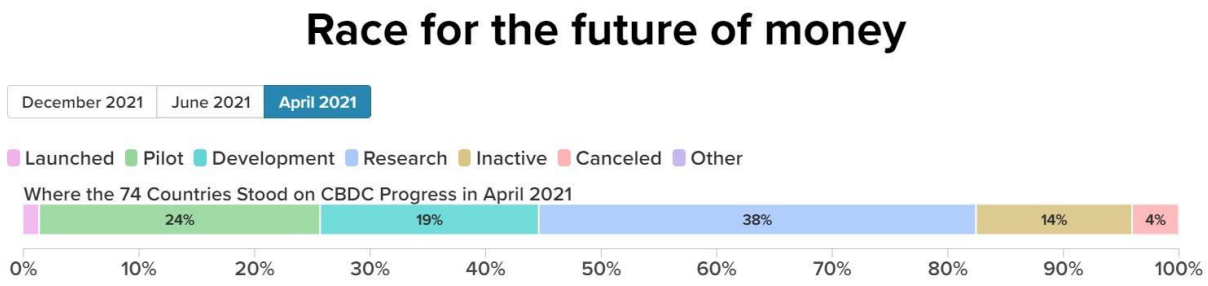
2022 Global Digital Currency Outlook Report - Use Cases, Development, and Adoption

The last several years has seen a tremendous rise in interest concerning the research, development, and implementation of digital currencies. This includes both state-sponsored digital currencies (central bank digital currencies or CBDCs) as well as decentralized cryptocurrencies (most appropriately, stablecoins).

As of the second quarter of 2022, there are now over 90 different countries and over 80 different cryptocurrency stablecoins either fully operational or in research and development.



CBDC Tracker - Atlantic Council

This report will outline the specific economic use cases of digital currencies, distinguish between advantages & disadvantages, and conduct an analysis into the top cryptocurrency stablecoins & nations working on CBDCs.

Use Case & Economics

Digital currencies either improve upon or introduce additional use cases that traditional cash or physical currencies have. Because these new currencies are in fact digital, this allows computation to be a significant resource requirement for economic progress rather than the collection and repurposing of physical natural resources to create physical currencies.

Digital currencies share the following broad economic use cases:

- Market Advantages
- Financial Applications
- Economic Bridging and Interoperability

Market Advantages

In a lot of ways, modern global markets are based largely on digital functionalities. The digitalization of global markets has complemented the rise of smart phone technologies and digital trading platforms.

Additionally, digital banking and financial services build upon this trend. A move into fully digitalized currencies (whether decentralized or centralized) makes the interoperability of the global financial system far easier, cheaper, and arguably more stable.

While the cryptoeconomy (decentralized currencies) is a separate economic entity from the global financial system (centralized currencies), the following outlined advantages apply to both systems:

- Unit of Account Stabilization
- Volatility Protection
- Systemic Cost Reductions

Unit of Account Stabilization

Unit of account is a base function of money. Specifically, a unit of account is a divisible standard numerical monetary unit of measurement that can be used to value securities, commodities, and other assets within a market.

For example, a currency as a unit of account is what allows for the pricing of goods within an economy for trade and commerce to commence. The price of physical assets, however, depends on the underlying strength and buying power of the currency itself. A stable unit of account also enables the ability for a currency to support lending & borrowing properties.

In theory, because digital currencies are more easily upgradeable and adjustable, the issuing entity can provide more stabilization to the unit of account of any currency. This can lead to issuers having a better grip over concepts like inflation and applies to both central banks issuing CBDCs as well as decentralized protocols issuing stablecoins or other blockchain-based assets.

Volatility Protections

Digital currencies come with the advantage of stronger volatility protections. This is possible through interoperability between currencies that can facilitate conversions and transfers faster than physical currencies.

An interconnected global economy operating through digital currencies would allow participants to enter and exit different currencies easier. Motivations for doing this could include any of the following reasons:

- Converting between currencies for travel purposes
- Escaping currency volatility in emerging or declining economies

- More easily converting wealth to escape areas of war, conflict, or other socio-economic stressors

Interoperability between economies ultimately helps to establish more stability for the average individual within the global financial system, at least in theory. In the event of a depegging event (stablecoins) or currency collapse (state-controlled fiat systems), investors and users can more easily transfer wealth out of danger. This protects the livelihoods of normal, everyday consumers, businesses, and organizations.

