' the Committee recommended that both OCC decisions regarding digital assets be reversed under the future Biden administration. To make matters even more interesting, after this letter was sent, the OCC issued another interpretive letter related to digital assets.

On January 4th, 2021, the OCC published its 'OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities'<sup>30</sup> Interpretive Letter, otherwise known as OCC Interpretive Letter 1174.

30 [Interpretive Letter #1174, OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities](#)

January 2021.

# Stablecoin Regulation & Compliance

As written in the introduction of OCC Interpretive Letter 1174, the memo “addresses the legal permissibility of certain payment-related activities that involve the use of new technologies, including the use of independent node verification networks (INVNs or networks) and stablecoins, to engage in and facilitate payment activities. National banks and Federal savings associations (collectively referred to as ‘banks’) may use new technologies, including INVNs and related stablecoins, to perform bank-permissible functions, such as payment activities.”<sup>31</sup>

For the amount of certainty provided by Interpretive Letter 1170 & 1172, OCC Interpretive Letter 1174 established itself as the clearest legal guidance for digital assets from the OCC to date.

Acting Comptroller of the Currency, Brian P. Brooks, discussed the importance of government agencies providing legal certainty with novel technologies, such as blockchain, in the OCC’s press release for Interpretive Letter 1174.

As quoted in the press release<sup>32</sup>, Brooks stated:

“While governments in other countries have built real-time payments systems, the United States has relied on our innovation sector to deliver real-time payments technologies. Some of those technologies are built and managed by bank consortia and some are based on independent node verification networks such as blockchains ... The President’s Working Group on Financial Markets recently articulated a strong framework for ushering in an era of stablecoin-based financial infrastructure, identifying important risks while allowing those risks to be managed in a technology-agnostic way. Our letter removes any legal uncertainty about the authority of banks to connect to blockchains as validator nodes and thereby transact stablecoin payments on behalf of customers who are increasingly demanding the speed, efficiency, interoperability, and low cost associated with these products.”

Brooks’ quote touched on several themes that were central to the findings of OCC Interpretive Letter 1174. First and foremost, the OCC established that distributed ledger technology (DLT) has the potential to reshape real-time payments in the United States and abroad.

31 [Interpretive Letter #1174, OCC Chief Counsel’s Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities](#)  
pg. 1 January 2021.

32 [Federally Chartered Banks and Thrifts May Participate in Independent Node Verification Networks and Use Stablecoins for Payment Activities | OCC](#)  
January 4th, 2021.

# Stablecoin Regulation & Compliance

Concepts from Interpretive Letter 1170 & 1172 were used to support this claim.

The OCC holds that distributed ledger technology (DLT), a form of an INVN, is an evolution in data structuring that can transform the mechanism for storing, transferring, transmitting, and exchanging value using stablecoins. A stablecoin was defined as “a type of cryptocurrency that is designed to have a stable value as compared with other types of cryptocurrency.”<sup>33</sup> By using stablecoins as a vehicle for facilitating payment activities with DLT, the speed and cost of transferring funds anywhere in the world can dramatically improve.

Another major theme touched upon in the letter was the relationship between technological innovation and historical changes in banking legislation to accommodate said innovations. Citing court rulings, such as *Auten v. U.S. Nat’l Bank of New York*, 174 U.S. 125, 143 (1899)<sup>34</sup>, the OCC determined that banks are financial intermediaries meant to facilitate money and credit flow in a manner adaptive to shifting economies and changing consumer needs.

As written in the letter:

“Over time, banks’ financial intermediation activities have evolved and adapted in response to changing economic conditions and customer needs. Banks have adopted new technologies to carry out bank-permissible activities, including payment activities. The emergence of new technologies to facilitate payments, support financial transactions, and meet the evolving financial needs of the economy has led to a demand for banks to use INVNs to carry out their traditional functions. The changing financial needs of the economy are well-illustrated by the increasing demand in the market for faster and more efficient payments through the use of decentralized technologies, such as INVNs, which validate and record financial transactions, including stablecoin transactions.”<sup>35</sup>

The OCC cited interpretive letters from the 90s and early 2000s that established a precedent when it comes to adapting to new technologies to develop and operate electronic funds transfer systems, real-time settlement systems, and stored value systems. As we discuss in

33 [Interpretive Letter #1174, OCC Chief Counsel’s Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities](#)  
pg. 2 January 2021.

34 [Auten v. United States Nat’l Bank of New York, 174 U.S. 125 \(1899\)](#)  
Decided April 24, 1899.

35 [Interpretive Letter #1174, OCC Chief Counsel’s Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities](#)  
pg. 3 January 2021.

the Appendix to this report, the rise of electronic money (e-money) throughout the years of Web 1.0 (1990s to early 2000s) provides a scope for pragmatically viewing e-money innovations of the next Web: stablecoins. So, the use of INVNs to carry out financial services functions with stablecoins can be seen as the natural step forward for banking infrastructure, similar to the initial adaptation to the internet.

Moreover, stablecoins may be the way to unlock the stability of sovereign currencies and the efficiencies that come along with INVNs. According to the OCC, “stablecoins can provide a means of transmitting value denominated in an existing currency using INVN technology. Stablecoins thus provide a means by which participants in the payment system may avail themselves of the potential advantages associated with INVNs. Billions of dollars’ worth of stablecoin trade globally and demand for stablecoin continues to grow.”

So, the OCC recognizes the current demand for stablecoins and sees the potential for them to serve as a mechanism for transmitting, storing and settling value using infrastructure of the next iteration of the internet. By treating public blockchains as infrastructure for financial services, one can potentially look at DLT in a manner similar to networks such as SWIFT.

## Industry Experts Weigh in on Permissioned Pseudonymity

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Speaking of prepaid debit cards, payments expert JP Koning wrote about their relation to pseudonymous stablecoin transactions in his ‘From unknown wallet to unknown wallet’<sup>36</sup> blog post in November 2019. Koning drew inspiration from fellow digital assets specialist Antony Lewis’ ‘KYC in Stablecoins’<sup>37</sup> piece, wherein Lewis reveals that fiat-backed stablecoin issuers don’t need to identify all holders currently — rather only users converting between bank funds and stablecoins. Lewis dubs the concept “permissioned pseudonymity,” since regulators are currently providing permission to stablecoin issuers to have pseudonymous network users.

Koning wonders how much longer stablecoin permissioned pseudonymity will continue, seeing as how Financial Action Task Force

36 [Moneyiness: From unknown wallet to unknown wallet](#)  
JP Koning November 2019.

37 [KYC in Stablecoins](#)  
Antony Lewis October 2019.

“It’s important to note that the larger stablecoin projects do comply with law enforcement and will freeze and/or zero out specific wallet addresses of bad actors. There are examples of this which can be seen on-chain. These capabilities are coded into the smart contracts themselves.”

—  
Antony Lewis, [Bitsonblocks.net](https://bitsonblocks.net)

(FATF) regulations are meant to be technology agnostic. He writes how “the problem is that granting permissioned-pseudonymity to stablecoin operators contradicts technology-neutrality. It sets one set of standards for bank accounts and another for stablecoins.”<sup>38</sup> However, Koning points out one regulatory exception for payments identification, prepaid debit cards, which were also discussed in Lewis’ blog post.

As Koning wrote: “In many parts of the world, people can buy prepaid debit cards (or in Europe, e-money) without providing any ID. This provides the card owner with pseudonymous access to the Visa or MasterCard networks ... stablecoins, like prepaid debit cards, might be granted their own exemption.” It’s important to note that there is a low threshold for access to pseudonymous debit cards (\$1,000 in the U.S.) and e-money wallets (€150 in Europe). Furthermore, in the United States, these cards aren’t reloadable and can’t be used at ATMs or for person-to-person payments.

According to Koning, “regulators believe that by keeping the pseudonymous prepaid ceiling low and reducing the features that a card offers, they achieve two things. The risk of money laundering and terrorist financing are minimized. At the same time, the unbanked and those without ID still get access to the retail payments system.” If the FATF were to allow a permissioned pseudonymity exemption to continue in the future, he believes that stablecoins would be subject to a similar minimum threshold.

## The Financial Action Task Force’s Report to the G20

Interestingly enough, the FATF was tasked by the G20 to determine Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) concerns related to stablecoins in October 2019, a month before JP Koning wrote his blog post on permissioned pseudonymity.

After working with the IMF, FSB and other standard-setting organizations, the ‘FATF Report to the G20 Finance Ministers and Central Bank Governors on So-called Stablecoins’<sup>39</sup> was released in June

38 [Moneyless: From unknown wallet to unknown wallet](#)  
JP Koning November 2019.

39 [FATF-Report-G20-So-Called-Stablecoins.pdf](#)  
June 2020.

2020. Among the top criminal abuse risks for money laundering and terrorist financing (ML/TF) were unhosted wallets facilitating anonymous peer-to-peer transactions. The FATF is still in the process of determining how to best alleviate threats associated with such disintermediated transactions.

Operators under the FATF's supervision are required to have robust transaction monitoring controls in place to prevent AML/CFT risks. This starts with the customer AML onboarding process and extends to methodologies for monitoring on-chain transactions. Central developers and governance bodies are uniquely equipped to mitigate ML/TF risks, since they determine the operating, design and functionality conditions for their stablecoins.

The FATF maintains that these centralized entities "can also control the access points to the arrangement [e.g. who can participate as an exchange or transfer service or whether a person can only access the system through a virtual asset service provider (VASP)] and impose AML/CFT standards setting out expectations or operating requirements for key entities in the arrangement, including exchanges and custodial wallet providers."<sup>40</sup> Exchanges and stablecoin issuers operating within FATF jurisdictions are being closely monitored for potential interactions with unregulated exchanges. Since unregulated exchanges have a lack of KYC policies and could potentially not be compliant with AML/CFT orders, there is increasing speculation that the next round of FATF guidance will bar regulated companies from transacting with these entities.

Revised standards are expected to be reviewed by the FATF by June 2021. The next round of guidance "will set out in more detail how AML/CFT controls apply to so-called stablecoins, including the tools available to jurisdictions to address the ML/TF risks posed by anonymous peer-to-peer transactions via unhosted wallets."<sup>41</sup> In sum, the FATF is on a mission to provide international binding standards for the digital assets industry. As of October 2020, 25 of 39 FATF members used the current set of standards to create domestic frameworks.<sup>42</sup>

40 [FATF-Report-G20-So-Called-Stablecoins.pdf](#)  
pg. 13 June 2020.

41 [FATF-Report-G20-So-Called-Stablecoins.pdf](#)  
pg. 4 June 2020.

42 [FATF President's remarks to G20 Finance Ministers a](#)  
October 14th, 2020.

## Regulation on Markets in Crypto-assets (MiCA)

Many believe that the European Commission's (EC) Digital Finance Package (DFP) is the most definitive regulatory guidance to date. The DFP aims to facilitate financial sector competitiveness and innovation in the European Union (EU), establish Europe as a global standard-setter and provide consumer protection to digital finance and modern payments. Two legislative proposals, the DLT Pilot Regime and the Regulation on Markets in Crypto-assets (MiCA), are the first tangible actions taken under the DFP.

“The Markets in Crypto-assets (MiCA) regulatory proposal in Europe is to cryptoassets what General Data Protection Regulation (GDPR) was to internet privacy, and it's going to serve as a major legal precedent for digital assets worldwide.”

—  
Dante Disparte, Diem

Both proposals were leaked in early September 2020, and were adopted by the EC later that month; it should be noted that each proposal is only a draft, both of which need to be considered by the European Parliament and EU Council. The pilot regime on distributed ledger technology market infrastructure hopes to provide a safe environment for DLT experimentation, otherwise known as a 'sandbox' approach. If successful, this should expedite the creation of digital asset financial instruments within a novel secondary market. These activities would be in line with the European Capital Markets Union, a 2014 initiative that aims to establish a single market for capital throughout the EU, an effort to lower barriers to macroeconomic benefits. Once voted on, the DLT Pilot Regime Regulation would be solidified 20 days after being published in the Official Journal of the European Union (OJEU), and the law would be applicable one year later.

The MiCA Regulation is a 168-page document that provides a significant level of insight into the EU's plans for regulating digital assets. When reading the proposal it is clear that concepts from existing financial services and banking regulations were influential in creating this draft. Securities law expert Bastiaan Siemers finds that MiCA's "whitepaper requirement is like the prospectus requirement applicable under the Prospectus Regulation whereas the authorization for issuers of asset-referenced tokens and providers of crypto-as-

set services has similarities with the MiFID II authorization regime. Together with the fact that the draft MiCA Regulation includes a 'light touch' market abuse regime that is no doubt derived from the MAR, just like custody and payment requirements that seem to come from the AIFMD and the PSD2, the draft MiCA Regulation also refers to the CRD and the EMD for the authorization of issuers of e-money tokens. All in all, the draft MiCA Regulation seems to be a collection of (parts of) these banking and financial services regimes."<sup>43</sup> It appears as if digital asset issuers and crypto-asset service providers (CASPs) are on a path to become regulated on par with traditional financial services in the EU.

MiCA's definition of crypto-assets is intentionally broad and seeks to cover all potential forms that are not already within the scope of EU financial services legislation, such as stablecoins and CASPs. In fact, stablecoins are directly referenced in the 'Reasons for and objectives of the proposal' section at the beginning of MiCA's Explanatory Memorandum.

Paying homage to the G7 working group's 2019 research report on stablecoins and a 2019 letter from the FSB Chair to the G20, the memorandum states "a relatively new subset of crypto-assets – the so-called 'stablecoins' – has recently emerged and attracted the attention of both the public and regulators around the world. While the crypto-asset market remains modest in size and does not currently pose a threat to financial stability, this may change with the advent of 'stablecoins', as they seek wider adoption by incorporating features aimed at stabilising their value and by exploiting the network effects stemming from the firms promoting these assets."

Crypto-assets are broken down into three categories: utility tokens, asset-referenced tokens and e-money tokens. Definitions from MiCA Article 3<sup>44</sup> for each token category are listed below:

- 1. Utility Token** · A type of crypto-assets which are intended to provide access digitally to an application, services or resources available on a distributed ledger and that are accepted only by

43 [Regulation on Markets in Crypto Assets \(miCA\)](#) pg. 31 October 2020.

44 [Regulation on Markets in Crypto Assets \(miCA\)](#) pg. 31 October 2020.

# Stablecoin Regulation & Compliance

the issuer of that token to grant access to such application, services or resources available.

- 2. Asset-Referenced Tokens** · A type of crypto-assets whose main purpose is to be used as a means of exchange and that purports to maintain a stable value by referring to the value of several fiat currencies, one or several commodities or one or several crypto-assets, or a combination of such assets.
- 3. E-Money Token** · A type of crypto-assets whose main purpose is to be used as a means of exchange and that purports to maintain a stable value by being denominated in (units of) a fiat currency.

Stablecoins fall under the asset-referenced tokens (ARTs) or e-money tokens (E-MTs) categories, which are laid out in Title III (ARTs) and Title IV (E-MTs) of MiCA. DAI, which is backed by cryptocurrency, is an example of an ART stablecoin. GMO's GYEN/ZUSD stablecoin exemplifies an E-MT, as it is a regulated stablecoin pegged to the Japanese Yen. MiCA doesn't formally provide a definition of stablecoins, but it does use the phrase "often described as 'stablecoin'" when referring to ARTs and E-MTs.<sup>45</sup> Furthermore, when discussing potential options for regulating stablecoins, it's stated that "'Stablecoins' whose value is backed by funds or assets are close to the definition of e-money under the Electronic Money Directive."<sup>46</sup>

Feedback on the MiCA draft was welcome until December 2, 2020. MiCA expresses the EC's weariness of global stablecoins arrangements. The benefits offered by GSCs to EU citizens in terms of efficient and inclusive payments would have to clearly outweigh risks related to monetary policy, financial stability and monetary sovereignty. It is noteworthy that MiCA goes as far as to say that outright banning or limiting the use of such stablecoins within the EU "would not be consistent with the objectives set at the EU level to promote innovation in the financial sector."

Only time will tell how stablecoin regulation will unfold within the European Union. Some experts speculate that MiCA will forge a path for digital asset regulation similar to that established by General Data Protection Regulation (GDPR) for data protection and privacy. This could

<sup>45</sup> [Regulation on Markets in Crypto Assets \(miCA\)](#)  
pg. 31 September 2020.

<sup>46</sup> [Regulation on Markets in Crypto Assets \(miCA\)](#)  
pg. 9 September 2020.

# Stablecoin Regulation & Compliance

“The MiCA regulation will directly apply to stablecoins and might be applied in a similar fashion to the European GDPR, with a European-centric reach that spans globally. It is also highly likely that other jurisdictions will follow suit and publish their respective versions of an updated regulatory framework. Additionally, governments, central banks and other leading authorities are gradually becoming involved in monitoring CBDCs.”

—  
Samuel Lim, Binance

potentially limit the competitiveness and innovativeness of digital payments and stores of value in the EU compared to other jurisdictions.

As for the next steps, feedback on the MiCA draft is welcome until December 2, 2020. After approval from the Council of the EU and the European Parliament, MiCA would be eligible to come into force. Once implemented, provisions for asset-referenced tokens and e-money tokens would apply immediately for all EU member states, while the rest of the regulation would be implemented 18 months later.

Bastiaan Siemers included a concise table<sup>47</sup> covering the main aspects of MiCA Regulation at the end of his blog post for Legaltree. The Block Research customized the following table to display MiCA highlights for the two main categories of stablecoins, asset-referenced tokens (ARTs) and e-money tokens (E-MTs), as well as for entities offering provisional services for crypto-assets:

47 [Main aspects of the Regulation on Markets in Crypto-assets \(MiCA\)](#)  
September 24th, 2020.

# Stablecoin Regulation & Compliance

## MAIN ASPECT OF MICA REGULATION FOR STABLECOINS & PROVISION OF SERVICES

CATEGORY	ASSET-REFERENCED TOKENS (ARTs)	E-MONEY TOKENS (E-MTs)	PROVISION OF SERVICES
<b>Exemptions</b>	Crypto-assets qualifying as a financial instrument, e-money, (structured) deposit or securitisation		i. (Re)insurance undertakings ii. Intragroup services
<b>Partial exemptions</b>			i. Authorized credit institutions ii. Investment firms iii. Payment institutions (partially exempted from certain provisions already otherwise met due to their authorization)
<b>Legal status required</b>	Legal entity	Legal entity	-
<b>Domicile required</b>	EU	-	EU
<b>Authorisation</b>	Required	Required as credit institution or e-money institution	Required
<b>Manager requirements</b>	Good repute, experience & skills	-	Good repute, experience & skills
<b>Organisational requirements</b>	Policies on (e.g.): i. stabilisation ii. custody of reserve assets iii. rights of token holders iv. transaction validation v. functioning of DLT vi. conflicts of interest vii. complaints handling viii. liquidity management ix. orderly wind-down	As per CRD/CRR or EMD	Policies on (e.g.): i. business continuity ii. systems and security iii. transaction recording iv. safeguard ownership rights v. market abuse detection vi. complaints handling vii. conflicts of interest viii. outsourcing
<b>Whitepaper</b>	Compliant with Annex 1 & 2 Must be approved by regulator	Compliant with Annex 1 & 3 Must be submitted to regulator	-
<b>Private placement</b>	i. < € 5 million per 12 months ii. qualified investors only	i. < € 5 million per 12 months ii. qualified investors only	-
<b>Capital requirements</b>	Owns funds (CET1) of higher of: i. € 350,000 ii. 2% of average amount reserve assets	As per CRD/CRR or EMD	Own funds (CET1) or insurance policy for higher of: i. amount in Annex IV (unknown) ii. 25% of fixed overheads preceding year
<b>Custody requirements -</b>	Crypto-asset services provider (crypto-assets as reserve assets) or credit institution (other reserve assets)	-	-
<b>Ongoing information requirements</b>	i. Website ii. Monthly disclosure of amount ARTs and value of reserve assets iii. Semi-annual independent audit of reserve assets iv. Immediate disclosure of significant effects on value of ARTs or reserve assets	As per CRD/CRR or EMD	Specific requirements may apply to specific services
<b>Regulator reporting</b>	i. Changes to management ii. Notice of significant change to business model (to regulator)	As per CRD/CRR or EMD	Changes to management
<b>Shareholder requirements</b>	i. Owners of ≥ 20% of issuer's capital must be of good repute ii. Assessment of acquisitions and disposals in issuer of 10%, 20%, 30% and 50% by regulator	As per CRD/CRR or EMD	i. Owners of ≥ 20% of issuer's capital must be of good repute ii. Assessment of acquisitions and disposals in service provider of 10%, 20%, 30% and 50% by regulator
<b>Relevant timelines</b>	Authorization and whitepaper approval may take 7 months	Whitepaper to be submitted to regulator at least 20 BDs prior to publication (authorization as per CRD/CRR and EMD)	Authorization may take 4 months
<b>Legal opinion</b>	Assessment required that activity is within scope of financial services regulations	-	-

## The STABLE Act Proposal

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On December 2nd, 2020, a proposal for the Stablecoin Tethering and Bank Licensing Enforcement (STABLE) Act was announced by members of the 116th United States Congress. The bill's discussion draft was introduced by Congresswoman Rashida Tlaib (MI-13), Congressman Jesús "Chuy" García (IL-04) and Chairman of Task Force on Financial Technology Rep. Stephen Lynch (MA-08).

According to the press release<sup>48</sup>, the passage of the STABLE Act would require:

1. Any prospective issuer of a stablecoin to obtain a banking charter;
2. That any company offering stablecoin services must follow the appropriate banking regulations under the existing regulatory jurisdictions;
3. That any company or bank issuing a stablecoin to notify and obtain approval from the Fed, the FDIC, and the appropriate banking agency 6 months prior to its issuance and maintain an ongoing analysis of potential systemic impacts and risks;
4. That any stablecoin issuers obtain FDIC insurance or otherwise maintain reserves at the Federal Reserve to ensure that all stablecoins can be readily converted into United States dollars, on demand.

So, three of the four main requirements from the STABLE Act pertain to stablecoin issuers, while the other requirement covers stablecoin service providers.

The primary motivation cited for the bill was consumer protection, specifically those that are from low-to-moderate income (LMI) communities. Advocates of the STABLE Act hold that LMI consumers are vulnerable to exploitation from stablecoin issuers and service providers, especially during the COVID-19 Pandemic. They believe that the pandemic has exposed infrastructure inefficiencies for LMI consumers to access mainstream financial services, which financial technology companies have taken advantage of, in their mind.

Facebook, JP Morgan and Apple are among the companies specifically named in the STABLE Act One-Pager. Within that document,

48 [Tlaib, García and Lynch Introduce Legislation Protecting Consumers from Cryptocurrency-Related Financial Threats](#)  
December 2nd, 2020.

the sentence “it is critical not to let Wall St and Silicon Valley own the future of digital payments, which is why Rep Tlaib is introducing the STABLE Act,”<sup>49</sup> best summarizes the purpose of the bill. However, when you dig into the specifics of the STABLE Act proposal, it is unclear how exactly the bill would do this?

When analyzing the STABLE Act proposal, it appears that the bill would significantly benefit the incumbents in the financial services sector, specifically the legacy financial institutions. Further, it looks to be a way to block technology companies, such as Facebook, from executing on their stablecoin visions.

As written on The STABLE Act Discussion Draft, the bill seeks “to amend the Federal Deposit Insurance Act to provide for the classification and regulation of stablecoins, and for other purposes.”<sup>50</sup> We will first examine the proposed legislation’s definition of stablecoins before getting to the “other purposes” of the bill.

Under a header titled ‘Definitions Related to Stablecoins,’<sup>51</sup> the term “stablecoin” means any cryptocurrency or other privately-issued digital financial instrument that—

- A. is directly or indirectly distributed to investors, financial institutions, or the general public;
- B. is—(i) denominated in United States dollars or pegged to the United States dollar; or (ii) denominated in or pegged to another national or state currency; and
- C. is issued—(i) with a fixed nominal redemption value; (ii) with the intent of establishing a reasonable expectation or belief among the general public that the instrument will retain a nominal redemption value that is so stable as to render the nominal redemption value effectively fixed; or (iii) in such a manner that, regardless of intent, has the effect of creating a reasonable expectation or belief among the general public that the instrument will retain a nominal redemption value that is so stable as to render the nominal redemption value effectively fixed.

The term “nominal redemption value” and its relation to stablecoins

49 [STABLE Act One Pager](#)  
December 2020.

50 [STABLE Act Discussion Draft](#)  
pg. 1 December 2020.

51 [STABLE Act Discussion Draft](#)  
pg. 8 December 2020.

is explained further. Within the context of the bill, nominal redemption value “means the value at which the stablecoin can readily be converted into United States dollars, or any other national or state currency, or a functional monetary equivalent, on demand, at the time of issuance, or otherwise accepted in payment or to satisfy debts denominated in United States dollars or any other national or state currency.”<sup>52</sup>

When describing the intended legal treatment of monetary instruments using currency pegs<sup>53</sup>, the bill finds that—

**1. Instruments Pegged to the United States Dollar:**

The value at which a stablecoin that is pegged to the United States dollar or a functional monetary equivalent can readily be converted into United States dollars, on demand, at the time of issuance shall be calculated using the express or implied pegged rate for such conversion at the time of issuance.

**2. Instruments Pegged to Another National or State Currency:**

The value at which a stablecoin that is denominated in or pegged to another national or state currency or a functional monetary equivalent can readily be converted into United States dollars, on demand, at the time of issuance shall be calculated using the express or implied exchange rate for such conversion at the time of issuance.

Lastly, the term “functional monetary equivalent”<sup>54</sup> is defined as:

- i. deposits, as defined under section 3 of the Federal Deposit Insurance Act;
- ii. e-money and money transmitter balances;
- iii. other stablecoins; and
- iv. any other financial instrument issued for the purpose of circulating as money, making payments, or satisfying debts denominated in United States dollars or any other national or state currency.

52 [STABLE Act Discussion Draft](#)  
pg. 9 December 2020.

53 [STABLE Act Discussion Draft](#)  
pg. 10 December 2020.

54 [STABLE Act Discussion Draft](#)  
pg. 11 December 2020.

As noted earlier, three of the four main requirements from the STABLE Act pertain to stablecoin issuers. The amendment to the Federal Deposit Insurance Act would mandate that all organizations issuing stablecoins be insured depository institutions. Since banks and

# The STABLE Act Proposal

savings associations are currently insured by the FDIC, as they are members of the Federal Reserve System, with access to the Fed's Master Account, stablecoin issuers would need to be classified as such too.

In order to gain and maintain approval to issue stablecoins<sup>55</sup>, an organization would need to:

1. Notify the appropriate federal banking agency, the FDIC, and the Board of Governors of the Federal Reserve System of the intention to issue a stablecoin at least six months in advance of the date of issuance.
2. Receive written approval from the appropriate federal banking agency, the FDIC, and the Board of Governors of the Federal Reserve System prior to issuing any stablecoin or stablecoin-related product, providing any stablecoin-related services, or otherwise engaging in any stablecoin-related commercial activity, including activity involving stablecoins issued by other persons; and
3. Provide ongoing analysis to the Federal Reserve Board, Financial Stability Oversight Council, and Office of Financial Research on potential systemic impacts or monetary policy implications of the stablecoin.
4. Maintain the ability to immediately redeem all outstanding stablecoins at their nominal redemption value, upon demand, in United States dollars.
5. Maintain deposit reserves with the applicable Federal reserve bank in a segregated account in an amount equal to the nominal redemption value of all outstanding stablecoins issued by the issuer.
  - i. These reserves would serve as collateral for the issuer's stablecoins.
  - ii. However, there is an exception for insured deposits, where the need for collateral would not apply with respect to the value of any outstanding stablecoins that the issuer of the stablecoins knows are insured deposits.

The bill gives regulators the authority to penalize stablecoin issuers if they are unable to adhere to these requirements.

<sup>55</sup> [STABLE Act Discussion Draft](#)  
pg. 12-14 December 2020.

Specifically, if the issuer of a stablecoin fails to immediately redeem an outstanding stablecoin, upon demand, in United States dollars (or if the appropriate Federal banking agency determines that the issuer does not have the ability to immediately redeem all outstanding stablecoins, upon demand, in United States dollars) the appropriate Federal banking agency shall penalize the issuer, which may include<sup>56</sup>—

- A. the revocation of deposit insurance provided under this Act;
- B. the revocation of the issuer’s membership in the Federal Reserve System;
- C. the revocation of the issuer’s Federal charter; and
- D. such lesser penalty as the agency determines appropriate.

In addition to the above mentioned terms and conditions, stablecoin issuers would be subject to the existing legislation and laws that banks are required to adhere to. This includes anti-money laundering (AML) and know your client (KYC) guidelines, the Bank Secrecy Act requirements, privacy laws and more.

As for non-issuers, the bill proposal also mandates disclosure requirements and standards related to stablecoin products and service providers. Under a section header titled ‘Products and Services Related to Stablecoins,’<sup>57</sup> conditions for general reporting requirements are listed.

One reporting condition holds that any person offering or providing a product or service with respect to a stablecoin, regardless of whether such person is the issuer of the stablecoin, shall clearly disclose—

- A. whether the person is the original issuer of the stablecoin; and
- B. if the person is the original issuer of the stablecoin, whether—
  - (i) the stablecoin is being held as an insured deposit; or
  - (ii) the stablecoin is fully collateralized by reserves maintained at a Federal reserve bank.

<sup>56</sup> [STABLE Act Discussion Draft](#)  
pg. 15 December 2020.

<sup>57</sup> [STABLE Act Discussion Draft](#)  
pg. 15 December 2020.

Another disclosure requirement is related to the use of the term “dollar” when referring to the balance of a stablecoin. As written in the

# The STABLE Act Proposal

“While it is important and correct for crypto proponents to point out unintended consequences of the STABLE act - such as how the operation of Ethereum nodes could suddenly become illegal - it seemed as if the strong community backlash did not stem from a good faith assessment of the act. The act would somewhat follow the European EMD2 and is clearly intended to protect consumers by guaranteeing them the option to redeem into the underlying collateral. Particularly when reserve holdings are only published occasionally and redemption requires the ability to enforce legal claims, it is important to make sure that current legislation has an appropriate mandate. Dismissing the bill completely would thus be the same mistake, as letting the STABLE act pass in its current form.”

—  
Jonas Klemm, Research Analyst

discussion draft, “a person offering or providing a product or service with respect to a stablecoin may not use the term ‘dollar’ or ‘dollars’ to refer to stablecoin balances unless such reference is pre-approved by either the Comptroller of the Currency or the Board of Governors of the Federal Reserve System.”<sup>58</sup>

Not only do non-issuers need to adhere to the disclosure requirements, but they also must obtain written approval and maintain said approval on an ongoing basis from the appropriate regulatory bodies. These regulatory organizations include the appropriate federal banking agency, the FDIC, and the Board of Governors of the Federal Reserve System.

The proposed legislation’s description of non-issuers is broad, allowing it to cover a large number of stakeholders. Specifically, non-issuers include any person who provides any stablecoin-related service, issues a stablecoin-related product, or otherwise engages in any stablecoin-related commercial activity, including activity involving stablecoins issued by other persons. Without approval from the above

mentioned regulators, it is illegal for non-issuers to perform commercial functions for stablecoins.

As one might imagine, the digital assets community had a lot to say about the STABLE Act proposal, especially given the increase in stablecoin supply and demand over the past several years. Considering the extent of stablecoin supply and demand growth over the past three years, can anyone blame the industry for wanting to defend its territory?

However, it’s much more than increasing economic metrics that digital asset advocates are vindicating. Many believe that stablecoins are key to the future of next generation financial and technological services, meaning a legislative proposal such as the STABLE Act would potentially constrict much needed innovation in the United States.

58 [STABLE Act Discussion Draft](#)  
pg. 16 December 2020.

# The STABLE Act Proposal

In its latest interpretive letter on digital assets, the U.S. Office of the Comptroller of the Currency's (OCC) recognized the current demand for stablecoins and illustrated the potential for them to serve as a mechanism for transmitting, storing and settling value using infrastructure of the next iteration of the internet. By treating public blockchains as infrastructure for financial services, one can potentially look at DLT in a manner similar to networks such as SWIFT and ACH.

Having the OCC share a favorable opinion with the digital assets community is a victory for innovation advocates. Even if members of Congress, such as those pushing for the STABLE Act, are recommending that the current administration rescind the OCC's recent decisions regarding digital assets, there is now official precedent from a financial services authoritative body that stablecoin advocates can point to when making the argument for innovation friendly regulation.

Coin Center, the non-profit organization focusing on digital assets policy issues, has long been one of the biggest advocates for pragmatic legislation that doesn't dampen the flames of innovation. In response to the STABLE Act proposal, Coin Center released a blog post titled 'The Unintended(?) Consequences of the STABLE Act: On purpose or not, the bill could turn even node operators into criminals.'<sup>59</sup>

Written by Research Director Peter Van Valkenburgh, the post starts out by echoing some of the thoughts related to dollar-denominated stablecoins from other members of the digital assets community that we covered in the previous section.

Referring to them as "dollar-denominated liabilities," Van Valkenburgh wrote:

"It's one thing to argue that all dollar-denominated liabilities should be the exclusive purview of banks. But this bill does not do that. This bill seems to leave most non-bank dollar-denominated liabilities out; it apparently does not cover any liabilities held by PayPal, Venmo, Square Cash, Apple Pay, Google Pay, nor any of the traditional money transmitters like Western Union and Moneygram. The bill, instead, targets dollar-denominated liabilities for special regulatory treatment if and only if they are so-defined 'stablecoins.'

59 [The Unintended\(?\) Consequences of the STABLE Act](#)  
December 3rd, 2020.

# The STABLE Act Proposal

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*The risks of these liabilities are certainly no greater when they are held by a stablecoin-issuing money transmitter rather than a traditional money transmitter, indeed they are probably reduced because public blockchains create verifiable accounting tools for auditing the supply of instruments in circulation. The risks are even fewer for stablecoins issued by smart contracts through which backing is secured by a decentralized protocol and no person or corporation has the power to run away with the reserve funds.”*

Van Valkenburgh believes that the bill is specifically targeting stablecoins, as opposed to traditional money transmitters, because it is easier to go after a less established industry. Alternatively, he theorizes that the vague wording of the bill’s discussion draft may even be a clever attempt to extend banking regulation to traditional Fintech companies as well. One can only really know once an actual H.R. Bill is introduced to the floor of the House of Representatives.

In the second half of his blog post, Van Valkenburgh brings up a potential scenario that most have not thought about. Outside of dollar-denominated stablecoins, what does this bill potentially mean for decentralized applications, such as Maker Dao, and the blockchain platforms that these applications run on, such as Ethereum?

On this issue, Van Valkenburgh wrote:

“Stablecoins aside, the bill would have dire implications for permissionless blockchains generally. The bill is intended to cover smart-contract-issued stablecoins like Dai. The logical consequence of the bill is that if any person is running software that validates Dai or other stablecoin smart contracts they will, themselves, be violating the law unless they are a chartered bank. Wisely, the bill does not appear to criminalize authoring or distributing that smart contract code because that would almost certainly face strict constitutional scrutiny on First Amendment grounds, as we’ve written about extensively.

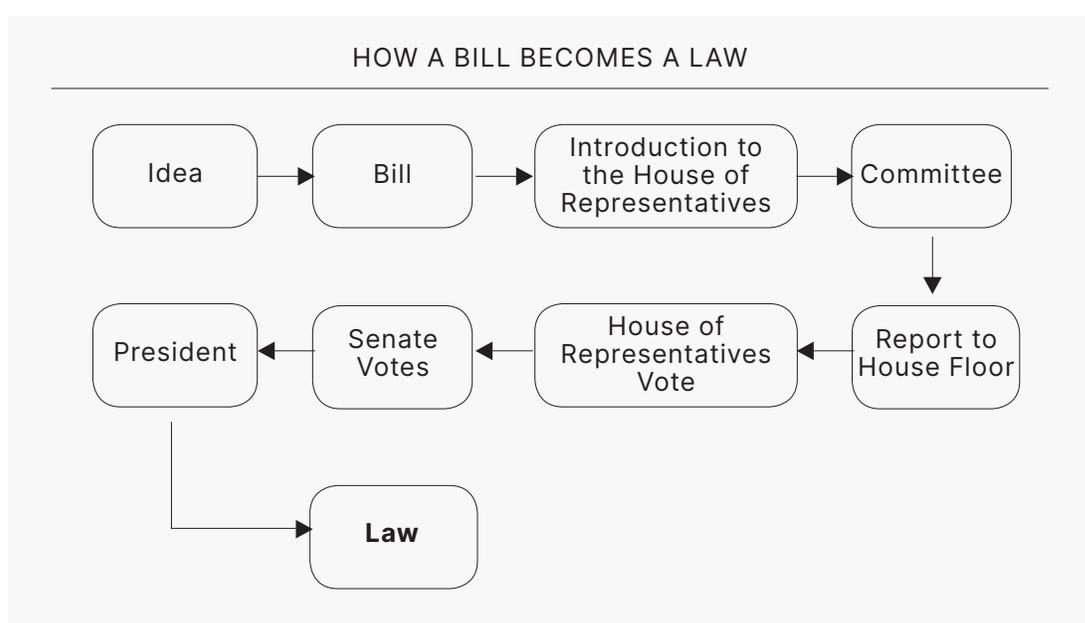
*Instead, it makes it illegal to run that software. To be clear, that software is the Ethereum network client. An Ethereum node does not discriminate between the various otherwise validly constructed smart*

# The STABLE Act Proposal

*contracts, it simply checks the math. If your software can't discriminate between 'legal' and 'illegal' smart contracts, the bill's sponsors might argue, then your choice to run that software is, itself, illegal. By targeting stablecoins this bill would have the effect of also destroying the larger Ethereum network and any other smart-contract-enabled public blockchain as necessary collateral damage."*

Even if the creators of the STABLE Act proposal did not mean for the proposed legislation to cover node operators, Van Valkenburgh does a good job at trying to imagine the potential ramifications. The truth is, at this early a stage, a lot of the proposal in its current form is open to interpretation. We will not have a better understanding until the creators provide more context or when/if the bill is introduced to the floor of the House of Representatives.

For those that need a refresher, the flow chart below illustrates the basic process of how a bill becomes a law in the U.S.



The STABLE Act is currently at the second step of the process. It is a bill that has yet to be introduced to the floor of the House of Representatives. With the 117th United States Congress now in session, we should be on the lookout for the sponsors to potentially introduce it as an H.R. Bill.

# The STABLE Act Proposal

“Stablecoins were designed to improve capital and operational efficiency across all digital asset marketplaces and they bring about a number of benefits, including 24/7 money movement capability, payments for goods and services, using a stable store of value, and participation in the burgeoning DeFi space. Obtaining regulatory approval and maintaining compliance is key to ensuring appropriate guard rails are in place to provide transparency and customer protection.”

—  
Yusuf Hussain, Gemini

At this early stage, the digital assets community should weigh-in and make our voices heard publicly. We can potentially influence a legislative proposal that would have significant consequences for our industry.

## Aspects of Stablecoin Compliance

There are four key aspects of stablecoin regulation from a compliance perspective:

- 1. Rigid AML onboarding process**
- 2. On-chain monitoring process for possible violations (having to file Suspicious Activity Reports)**
- 3. Compliance with law enforcement for investigations**
- 4. Periodical checks whether new supply is only created when money is in the bank account (optional)**

Within the United States, both state and federal agencies are involved in stablecoin regulation. It is important to note that there are multiple facets to stablecoin oversight, and that not all stablecoins which claim to be regulated are undergoing the same depth of compliance.

There are stablecoin providers that are trying to maintain adherence as close as possible to fiat currency; fiat requires banking charters, bank licenses and trust licenses. Prime stablecoin issuers such as Gemini, Paxos and GMO have taken the stance that they are a trust licensed entity and its stablecoins are issued under the trust license, which provides additional levels of transparency and sureties.

Those stablecoin issuers that are regulated by the New York State Department of Financial Services (NYDFS), such as GMO, Paxos and Gemini, are required to undergo annual exams, maintain capital reserve requirements, and adhere to heightened cyber security, Bank Secrecy Act (BSA), Anti-money laundering (AML), Know Your Customer (KYC) standards. For these exchanges and issuers, it becomes a question of what exact regulation they must follow?

# The STABLE Act Proposal

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One should look at the stablecoin parties through the lens of how a traditional financial institution is regulated. There are different degrees of regulation, with the minimum bar being a stablecoin issuer having a state by state money transmission license assuming they want to operate in the United States. The next degree involves federal cooperation across states, which involves a money transmission license that enables regulation at the federal level.

In September 2020, the Conference of State Bank Supervisors (CSBS), a national bank regulatory agency representing all 50 states, announced the 'MSB Networked Supervision' initiative. This program will allow U.S.-based money transmitters to take a single comprehensive examination that fulfills the requirements for each state.

According to Kevin Hagler, Georgia Department of Banking and Finance commissioner and CSBS Board chair, "MSB Networked Supervision is a significant and important shift in how state regulators will ensure compliance with consumer protection and safety and soundness standards for the largest payments companies. By working together and relying on the excellent work of fellow state regulators, we will be able to do even more."<sup>60</sup> Building off the 'One Company, One Exam pilot' program, the MSB Networked Supervision initiative is years in the making and will begin in 2021.

The third tier of regulation involves being at the trust level. As a regulated trust entity, essentially it's a bank, but the entity cannot do any lending or take fiat deposits. Trust licensed entities in New York that are in the digital assets industry have to adhere to requirements of both the BitLicense and a trust company. Finally, the most stringent tier of stablecoin regulation is to obtain a federally chartered banking license, meaning the institution is regulated like a bank.

60 [State Regulators Roll Out One Company, One Exam for Nationwide Payments Firms](#)  
Sep 15th, 2020.

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch. 6 · 65-80

# Current State of the Stablecoin Market

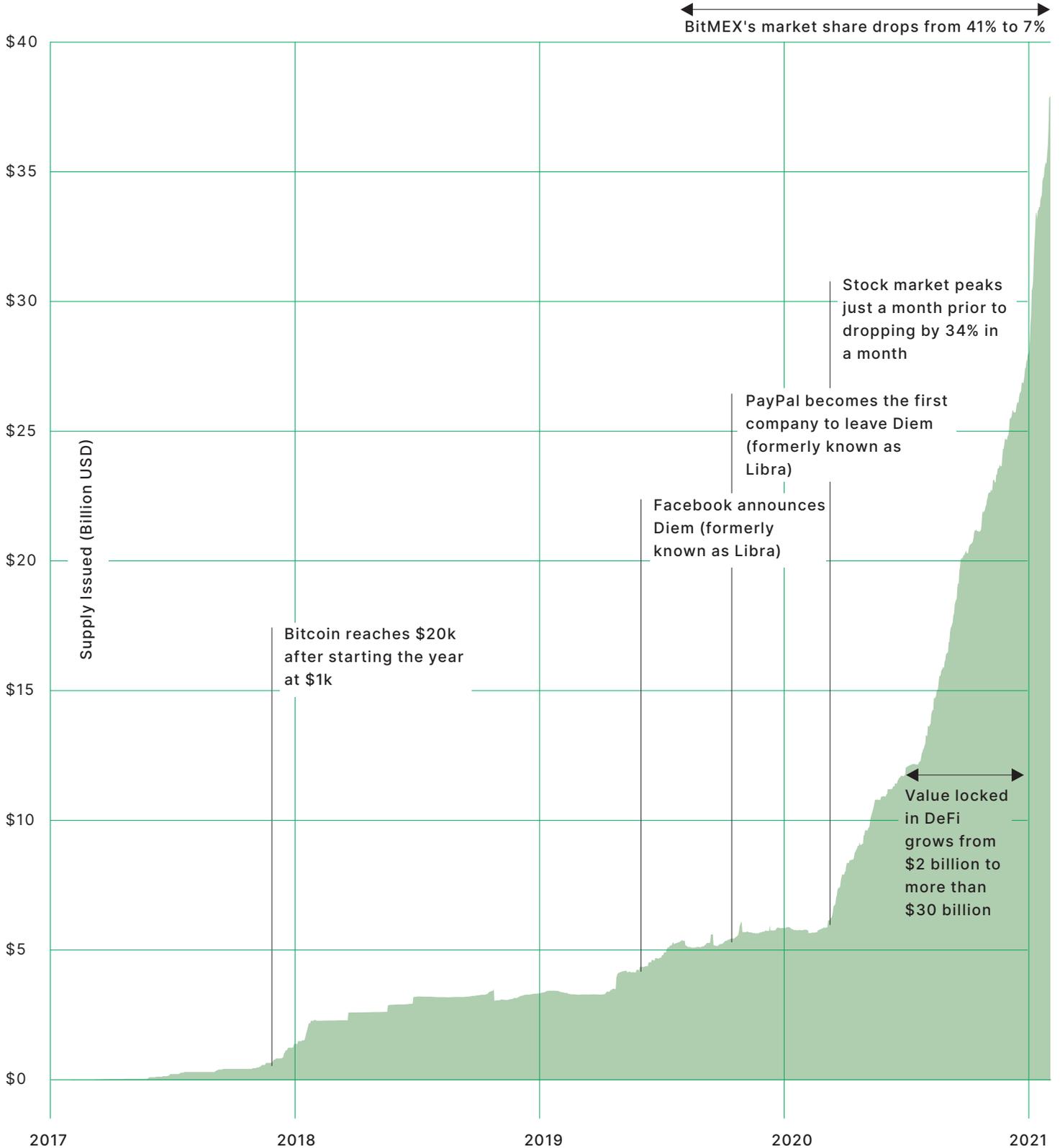
There are several factors that together contributed to the explosive growth of stablecoins this year: miners covering their loans, stablecoin-collateralized derivatives, Bitcoin's fall of base pair dominance, the explosion of Decentralized Finance (DeFi) and mainstream Bitcoin interest growth in 2020, among others.

Metrics calculated include: Transaction Volume, Daily Active Users, Number of Transactions, Typical Payment Size, Stablecoin Velocity, Distribution of Stablecoins and Geographical Distribution, among others.

# Current State of the Stablecoin Market

## AGGREGATE SUPPLY ISSUED OF STABLECOINS

The total supply of issued stablecoins has grown rapidly this year. Since mid-February, the total aggregate supply has grown from \$5.7 billion to \$37.8 billion issued by the end of January 2021.



# Current State of the Stablecoin Market

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## Current State of the Stablecoin Market

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There are several factors that together contributed to the explosive growth of stablecoins in 2020.

1. Miners and other borrowers who loaned out Tether against Bitcoin and needed to repay debt due to the March price crash
2. The popularity of stablecoin-collateralized derivatives grew dramatically
3. Bitcoin losing its lead as a base currency in spot trading
4. Explosion of DeFi and the yield farming food token craze
5. A flight to liquidity as investors exited risk-on investments in March
6. Increased demand for cryptocurrencies

## Miners covering their loans

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Global equity markets saw their H1 2020 high on February 20th, and consequently suffered a historic decline during March, as the world grappled with the fallout of the COVID-19 pandemic. The S&P 500 index dropped by 34% in the matter of one month. Bitcoin initially sold off even more amidst the uncertainty, underperforming the S&P 500 and falling by as much as 56%.

The majority of Bitcoin mining, which was a \$5 billion dollar industry in 2020, is situated in China. Miners in China pay for a lot of their operating expenses in Tether by borrowing it against Bitcoin. The main reason for a sharp increase in stablecoin issuance in March was due to miners having to repay their debt as the size of their BTC collateral shrunk by nearly 50%. This created a strong bid on USDT/USD and catalyzed multi-billion dollar Tether issuance.

The other less significant factor is that miners had to buy new mining equipment prior to the block reward halving, which took place on May 11. As the mining subsidy dropped from 12.5 BTC to 6.25 BTC, running last-gen mining equipment was no longer profitable. Most of the mining equipment by Bitmain or MicroBTC is acquired with either Tether or Bitcoin.

# Current State of the Stablecoin Market

## Stablecoin-collateralized derivatives

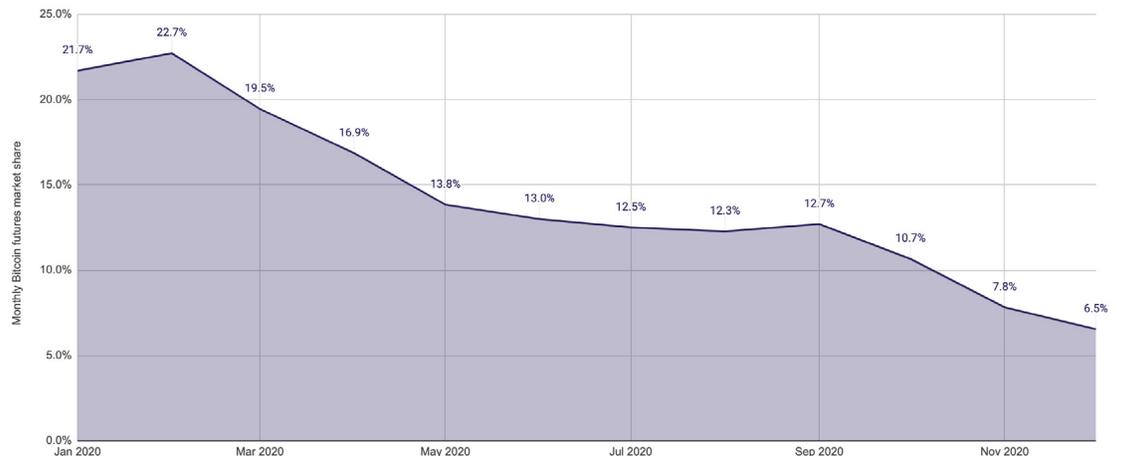
As Bitcoin crashed in March, BitMEX, which was the most liquid derivatives exchange at the time, suffered outages allegedly caused by DDoS attacks. And as hundreds of millions in liquidations started rolling in, the event served as a wake-up call for traders. BitMEX, unlike many of its competitors, doesn't allow traders to use assets aside from bitcoin as collateral for its perpetual swap and futures contracts. Traders who only used BitMEX were likely awakened to the option of collateralizing in dollars, which can derisk traders in these liquidity crunch events.

Following the March 12 liquidity crunch, the popularity of stablecoin-collateralized derivatives started growing dramatically and so did the demand for stablecoins. Furthermore, on October 1, 2020, the U.S. Department of Justice (DOJ) and the Commodity Futures Trading Commission (CFTC) filed charges against BitMEX and its owner-operators, including co-founder and CEO Arthur Hayes. Besides changes in leadership, the lawsuit has had a direct impact on BitMEX's exchange Bitcoin holdings, and has led to a further decline in the relevance of BitMEX for the wider cryptocurrency markets.

Binance, OKEx and Huobi, which all support Tether-collateralized trading, have overtaken BitMEX as traders' go-to market. The demand for stablecoins has therefore drastically increased as the total open interest grew from less than \$2 billion in March to more than \$10 billion in January 2021.

Source: skew

Aggregated open interest of Bitcoin futures



# Current State of the Stablecoin Market

“Although it was short lived, the Summer of DeFi showed us where the future potential for stablecoin market growth may be. Specifically, a stable store of digital value facilitates activities within decentralized finance ecosystems, which is a killer -app in itself.”