Of course, it is entirely possible to convert currencies in the traditional fiat monetary system that dominates much of the world today. However, this generally comes with more hurdles, taxes, fees, and takes time to execute. Bridges between both blockchain networks in the cryptoeconomy and CBDC payment networks (such as the m-CBDC bridge) can expedite this process and lower costs.

Cost Reductions

Minting and managing physical currencies comes with expenses. Resources must be extracted to either mint coins out of (mining metals) or printing paper notes. These resources then need to be processed and go through a production process to physically create banknotes and coins.

This entire production process takes time, money, and man power. For instance, the Federal Reserve Bank of the United States creates and approves a budget entirely for minting new currency.

In 2022, the Fed approved a currency operating budget of just over $1 billion just to print new currency. This can be broken down into the following projected costs:

- $1 bills - 7.5 cents per note
- $5 bills - 12.7 cents per note
- $10 bills - 12.4 cents per note
- $20 bills - 13.8 cents per note
- $50 bills - 13.3 cents per note
- $100 bills - 17 cents per note

A physical currency system also requires a high degree of maintenance to ensure the usability of the bills and coins themselves. Paper money has a lifespan that varies depending on the velocity of its use over time.

The Fed projects the following to be the lifespans of different denominations:

- $1 bills - 6.6 years
- $5 bills - 4.7 years
- $10 bills - 5.3 years
- $20 bills - 7.8 years

- $50 bills - 12.2 years
- $100 bills - 22.9 years

With the removal of the gold standard and increased emphasis on the digitalization of finance, over time the demand for paper money has subtly declined. A move scaling into a digital currency has the advantage of bypassing all of these shortcomings of paper money. There is no need to physically create cash, so there is no demand for the resources required to make that cash.

This also means that digital money has no replacement lifespan. For instance, Bitcoin (BTC) does not need to mint new digital bitcoins every few years to replace old ones. Digital currencies, whether cryptocurrencies or CBDCs, typically come with distinct cost advantages over that of physical currencies.

Financial Applications

Digital currencies offer vast improvements over physical currencies in multiple financial applications. Even with the digitalization of many banking services, because the payment rails are not fully efficient, transferring funds can still remain time consuming and costly. This relates to the settlement time of credit card services, direct deposit and wire transfer times, and other forms of financial transactions.

The technology behind digital currency systems improves upon this process by speeding up transaction times and introducing a higher degree of interoperability between peer to peer, wholesale, and money market financial functions.

Peer-to-Peer Transactions

Significant improvements have been tested and implemented in regards to peer-to-peer transactions (P2P) through digital currencies, particularly through cryptocurrencies themselves. Cryptocurrencies utilize digital wallets connected through blockchain technology to communicate and settle P2P transactions much faster than traditional systems.

Blockchain networks such as Ethereum also leverage a revolutionary technology called smart contracts which supports quick P2P transactions and allows for the building of digital applications, like borrowing/lending protocols, directly on the blockchain network itself. This is allo powered through digital wallet technologies.

CBDCs are also implementing similar financial rails through leveraged digital wallet technologies. Digital wallets allow one participant (A) to immediately send funds to another participant (B) wallet to wallet.

While countries are typically limited to only individuals within its borders using a particular CBDC (like The Bahamas utilizing the Sand Dollar CBDC token), cryptocurrencies allow for peer-to-peer transactions between any two individuals quite literally anywhere in the world. For

CBDCs, both joint projects and bridging between CBDC networks is a direct counter to the cryptocurrency interoperability model.

Borrowing / Lending Markets

Digital currencies, most notably cryptocurrencies (crypto stablecoins and units of account), also offer improvements to borrowing/lending markets. The digitalization of banking has allowed for easier access to banking & financial services essentially world wide. There is no need to even have physical bank locations anymore - just consider a service like Ally bank offering purely online banking options.

The cryptoeconomy takes these improvements to the next level through offering decentralized financial services (DeFi). There are now numerous decentralized applications built directly onto blockchain networks like Ethereum that individual users can take advantage of to earn yield on assets like stablecoins, participate in liquidity pools or staking to secure protocols, and even post collateral to borrow against.

Examples of this include the following decentralized applications:

- Aave (AAVE)
- Compound (COMP)
- MakerDAO (MKR, DAI)

Economic Bridging

The most important aspect of digital currencies is the connectivity it provides. Implementing digital currencies, whether the same or different currency from trade partners, allows for interoperability, cooperation, and connection financially on a level not seen before.

Current physical fiat currencies are able to provide a form of connectivity in designated markets, but it is not fast nor efficient. With digital currencies, transferring value between currencies is fluent and easy. Cryptocurrencies and stablecoins share this advantage and are able to be converted between each other in centralized exchanges or decentralized exchanges like Uniswap.