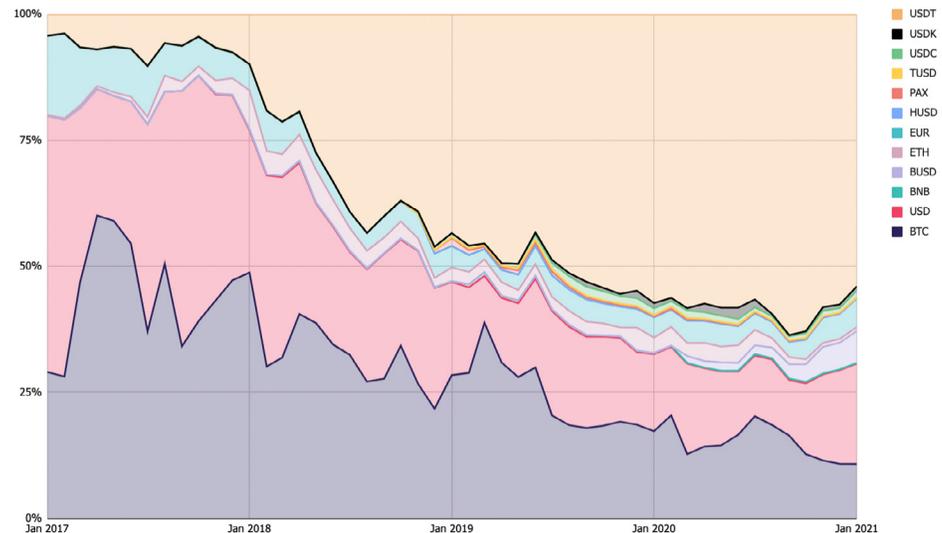
Anastasia Melachrinou, Kaiko

## Bitcoin’s fall of base pair dominance

Another related reason is the changing pair denominations of spot markets. Before 2018, most of the pairs on spot cryptocurrency exchanges were denominated in either Bitcoin, USD or EUR. In Q1 2017, only about 5% of the traded volume was denominated in Tether while BTC pairs were nearly 50% of volume and USD pairs about 40%. Fast forward to January 2021, and around 60% of all volume is denominated in Tether and another 4% in other stablecoins, while only about 11% comes from BTC pairs.

Source: DeFi Pulse

Share of volume based on pair denomination



## The explosion of DeFi

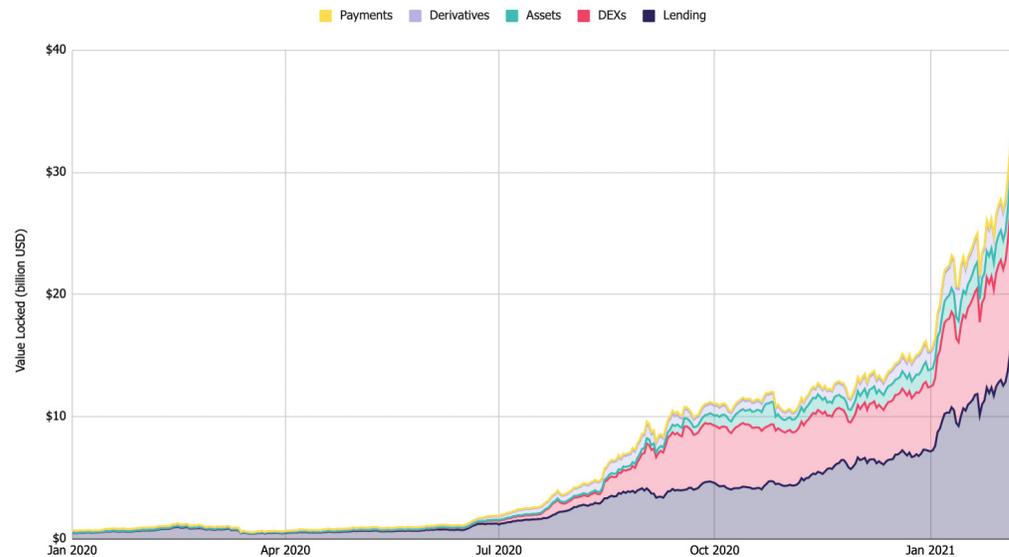
Another important catalyst for stablecoin growth in 2020 was the boom of Decentralized Finance (DeFi). Offering much higher interest rates compared to traditional finance, meaningful amounts of capital entered the crypto markets in search of yield.

A live proxy for the growth has been the rise in total value locked of DeFi protocols. The total value locked in DeFi has passed \$30 billion in 2021, which is up from around \$1 billion at the beginning of June last year. Stablecoins began to play a significant role in lending and non-custodial trading.

# Current State of the Stablecoin Market

Source: DeFi Pulse

Defi - total value locked by category



## Interest in Bitcoin grew in 2020

Unlike all the previous rallies, it's commonly accepted that the bull market, which has seen the price of bitcoin go from ~\$10,000 to more than \$40,000 in only three months, has been driven by the entrance of institutional money.

In H2 2020, MicroStrategy acquired \$1.13 billion, Ruffer Investment bought about \$744M, MassMutual another \$100M, and finally Square around \$50M. Macro investors Paul Tudor Jones and Stanley Druckenmiller also publicly supported Bitcoin and said that they have allocated money. Guggenheim's \$5B Macro Opportunities Fund filed an amendment with the SEC to allow it to gain exposure to bitcoin by investing up to 10% of the fund's net asset value in GBTC.

As the value of Bitcoin skyrocketed in 2020, the demand for stablecoins naturally increased as well. Stablecoins are often used as a fiat on-ramp as well as for traders to get in and out of positions.

## Growth in 2020

1. Supply grew from \$5.9 billion to \$28.3 billion (320% growth)
2. Transaction volume grew from \$248 billion in 2019 to more than a

# Current State of the Stablecoin Market

trillion dollars in 2020 (320% growth)

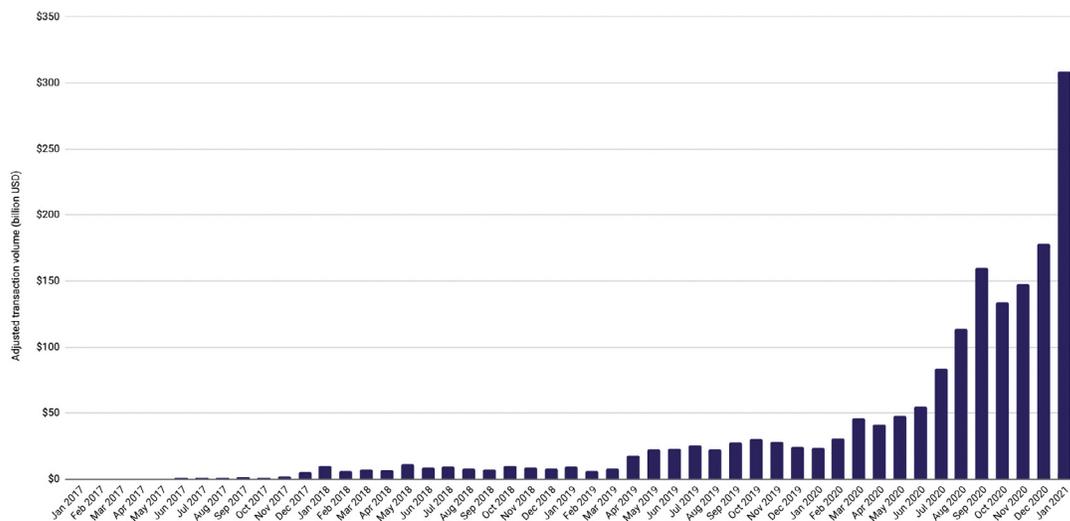
3. Number of passive users grew from ~280k to more than a million (260% growth)
4. Daily active daily users grew from ~50k to ~230k (330% growth)
5. Daily number of transactions grew from ~100k to ~600k (500% growth)

## Transaction Volume

The transaction volume of stablecoins, which measures how much stablecoins are used on the blockchain, has grown more than ten-fold since last year as it reached \$308.5 billion in January 2021 after constituting less than \$24 billion in January 2020.

Source: Coin Metrics

Adjusted transaction volume of stablecoins



## Daily Active Users

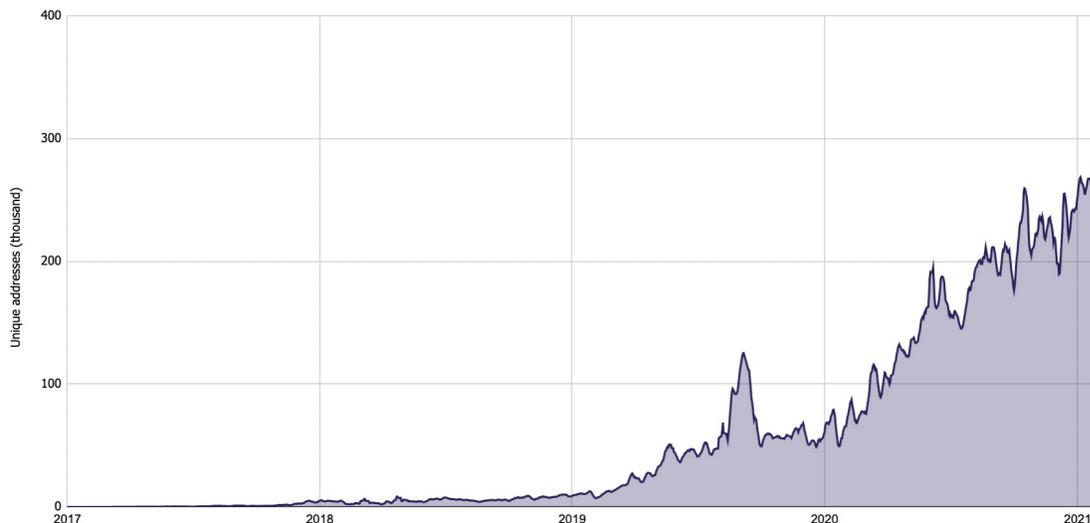
The number of daily active users of stablecoins, which we define by taking the sum of all unique addresses that interact with stablecoins in a given day, reached an all-time high of 300,000 in January 2021. This means that there are currently 300,000 wallets interacting with stablecoins every single day. Since last year, this user population has grown by more than 400%.

# Current State of the Stablecoin Market

Source:Coin Metrics

Daily unique active addresses  
Interacting with  
stablecoins

7 Day rolling average



## Passive users

If we define a passive user as a wallet that holds at least \$100 of stablecoins, there are now more than a million passive users. Since last year, the passive user population has grown by more than 400%.

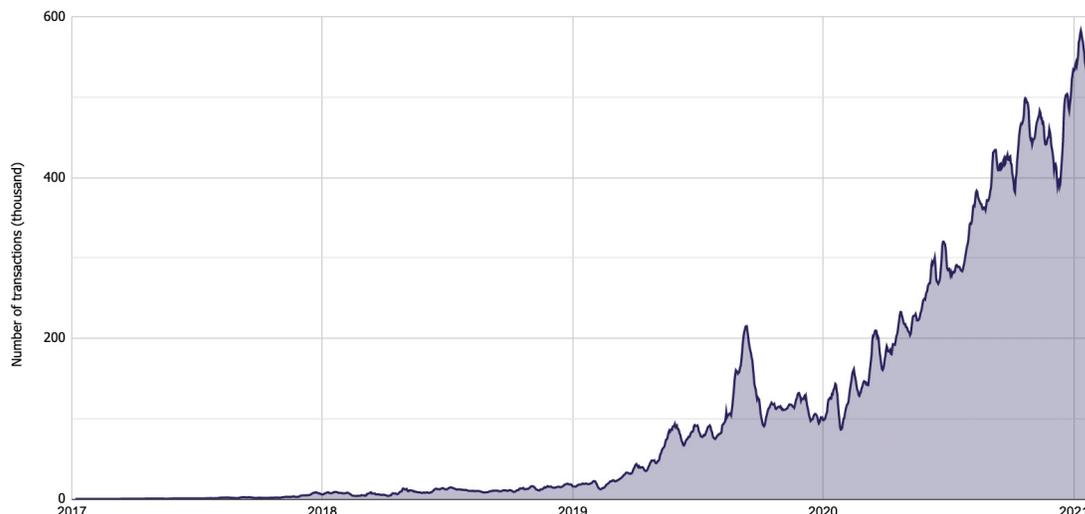
## Number of Transactions

The number of daily transactions reached an all-time high of nearly 600,000 in 2021 and has grown by 500% since last year.

Source:Coin Metrics

Daily on-chain  
transactions Involving  
Stablecoins

7 Day rolling average



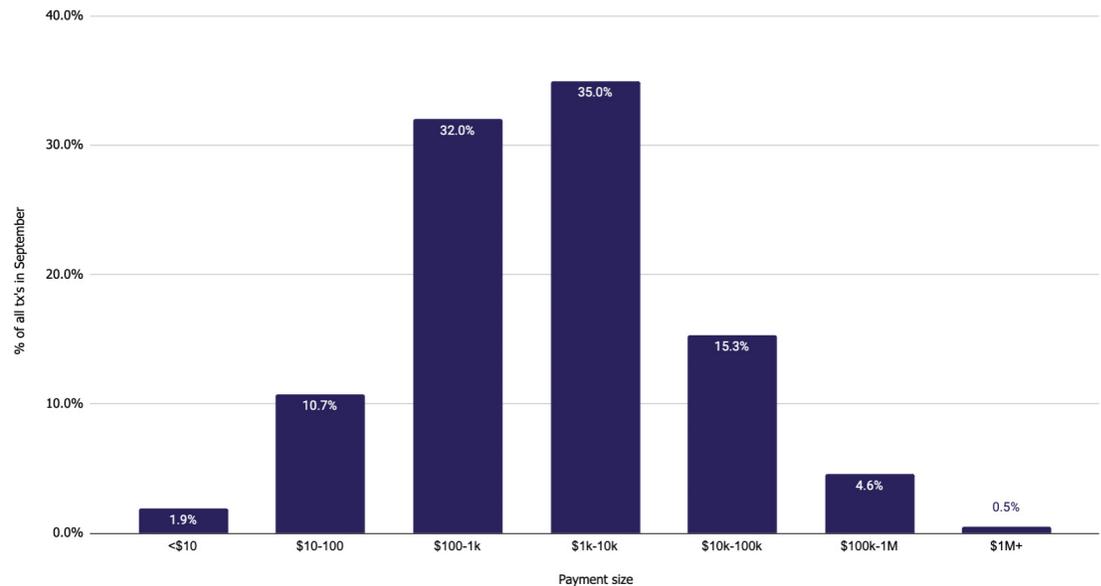
# Current State of the Stablecoin Market

## Typical Payment Size

Stablecoins are not used for smaller payments at the moment. The vast majority (~67%) of all transactions ranged between \$100 to \$10,000. Less than 2% of all transactions were smaller than \$10 and 10.7% ranged from \$10 to \$100. This is a consequence of high transaction fees on Ethereum. During the last month, the average transaction fee on Ethereum was more than \$5. More than 5% of all transactions were transactions bigger than \$100,000.

Share of stablecoin transactions based on value

January 2021



Source: Chainalysis

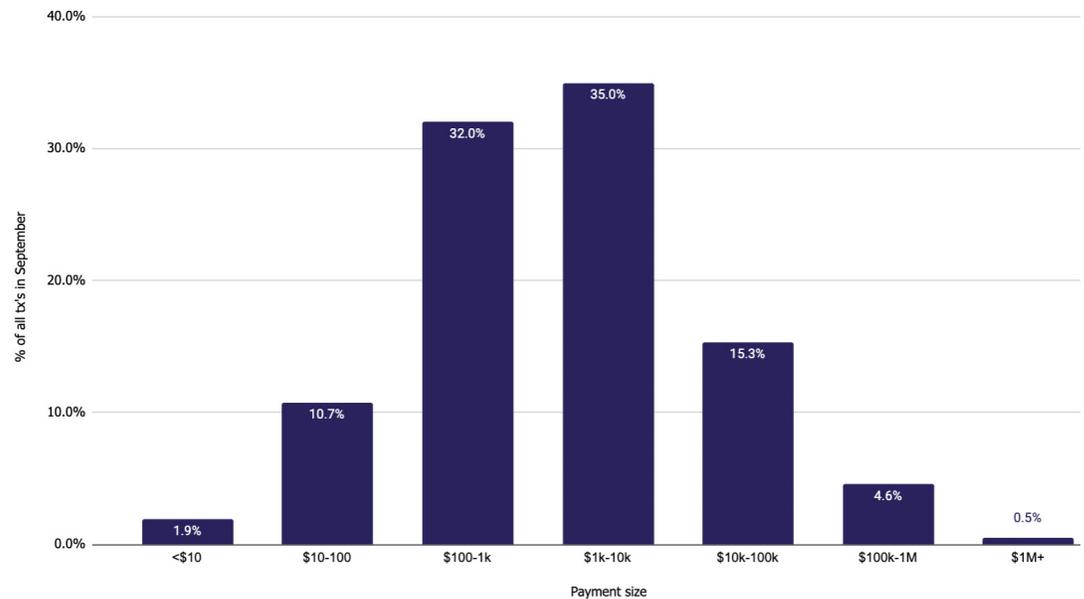
Share Of Stablecoin Transactions Based On Volume  
January 2021

If one compares this situation to January 2020, when the average transaction fee was less than 10 cents, stablecoins were used for smaller payments more frequently — but in the grand scheme of things, this was still not that much. Only 8.7% of all transactions were smaller than \$10 and 17.2% were between \$10 to \$100. This, combined with the fact that each user on average only makes about two transactions every day, suggests that stablecoins are still not really used for commerce or any transaction-heavy tasks.

# Current State of the Stablecoin Market

Source: Chainalysis

Share Of Stablecoin Transactions Based On Volume · Jan 2021



## Stablecoin Velocity

Stablecoin velocity, which is a measurement of the rate at which the supply is exchanged, also saw significant growth over the last few years. In January 2021, the supply changed hands twice as much as in January 2020 — eight times compared to four times. This data shows that the available supply is becoming much more active on-chain as opposed to being held on exchanges.

Source: Coin Metrics

Velocity Of Stablecoins  
Total Adjusted Volume  
Divided By Total Supply



# Current State of the Stablecoin Market

This phenomenon is happening largely due to DeFi growth, which manifests itself in higher on-chain volume. Prior to 2020, much of the stablecoin velocity resulted from transfers to and from personal wallets, and then from one exchange to another.

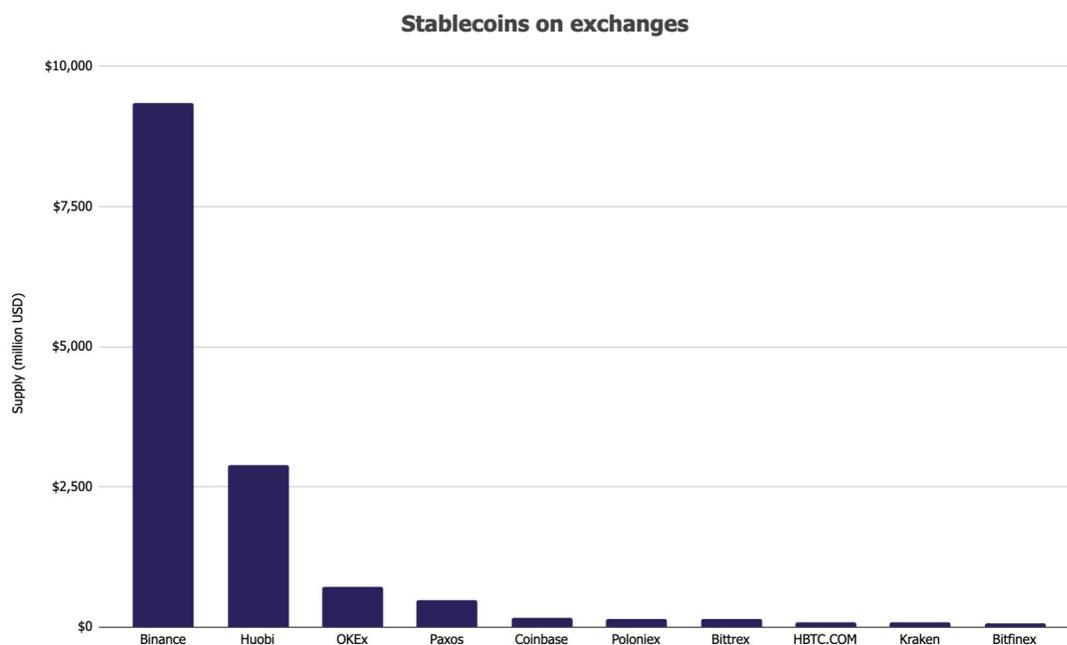
## Distribution of Stablecoins

At least \$14.4 billion worth of stablecoins, or about 38% of the total supply, is currently held by exchanges on behalf of their users. Binance, the largest cryptocurrency exchange, currently has the highest amount in its wallets (\$9.3 billion), followed by Huobi (\$2.9 billion) and OKEx (\$721 million).

At least \$4.3 billion in stablecoins, or about 11% of the total supply, is currently locked in DeFi protocols and services. This sum was less than \$100 early last year. Curve, a decentralized exchange for stablecoins, currently has the greatest value locked in its contracts (\$744M), followed by Aave (\$675M), and Uniswap (\$654M).

Source: Nansen, The Block

Stablecoins On Exchanges



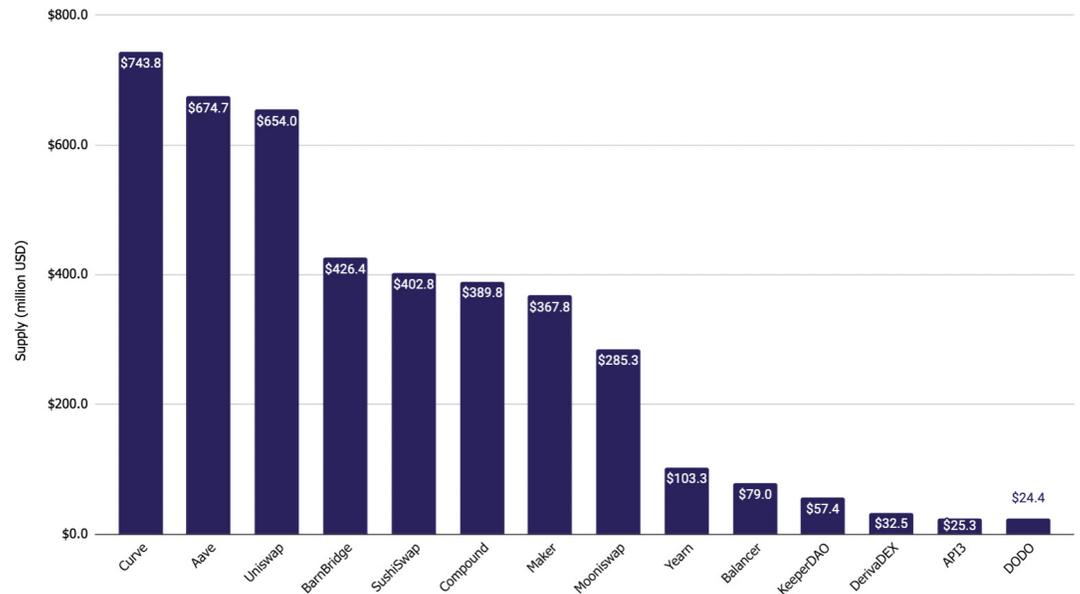
The remaining 51% of stablecoin supply is held in unidentified wallets. Most of these likely belong to OTC desks, trading companies

# Current State of the Stablecoin Market

and private wallets owned by traders or retail investors. Some may also belong to untagged addresses of exchanges or DeFi protocols, but this likely constitutes a small amount of the total.

Source: Nansen, The Block

Stablecoins  
Locked In Defi  
Protocols



## Geographical distribution

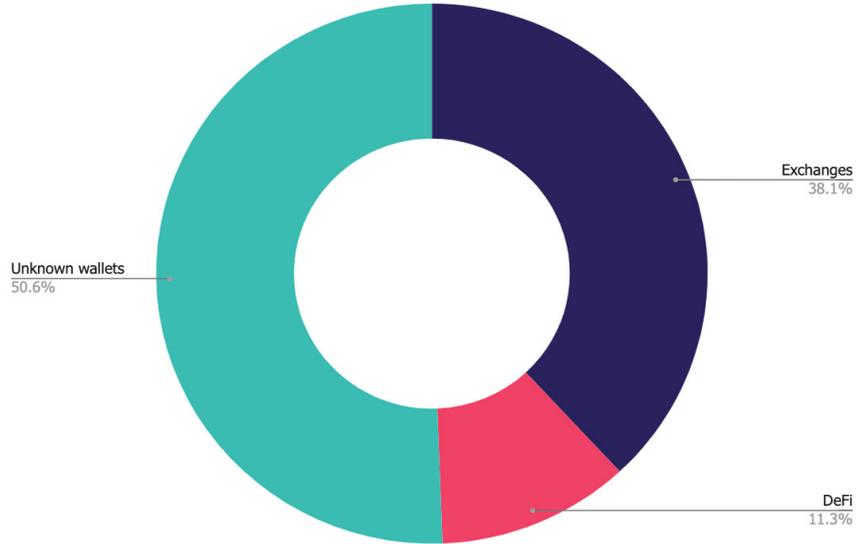
It's nearly impossible to determine where stablecoin holders are located due to the pseudonymous nature of blockchains. While exchanges and stablecoin distributors might possess this information because of KYC requirements, the data is not publicly available. One proxy can be found by examining network activity based on the time of day. Tether transfers occur much more often in Asian time zones than USDC transfers, which occur more often in American time zones.