CBDCs also have the ability to be interoperable through either directly compatible wallet technologies and exchange platforms or through bridging projects that connect multiple CBDC tokens through a common financial rail system.

Cross-Border Transactions

Both decentralized stablecoins and CBDCs offer countries the opportunity to establish valuable currencies and connect with trade partners like never before. This can lead to much easier, faster, and cheaper cross-border transactions - helping to improve economic growth through fostering robust trading relationships.

CBDCs have also enabled the formation of financial or monetary alliances to formulate far easier than before, especially between smaller countries. The Eastern Caribbean is a prime example of a group of individual countries that came together under a single digital currency. The European Union is the prominent example of this in the traditional global economy.

Interoperability also allows for the formation of trading blocs. For instance, if regional countries would like to facilitate trade, they can leverage digital currencies to make cross-border transactions far easier and increase the ability of all parties to participate.

The disadvantages of this aspect of digital currencies is the assumption that all participants in the global economy eventually adopt a form of compatible digital currency to engage with such trade and commerce. Those not up to par or that are behind in the technological progress of digital payment systems could be effectively left out of trade arrangements or make it harder for goods and commodities to be exchanged between countries.

Interestingly, many smaller countries (like that of The Bahamas or Nigeria) are years ahead of established economic giants like the United States or United Kingdom. The small nation of El Salvador has already adopted Bitcoin as legal tender and countries like Panama are moving swiftly to legalize decentralized digital assets.

Digital Currency Research, Development, & Adoption Progress

The following is a comprehensive breakdown of highlighted projects involved in the creation and adoption of digital currencies. This list is by no means representative of every single digital currency project.

It will be broken down into two core sections - decentralized (stablecoins) and centralized (CBDCs) currencies:

Cryptocurrency Stablecoins - Decentralized Digital Currencies

The cryptocurrency market is considered a risk-on, volatile asset class that features the likes of Bitcoin, Ethereum, and more. Because of the highly innovative and uncertain nature behind many blockchain & crypto projects, price action can be highly unpredictable.

Rises and declines in price of over 20% are quite common in crypto, price fluctuations would be truly chaotic if seen in major stock indices such as the S&P 500. Investors both inside and outside the cryptoeconomy needed “safe haven” assets in which to store value during times of high volatility and uncertainty.

This is where stablecoins come in. Put simply, stablecoins provide exactly that - stability in times of high volatility. For cryptocurrency investors and enthusiasts, stablecoins provide a durable asset generally backed with value.

Because of high volatility, many cryptocurrency assets cannot perform all the necessary functions of money. In the case of Bitcoin, both volatility and unfavorable denominations make conducting transactions or basic borrow/lending difficult. Stablecoins counteract this problem by eliminating volatility and offering favorable denominations of generally 1 token to $1.

Stablecoins are most often backed by US Dollars or the Euro. Other collateral options have included commercial paper, government bonds, gold, and even other cryptocurrencies. The collateral behind stablecoins works just as gold did for government currencies on the gold standard - give the currency in question some form of perceived value.

There are different stablecoin classifications depending on the stabilization mechanism of the coin or token. This can come in many different forms, each with their own distinct benefits and risks.

There are four types of stablecoins that will be discussed here:

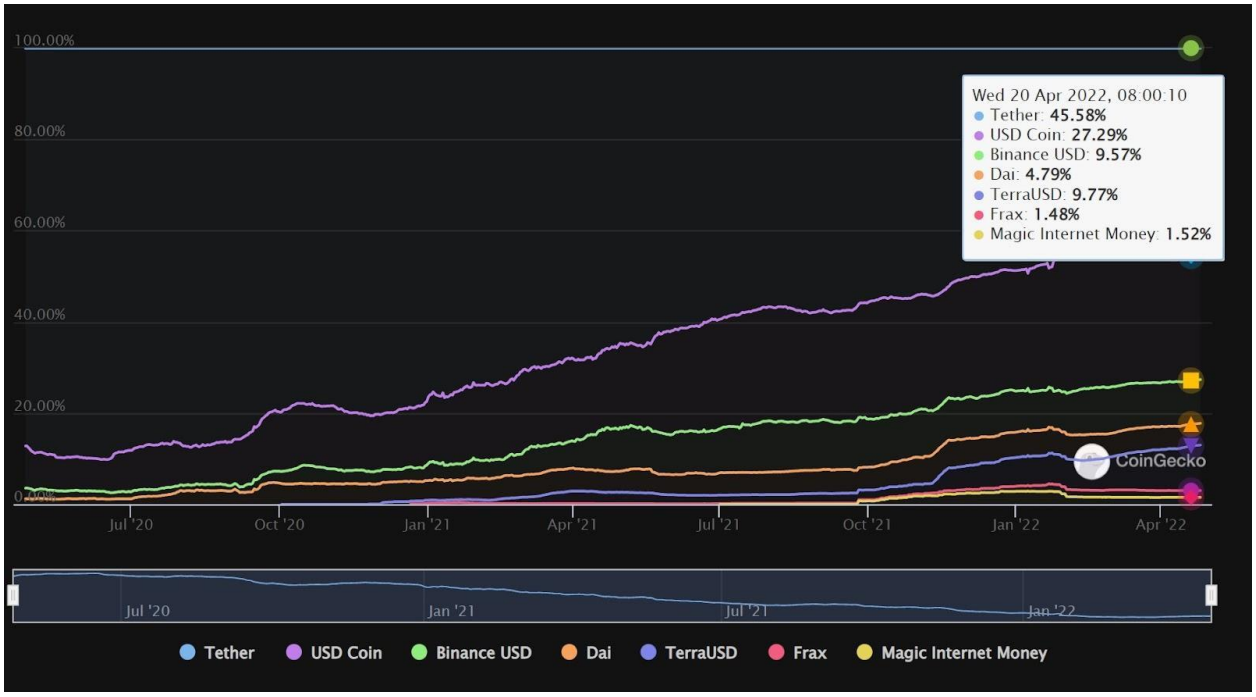
- Tokenized (FIAT-Collateralized)
- Off-Chain (Commodity-Collateralized)
- On-Chain (Crypto-Collateralized)
- Algorithmic (Non-Collateralized)

Tokenized

Tokenized stablecoins include any that are collateralized with fiat currencies like the USD or Euro. This type of stablecoin is generally considered the simplest and easiest to understand, with simplicity driving its adoption.

Tokenized stablecoins create stability by ‘tokenizing’ fiat currencies, bringing the stability and recognition of government-issued currencies to the blockchain to be used in smart contracts. For this reason, tokenized stablecoins currently lead the stablecoin market cap by a substantial amount.

Just between Tether, US Dollar Coin, and Binance USD alone - tokenized stablecoins account for over 80% of the entire stablecoin market.



[CoinGecko - Stablecoin Market Capitalization]

Tether (USDT)

Key Metrics

- Total market cap: $75.7 billion
- Circulating supply: 75.7 billion USDT
- Stablecoin market cap ranking: 1st
- Total crypto market cap ranking: 3rd

Tether is the stablecoin market's leading project and is the third largest cryptocurrency by market capitalization overall. Tether is predominately deployed on the Bitcoin and Ethereum blockchains, generating a tremendous amount of volume between the two.

Tether was founded in 2014 by Brock Pierce, Craig Sellars, and Reeve Collins under the original name of 'Realcoin' before being named Tether under Tether Ltd. The purpose of Tether was to bypass the traditional problems of high volatility and price risk in the cryptocurrency market.

It was understood in the beginning that Tether was backed 1:1 with US Dollars held at banks. This provided confidence in the collateral of Tether that helped to push demand on-chain. USDT tokens can be acquired by trading in USD. The USDT is most often an ERC-20 token, an Ethereum native token that works on the Ethereum network.

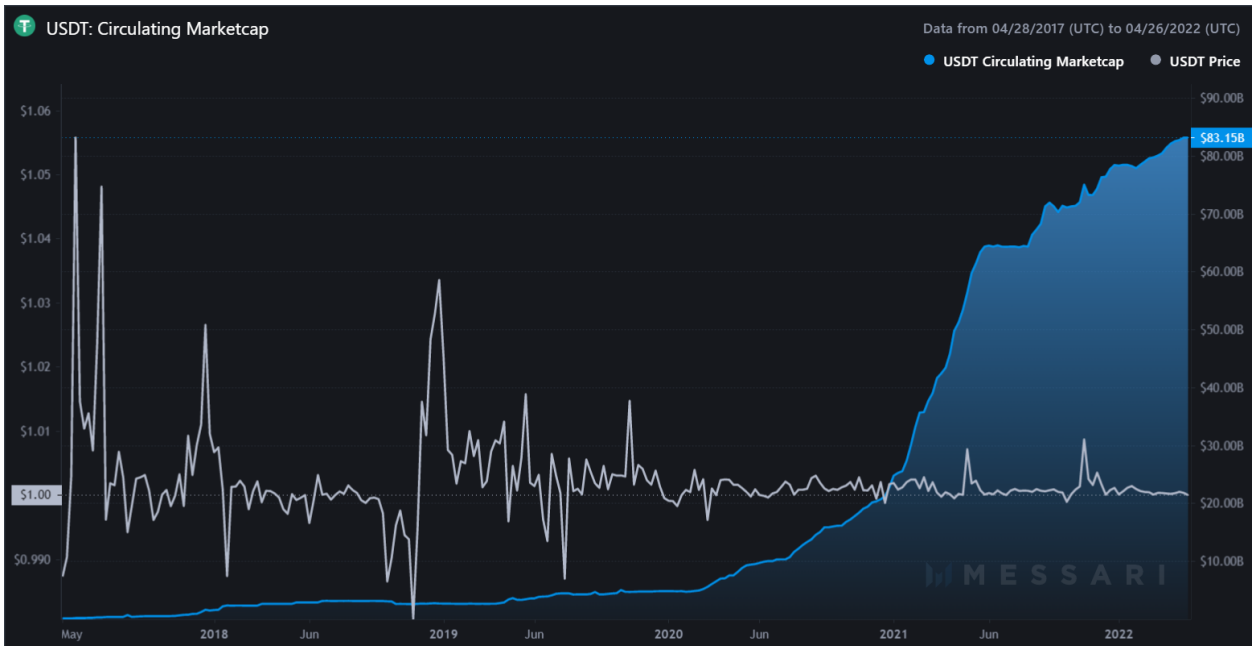
This conversion can be completed on a large number exchanges. Examples include:

- Bitfinex
- Binance
- Coinbase
- Kraken

Overview

Tether is currently holding a market cap of over $80 billion. Having liquidity on several global cryptocurrency exchanges has allowed Tether to prosper across the ecosystem, routinely posting daily volume that is magnitudes higher than most, usually all, crypto projects.

Tether saw explosive growth over the course of 2020 and 2021. The only notable period of non-growth occurred after the May 2021 cryptocurrency market crash. The market cap never declined, just stopped expanding. Since then, Tether has risen quickly to $83 billion in Q2 2022.

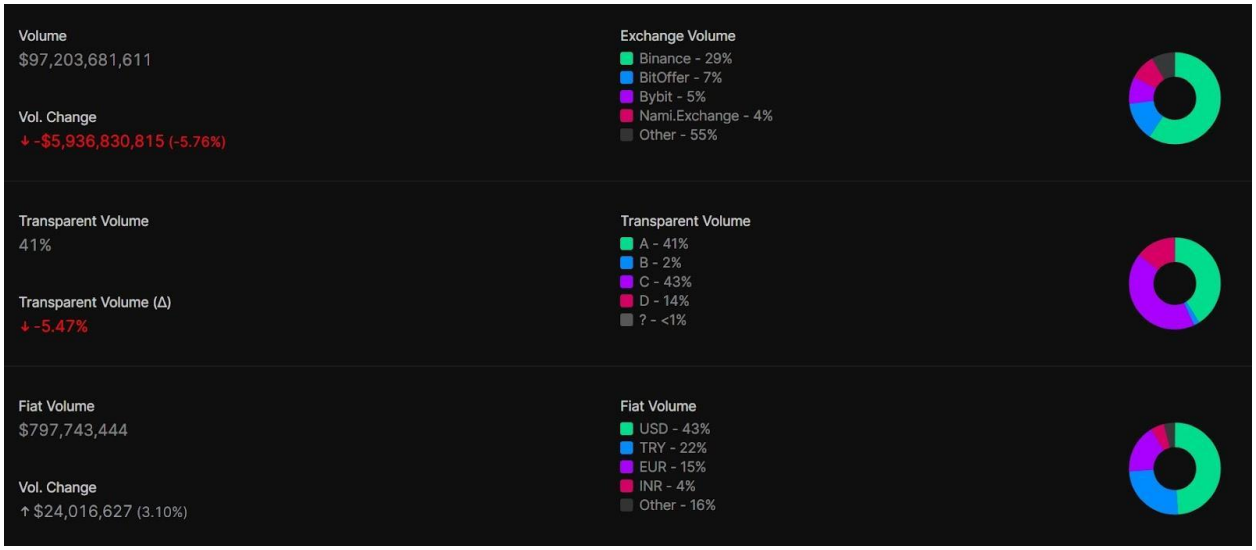


Messari - USDT Circulating Market Cap

Per Nomics, out of Tether's total reported volume, only 42% of that volume is considered transparent. This means that nearly 60% of Tether's volume is effectively unverified.