# Current State of the Stablecoin Market

Source: Nansen, The Block

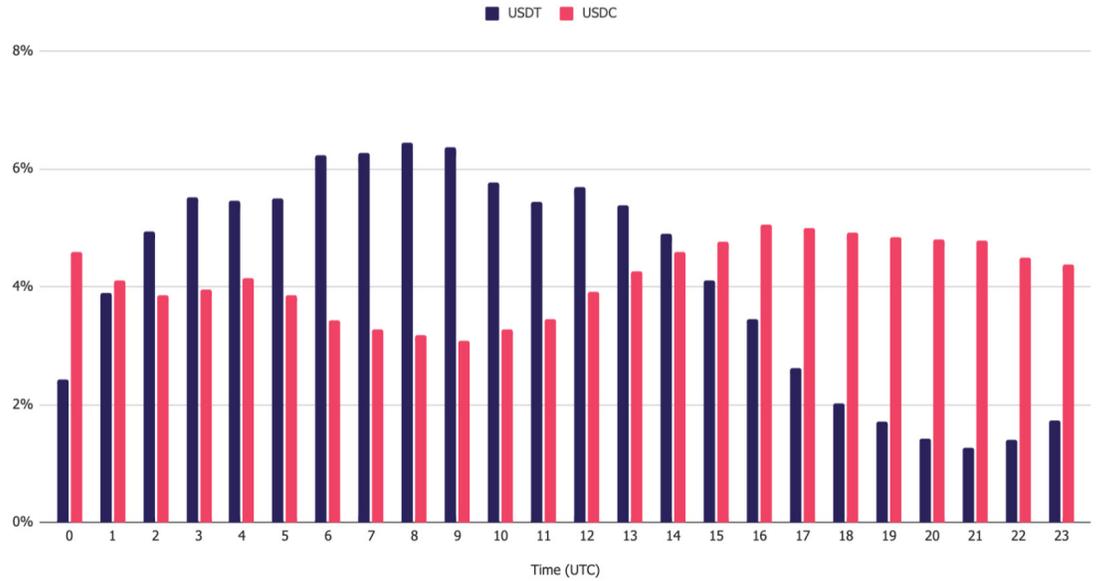
Share Of Stablecoins' Supply Based On Location

Total Supply As Of The End Of January Is \$37.8 Billion



Source: Chainalysis, The Block

Stablecoins Transfer By Time Of Day · % Of Transfers By Utc Hour Of The Day



## Use Cases Outside Of Cryptocurrency Trading

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One can already observe a strong push by stablecoin providers beyond the utility of cryptocurrency trading. The main benefits of stablecoins — namely, faster transaction speed, borderless payments, generally lower fees, and eventually programmable money — already enable a multitude of other use cases today. These include, but are not limited to:

- Remittances
- Micropayments
- Commercial Payments
- Bank deposit and Withdrawals
- Payroll
- Escrow
- Store of Value
- Settlement
- Lending
- Wealth Management
- Foreign Exchange Trading
- Powering Decentralized Applications

Many of these require fiat on- and off-ramps via support from the respective local banking sector. Regulation is the other key pillar driving adoption. Currently, cross-border and cross-currency businesses and individuals in particular can already benefit greatly from the easy use of stablecoins for remittances, micropayments, payments, payroll, escrow, store of value and settlement.

Simultaneously, stablecoins can help unbanked communities bootstrap bank-like institutions which enable localized lending and wealth management. This is especially true for regions with highly volatile fiat currencies, where an immediate demand for more stable value and better money exists. Users are literally voting with their smartphones.

On the traditional finance side, foreign exchange trading can benefit immensely from the utilization of stablecoins. This can already

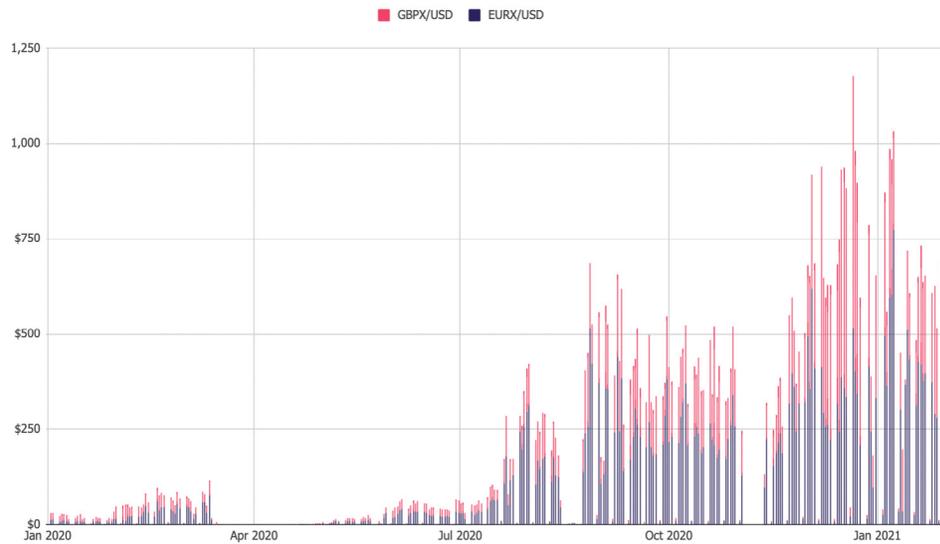
# Current State of the Stablecoin Market

be seen from the volumes for EURX/USD and GBPX/USD on eToroX, which in aggregate frequently exceeded several hundred million USD in daily trading volume recently.

Source: eToroX

Etoro Eurx/Usd And GbpX/Usd Daily Volume

January To September 2020

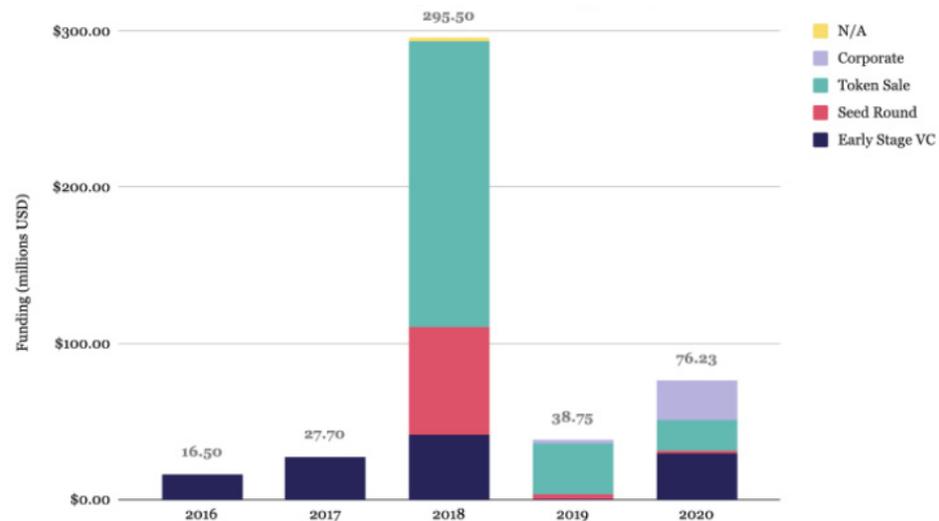


Interestingly enough, eToroX's stablecoins have close to no on-chain transaction volume, which suggests that they are only used for trading and might not really be necessary. In reality, using stablecoins is only justified if they are being used across multiple different applications or use cases and therefore have some on-chain usage.

## Stablecoin Project Funding

Source: Pitchbook

Stablecoin Project Funding (YOY)



# Current State of the Stablecoin Market

In aggregate, since 2016, companies designing stablecoin projects have raised roughly \$473.5 million across 36 capital raises. The median deal size for early-stage venture deals was \$15 million and the median size of early-stage initial coin offerings (ICOs) was roughly \$15.4 million. Seed deals for stablecoin projects were dramatically lower in value, with a median deal size of \$2 million.

2018 saw the highest amount of investment in this sector, with \$295.5 million allocated to stablecoin projects — largely stemming from the popularity of ICOs at the time. Synthetix (Havven at the time), Basis, and TrueUSD conducted their raises during that year, which combined accounted for 62% of 2018's sector funding.

Investment in stablecoin issuers dropped off significantly — by approximately 87% — in 2019. The largest raise was by MakerDAO, which sold \$27.5 million in tokens to Dragonfly Capital Partners and Paradigm.

While investments in stablecoin projects in 2020 have not reached the heights of 2018, renewed interest and demand in stablecoins have led to a 97% year-over-year increase in funding for the segment. Circle secured \$25 million from Digital Currency Group to build out its USDC yield and lending services.

Source: Pitchbook

Stablecoin Project  
Funding (YOY)



Source: Crunchbase, Pitchbook, The Block Research. Sizing not to exact scale.

# Current State of the Stablecoin Market

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A slight revival in token sales has occurred in 2020. cLabs (Celo), mStable (mUSD), and Equilibrium Lab (EOSDT) conducted token sales in 2020.

Basis raised the highest amount — raising \$133 million — among stablecoin issuers. Backers of the project included Bain Capital Ventures, GV, Andreessen Horowitz, Lightspeed Ventures, among other firms. The funds, which were eventually returned to investors after the project was scuttled, represented roughly 73% of stablecoin funding from token sales and 45% of all stablecoin funding during 2018.

After Basis, cLabs — the company behind Celo — raised the most capital in aggregate. The mobile-focused platform raised a total of \$56.5 million from investors such as Andreessen Horowitz, Coinbase Ventures, Polychain Capital, and angels, including Jack Dorsey, Elad Gil, and Naval Ravikant.

Funding for USDC, the second-most dominant stablecoin by market share, totals \$45 million in aggregate. This funding includes money raised by Centre Consortium (Coinbase and Circle), the issuer of USDC, and recent capital raised this year by Circle to focus on the further development of USDC.

Other significant funding raises include Terra's \$32 million seed round, Sogur's \$30 million seed round, Synthetix's \$30 million ICO, and TrustToken's two early-stage deals that constituted \$35 million in aggregate.

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch. 7 · 82-113

# Existing Stablecoins

There are currently about 50 different live stablecoins issued by 25 different companies. The total stablecoin supply of all of them combined is \$37.8 billion.

Of the total supply of \$37.8 billion, 99.5% is pegged to the U.S. dollar while only 0.3% is pegged to the EUR and another 0.1% to the KRW. One major reason is that the U.S. dollar is the most widely held reserve currency, representing 61% of international foreign currency reserves.

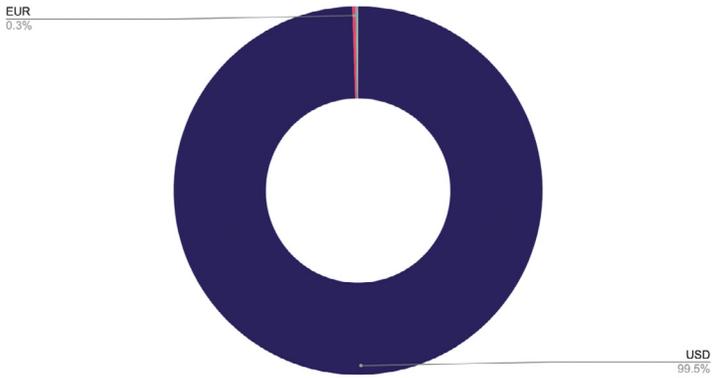
Case studies explore Tether, USD Coin (USDC), Paxos Standard (PAX) and Diem (Formerly known as Libra).

# Existing Stablecoins

## LIVE STABLECOINS

NAME	ISSUER	CURRENCY	BACKING	TOKEN	ETH	OTHER	SUPPLY (\$M)
USDT	iFinex	USD	Fiat	✗	☑	☑	\$26,757
USDC	CENTRE	USD	Fiat	✗	☑	☑	\$6,066
Dai	Maker	USD	Crypto	MKR	☑	✗	\$1,651
Binance USD	Paxos	USD	Fiat	✗	☑	☑	\$1,427
PAX	Paxos	USD	Fiat	✗	☑	✗	\$667.7
HUSD	Paxos	USD	Fiat	✗	☑	✗	\$456.5
TrueUSD	TrustToken	USD	Fiat	✗	☑	☑	\$389.1
UST	Terra	USD	Algorithmic	LUNA	✗	☑	\$261.0
sUSD	Synthetix	USD	Crypto	SNX	☑	✗	\$144.6
ESD	Empty Set Dollar	USD	Algorithmic	✗	☑	✗	\$109.1
FRAX	Frax	USD	Algorithmic	FXS	☑	✗	\$82.7
Gemini dollar	Gemini	USD	Fiat	✗	☑	✗	\$78.8
EURT	iFinex	EUR	Fiat	✗	☑	✗	\$60.2
EURS	STASIS	EUR	Fiat	✗	☑	✗	\$45.1
mUSD	mStable	USD	Stablecoin	✗	☑	✗	\$38.1
KRT	Terra	KRW	Algorithmic	LUNA	✗	☑	\$34.2
cUSD	Celo	USD	Crypto	CELO	✗	☑	\$33.0
DSD	Dynamic Set Dollar	USD	Algorithmic	✗	☑	✗	\$32.6
USDK	OKLink	USD	Fiat	✗	☑	✗	\$32.5
BAC	Basis Cash	USD	Algorithmic	BAS	☑	✗	\$31.8
BiLira	BiLira Teknoloji	TRY	Fiat	✗	☑	✗	\$17.7
USDJ	TRON	USD	Crypto	JST	✗	☑	\$14.7
TrueGBP	TrustToken	GBP	Fiat	✗	☑	✗	\$13.3
DUSD	DefiDollar	USD	Stablecoin	✗	☑	✗	\$10.8
TrueAUD	TrustToken	AUD	Fiat	✗	☑	✗	\$6.3
MIC	Mithril Cash	USD	Algorithmic	BAS	☑	✗	\$6.2
TrueHKD	TrustToken	HKD	Fiat	✗	☑	✗	\$4.4
CNHT	iFinex	CNH	Fiat	✗	☑	✗	\$3.9
Binance KRW	Binance Korea	KRW	Fiat	✗	✗	☑	\$3.3
TrueCAD	TrustToken	CAD	Fiat	✗	☑	✗	\$2.8
EOSDT	Equilibrium Lab	USD	Crypto	NUT	✗	☑	\$2.0
Reserve	Reserve	USD	Stablecoin/algo	RSR	☑	✗	\$1.6
EURX	eToroX	EUR	Fiat	✗	☑	✗	\$1.2
JPYX	eToroX	JPY	Fiat	✗	☑	✗	\$0.5
StableUSD	Stably	USD	Fiat	✗	☑	✗	\$0.5
CADX	eToroX	CAD	Fiat	✗	☑	✗	\$0.4
NZDX	eToroX	NZD	Fiat	✗	☑	✗	\$0.4
MNT	Terra	MNT	Algorithmic	LUNA	✗	✗	\$0.3
CNYX	eToroX	CNY	Fiat	✗	☑	✗	\$0.1
PLNX	eToroX	PLN	Fiat	✗	☑	✗	\$0.1
SGDX	eToroX	SGD	Fiat	✗	☑	✗	\$0.1
HKDX	eToroX	HKD	Fiat	✗	☑	✗	\$0.1
ZARX	eToroX	ZAR	Fiat	✗	☑	✗	\$0.1
TRYX	eToroX	TRY	Fiat	✗	☑	✗	\$0.1
RUBX	eToroX	RUB	Fiat	✗	☑	✗	\$0.0

# Existing Stablecoins



Source: The Block

Share of stablecoins' supply based on the pegged currency

Total supply as of the end of January is \$37.8 billion

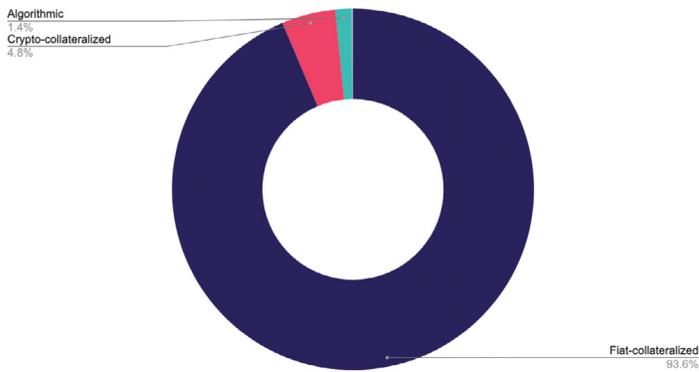
## Existing Stablecoins

Virtually all digital assets have historically been priced in U.S. dollars, while derivatives are collateralized by either bitcoin or USD stablecoins. With stablecoin issuers looking to earn interest on their reserves, the U.S. dollar offers an attractive yield; that yield can sometimes be upwards of

1%, while EUR yields are significantly lower. However, this will likely change in the future as institutions outside of crypto start issuing their own stablecoins.

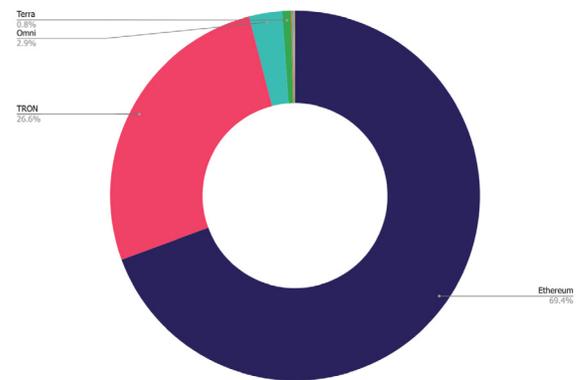
Fiat-collateralized stablecoins have found the best product-market fit primarily because they are the only category that is scalable enough to reflect demand. Ninety-four percent of the total supply is collateralized by fiat while only only 3.5% is collateralized by cryptocurrencies. Only around 1% of the supply is algorithmic.

When it comes to blockchains that issuers use, Ethereum is the clear leader with 69.4% of the total supply. Ethereum is followed by TRON (26.6%) and Omni (2.9%). All other blockchains currently have less than 1% of the total supply issued on them.



Source: The Block

Share Of Stablecoins' Supply Based On The Stabilization Mechanism  
Total supply as of the end of January is \$37.8 billion



Source: The Block

Share Of Stablecoins' Supply Based On The Underlying Blockchain  
Total Supply As Of The End Of January Is \$37.8 Billion

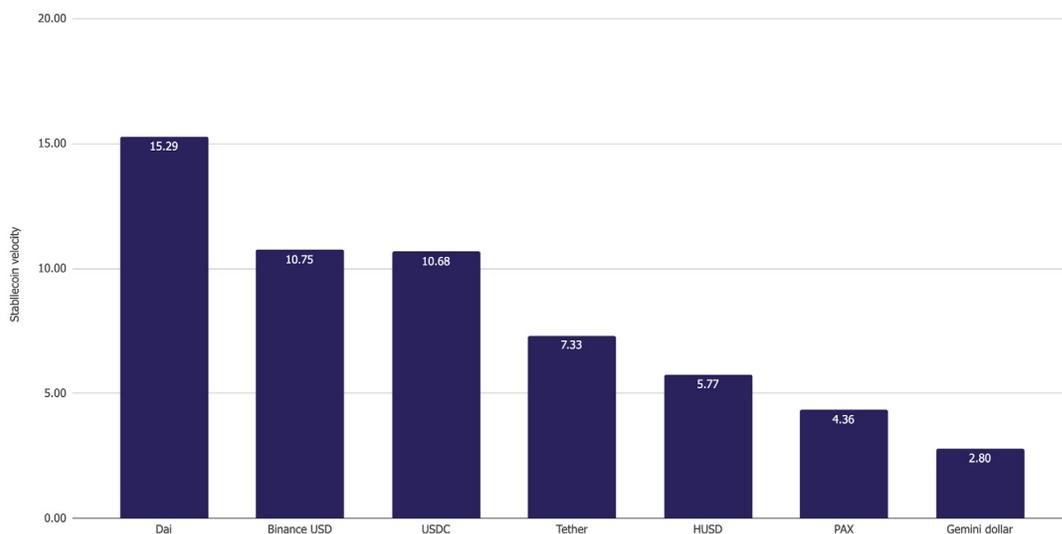
# Existing Stablecoins

Dai has by far the highest velocity of all stablecoins, primarily because it's issued by a decentralized lending platform, and as a result many of the associated transactions occur on-chain. Dai is also heavily used in DeFi. In January 2021, Dai's supply changed hands 15 times while USDC and BUSD changed hands 11 times and Tether only changed 7 times.

Source: The Block

Stablecoin Velocity In January

Ratio Between Supply Issued And Adjusted Transaction Value



According to data compiled by Chainalysis, USDC and TUSD have become more liquid recently, while the recent issuance of Tether is increasingly stored rather than circulated. This indicates that Tether is more often used as a store of value “when” compared to other stablecoins.

## The dominance of Tether

The story of stablecoins today is the story of Tether. Around 70% of the entire supply consists of USDT, followed by USDC (15.8%), Dai (4.3%), Binance USD (3.7%), HUSD (1.2%), and PAX (1.7%). All other stablecoins have less than 1% of the supply.

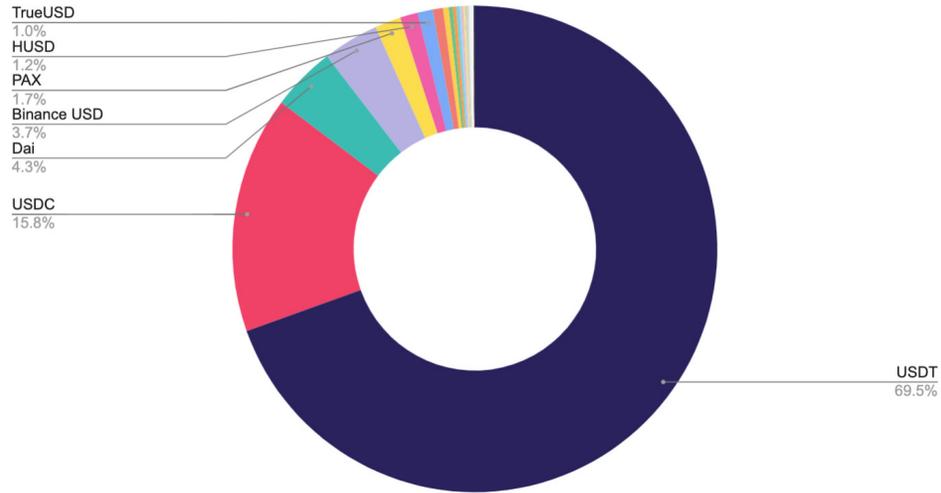
About 67% of all stablecoin on-chain volume came from Tether, followed by USDC (19.8%), Dai (9.1%), and Binance USD (2.7%). All other stablecoins saw volumes of less than 1% of the total.

# Existing Stablecoins

Source: The Block

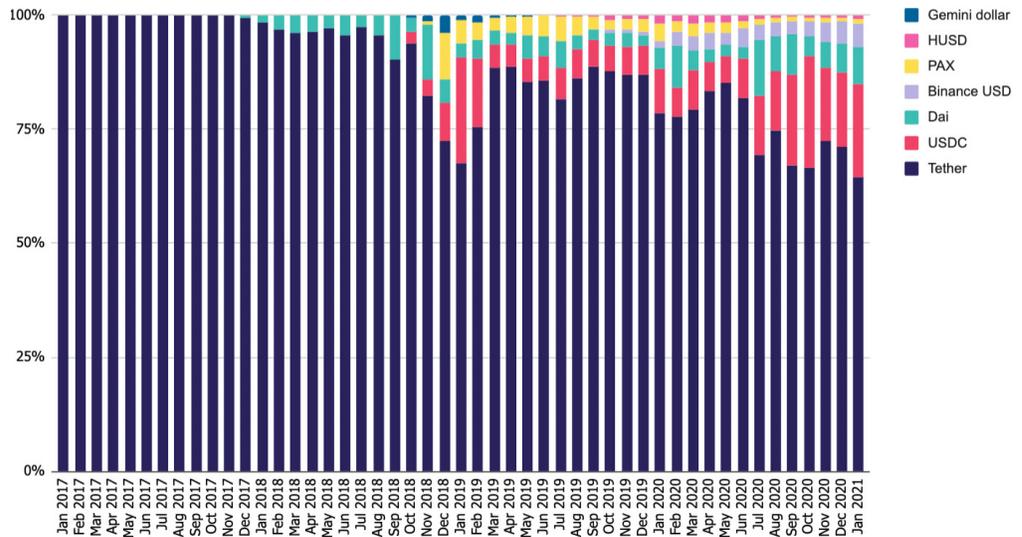
Share of stablecoins' supply based on stablecoin

Total supply as of the end of January 2021 is \$37.8 Billion



Source: Coin Metrics

Share of Adjusted Transaction Volume Of Stablecoins



## Trading volume

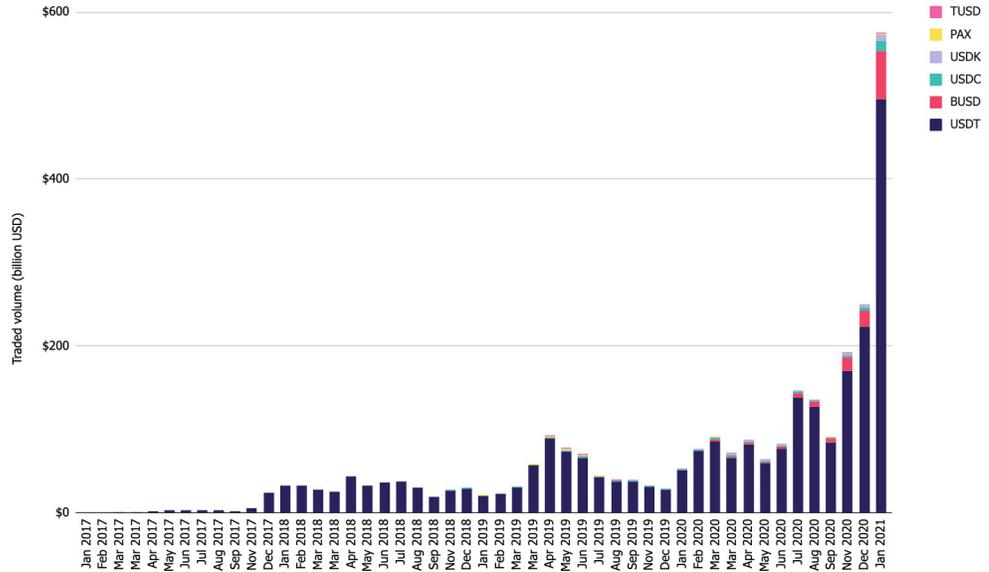
Tether is unmatched when it comes to trade volume on centralized exchanges. In January 2021, Tether saw \$495 billion of volume while the trailing BUSD and USDC saw \$58 billion and \$12 billion in volume, respectively. All other stablecoins saw less than \$10 billion in traded volume.

# Existing Stablecoins

Source: Coin Metrics

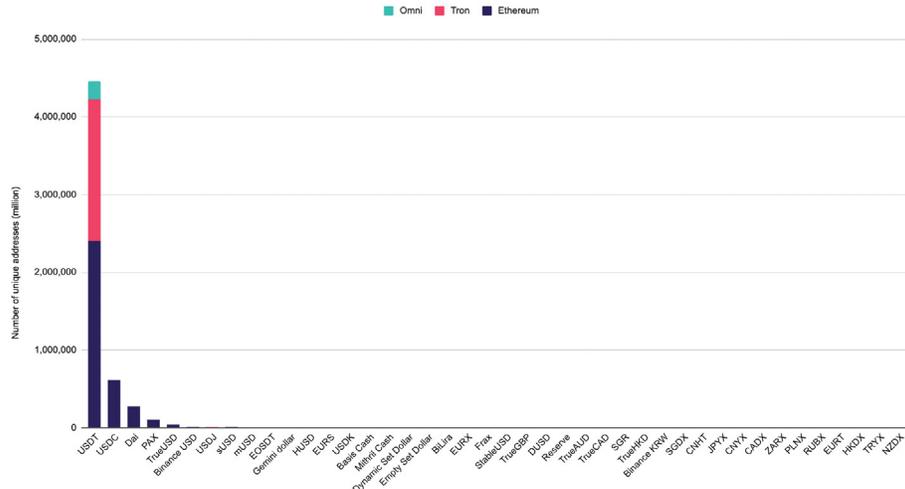
Traded volume of stablecoins on centralized exchange

Exchange: binance, huobi, okex, bitfinex, coinbase, kraken, bitstamp, bittrex, poloniex



Source: Etherscan, TRONSCAN, Tokenview

Number of unique addresses holding stablecoins



Tether had 225,000 daily active addresses in January 2021 while the two trailing stablecoins, USDC and Dai, had 25,000 and 11,000 active addresses, respectively. All other stablecoins on Ethereum have less than 2,000 daily active addresses. Tether also has more than 7 times more holders than USDC.

## Fiat-backed stablecoins

There are currently 11 fiat-backed stablecoins with a supply of more than \$10 million. Ten of them are pegged to the U.S. dollar while two are pegged to the euro and one is pegged to the Singa-

# Existing Stablecoins

pore dollar. Only two had more than 10,000 average daily unique users in January 2021: Tether and USDC. Two of these stablecoins are getting virtually no on-chain usage: EURT and USDK. Three other ones are getting very little on-chain usage: HUSD, EURS, and the Gemini dollar.

STABLECOIN	CURRENCY	SUPPLY (\$M)	TOTAL HOLDERS	AVG DAILY UNIQUE USERS (JAN 21)	AVG DAILY ON-CHAIN VOLUME (JAN 21)	AVG DAILY # OF TRANSACTIONS (SEP)
USDT	USD	\$26,757.2	4,456,776	109,352	\$5,489,302,315	216,057
USDC	USD	\$6,066.0	618,323	24,494	\$3,115,916,339	51,111
Binance USD	USD	\$1,426.6	14,434	741	\$703,860,741	1,633
PAX	USD	\$667.7	103,859	1,267	\$145,219,547	1,563
HUSD	USD	\$456.5	3,954	158	\$160,816,370	588
TrueUSD	USD	\$389.1	41,645	960	\$125,496,042	1,725
Gemini dollar	USD	\$78.8	4,022	196	\$13,367,063	442
EURT	EUR	\$60.2	15	0	\$0	0
EURS	EUR	\$45.1	3,804	89	\$5,080,142	325
USDK	USD	\$32.5	3,438	5	\$454,170	7

Apart from Tether, all other stablecoins issuers publish regular attestations by auditing or accounting firms. Most of stablecoin issuers disclose their primary banking provider.

All of the fiat-backed stablecoins are issued on Ethereum while some also support other blockchains. Tether supports the most, utilizing Ethereum, TRON, Omni, EOS, Liquid, OmiseGo, Algorand, and Solana. USDC also started expanding recently, adding Algorand, Stellar and Solana.

Tether, USDC and PAX are by far the most commonly listed among major exchanges. This results in much higher liquidity as well as higher traded volumes.

# Existing Stablecoins

STABLECOIN	CURRENCY	ACCOUNTING FIRM	ATTESTATIONS	PRIMARY BANK
Tether	USD	-	Last in 2018	Deltec Bank
USDC	USD	Grant Thornton LLP	Monthly	US Bancorp
Binance USD	USD	Withium	Monthly	Silvergate
TrueUSD	USD	Armanino	Real time	Unknown
PAX	USD	Withium	Monthly	Silvergate
HUSD	USD	Withium	Monthly	Silvergate
EURT	EUR	-	Never	Deltec Bank
EURS	EUR	BDO Malta	Monthly	EXT LTD
USDK	USD	Elde Bailly LLP	Monthly	Prime Trust
Gemini Dollar	USD	BPM, LLP	Monthly	State Street Bank

BLOCKCHAINS												
STABLECOIN	CURRENCY	ETH	BCS	TRX	OMNI	EOS	LIQUID	OMISEGO	ALGORAND	STELLAR	SOLANA	
Tether	USD	☑	×	☑	☑	☑	☑	☑	☑	×	×	
USDC	USD	☑	×	×	×	×	×	×	☑	×	×	
Binance USD	USD	☑	☑	×	×	×	×	×	×	×	×	
TrueUSD	USD	☑	☑	×	×	×	×	×	×	×	×	
PAX	USD	☑	×	×	×	×	×	×	×	×	×	
HUSD	USD	☑	×	×	×	×	×	×	×	×	×	
EURT	EUR	☑	×	×	×	×	×	×	×	×	×	
EURS	EUR	☑	×	×	×	×	×	×	×	×	×	
USDK	USD	☑	×	×	×	×	×	×	×	×	×	
Gemini Dollar	USD	☑	×	×	×	×	×	×	×	×	×	

EXCHANGES												
STABLECOIN	CURRENCY	BINANCE	HOUBI	OKEX	FTX	COINBASE	KRAKEN	BITTREX	POLONIEX	BITSTAMP	GEMINI	BITFINEX
Tether	USD	☑	☑	☑	☑	×	☑	☑	☑	×	×	☑
USDC	USD	☑	×	☑	☑	☑	☑	☑	☑	×	×	×
Binance USD	USD	☑	×	×	☑	×	×	×	☑	×	×	×
TrueUSD	USD	☑	☑	☑	☑	×	×	☑	×	×	×	×
PAX	USD	☑	☑	☑	☑	×	×	☑	☑	☑	×	×
HUSD	USD	×	×	×	☑	×	×	×	×	×	×	×
EURT	EUR	×	×	×	×	×	×	×	×	×	×	☑
EURS	EUR	×	×	×	×	×	×	×	×	×	×	☑
USDK	USD	×	×	×	×	×	×	×	×	×	×	☑
Gemini Dollar	USD	×	×	×	×	×	×	×	×	×	☑	☑

## History

Tether, the first fiat-collateralized stablecoin, was announced in 2014 by co-founders Brock Pierce, Reeve Collins, and Craig Sellars<sup>61</sup>. The stablecoin was created to address traders' inconvenience of moving fiat currency quickly from one account to another, regardless of where each holder was located.

Eventually, Tether also helped new exchanges obtain cheap access to fiat liquidity since getting a bank account was nearly impossible for cryptocurrency businesses at the time and compliance costs were high for new entrants. Most early exchanges, especially those offering margin or derivatives trading, also had no interest in touching fiat currencies directly since it implied they would have to become regulated.

After several months of functioning in beta, Bitfinex, one of the largest cryptocurrency exchanges at the time, listed Tether in early 2015. Despite Tether claiming that there is only a small overlap of shareholders with Bitfinex, the Paradise Papers leaks<sup>62</sup> in November 2017 showed that executives of Bitfinex, Phil Potter and Giancarlo Devasini, set up Tether's entity in the British Virgin Islands in late 2014. Since the leaks became public, both Tether and Bitfinex have been operating under one entity called iFinex.

Tether has historically operated with very little transparency about the location of its reserves, which attracted public controversy. But since no other fiat-backed stablecoin existed until early 2018, Tether remained the go-to option and was used by mostly traders throughout the years.

In April 2017, Bitfinex was cut off from Wells Fargo and Taiwanese banks and its \$1 peg broke for the first time. After losing access to its banks, Tether began to undertake alternative approaches. In some instances, it obtained access to the banking system through private bank accounts of shell companies and through third-party payment processors. As the uncertainty about Tether's backing increased, the company released its first attestation done by Friedman LLP in September 2017, which confirmed that Tether had the cor-

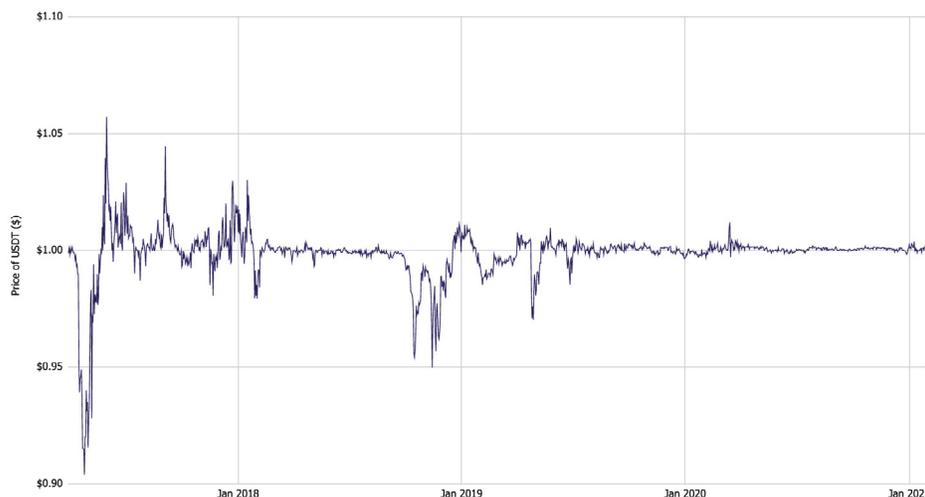
61 [What is Tether?](#)

62 [OFFSHORE LEAKS DATABASE - Tether Holdings Limited.](#)

responding reserves of \$443 million. In December 2017, the CFTC issued subpoenas to Bitfinex and Tether<sup>63</sup>.

Source: TradingView

Price Of Usdt - Based On  
Usdt/Usd Kraken



Since 2018, Tether officially stopped issuing its stablecoin to U.S. residents as the regulatory environment tightened. As Tether's supply grew to more than a billion dollars, Tether released its second attestation, stating that it had \$2.5 billion in reserves in its accounts. This attestation was produced by law firm Freeh, Sporkin & Sullivan. Towards the end of 2018, Tether started increasingly relying on a payment processor Crypto Capital.

In October 2018, concerns about Tether's solvency began to resurface. After losing one of its deposit accounts, Bitfinex briefly paused all fiat deposits. As a result, Tether's peg broke down for the second time and traded at as much as a 5% discount for three weeks.

Tether then started using Bahamas-based Deltec Bank, which it uses today. In order to reassure USDT holders, Tether released its third attestation by Deltec Bank, which reported corresponding USD reserves of \$1.8 billion.

We will refrain from going too deep into the allegations, lawsuits and regulatory investigations surrounding Tether. Instead, we encourage all readers to do their own due diligence in relation to such matters.

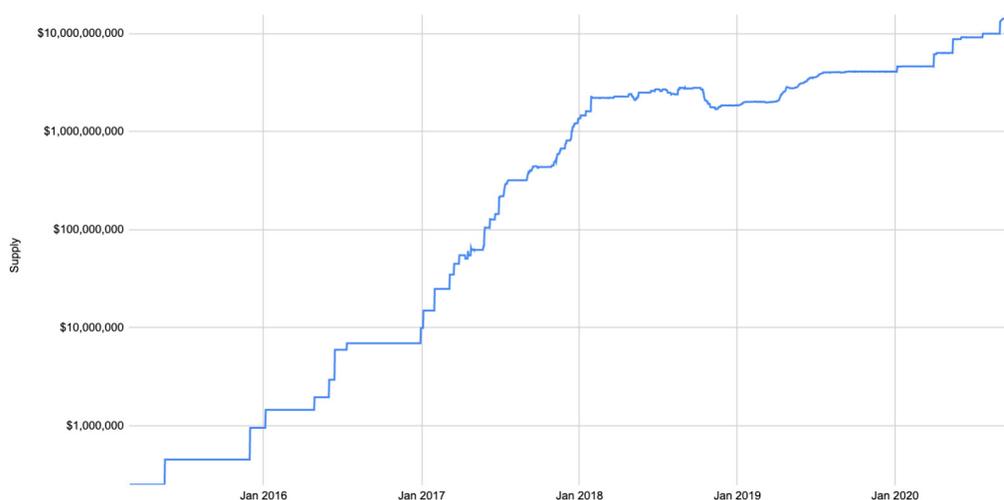
63 [U.S. Regulators Subpoena Crypto Exchange Bitfinex, Tether](#)  
January 30th, 2018.

## Growth

Despite the controversy surrounding Tether's issuer, the stablecoin has experienced exponential growth. It took Tether a year to cross the first \$1 million of supply, then another year to cross \$10 million and then another year to cross \$1 billion. In 2017, as the cryptocurrency space exploded in size, so did Tether issuance.

Source: TradingView

Tether Supply (Log Scale)



The most significant growth of Tether happened in 2017 when the supply grew by about \$1 billion dollars. The price of Bitcoin grew from \$1,000 to nearly \$20,000 in a nine month period and the market was experiencing a speculative mania. As the result of the rapidly growing market size, the demand for stablecoins increased significantly and the market experienced a speculative mania. At the same time, a new set of exchanges started and required Tether for quick access to liquidity.

However, the main catalyst likely came from the trio of Chinese exchanges: Binance, Huobi, and OKEx (then called OKCoin). In September 2017, China banned exchanges from servicing Chinese customers and dealing with the national currency. All exchanges were forced to relocate and they started operating out of China. A majority of Tether's supply at that time ended up being held by these three exchanges. The Chinese exchanges lost access to Renminbi

# Tether

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fiat links and switched to Tether as the main source of liquidity. This also meant that Chinese customers that were exposed to cryptocurrencies at the time couldn't easily cash out to fiat.

Since the price of cryptocurrencies increased significantly in 2017, it's sensible to assume that many customers wanted to cash out. Therefore it's likely that a lot of the money that came from China was eventually converted to Tether and then stayed there as means of the store of wealth.

Even though exchanges are theoretically banned in China, there is a really mature on- and off-ramp P2P market in China. Tether has a lot of liquidity on these P2P markets, which is likely a direct consequence of a lot of people in China having Tether liquidity from 2017.

Despite its controversies, Tether is still used by traders globally. This was proven in 2020 as the supply grew by more than \$10 billion. These market participants seem to believe that Tether has the required cash reserves, as they are willing to wire billions of dollars to Tether's banks.

A big reason for Tether's success is its network effect. Another factor is that Tether is not associated with the United States (despite being registered with FinCEN). Tether's continuing support is in large part driven by people outside of the jurisdiction of the United States that want exposure to the U.S. dollar. While stablecoins like USDC and PAX are considered American, Tether isn't.

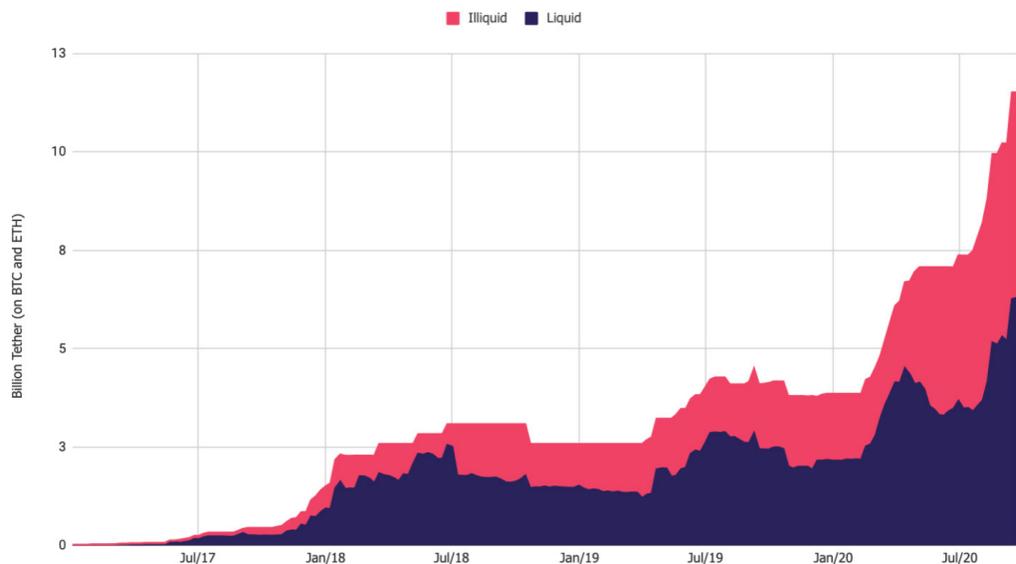
Another massive growth period occurred in 2020 when the supply grew from a little over \$4 billion to now more than \$15 billion. There are several reasons for this growth, according to Paolo Ardoino, CTO of Tether:

1. Users exiting cryptocurrencies into stablecoins after the March 12th crash
2. The explosion of derivatives that use USDT as collateral vs. BTC
3. Hedge funds getting exposure to Bitcoin after the March 12th crash
4. Chinese miners buying mining equipment in Tether
5. Decentralized Finance (DeFi) on Ethereum taking off

When it comes to on-chain usage, Tether is typically very liquid, which suggests that it's historically been mainly used as a medium of exchange. However, liquidity has declined considerably this year, which indicates that people are holding and not sending it out for longer periods of time. Since the global liquidity crunch in March, the data seems to indicate that people started using Tether more as a store of wealth rather than just as a medium of exchange.

Source: Chainalysis

Supply of Tether based on liquidity



## Blockchain-agnostic approach

Unlike other competing stablecoins, Tether currently supports seven blockchains. While the vast majority of the supply is issued on Ethereum, TRON, and Omni, Tether believes in a blockchain-agnostic approach. It issues new supply on the blockchains where the demand justifies it. If customers want more of Tether on one blockchain than another, Tether would simply swap to another chain. Ultimately, customers decide where most of the supply will be issued.

## Business model

Tether's main business model is collecting interest on the money that's sitting in its banks. Tether also has the mandate to invest in Treasuries and other low-risk money-like investments. It currently earns an interest rate of a little more than 1%. If interest rates even-

tually turn negative, Tether could also invest in riskier assets, such as municipal or corporate bonds.

According to Paolo Ardoino, Tether may start offering consulting services for another supplemental source of revenue. Third-party service providers have indicated to Tether that they want to understand how to deal with multiple blockchains, how the security is ensured on these blockchains, and how the infrastructure is set up for book-keeping. Moreover, another possibility for an additional revenue source is working with partners (such as a remittance network) and charging a very small revenue fee for each transaction.

## Use cases

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Tether's primary use case is and always has been trading. It is mainly used by traders to send money across exchanges, to exit out of cryptocurrencies, and to use as collateral on their futures positions. Tether has aspirations for micropayments on top of the Lightning Network and also wants to build out a non-custodial derivatives platform that functions with the Lightning Network.

## Regulation

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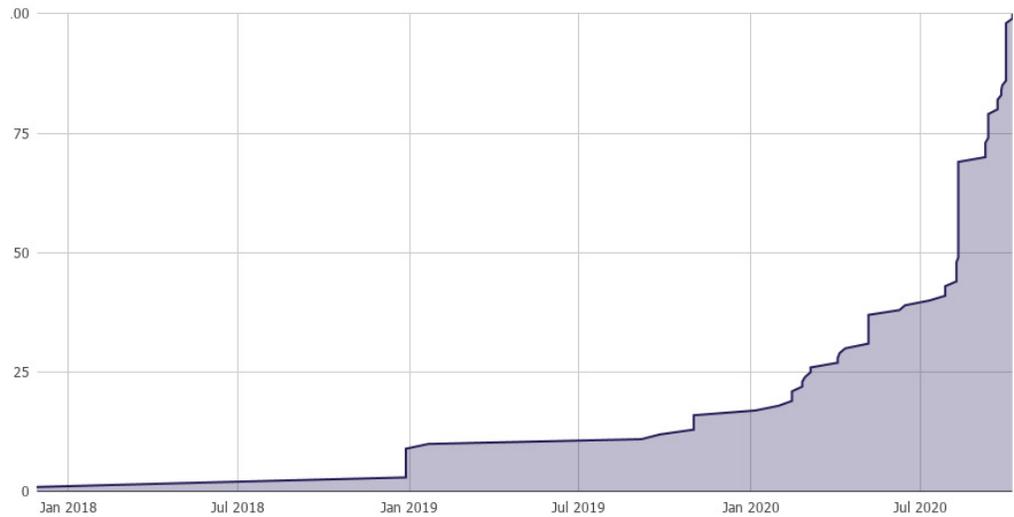
Tether is considered to be a semi-regulated stablecoin. It's internal compliance structure includes a KYC/AML team and an investigations team. The KYC/AML team handles the onboarding process of new clients. Tether's investigation team monitors on-chain developments and manages information requests from law enforcement.

Since Tether is registered with FinCEN, it is required to file Suspicious Activity Reports (SARs) if it detects suspicious activity. These suspicious activities could for example involve transactions from illegal markets on the Darknet or if a redeeming party is suspected of being involved in money laundering activities. Tether also has a comprehensive KYC/AML compliance manual, which has been approved by Tether's bank. Since 2018, Tether's compliance efforts are headed by former AML Quality Control Manager at the Bank of Montreal, Leonardo Real.

# Tether

Source: Dune Analytics

Amount of blacklisted  
USDT addresses



In order to ease the compliance burden and function more efficiently, Tether only lets very few parties (virtually only exchanges, OTC desks, and large traders) originate and redeem USDT. From there, exchanges or OTC desks distribute Tether themselves to retail customers. So, if there are KYC information requests from law enforcement, they usually go directly to exchanges rather than to Tether who just distributes B2B.

# USD Coin (USDC)

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## History

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After Paxos and Gemini announced their respective stablecoins, Circle announced USDC, its own fiat-backed stablecoin, in September 2018. USDC launched with a vision of enabling an open global financial system with a stable instrument on a blockchain. The stablecoin was announced in cooperation with Bitmain, the largest bitcoin hardware mining producer, which had led a \$110 million investment round in Circle just prior to the USDC launch.

A foundation called Centre was started to govern the stablecoin. It was initially set up as a wholly owned subsidiary of Circle but now functions as a governance consortium and a multi-issuer framework. Centre was created to be an independent entity that provides the support, governance, and ongoing R&D for USDC. Centre also provided a mechanism to govern the new issuers.

Bitmain and Circle, which owned Poloniex at the time, were the first two members of Centre. About a month after the launch, the largest regulated spot exchange by volume, Coinbase, announced that it had become a founding member of the Centre consortium. Binance, the largest crypto-to-crypto exchange, listed USDC a month later. The combination of being listed on both Coinbase and Binance helped bootstrap USDC liquidity quickly. Thus, initial growth came from its growing popularity within the crypto markets and was supported by the general demand for high liquidity.

Similar to other Tether competitors, USDC was introduced as a more regulated alternative for cryptocurrency traders. In early 2020, USDC's vision of becoming a global medium of exchange gained further relevance during the coronavirus pandemic. Concurrent with several feature releases, fresh demand started coming from emerging markets where people utilized USDC as a hedge against their local fiat currencies, according to Circle CEO, Jeremy Allaire.

At the same time, users began to increasingly store USDC outside of exchanges. Many users stored it in their personal wallets. In addi-

# USD Coin (USDC)

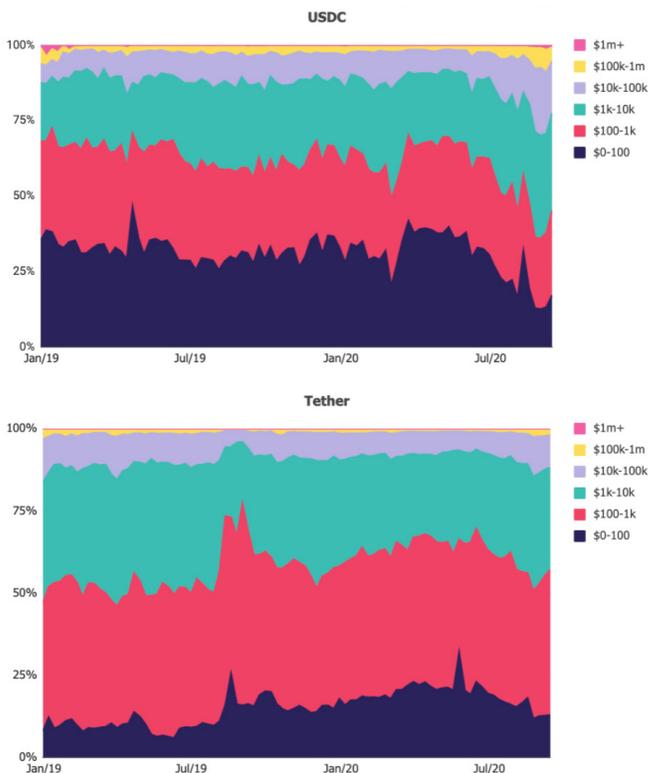
tion, usage from international businesses for cross-border payments increased organically — with real utility derived from USDC’s role as a global payments network without counterparty risk, near instant settlement and relatively low transaction costs.

Today, USDC is the leading stablecoin by the deposited amount for various DeFi platforms, surpassing even Tether. Recent innovations in DeFi, such as yield farming, have led to a further increase in overall demand for USDC. As infrastructure around permissionless DeFi protocols matures along with global financial markets, the positive trend for USDC is likely to continue.

In late August, Centre introduced USDC 2.0, which enabled wallet developers to either pay fees on behalf of customers or present/deduct these fees in USDC instead of ETH via the “gasless sends” feature. With gasless sends, digital wallet and app developers can build user experiences that more closely resemble the experience of existing mobile payment applications, with fees expressed and paid in USDC.