Tether received a C (Fair) grade from Nomics. This score is compiled because of the presence of recent candle data, but does not disclose trades themselves.

Binance is the leading exchange for Tether, with 30% of volume coming from there. The next leading exchange is BitOffer, followed by Bybit, Nami.Exchange, and an assortment of other exchanges.



Nomics - USDT Volume Data

Risk Profile

There are significant allegations against Tether. Controversies have continued to rise as Tether has grown over the past two years, with the most merit being given to the claim that Tether does not have the reserves on hand to back all outstanding USDT tokens.

This claim was proven legitimate when it was revealed by the State of New York that Tether did in fact blatantly lie about its reserves. This led to Tether being barred from doing business in New York and updated its website to say the following:

> Every Tether token is always 100% backed by our reserves, which include traditional currency and cash equivalents and, from time to time, may include other assets and receivables from loans made by Tether to third parties, which may include affiliated entities (collectively, “reserves”). Every Tether token is also 1-to-1 pegged to the dollar, so 1 USD₮ Token is always valued by Tether at 1 USD.

Tether Holdings was claiming that it holds $30 billion in commercial paper to round out its reserves that are on hand, of which has reportedly been slowly reduced. Commercial paper is just another term for holding corporate debt. With a $30 billion reserve in commercial paper, this would make Tether one of the world’s largest holders of corporate debt.

It should be noted that part of the claim in the New York settlement was that Tether would routinely post audits to verify its internal affairs and reserves. This has never occurred. As a matter of fact, Tether has never had a trustworthy, external audit conducted.

Without an audit, it is impossible to verify Tether’s claims. It is also impossible to dismiss the allegations against it.

US Dollar Coin (USDC)

Key Metrics

- Total market cap: $52 billion
- Circulating supply: 52 billion USDC
- Stablecoin market cap ranking: 4th
- Total crypto market cap ranking: 2nd

USD Coin is another fiat-collateralized stablecoin, similar to Tether. The stablecoin is operated by Circle and Coinbase in a partnership. This partnership is known as the CENTRE Consortium.

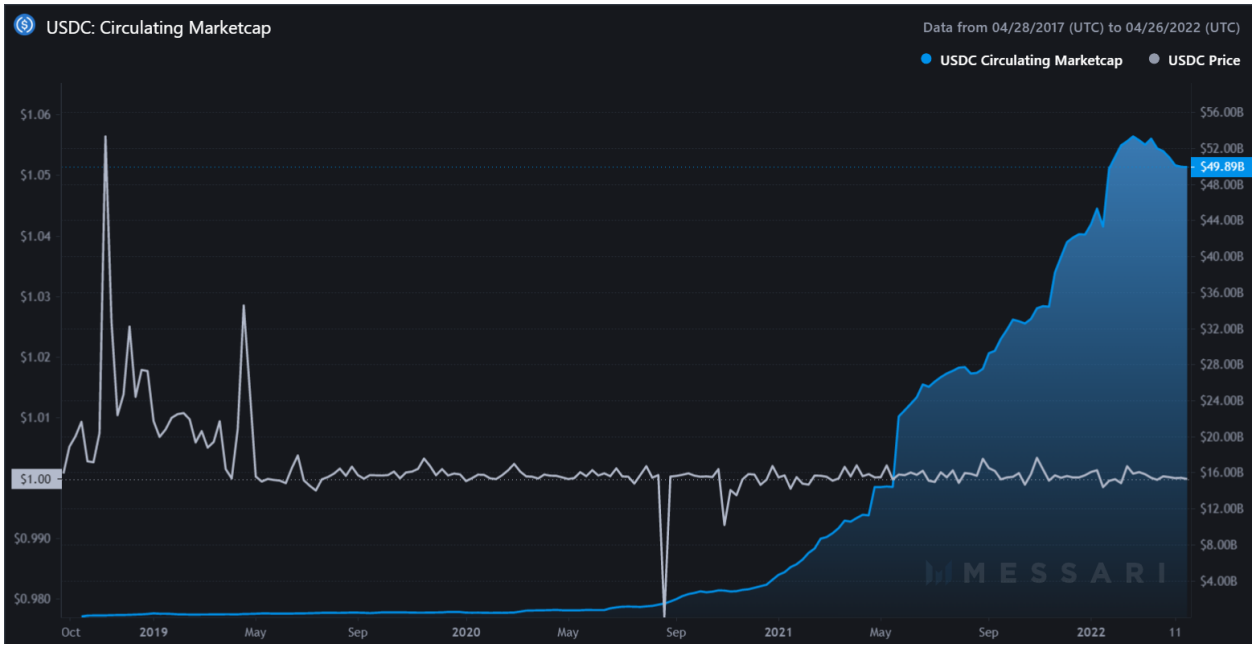
USDC sets out to provide a solution to the crypto dilemma of high volatility and unfavorable contract denominations. USDC is stated to be 100% collateralized with a 1:1 ratio to USD that is held in reserve banks. It has been pointed out, however, that USDC too is not fully backed by physical dollars but rather cash and US Treasurys that are regulated.