Source: Chainalysis

Share of transactions not coming from exchanges



## Growth and use cases

The growth of USDC use stems from the crypto space, particularly from crypto traders, many of which are active on DeFi applications.

According to Jeremy Allaire, business adoption is focused primarily in B2B SMEs which utilize USDC as a payment medium. This organic growth can be seen with companies in South East Asia that source inventory from mainland China. They prefer to use USDC as a payment medium since their local currencies have limitations for international payments and many Chinese suppliers prefer to receive payments in USD. Similar trends can be observed in Latin and Central America, where Brazil, Mexico and Argentina lead the way. This is supported by liquid conversion mechanisms between USDC and local banking operations in many countries.

# USD Coin (USDC)

“Over time, we expect the costs of storing and moving value to plummet to zero just like it has for data, communications and content.

When anyone can program money, there will be fundamental shifts in how financial applications work.”

—  
Jeremy Allaire, Circle

Compared to its closest competitor, Tether, USDC is more frequently used for smaller transactions, which indicates that it's being used more for non-trading use cases.

According to Jeremy Allaire, USDC also plans to work with commercial banks to allow users to deposit and withdraw stablecoins into their traditional bank accounts instead of using wire transfers or ACH payments.

In the future, USDC might evolve to become a regulated private version of CBDCs which are used on public networks. In such an environment, standards for CBDCs could be driven by public-private partnerships where private sector innovation leads the way forward. This is currently the case, with private stablecoins leading in terms of innovation due to an overall much slower development and adoption cycle of CBDCs globally. An ideal outcome of such partnerships could be that the liabilities underpinning tokenized fiat currencies become subject to central bank custody or at least, defined terms around those liabilities provided by the central authority, which could potentially become actual central bank liabilities, while keeping public stablecoin arrangements on public networks.

## Business model

USDC's business model is twofold. Just like for the other stablecoins, the primary source of revenue is earning interest on the fiat collateral that underpins USDC.

Furthermore, much like open source software, USDC does not need to earn income from transactions themselves. Instead, Circle builds and monetizes products and services around USDC usage and adoption. One example is Circle's recently launched family of platform services, which include Circle Payments, Wallets, Marketplaces and Business Account APIs, which are reportedly growing.

Its monetization model is similar to that of large platform services like transaction banking. It monetizes API usage via fees and leverages

# USD Coin (USDC)

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its existing infrastructure to onboard new businesses into the USDC ecosystem. Additional services provided by Circle include blockchain infrastructure, custody storage and transaction management.

An important distinction is that Circle does not intend on becoming a middleman in the consumer layer. Instead, it wants to enable companies to directly offer services to their consumers with minimum friction.

## Regulation

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USDC operates under US money transmission laws and is built on an open source framework. USDC issuers like Circle and Coinbase are regulated as money transmitters by state licensing authorities and are registered as Money Service Businesses (MSBs) at the federal level with FinCEN. Centre publishes monthly attestations by Grant Thornton LLP, uses Silvergate Bank to transact and US Bancorp Asset Management as its primary bank to store reserves. Unlike the stablecoins issued by Paxos and Gemini, USDC is not regulated by the NYDFS.

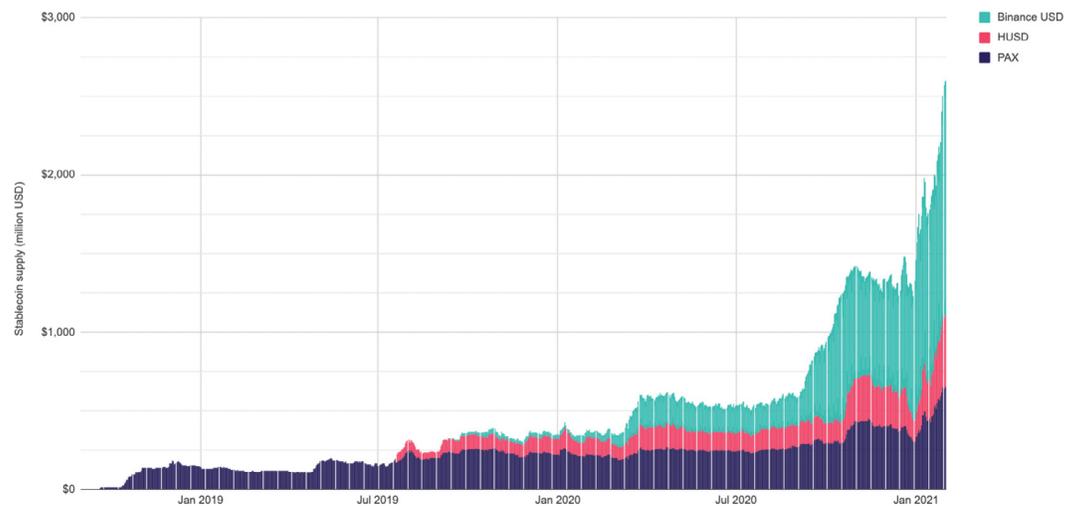
# Paxos Standard (PAX)

## History

Paxos, the issuer of Paxos Standard, was founded in 2012 and launched its itBit exchange in 2013. In 2015, the NYDFS granted Paxos a limited-purpose trust charter, establishing Paxos as the first company approved and regulated to offer crypto products and services. In September 2018, Paxos launched its U.S. dollar pegged stablecoin Paxos Standard (PAX), which was one of the first two stablecoins regulated by the NYDFS along with the Gemini dollar (GUSD).

Source:Coin Metrics

Paxos stablecoin universe  
sept 2018 - sept 2020



In September 2019, Paxos announced the launch of its first whitelabel stablecoin on Binance, Binance USD (BUSD). This was followed by its second whitelabel stablecoin, Huobi USD (HUSD), which launched in July 2019. Paxos allows for direct purchase and redemption of BUSD and HUSD through its platform, which also handles custody of the funds and compliance. HUSD is only available for customers outside the US.

## Growth and use cases

PAX was quickly bootstrapped by being the first stablecoin regulated by NYDFS to list on Binance. Not even two weeks after its launch and nearly two months before USDC, PAX got listed on the largest crypto-to-crypto exchange and started serving as one of the base pairs.

# Paxos Standard (PAX)

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Unlike USDC and even Tether to an extent, PAX didn't gain significant traction in DeFi. Most of the largest holders of PAX are centralized exchanges and centralized crypto lending platforms. Most of the growth of Paxos' stablecoins comes from its unique whitelabel approach as exhibited in the chart above.

If the rumors of PayPal working with Paxos to roll out its own version of a stablecoin prove true, then Paxos' whitelabel strategy is in a nice position for growth.

## Business model

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Paxos' business model features several income streams, which are all based on growing its inclusive universe together with its partners globally. Just like the other stablecoin providers, Paxos earns most of its income from interest rate capture of its fiat flows. If U.S. dollar interest rates decline substantially or turn negative, Paxos says it would likely have to start charging fees, which could take various forms such as transaction fees or redemption fees. Besides interest rate capture, Paxos offers a suite of complementary services to third parties. As such, its stablecoin PAX, while being an important part of its ecosystem, is only one part of its business model.

Paxos believes that, similar to how there are a number of banks, there will be several major stablecoin providers, supplemented by many small providers to fill niche use cases eventually. With that in mind, Paxos has developed a white-label strategy which is based on its curated regulatory and technological foundations. Via its white label, Paxos enables its partners to launch NYDFS regulated stablecoins without having to develop the technological foundations themselves. For partners using Paxos for their white label stablecoin, this may translate into cost savings and a reduced time to market. White label partners include Binance, with its stablecoin BUSD, and Huobi, with its stablecoin HUSD. As of October 2020, the circulating supply of BUSD has grown to be larger than PAX itself. However, Paxos sees this as beneficial due to network effects. Taking into account the total value of its stablecoin universe, Paxos' assets under custody grow alongside the success of its partners.

# Paxos Standard (PAX)

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“What is needed is more privacy in stablecoins, I don’t think more anonymity is necessary. Privacy and anonymity are not the same. Privacy is when no one knows the details of a transaction. Anonymity is when no one knows the identity of the transactor, but everyone knows a transaction occurred. The industry needs more privacy controls and transactions will need to stay pseudonymous.”

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Charles Cascarilla, Paxos

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## Regulation

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Paxos is a New York State-chartered trust company regulated by the New York Department of Financial Services (NYDFS), making it subject to a higher level of regulatory oversight. Paxos is required to meet specific NYDFS capital reserve, consumer protection, compliance, and anti-money laundering standards. It also must undergo regular exams, making Paxos’ whitelabel stablecoins (BUSD and HUSD) among the most heavily regulated stablecoins with market trac-

tion. It should also be noted that Paxos filed for a Federal Bank Charter in December 2020.

# Diem (Formerly known as Libra)

## History

In June 2019, after months of whispers within the digital assets industry, Facebook announced the Diem initiative with a white paper and several other documents detailing Diem's plans. Diem initially aspired to create a global digital currency built atop a novel payments infrastructure that would be designed by a Facebook-led consortium. Following immediate backlash from global monetary and regulatory authorities, Diem lost several of its high-profile consortium members including PayPal, eBay, Visa, Mastercard, and Stripe. The initiative then withdrew from the public eye, only to emerge again with an updated version of its white paper in April 2020.

“The initial whitepaper was more of the currency’s proof of concept. The second whitepaper outlines more details on the regulation aspect, especially with unhosted wallets, while allowing the creation of domestic stablecoins (e.g., DiemUSD, DiemGBP).”

— Samuel Lim, Binance

The Diem Association claims that the goal of the initial project announcement was to spark a collaborative dialogue with stakeholders around the globe. After taking the past year to speak with such interested parties, Diem is now trying to figure out how to incorporate blockchain technology into established regulatory frameworks. As its cover letter noted, the “objective is for the Diem payment system to integrate smoothly with local monetary and macroprudential policies and complement existing currencies

by enabling new functionality, drastically reducing costs, and fostering financial inclusion.”<sup>64</sup>

There is a clear difference in tone throughout the updated white paper that is less conceptual and more realistic from a cooperative approach, especially when it comes to complying with existing global financial regulations. A novel seven page ‘Compliance and the Prevention of Illicit Activity’ section, in addition to ten more granular pages detailing platform activities, management and scope, increased the new white paper’s length to 29 pages, which is more than double the original size.

Furthermore, the language is more judicious, as noted by industry analyst Michael Rauchs’ blog, “the term cryptocurrency has been

64 [White Paper v2.0 | From the Diem Association Members Cover letter](#) April, 2020.

# Diem (Formerly known as Libra)

removed from the document (never mind that Diem was never a cryptocurrency to begin with), and the word decentralized has been replaced with distributed. Similarly, the language has shifted from somewhat vague assertions (e.g. responsible financial services innovation) to more concrete, regulatory-friendly propositions (e.g. safe and compliant financial applications).<sup>65</sup>

Binance Research provided a great table on Diem's updates in its 'Will Diem Live Up To Its Initial Ambitions?'<sup>66</sup> research piece, which The Block Research recreated below.

Diem has three main components:

## 1. Diem Blockchain

A distributed ledger serving as the payment system's technological foundation.

## 2. Diem Coins

Stablecoins backed by the Diem Reserve, which includes cash, cash equivalents and short-term government debt issuances.

## 3. Diem Association & Diem Networks

The independent Switzerland-based organization, Diem Association, and its subsidiary, Diem Networks, are both tasked with governing, developing and operating the payment system.

Focusing on scalability in an effort to meet the financial needs of billions of people, the Diem Blockchain touts an open-source architecture. The payment system will feature finality of settlement, increased transaction flow rate, decreased latency, efficient storage, compatibility and regular software updates.

According to Binance Research<sup>67</sup>, the Diem Blockchain relies on the following six characteristics:

## 1. Diem BFT

A variant of Hotstuff, a leader-based Byzantine fault-tolerant replication protocol, that provides settlement finality, incorporates a novel round synchronization mechanism and the ability to reconfigure itself following a priori defined process.

<sup>65</sup> [Diem 2.0: A Preliminary Analysis \(Part I\) — Michel Rauchs](#)  
April 2020.

<sup>66</sup> [Will Diem Live Up To Its Initial Ambitions? Binance Research](#)  
April 2020.

<sup>67</sup> [Will Diem Live Up To Its Initial Ambitions? Binance Research](#)  
April 2020.

# Diem (Formerly known as Libra)

## 2. Proof-of-Authority

The network will be a permissioned network, with validators being selected by the Diem Association. In the long-term, there will be a mechanism to induce new validators through a “fair and competitive process.”

## 3. Programmability

Smart contracts are supported on the network. At launch, only predefined smart contracts will be able to be executed at the time of the network’s launch. New smart contracts will require approval from validators.

## 4. Merkle Trees

Merkle trees are used to verify data integrity. They can detect any changes in the existing data by using hashes, instead of the full files.

## 5. Interoperability

While Diem will be operated as a permissioned network, the Diem protocol will be “built for a high degree of interoperability.”

## 6. Upgradeability

Preconceived policies and procedures will be in place to structure a reconfiguration of the Diem blockchain to handle critical errors or enable general updates.

The change from a single Diem coin to offering multiple Diem coins is arguably the most noteworthy change from a design standpoint between the white paper versions. The Diem Network now provides single-currency stablecoins alongside a multi-currency Diem coin. As per Diem, this change was prompted because “a key concern that was shared was the potential for the multi-currency Diem Coin (DBR) to interfere with monetary sovereignty and monetary policy if the network reaches significant scale and a large volume of domestic payments are made in DBR. We are therefore augmenting the Diem network by including single-currency stablecoins in addition to DBR, initially starting with some of the currencies in the proposed DBR basket (e.g., DiemUSD, DiemEUR, DiemGBP, DiemSGD).”<sup>68</sup>

Each coin is backed by the Diem Reserve’s off-chain collateral; there is an 80/20 split, with 80% of the stablecoin’s face value being composed

68 [White Paper v2.0 | From the Diem Association Members Cover letter](#)  
April 2020.

# Diem (Formerly known as Libra)

of short-term government debt and 20% held in reserve as cash and cash equivalents. Over time, Diem hopes to increase the number of supported fiat currencies offered as single-currency stablecoins. While media coverage painted the addition of single-currency stablecoins to a multi-currency Diem Coin as capitulation by Diem to regulators. The Block Research spoke to an array of industry experts who saw this move as a step forward, since being denominated in local currencies will entice users to trust the Diem stablecoins more. The initial Diem proposal was confusing to most users from a unit of account standpoint, as the DBR unit is not nearly as common as major currency denominations, such as USD, JPY, EUR, etc.

By offering several major currency units of account, along with the DBR basket denomination, Diem's total addressable market is enlarged. Industry analyst Michael Rauchs blog echoed this sentiment, writing "what started as an opportunistic move to alleviate the

concerns of central banks may eventually turn out to be a major adoption catalyst as it greatly increases the platform's attractiveness and utility to end users."<sup>69</sup>

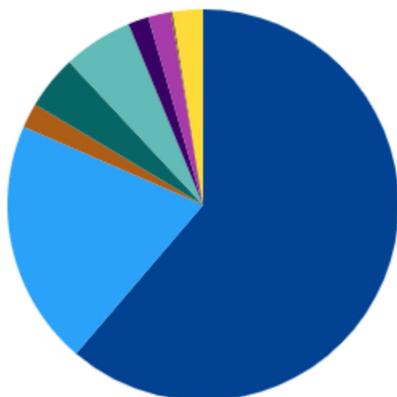
Diem still kept the multi-currency Diem Coin (DBR) in the updated design. DBR is envisioned as a currency-basket, similar in concept to the IMF's Special Drawing Rights (SDR), where single-currency Diem stablecoins are combined according to predetermined nominal weights. One can speculate

that USD will hold more weight than other fiat currencies within the DBR basket, as it is the global reserve currency. According to the IMF's 'World - Allocated Reserves by Currency for 2020<sup>2</sup>' data, U.S. dollars made up 61.26% of global reserves.<sup>70</sup>

Furthermore, Diem's own example of DBR's potential weighting was 50% USD. According to the 'Economics and Diem Reserve' section of the white paper, Diem finds "single-currency stablecoins simplify the design of DBR. DBR can be implemented as a smart contract that

Source: Coin Metrics

World - allocated reserves currency for 2020 Q2



<sup>69</sup> [Diem 2.0: A Preliminary Analysis \(Part I\) — Michel Rauchs](#) April 2020.

<sup>70</sup> [Currency Composition of Official Foreign Exchange Reserve](#) September 2020.

## Diem (Formerly known as Libra)

aggregates single-currency stablecoins using fixed nominal weights (e.g., DiemUSD 0.50, DiemEUR 0.18, DiemGBP 0.11, etc.).”<sup>71</sup> The Diem Association also invites regulators, central banks and other international organizations, such as the IMF, to provide oversight and manage the basket composition. This could be done under the guidance of the Swiss Financial Market Supervisory Authority (FINMA), which is Diem’s primary supervisory authority.

The concept of basket-backed stablecoins is clearly on the Federal Reserve’s radar, having made its way into the Finance and Economics Discussion Series (FEDS). In February 2020, the Federal Reserve Board released its ‘Global Demand for Basket-Backed Stablecoins’ paper, written by Economists Garth Baughman and Jean C. Flemming. The first sentence of the abstract cites Diem, along with Bank of England Governor Mark Carney’s “synthetic hegemonic currency” proposal, as motivation for creating a model to gauge demand for basket composition stablecoins during trade shocks. Since most stablecoins are pegged to single sovereign currencies, a basket-backed approach could potentially limit price volatility, leading to increased global acceptance.

Numerical simulations<sup>72</sup> discovered four primary outcomes:

1. Because of general equilibrium effects of the basket currency on the volatility of currency values, overall demand for that currency is small.
2. Despite scant holdings of the basket, its global reach may contribute to substantial increases in welfare if the basket is widely accepted, allowing it to complement holdings of sovereign currencies.
3. When calculating the welfare maximizing composition of the basket, optimal weights depend on the pattern of international acceptance, but that basket composition does not significantly affect welfare.
4. Despite potential welfare improvements, low demand for the basket currency from buyers limits sellers’ incentives to invest in accepting it, suggesting that fears of a so-called global stablecoin replacing domestic sovereign currencies may be overstated.

71 [White Paper v2.0 | Economics and the Diem Reserve](#)  
April 2020.

72 [Global Demand for Basket-Backed Stablecoins](#)  
[The Fed](#)  
February 2020.

## Diem (Formerly known as Libra)

These simulations found that increased basket demand coincided with heightened demand for the underlying sovereign currencies. The model also demonstrated that “although the basket may have the potential to become important and globally demanded, general equilibrium effects on the relative values of the component currencies when the level of trade changes make it such that the basket never dominates either of the component currencies. At the same time, the introduction of the basket leads the more volatile sovereign currency to become more stable, substantially increasing currency holdings, trade, and welfare; we find that welfare gains can be on the order of 2% of GDP when transitioning from a ‘dollarized’ global economy to one in which the basket is globally accepted, although we emphasize that this is under generous assumptions regarding the acceptability of the basket and its other characteristics.”<sup>73</sup>

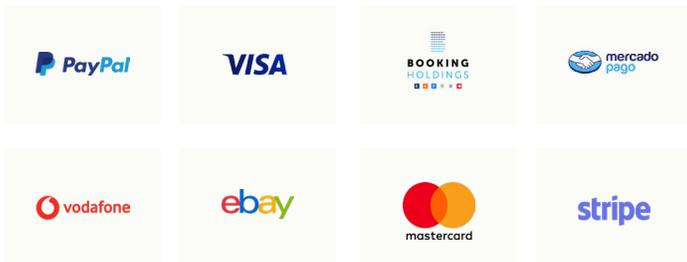
The paper concludes that there would need to be significant benefits in addition to those studies for basket-backed stablecoins to achieve mass adoption. Further research into network externalities of payment systems focused on producer and consumer incentives to utilize such an instrument is required. Technology companies like Facebook do possess large networks of users, which could make acceptance of a new instrument like Diem more likely and available. As discussed earlier, third-party commitment power is one of the principles of modern money. Understandably, there were initial concerns from monetary authorities, but as this paper demonstrates, those concerns are likely overblown.

Furthermore, Diem is making a clear attempt to ease monetary sovereignty concerns in Diem v2. As mentioned earlier, stablecoins and central bank digital currencies (CBDCs) are the two leading digital financial innovations being discussed for the financial system of the future. It is no surprise that Diem is also looking to cater to CBDCs on its network. Diem’s “hope is that as central banks develop central bank digital currencies (CBDCs), these CBDCs could be directly integrated with the Diem network, removing the need for Diem Networks to manage the associated Reserves, thus reducing credit and custody risk. As an example, if a central bank develops a digital rep-

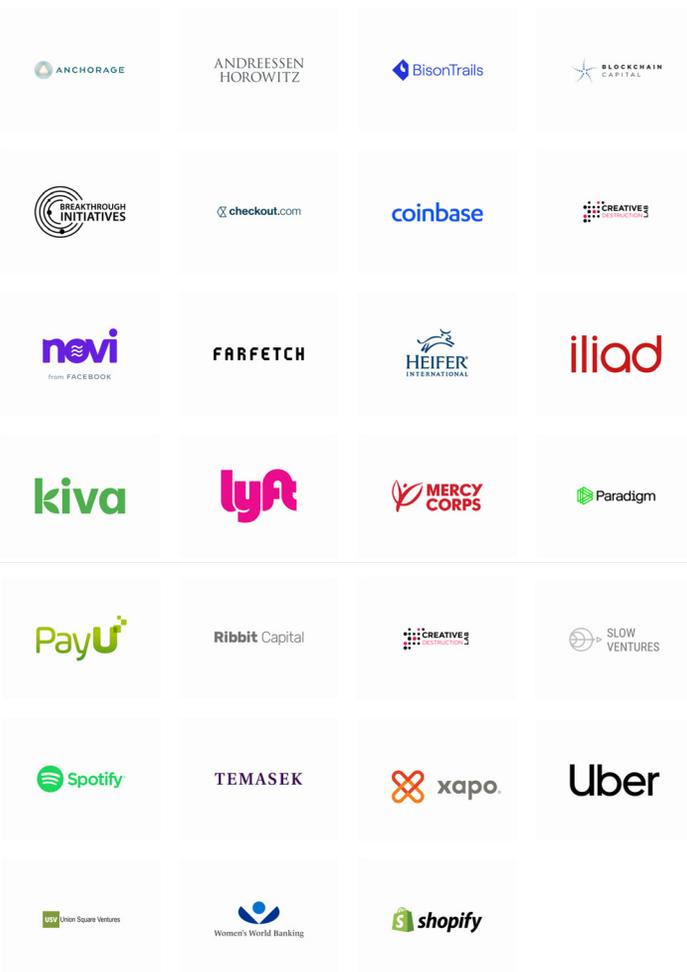
73 [Global Demand for Basket-Backed Stablecoins](#), pg. 32 February 2020.

# Diem (Formerly known as Libra)

## Former Members



## Active Members



resentation of the US dollar, euro, or British pound, the Association could replace the applicable single-currency stablecoin with the CBDC.”<sup>74</sup> From the central bank’s perspective, time will tell if monetary authorities would be interested in leveraging Diem’s infrastructure to enhance payment capabilities and further increase access to financial services.

Lastly, Diem’s administrative system is developed and controlled by the Diem Association (the Association), and its subsidiary, Diem Networks. Headquartered in Geneva, Switzerland, Diem Association “is designed to facilitate the operation of the Diem payment system; to coordinate the agreement among its stakeholders in their pursuit to promote, develop, and expand the network; to oversee the administration of the Diem Reserve; and to facilitate the provision of services in the Diem payment system in a safe and compliant manner.”<sup>75</sup> Governance is the primary responsibility of the Association, which is managed by the Association Council.

The Association Council consists of one representative per association member, each of which is given one vote per affair brought before the council. As of this report date, in February 2021, there are currently 27 active members, composed of international not-for-profit organizations and businesses.

The figure above shows the logos of active Diem Association members, both former and active.

<sup>74</sup> [White Paper v2.0 | Economics and the Diem Reserve](#) April 2020.

<sup>75</sup> [White Paper v2.0 | The Diem Association](#) April 2020.

# Diem (Formerly known as Libra)

“Encouraging market developments suggests the era of cryptocurrencies is beginning to bridge the gap into the real economy. 2020 was the year this change became lasting. 2021 and beyond will mark the period these developments gain much needed regulatory clarity following a same risk, same rules technology neutral approach to oversight.”

—  
Julien Le Goc, Diem

According to the white paper, “the Council may delegate its authorities to the board and the executive staff of the Association and rely on the board and the executive staff for the execution of its decisions. Major policy decisions require the consent of two-thirds of the Council representatives, the same supermajority of the network required in the Diem Byzantine Fault Tolerance (DiemBFT) consensus protocol.”<sup>76</sup> At the end of 2019, a Technical Steering Committee (TSC), consisting of five active associa-

tion members, was appointed by the Council to supervise the creation of the Diem Networks.

## Diem Networks’ responsibilities include:

1. Operating the Diem Payment System
2. Minting (Creating) and Burning (Destroying) Diem Coins
3. Administering the Reserve
4. Facilitating Diem Blockchain’s Services

Diem Networks is awaiting approval for a payment system license from the Swiss Financial Market Supervisory Authority (FINMA). If approved, FINMA will directly supervise Diem Networks, the Association and all related entities. A Chief Compliance Officer (CCO) and the Financial Intelligence Function (FIU-function) will be responsible for adhering to FINMA regulations.

The CCO and FIU-function will “conduct due diligence and continuous monitoring to ascertain the integrity, lawfulness, and legally compliant conduct of all Members, Designated Dealers, and Virtual Asset Service Providers (VASPs), such as custodial wallets or exchanges, that have an address on the Diem Blockchain; govern the implementation of protocol-level sanctions controls; govern the implementation of protocol-level transaction and address balance limits where required, per its policies; facilitate and guide the adherence to the Travel Rule on the Diem Blockchain; monitor the activity on the Diem Blockchain to detect suspicious activity, including attempts to circumvent network limits; and partner with regulators

<sup>76</sup> [White Paper v2.0 | The Diem Association](#) April 2020.

# Diem (Formerly known as Libra)

and law enforcement through reporting suspicious activities and acting on them as appropriate.”<sup>77</sup>

The Block Research recreated the following ‘Diem Network Participants’ table<sup>78</sup> from Binance Research’s Analysis:

NETWORK PARTICIPANT	DESCRIPTION	FUNCTION	CONDITIONS	RELATIONSHIP TO ASSOCIATION	REGULATION
Association Members	The core of the Diem network that presides over network-wide governance.	<ul style="list-style-type: none"> <li>Operate nodes</li> <li>Participate in governance"</li> </ul>	"Network operation: n/a Join network: Pay to join"	<ul style="list-style-type: none"> <li>Constitute association</li> <li>Voting rights for governance decisions (1m1v)"</li> </ul>	Extrinsic: - Payment system license under FINMA college
Designated Dealers	Act as intermediaries between the Diem network and other for-profit entities.	<ul style="list-style-type: none"> <li>Purchase stablecoins from association</li> <li>Sell stablecoins to VASPs/ Association</li> <li>Make markets &amp; provide liquidity to VASPs"</li> </ul>	No transaction- & account balance limits	Contractual relationship	Extrinsic: On-chain Off-chain
Regulated VASPs	A second layer of intermediaries that interact with Designated Dealers and offer services to the general public.	<ul style="list-style-type: none"> <li>Offer consumer-facing products (e.g., exchanges, OTC dealers)</li> <li>On-board users"</li> </ul>	No transaction- & account balance limits	Meet internal off-chain requirements	Extrinsic: - Off-chain
Certified VASPs	Non-regulated VASPs that comply with internal regulations.	<ul style="list-style-type: none"> <li>Offer consumer-facing products (e.g., exchanges, OTC dealers)</li> <li>On-board users"</li> </ul>	Transaction- & account balance limits	Meet internal off-chain requirements	Intrinsic
Unhosted Wallets	Unknown third parties that operate within the Diem network.	<ul style="list-style-type: none"> <li>On-board users</li> </ul>	Transaction- & account balance limits	No direct relationship	Intrinsic
Users	People, businesses and organizations.	<ul style="list-style-type: none"> <li>Access transaction accounts &amp; stable currency</li> <li>Remittances</li> <li>Payments</li> </ul>	Transaction- & account balance limits	No direct relationship	Implicit only

77 [White Paper v2.0 | The Diem Association](#) April 2020.

78 [Will Diem Live Up To Its Initial Ambitions?](#) Binance Research April 2020.

# Defunct Stablecoin Projects

As with any innovative trend, stablecoin projects are not immune from failure.

Some projects never launched their stablecoin. Other projects did not outright collapse, but instead pivoted to serve other functions in the crypto ecosystem. While the reasons for failure are different for each project, they can be categorized into three broader categories:

1. Flawed implementations of stability mechanisms to maintain the desired currency peg.
2. Regulatory actions due to either direct law enforcement shut-downs or changes of the respective jurisdictions' legal framework.
3. Lack of income generated by missing adoption.

Below are some of the more significant projects that are defunct or no longer pursuing the issuance of a stablecoin.

NAME	DESIGN	LAUNCHED	FAILED/ PIVOTED	REASON
AAA Reserve	Asset collateralized	Jan 2017	Jan 2019	Lack of income as it was unable "to compete with VC-backed and multinational" stablecoins.
Ampleforth	Algorithmic	Dec 2018	Failed to maintain peg	In practice, the dynamic supply rebase mechanism doesn't result in a stable price
Augmint	Asset collateralized	Jan 2018	No traction	Failed to gain meaningful traction.
Basis	Algorithmic	Jun 2017	Dec 2018	Stablecoin design violated US securities regulations. Capital returned to investors.
Basis Cash	Algorithmic	Jul 2014	No traction	Broke the peg and didn't recover
BitShares (BitUSD)	Asset collateralized	Apr 2018	Jan 2020	First stablecoin ever created. Failed to gain traction due to illiquidity and low price stability.
Carbon Money	Asset collateralized	Sep 2018	Sep 2019	Carbon Money shut down all of its stablecoin products to focus on its "better-performing credit/debit card on-ramp."
Dynamic Set Dollar	Algorithmic	Sep 2014	Mar 2014	Broke the peg and didn't recover
Empty Set Dollar	Algorithmic	Jan 2020	No traction	Broke the peg and didn't recover
Frax	Algorithmic	Apr 2016	No traction	Broke the peg and didn't recover
Kowala	Algorithmic	June 2018	Pivot to "multi-currency"	Never gained significant traction
KRWb	Asset collateralized			Failed to gain traction. Issuing entity was acquired by Binance in March 2020. Binance KRW used going forward.

# Defunct Stablecoin Projects

NAME	DESIGN	LAUNCHED	FAILED/ PIVOTED	REASON
NuBits	Algorithmic	Sep 2014	Mar 2014	First fiat stablecoin. Sharp increase in supply led to peg decoupling. Did not recover.
Sogür (prev. Saga)	Asset collateralized	Jan 2020	Jan 2021	Failed to gain meaningful traction and shut down due to regulatory concerns
Steem (Steem Dollars)	Asset collateralized	Apr 2016	No traction	Broke its peg twice in 2017, second time over 1,300% to the upside. Did not recover.

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch. 8 · 115-120

# Stablecoin Stability

To put it simply, the most desired quality of a stablecoin is stability. Stability is a function of primarily two factors: stabilization mechanism and liquidity.

For fiat-backed stablecoins, the peg can only break (for longer periods) if the customers have a lack of belief in the issuer's ability to redeem the token for dollars. Crypto-collateralized stablecoins have more challenges with stability, due to riskier arbitrage execution. The credit facility essentially acts as a central bank and theoretically has three tools at its disposal - changing interest rates, conducting open market operations and changing the assets that can be used as collateral.

A case study explores MakerDAO and metrics related to stability are calculated for some of the market's biggest stablecoins.

# Stablecoin Stability

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The most desired quality of a stablecoin is, to put it simply, stability. The smaller the divergence from the peg on liquid secondary markets, the more appealing the stablecoin will be. Stability is a function of primarily two factors: stabilization mechanism and liquidity.

For fiat-backed stablecoins, the peg can only break (for longer periods) if the customers have a lack of belief in their ability to redeem the token for dollars with the issuer. Each fiat-backed stablecoin should always have resources to buy back 100% of the circulating supply if necessary. If the peg momentarily breaks on the secondary market and the redemption process works, arbitrageurs can simply buy at a lower price and then redeem it for profit. However when an issuer has banking issues and the trust in the redemption process goes down, arbitrageurs might not be interested to participate. This is why Tether's peg has broken twice for longer periods of time - arbitrageurs simply doubted that Tether could handle the redemptions in a timely manner. And then the peg eventually corrected back to \$1 as confidence rose once again.

For crypto-collateralized stablecoins, stability is much harder to achieve due to much riskier arbitrage execution. The credit facility essentially acts as a central bank and theoretically has three tools at its disposal - changing interest rates, conducting open market operations and changing the assets that can be used as collateral. If the price is below the peg, the procol usually counters by rapidly increasing the interest rates and vice versa. The most commonly talked about downside scenario in crypto-collateralized stablecoins is a situation in which prices of cryptocurrencies drop rapidly and the stablecoin becomes undercollateralized.

## The largest crypto-collateralized stablecoin system, MakerDAO, had its largest stress test on March 12th, 2020. Amidst a cascade of liquidations, the price of ETH plummeted from \$200 to a low of \$83 on that date, which made the MakerDAO Vault undercollateralized

The largest crypto-collateralized stablecoin system, MakerDAO, had its largest stress test on March 12th, 2020. Amidst a cascade of liquidations, the price of ETH plummeted from \$200 to a low of \$83 on that date, which made the MakerDAO Vault undercollateralized. When under-collateralization occurs, there is an auction to liquidate Dai. Due to network congestion on March 12th, at one point only one liquidator showed up, which allowed them to bid for the Dai at zero cost. This led to 5.7 million Dai becoming undercapitalized<sup>79</sup> -- a problem that was solved by minting and auctioning off MKR to pay back the system debt.

In July 2020, the DeFi boom started taking place, which inherently increased the demand for Dai. This makes it challenging for MakerDAO to keep Dai from consistently trading above its peg. The supply of Dai is limited by the users' willingness to borrow against their own assets. MakerDAO has demonstrated unwillingness to further decrease the protocol's interest rate and instead decided to add new collateral types (mainly fiat-backed stablecoins) in order to increase the supply

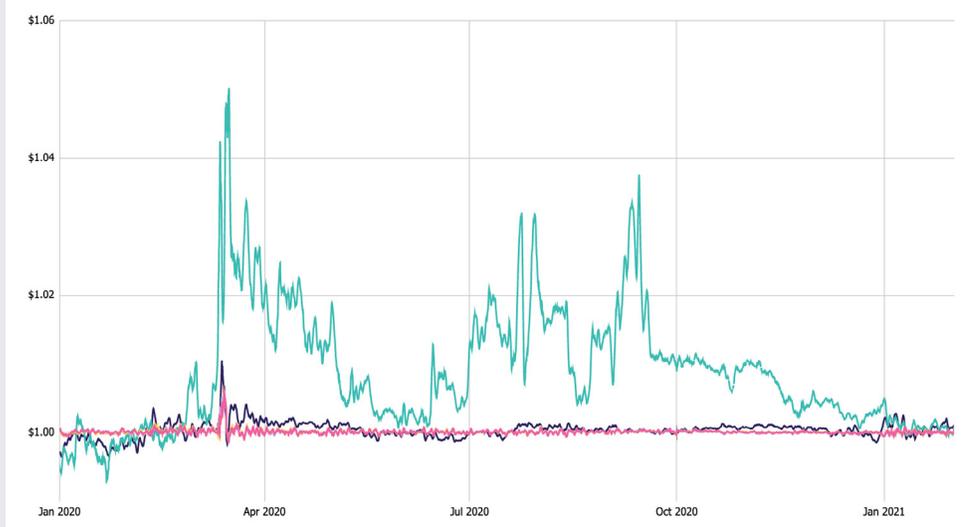
of Dai and get the peg back to \$1. Arbitrageurs then borrow Dai against their fiat-backed stablecoin and arbitrage the difference between the collateralization ratio and the price of Dai. Since then, 52% of Dai is backed by fiat-backed stablecoins<sup>80</sup> and the price of Dai has begun to get closer to its \$1 peg.

There is a tradeoff between centralization risks of collateral like fiat-backed stablecoins and volatility risk of trust-minimized crypto assets such as ETH. A higher proportion of assets like USDC leads to a systematic risk where addresses are being black-listed could threaten system-wide solvency. However, it's likely that when the demand for Dai decreases and price falls to the intended peg, it will no longer make sense for stablecoin arbitrageurs to have their loans open and it's likely that a lot of the fiat-backed stablecoins will naturally leave.

79 [Black Thursday for MakerDAO: \\$8.32 million was liquidated for 0 DAI](#) March 14th, 2020.

80 [Dai is now 60% backed by centralized assets – what does that mean?](#) September 26th, 2020.

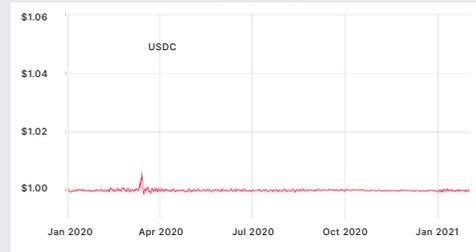
# Stablecoin Stability



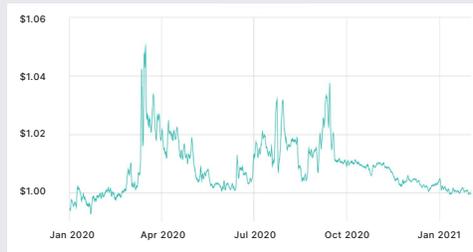
PRICE OF STABLECOINS COMPARED

- USDC
- Dai
- Binance USD
- PAX
- True USD
- Tether

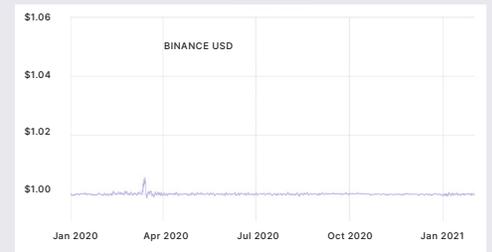
■ USDC



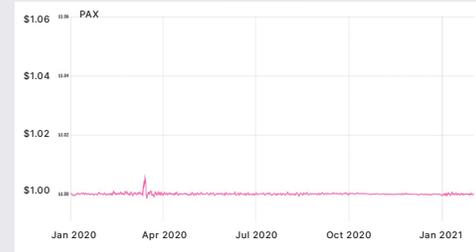
■ Dai



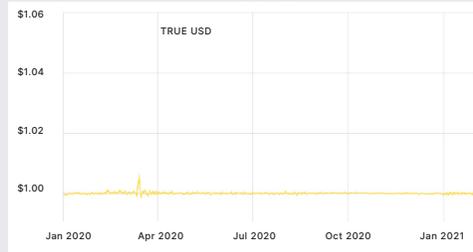
■ Binance USD



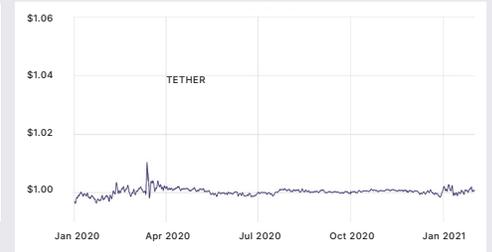
■ Pax



■ True USD



■ Tether



Source: Coin Metrics

In order to evaluate how well the stablecoins have fared this year, we look at six stablecoins with the largest supply and deepest liquidity - Tether, USDC, Dai, PAX, Binance USD, and TrueUSD. For each of those, we use hourly prices from centralized exchanges where the pair is the most liquid. Since USDC, PAX, Binace USD and TrueUSD don't have liquid USD pairs, their USDT pair is used and is normalized against USDT/USD price.

# Stablecoin Stability

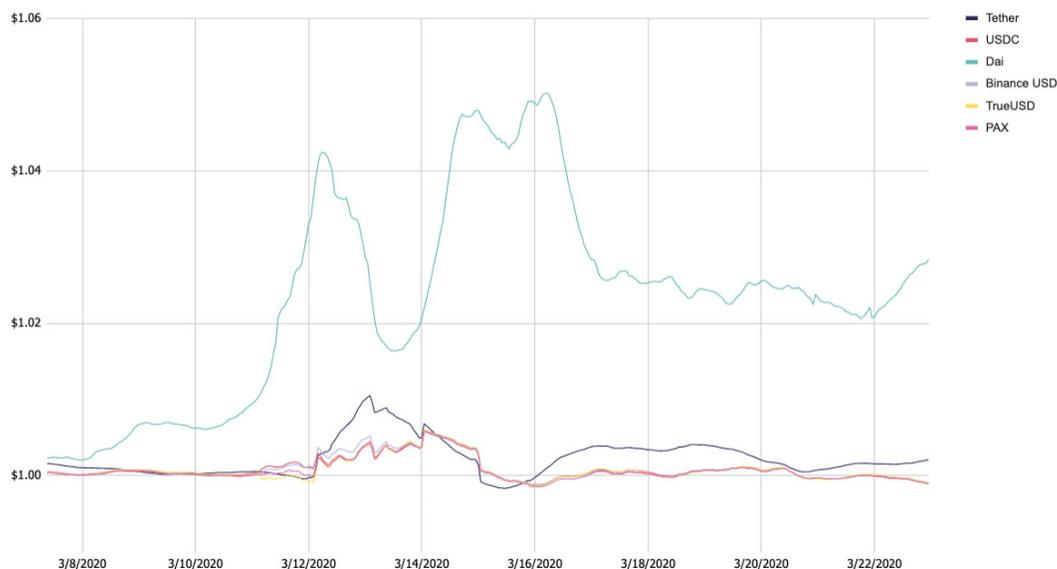
Even before looking at the volatility and deviation from the peg, it's apparent that Dai is by far the least stable and the most volatile. The price of the fiat-backed stablecoins that have regular attestations (USDC, PAX, Binance USD, and TUSD) is virtually identical and noticeably more stable than Tether.

Another observation is that all six stablecoins spiked by at least 0.5% on March 12th as the price of most of the cryptocurrencies crashed by more than 50%. This was the result of many market participants suddenly exiting their cryptocurrency holdings into an asset perceived to be safe — in this instance, the U.S. dollar. This artificially (and briefly) increased the demand for stablecoins. Arbitrageurs of fiat-backed stablecoins could wire money to stablecoin issuers, create new supply and then sell newly minted stablecoins on the market in order to push the price back down.

Source: TradingView

Price of stablecoins  
around march 12 crash

1d moving average of  
hourly prices



## Volatility and deviation

The most important parameter for a stablecoin is not necessarily volatility but rather deviation from its targeted peg (in this case \$1). Higher volatility is associated with larger price swings in either direction while higher deviation means that the stablecoin consis-

# Stablecoin Stability

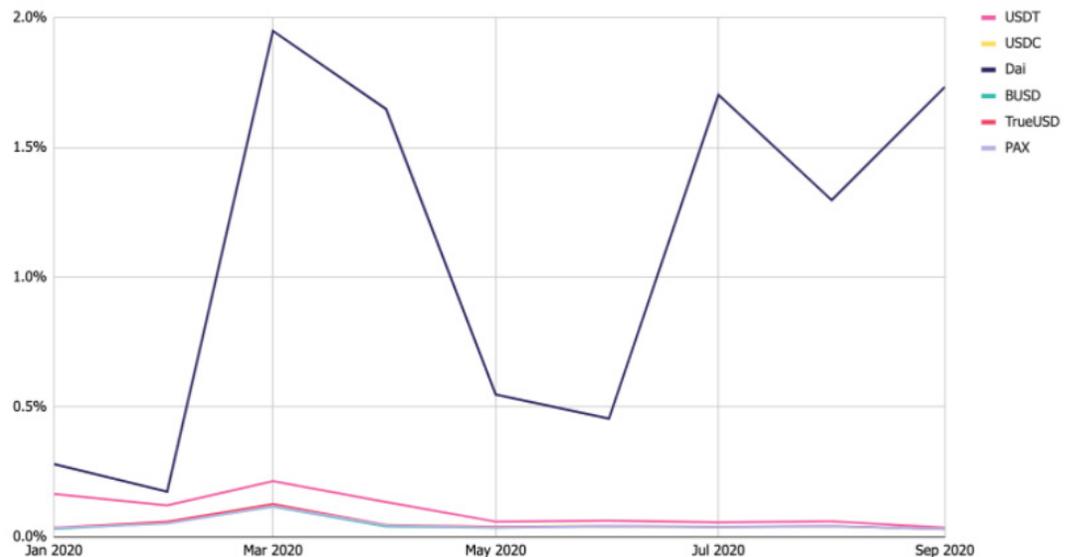
tently stays off its peg. If a stablecoin that's attempting to target \$1 stayed at \$2, it would have very little volatility but high deviation. An ideal stablecoin should therefore have low deviation as well as low volatility.

As was already apparent from the price charts of each stablecoin, Dai has the highest average deviation from its \$1 peg. In March, it deviated by an average of nearly 2% while other stablecoins were below 0.2%. This is because of Dai's stabilization mechanism, which uses monetary policy in order to achieve the intended price. Dai's divergence from its peg was kicked off on March 12th when the price of ETH plummeted from \$200 to \$83 amidst a cascade of liquidations, which resulted in a shortage of Dai (see the case study).

Source: TradingView

Deviation from \$1 of the largest stablecoins

Measured as the monthly average of daily deviation



Excluding Dai, Tether has deviated on average more than other competing fiat-backed stablecoins. This could be because Tether is by far the most popular base pair on exchanges. As much as 70% of all volume on cryptocurrency exchanges is denominated in Tether while only 4% is denominated in all the other stablecoins combined. When there was a liquidity crunch, there was a big rush into stablecoins and Tether was the easiest path to take.

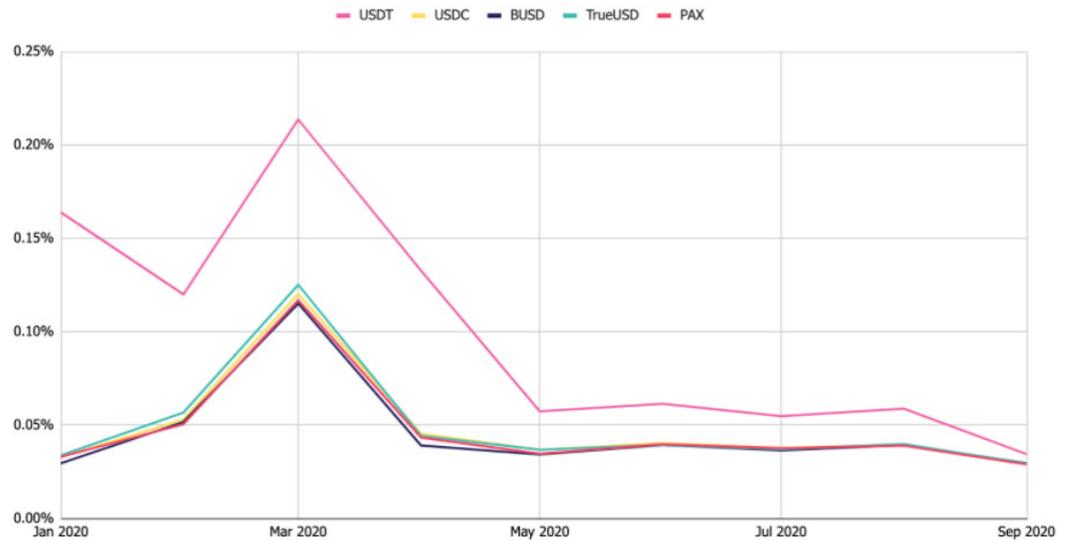
# Stablecoin Stability

Another reason — which also explains the two episodes when Tether traded below the peg for a longer period of time — is that Tether is slightly less trusted than other fiat-backed stablecoins whose operators provide routine attestations. Some customers might be pricing in the regulatory intervention risk or perhaps only the risk of not being able to redeem for dollars when necessary. But the difference between the deviation of Tether and other competing fiat-backed stablecoins is almost negligible in 2020, especially when compared to Dai.

Source: TradingView

Deviation from \$1 of the largest stablecoins

Measured as the monthly average of daily deviation



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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

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# Outlook for Stablecoins Moving Forward

Stablecoins have the potential to eventually be widely used by non-cryptocurrency users for remittances and payments. So far, all the stablecoins with traction have been issued by cryptocurrency-centric companies and projects. Throughout 2021, this will drastically change with more traditional companies expected to launch their own stablecoins.

GMO Internet already kicked things off by revealing its JPY-pegged stablecoin (GYEN) and USD-pegged stablecoin (ZUSD). This trend will accelerate with Diem's progression toward issuing both single-currency stablecoins and the multi-currency Diem Coin. Lately, PayPal's stablecoin is rumored to be announced in Q1 in cooperation with Paxos — if these rumors prove to be true, then the stablecoin floodgates could open.

Written analysis covers GMO Internet Group, PayPal

# Outlook for Stablecoins Moving Forward

“I think we’re asking too much of central banks to try to answer certain CBDC questions, like, should it be a token? Should it have privacy enhancing features? These are political questions that really need to be solved at the legislative level. Society as a whole through our elected representatives will need to discuss and think about such decisions, especially around transaction privacy. Central banks will continue to do research and present options, but ultimately the people should decide.”

—  
Garrick Hileman, [Blockchain.com](#)

The aggregate supply of stablecoins reached nearly \$40 billion (up from a base of near-zero within two years’ time), while stablecoin transaction volume exceeded more than \$300 billion in the month of January alone—surpassing the previous month’s 2020’s all-time high by more than 60%.

In 2020, more than \$1 trillion worth of volume has been transacted with stablecoins through public blockchain networks in 110 million transactions. While not exactly an equal comparison, PayPal had \$936 billion of payments volume in 2020 in 15.4 billion transactions. While the total volume is nearly identical, the difference in the use case is apparent from

the average payment size, which is about \$60 for PayPal and more than \$9,000 for stablecoins.

The growing use and demand for stablecoins more broadly this year has not been lost on executives at payment companies, international organizations or central bankers either. In May 2020, Visa CEO Alfred Kelly said that he views digital currencies backed by fiat currency as a potential emerging payments technology, additive to the payments ecosystem as opposed to being a negative or outright replacement.<sup>79</sup> Bank of England governor Andrew Bailey delivered a speech in September 2020 that touched on stablecoins, central bank digital currencies (CBDCs) and the future of payments. During that speech, Bailey reiterated that stablecoins are already a functioning reality, while offering a fertile and relatively low-risk laboratory to experiment with publicly, provides the path of least resistance for CBDCs to become their own reality.<sup>82</sup>

The explosion in 2020 was fueled by multiple factors, including the increased demand for stablecoins to use as derivatives collateral, increased dominance of spot pair denomination in stablecoins, and the DeFi boom as a whole. As explored in previous sections, however, the vast majority of stablecoin use is still tied to trading or speculating on cryptocurrencies.

81 [Visa is seeking a patent for ‘digital fiat currency’ – and the filing points to a central bank use case](#)  
May 14th, 2020

82 [Reinventing the Wheel \(with more automation\)](#)  
September 3rd, 2020.

# Outlook for Stablecoins Moving Forward

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This is why Tether, which is used predominantly for trading, currently accounts for more than 76% of the aggregate stablecoin supply. The strong product-market fit of stablecoins in cryptocurrency trading can translate quite seamlessly to other complementary fields such as forex trading, where fiat rails create unnecessary friction. Stablecoins have the potential to eventually be widely used by non-cryptocurrency users for remittances and payments. So far, all the stablecoins with traction have been issued by cryptocurrency-centric companies and projects. Throughout 2021, this will drastically change with more traditional companies expected to launch their own stablecoins.