Circle is a Boston, Mass located company that works on financial technology applications for retail and institutional clients. The company is predominantly known for the development of USDC as well as the release of Circle Pay.

The coin was launched in 2018 and has since grown exponentially after the stablecoin market boom in 2020 and 2021.

Overview

USD Coin has expanded immensely since 2020, rising to nearly $55 billion market cap before declining to its current valuation of ~$50 billion in Q2 2022. This places USD Coin as the second largest stablecoin behind Tether and the fifth largest cryptocurrency by market capitalization.



[Messari - USDC Market Capitalization]

USDC has a slightly worse rating for its reported volume, with only [34% being reported as verifiable and genuine]. This value keeps USDC within the 'Fair' category on Nomics, giving the coin a grade of C.

USDC being the second largest stablecoin by market cap conducts around [$5 billion in volume each day with the majority (~60%)] coming on Crypto.com, Uniswap V3, ZB.com, and Binance. The remaining 40% is spread across numerous exchanges.

Most of the underlying fiat volume of USDC is based out of Europe in the form of the Euro. This makes up 41% with another 36% of fiat volume coming from the United States.

[Nomics - USDC Volume Data]

Risk Profile

Similar to any tokenized stablecoins pegged to fiat currencies, they are subject to the underlying pressures of the currency, like inflation devaluing the USD. USDC is subject to the same 8.5% YoY inflation increase which leads to an equivalent loss in the purchasing power of USDC.

Additionally, USDC is a prime example of what is known as a centralized stablecoin. This is due to the fact that two companies developed and launched the token themselves, plus it is reliant on a government-backed currency for collateral.

Generally speaking, USDC is very similar in relative strength and stability to the USD. The reserves behind USDC are verified and stored in registered banks, and the companies operating the USDC cryptocurrency are subject to American business laws. This provides fundamental security guarantees for the holder.

Off-Chain

Stablecoins that use off-chain collateral are very similar to tokenized stablecoins, mindful of a key difference in the collateral itself. Tokenized refers to the indirect 'tokenization' of the fiat currency providing the collateral.

For off-chain collateralized tokens, a number of different resources or commodities can be leveraged for stablecoin collateral, including things like stocks & bonds, oil, real estate, precious metals, and more. Gold has recently been a popular collateralization asset in demand by the market.

This has led to the rise of both PAX Gold (PAXG) and Tether Gold (XAUT).

PAX Gold (PAXG)

Key Metrics

- Total market cap: $601 million
- Circulating supply: 329,000 PAXG
- Stablecoin market cap ranking: 11th
- Total crypto market cap ranking: 94th