GMO Internet already kicked things off by revealing its JPY-pegged stablecoin (GYEN) and USD-pegged stablecoin (ZUSD). This trend will accelerate with Diem's progression toward issuing both single-currency stablecoins and the multi-currency Diem Coin. Lately, PayPal's stablecoin is rumored to be announced in Q1 in cooperation with Paxos — if these rumors prove to be true, then the stablecoin floodgates could open.

## GMO Internet Group

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Since GMO's businesses are involved in several crypto-centric services like digital asset trading and mining, as well as broader digital offerings that include FX trading, online payments and remittances, the launch of its own set of stablecoins would seem to be a natural fit.

The Japanese internet conglomerate established a New York-based Trust Company: GMO-Z.com Trust Company (GMO Trust) and launched two fiat-backed stablecoins GYEN and ZUSD, which are backed by the Japanese yen and the U.S. dollar, respectively. GMO Trust was incorporated under New York State banking laws and is fully regulated by the NYDFS, placing them among the most regulated stablecoins including PAX, BUSD, and HUSD. This means they meet the most stringent requirements for federal banking regulations for cybersecurity, capital reserves, economic sanctions and anti-money laundering.

# Outlook for Stablecoins Moving Forward

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GMO Trust publishes monthly attestations produced by an accounting firm Friedman LLP to examine and confirm the underlying reserves of fiat currency. The fiat reserves will primarily be held at Prime Trust.

Since GYEN is the first regulated JPY-pegged stablecoin, GMO has an opportunity to serve a major untapped market. According to the Bank for International Settlements (BIS), the yen remained the third most actively traded currency (on one side of 17% of all trades)<sup>83</sup> in 2019. Given GMO's plethora of businesses in the APAC region, and their wide distribution network, GYEN has potential to reach a mass of users.

## PayPal

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After months of anticipation, PayPal officially announced in late October that it will support buying, selling and holding capabilities for cryptocurrencies in 2020. The same functionality will be integrated into Venmo by the first half of 2021. Square's Cash App, Venmo's closest competitor, has supported Bitcoin since 2017. Cash App generated \$875 million of revenue and \$17 million of gross profit from Bitcoin during the second quarter of 2020. PayPal also plans to launch a "pay with crypto at checkout" feature for over 26 million merchants. PayPal joined a number of other financial service providers and fintechs that are accelerating their strategic desires to expand into digital assets at large.

PayPal clearly recognizes the interest in CBDCs and stablecoins stemming from central banks, global policymakers, and even larger payment giants such as Visa and Mastercard. Considering on-chain stablecoin transaction volume (a payment flow) has crossed \$600 billion by the end of Q3 year-to-date — which is already near the total transaction volume PayPal did in 2019 (\$712 billion) — buy/sell/hold for cryptocurrencies is very likely just phase 1 of a much longer focused plan to expand into stablecoins.

PayPal was the first company to pull out of Diem after a massive wave of negative reactions from regulators but its ambitions for a

83 [Foreign exchange turnover in April 2019](#)  
September 16th, 2019

# Outlook for Stablecoins Moving Forward

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stablecoin remain. In the press release<sup>82</sup> announcing cryptocurrency support, PayPal said that “advanced technological platforms” (meaning blockchains and DLTs) offer the possibility of mainstreaming digital currencies; it also referenced that 1 in 10 central banks expect to issue their own digital currencies within the next three years.

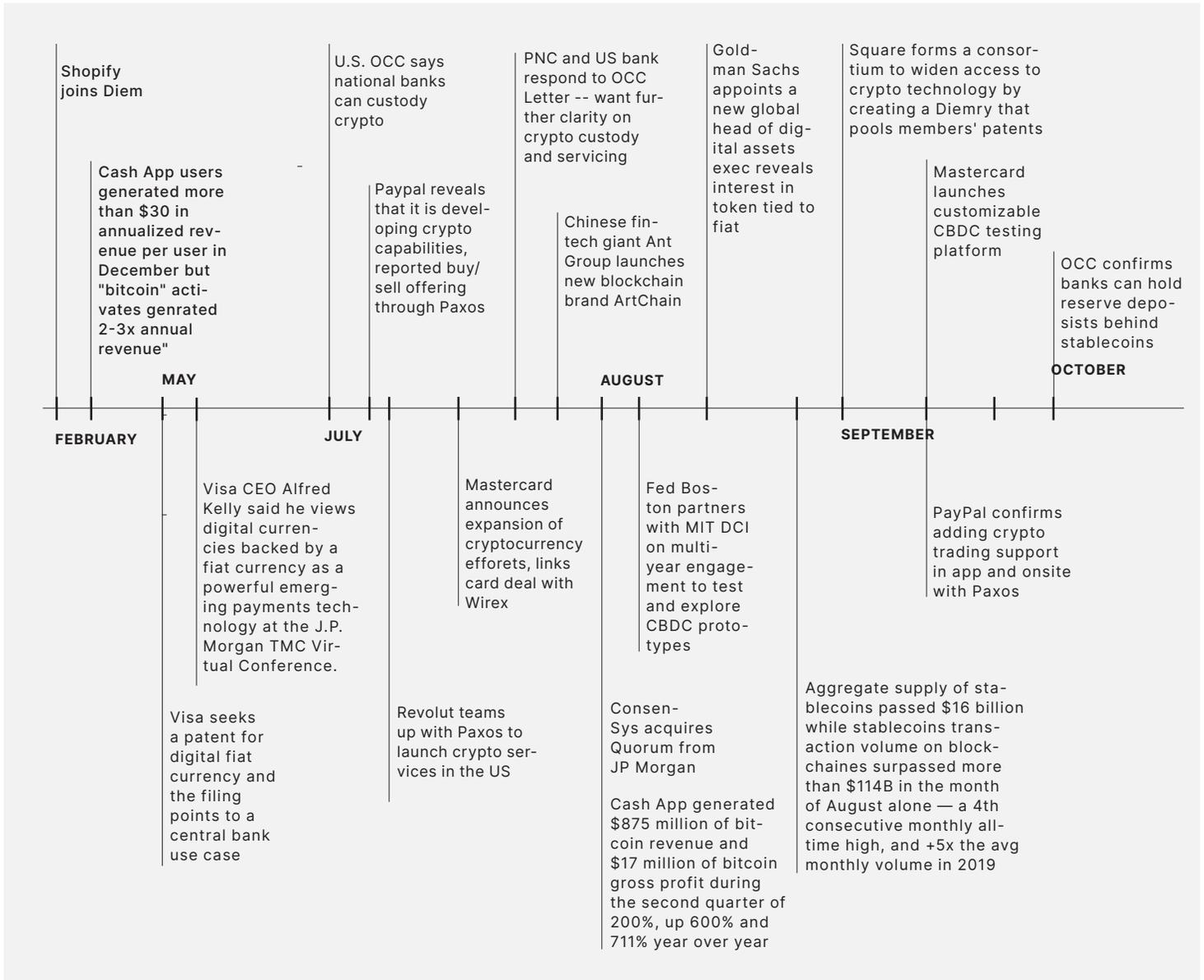
“The shift to digital forms of currencies is inevitable, bringing with it clear advantages in terms of financial inclusion and access; efficiency, speed and resilience of the payments system; and the ability for governments to disburse funds to citizens quickly,” said Dan Schulman, president and CEO, PayPal. “Our global reach, digital payments expertise, two-sided network, and rigorous security and compliance controls provide us with the opportunity, and the responsibility, to help facilitate the understanding, redemption and interoperability of these new instruments of exchange. We are eager to work with central banks and regulators around the world to offer our support, and to meaningfully contribute to shaping the role that digital currencies will play in the future of global finance and commerce.”

PayPal has been working with Paxos to enable cryptocurrency support, which is notable because Paxos already has a whitelabel stablecoin solution. Given that PayPal has been interested in stablecoins since last year, it’s highly likely that PayPal will launch its own stablecoin in 2021.

84 [PayPal Launches New Service Enabling Users to Buy, Hold and Sell Cryptocurrency](#)  
October 21st, 2020

# Outlook for Stablecoins Moving Forward

## FINANCIAL SERVICES DIGITAL ASSET DEVELOPMENTS



# Outlook for Stablecoins Moving Forward

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## Diem (formerly known as Libra)

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Following the initial Diem announcement in 2019, most government officials felt the multi-currency Diem Coin (DBR) could pose a threat to “monetary sovereignty.” This prompted Diem to rework the network concept and design; the mechanism changed from a single Diem currency to several single-currency stablecoins, along with a multi-currency Diem coin composed of a basket of the single-currency stablecoins. Diem hopes that CBDCs will eventually be directly integrated with the Diem network; CBDCs would replace the single-currency stablecoins, reducing credit and custody risk.

Diem was originally scheduled to launch in Q4 2020, but once again faced regulatory pushback. In early October, the Group of Seven (G7), an intergovernmental economic organization consisting of the largest economies in the world, opposed the launch of Diem’s stablecoins until the network is “properly regulated”. While international finance ministers agree that Diem’s stablecoins could improve access to global financial services while decreasing inefficiencies and costs, they believe it should be properly supervised to prevent undermining financial stability, consumer protection, privacy, taxation or cybersecurity.

The draft seen by Reuters<sup>85</sup> said: “The G7 continues to maintain that no global stablecoin project should begin operation until it adequately addresses relevant legal, regulatory, and oversight requirements through appropriate design and by adhering to applicable standards.”

It’s still unclear when Diem intends to launch and how it plans to address the new regulatory concerns. However, it is clear that if it does gain approval, the initiative would bring stablecoins to the masses.

85 [Facebook’s Libra must not start until properly regulated - G7 draft](#)  
October 12th, 2020.

# Outlook for Stablecoins Moving Forward

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## The next milestone

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Stablecoins have proven to possess a strong product-market fit for cryptocurrency enthusiasts and speculators. What's more, stakeholders and decision makers in both the public and private sectors are taking notice — and the developments we see today may shape the next decade to come.

As this report has outlined, stablecoins have become a potent force in the fast-changing cryptocurrency ecosystem. The next phase — perhaps a critical one — will hinge on the development of use cases beyond the niches of the digital assets industry.

This report has demonstrated the potential for stablecoins to expand beyond cryptocurrency as Web 3.0 comes into existence. However, such growth will likely be gradual until regulatory frictions are smoothed out as policymakers create laws and technical standards. As has been seen in the past, the shape and tenor of those debates — which will play out in public and draw in a variety of voices both positive and negative — may be hard to predict, both in terms of the outcome as well as the duration.

**“In general, stablecoins are at the point where they need a common technical standard. This would provide an element of composability for more fluid interactions between the different stablecoins in the market.”**

—  
Hugo Renaudin, LGO

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Yet barring any serious interventions, once global frameworks are established, we believe that \$1 trillion in annual stablecoin volume will only be the beginning: the rewards are immense for those that can successfully bridge the network gap between traditional money and the digital value ecosystem of tomorrow.

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## Stablecoins:

Bridging the Network Gap  
Between Traditional Money  
and Digital Value

Ch.10 · 130-136

# Appendix

Early definitions of electronic money from monetary authorities provide insight into how modern day policy makers and central bankers are likely viewing e-money innovations of the next Web: stablecoins.

Two examinations of e-money from the years of Web 1.0 — a 1996 Bank for International Settlements (BIS) report and a 2000 London School of Economics (LSE) working paper by British economist Charles Goodhart — document potential implications that electronic money developments will have for central banks.

Professor Goodhart's LSE paper made some eerily predictive monetary statements 20 years ago that are starting to play out today. One being a scenario in which the central bank could optimize the Treasury Department's ability to absorb fiscal costs, drawing parallels to current ideas of Modern Money Theory (MMT).

Goodhart also wrote that the debate on central bank independence would stay muted as long as inflation targets were hit. Fast forward to the decade following the global financial crisis, and the Federal Reserve struggled to consistently meet its 2% inflation target.

## Defining E-Money

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Today, digitalization is rapidly transforming the financial services industry as payments shift toward online platforms and mobile applications. These privately-run solutions have brought to light deficiencies in existing money and payment systems. Non-bank payment service providers (PSPs) and financial technology (Fintech) companies are facilitating online transactions with electronic money or e-money.

The 2009 Directive of the European Parliament and the Council of the European Union holds that e-money is “electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions.”<sup>86</sup> Alternatively, the Monetary Authority of Singapore defines e-money as an “electronically stored monetary value in a payment account that can be used to purchase goods or services, or to transfer funds to another individual.”<sup>87</sup>

It’s noteworthy that both descriptions focus on the store of value and medium of exchange functions of money, but specifically leave out the unit of account. Formal definition aside, e-money has evolved over time thanks to continual advancements in information technology (IT). A review of major stakeholders’ interpretations of e-money throughout the years of Web 1.0 (1990s to early 2000s) provides a scope for pragmatically viewing e-money innovations of the next Web: stablecoins.

## Web 1.0 Interpretations of E-Money

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In May 1994, European Union (EU) central banks released an analysis of prepaid cards, which they subsequently claimed constituted e-money stored on electronic purses (chip cards). As the ECB said at the time: “In that report the central banks welcomed the development of electronic money products, as these could, in principle, improve efficiency in payment operations for all parties involved, but recommended that, for a number of reasons, only credit institutions should be allowed to issue multi-purpose prepaid cards.”<sup>88</sup> From an economic standpoint, multi-purpose prepaid card balances were

86 [The 2009 Directive of the European Parliament and the Council of the European Union on electronic money](#) Article 2(1) September 16th, 2009.

87 [Consultation Paper on Proposed Payment Services Bill](#) pg. 15 November 21st, 2017.

88 [Report on electronic money](#) pg. 1 August 1998.

viewed by policymakers as a funding source equivalent to deposit-taking for issuers.

When the Bank for International Settlements (BIS) released its ‘Implications for central banks of the development of electronic money’ report in October 1996, various e-money schemes were emerging as a result of increased network connectivity from the internet. Electronic money was interpreted as “‘stored-value’ or ‘prepaid’ products in which a record of the funds or ‘value’ available to a consumer is stored on an electronic device in the consumer’s possession ... Moreover, the definition covers both prepaid cards (sometimes called ‘electronic purses’) and prepaid software products that use computer networks such as the Internet (sometimes referred to as ‘digital cash’).”<sup>89</sup> According to the BIS, the Group of Ten (G-10) central banks started studying e-money developments and related policy issues at the end of 1995.

Because e-money is a liability on issuers’ balance sheets, regulatory policy focused mainly on these institutions, as they were exchanging electronic IOUs to users. At the time, the BIS held that “these innovations, which are still at a relatively early stage of development, have the potential to challenge the predominant role of cash for making small-value payments and could make retail transactions easier and cheaper for consumers and merchants. However, they also raise a number of policy issues for central banks because of the possible implications for central bank seigniorage revenues and monetary policy and because of central banks’ general interest in payment systems.”<sup>90</sup> Thereafter, the disruptive potential of e-money became an openly-debated topic among policymakers, academics, economists and enthusiasts alike.

At the turn of the millennium, British economist Charles Goodhart released an influential working paper, ‘Can Central Banking Survive the IT Revolution?’, while serving as professor at the London School of Economics (LSE). His paper noted the widely-held convention that a central bank’s monopoly control of base money, through liability issuance and open market operations, allows it to control short-

89 [Implications for central banks of the development of electronic money](#)  
pg. 1 October 1996.

90 [Implications for central banks of the development of electronic money](#)  
pg. 1 October 1996.

term nominal interest rates, providing stability to the monetary system. However, rapid advancements in information technology (IT) led some to suggest that “the further development of e-commerce and associated computerisation will attenuate, or even remove altogether, the demand for monetary base, notably for currency; and that such vanishing demand for monetary base will in turn limit, or even prevent, the Central Bank from setting nominal interest rates in such a system.”<sup>88</sup> Proponents of “free banking” monetary arrangements, through which banks could issue their own banknote currencies under lax regulation, were highly supportive of this theory.

Goodhart made two fundamental arguments that countered the IT revolutionist’s assumptions about the future of money. First, he quipped that “electronic money does not have the characteristics of currency. It is not anonymous, and it is not legal tender. Given these special characteristics, the demise of currency at the hands of information technology will not happen, at least not unless an authoritarian government should decree that it must happen. The fact that such a prospect would terrify anyone with the slightest concern for liberty and freedom among people underlines just how important currency usage is for our way of life, including our ‘bad’ behaviour.”<sup>92</sup>

Bad behaviour is broadly referred to as currency usage within ‘underground’ economies for the sake of keeping activity out of the purview of governments and authorities. Kenneth Rogoff, Professor of Economics at Harvard University, documented such bad behaviour in his 1998 ‘Blessing or Curse? Foreign and Underground Demand for Euro Notes’ paper. Rogoff’s paper analyzed the supply and demand of Organisation for Economic Co-operation and Development (OECD) currencies in underground economies around the world. He found it peculiar that the OECD currency supply had grown as a share of gross domestic product (GDP), despite significant innovations in payments technology. Rogoff showed that “a large and growing share of OECD currency - probably well over 50% - is held in the domestic OECD underground economy.”<sup>93</sup> However, it was not entirely clear how to stop this phenomenon.

91 [Can Central Banking Survive the IT Revolution?](#)  
pg. 2 December 2002.

92 Rogoff, K., (1998), ‘[Blessing or Curse? Foreign and underground demand for euro notes](#)’, Economic Policy, 26, (April), pp 263-303.

93 Rogoff, K., (1998), ‘[Blessing or Curse? Foreign and underground demand for euro notes](#)’, Economic Policy, 26, (April), pp 263-303.

# Appendix

“Central banks are well aware that cash is used in black markets. And in a perfect world, of course, this wouldn’t happen. But at the end of the day, a central bank is more concerned that their currency is in demand, supported and maintained at a good exchange rate versus the money being pure as the virgin snow in terms of how it’s used.”

—  
Garrick Hileman, [Blockchain.com](#)

As for Goodhart’s mention of currency being legal tender, this is an important point. Indeed, besides maintaining the unit of account function, central bank money also has the status of legal tender, meaning it is protected by law as an instrument to settle all debts. Goodhart noted that many US dollars are held by foreigners outside the United States who believe the dollar is a better store of value than their local currency. Furthermore, Ken Rogoff’s paper found “it is extremely difficult to estimate the division of those

notes not held for domestic transactions purposes between those held externally and in the ‘underground’ economy. Fortunately for this analysis such a division is unnecessary here, since both motives derive from ‘bad’ behaviour, whereby the note user wishes to keep his activities out of reach of his own government.”

Goodhart determined that IT innovations are just a tool, and they weren’t likely to affect human behaviour patterns. Seeing as how ‘bad’ behaviour is innate to humanity, he felt it wasn’t realistic for users to give up on an instrument featuring anonymity. Enthusiasts might contend that some e-money has anonymous features, to which an article from *The Economist* retorts “forms of e-money might be technologically capable of providing anonymity, but they would still rely on trust between the parties (trust, that is, in the other party’s promise not to reveal the information the transaction has conveyed). Cash leaves no tracks and makes no demands on anybody else’s integrity.”<sup>94</sup> In fact, many early adopters thought Bitcoin network transactions were anonymous; some used the network to facilitate illicit activity, only to shockingly find out later by law enforcement that transactions were actually pseudonymous!<sup>95</sup>

Next, Goodhart went on to challenge the idea that if demand for base money were to theoretically disappear, that a central bank would not be able to set nominal interest rates. He stated “while it is, indeed, true that such control appears to rest on the Central Bank’s ability to vary its monopolistically supplied monetary base by open market operations, I shall argue that this is, in fact, a superfi-

94 [E-Money revisited](#)  
July 22nd, 2000.

95 [Why criminals can't hide behind Bitcoin](#)  
March 9th, 2016.

cial epiphenomenon. What the ability of the Central Bank ultimately depends upon is the fact that it is the governments' bank, and thus has the power to intervene in (financial) markets without concern for profitability, (let alone profit maximisation). It can, consequently, force its profit-seeking commercial confreres, in the last resort, always to dance to its tune." <sup>96</sup>

In a hypothetical 'e-money only' economy, long-term interest rates would still be determined by fundamental factors, such as productivity and time preferences, where a borrower's e-money demand is matched to supply from lenders. Commenting on Goodhart's paper, The Economist echoed his thoughts on short-term interest rates, writing "in the short term, though, the central bank can raise the interest rate simply by offering to borrow e-money at more than the prevailing market rate; or it can lower it by offering to lend e-money for less than the prevailing market rate."<sup>97</sup> Unlike private institutions, central banks can leverage the taxing power and law-making ability of governments to absorb losses and set policies.

## Goodhart's E-Money Predictions

Goodhart's working paper concludes with some eerily predictive statements. First, he discussed a scenario in which the central bank could control nominal interest rates by optimizing the Treasury Department's ability to absorb fiscal costs. Modern Money Theory (MMT), a heterodox school of macroeconomics, holds that "a fiscal deficit lowers the federal funds rate (FFR), which tends to lower other interest rates, all else equal."<sup>98</sup> MMT proponents concentrate on the interconnectedness between the central bank and the treasury, a topic that is coming more into the mainstream focus today.

With increased overlap between the treasury and central bank, Goodhart writes "this will raise, in more immediate and stark guise, the question of what benefits a country obtains from having an agent, a Central Bank, run monetary policy with some operational discretion, rather than rely on some more quasi-automatic mechanism. In other words, the debate on 'Free Banking' versus 'Central Banking' is likely to continue, mutatis mutandis."<sup>96</sup> Bitcoin advocates

96 [Can Central Banking Survive the IT Revolution?](#)  
pg. 4 December 2002.

97 [E-Money revisited](#)  
July 22nd, 2000.

98 [Modern Money Theory and Interrelations between the Treasury and the Central Bank: The Case of the United States](#)  
pg. 4 March 2014.

99 [Can Central Banking Survive the IT Revolution?](#)  
pg. 31 December 2002.

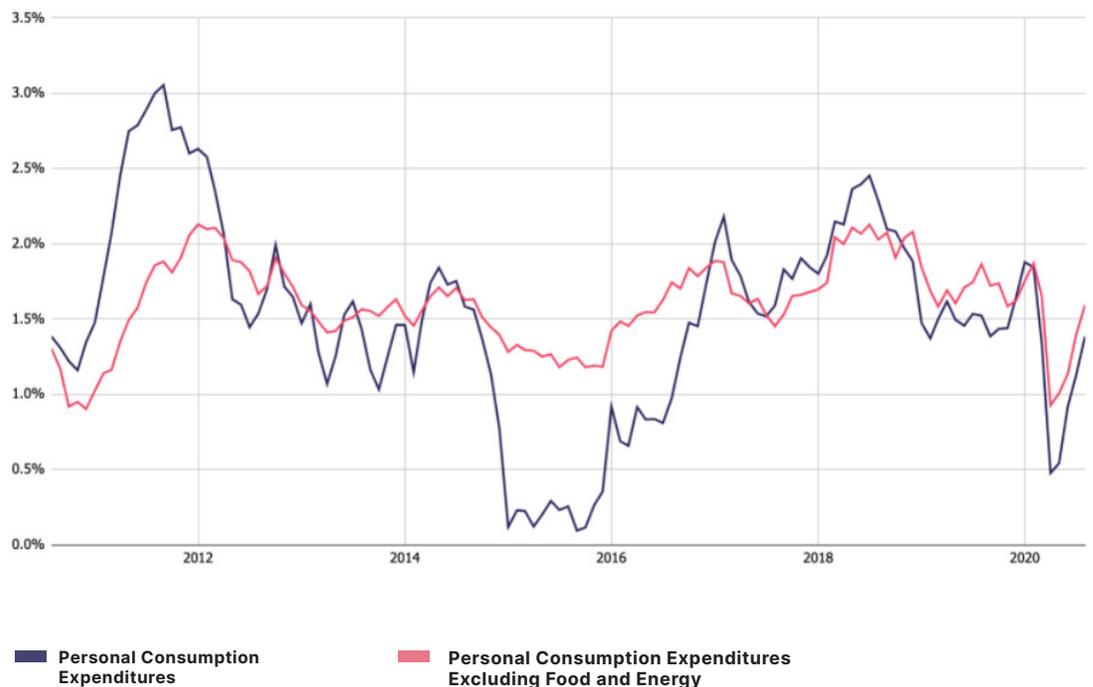
# Appendix

tout the blockchain network’s set monetary policy, by which its digitally scarce token supply is released in a quasi-automatic fashion over time. As IBM notes, Bitcoin “proved the feasibility of a self-regulating, global, digital, peer-to-peer payment network, operating without a trusted third-party intermediary (such as a bank, credit card company or payment company).”<sup>100</sup>

Bitcoin’s innovation has digital asset enthusiasts exploring what other possibilities so-called “programmable money,” enabled by distributed ledger technology (DLT) and smart contracts, might have to offer our financial system. Commenting on the economic environment twenty years ago, Goodhart wrote “for the moment the relative success of ‘independent’ Central Banks in hitting their inflation targets, without unacceptable side effects, has muted this debate. But if such success should prove transitory, the debate would reopen, whatever stage technology had reached.”<sup>101</sup> Fast forward to the decade following the global financial crisis (GFC), and the Federal Reserve (Fed) struggled to consistently meet its 2% inflation target, as shown in the figure<sup>102</sup> below.

Source: skew

Historical inflation in the U.S.



100 [Programmable money: Will central banks take the lead?](#) pg.3 January 2018.

101 [Can Central Banking Survive the IT Revolution?](#) pg. 31 December 2002.

102 [U.S. Bureau of Economic Analysis](#) December 31st, 2019.

# Appendix

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The figure above displays the year-over-year (YOY) percentage change for Headline PCE price index (Headline PCE) in blue and the Core Personal Consumption Expenditure Price Index (Core PCE) in pink throughout the previous decade. Both are standardized measurements of inflation, which clearly illustrate the Fed's battle with disinflationary forces following the GFC, particularly acute in Core PCE. Monetary authorities appear to have their work cut out for them in the 2020s, as secular disinflationary trends will likely accelerate due to global demographics.

Bridging The Network Gap  
Between Traditional Money  
and Digital Value

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