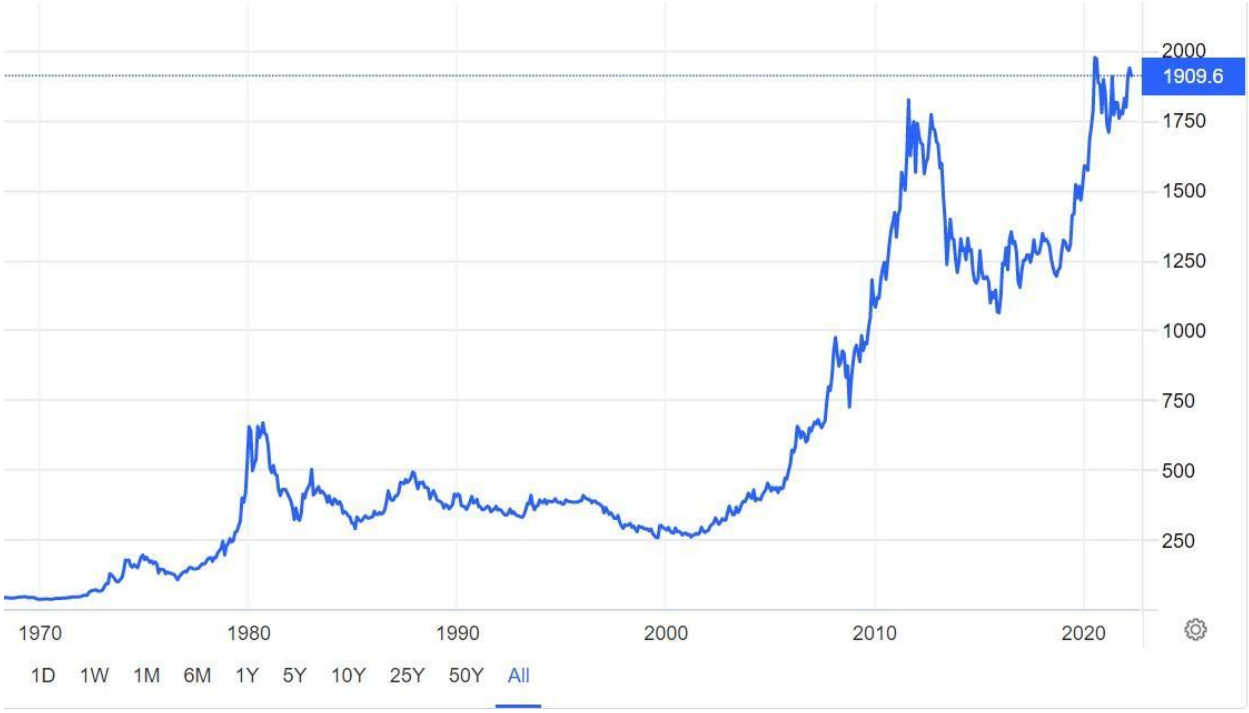
PAX Gold is a token that is fully backed by gold and tethers to the commodity price for gold. PAXG was developed and managed by Paxos, a regulated blockchain infrastructure platform.

Paxos has a long history, starting with the launch of the first regulated cryptocurrency exchange back in 2012. Since then, Paxos has secured a charter for digital assets through the New York State Department of Financial Services (NYSDFS) and released their two tokens, PAX & PAXG, in 2018 & 2019.

PAX is the original name for their rebranded stablecoin, now referred to as USDP. USDP has similar qualities to other tokenized stablecoins. The differentiator was in PAXG, the world's very first commodity-backed stablecoin that is highly redeemable for a full 400 oz London Good Delivery gold bar.

Overview

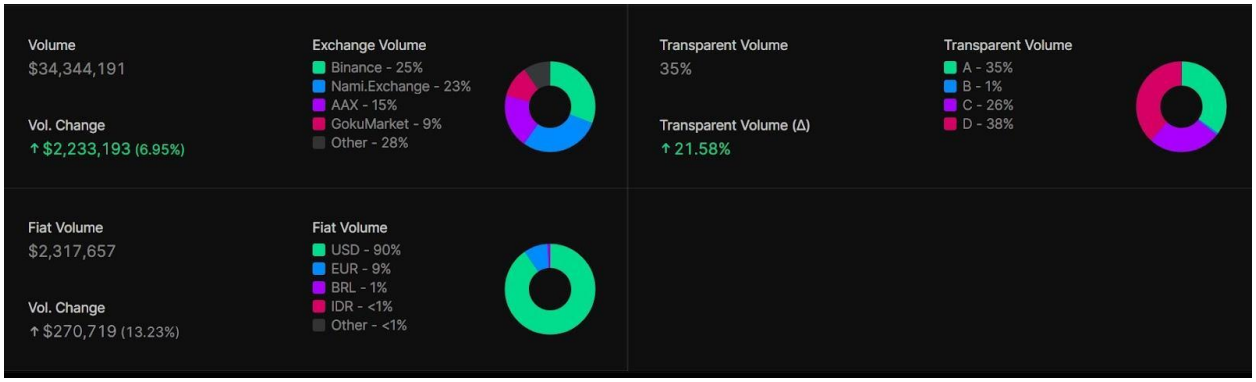
PAXG follows the price of gold, meaning that the price fluctuates based on the price of physical gold. This makes the price less "stable" than that of tokenized stablecoins, but provides the opportunity for investors to diversify their portfolios with direct exposure to gold.



Price of Gold Over Time - Trading Economics

PAXG currently holds a market cap of just over $600 million, placing it just outside the top 100 for largest cryptocurrencies by market capitalization. The circulating supply of PAXG is at 322,425 as of Q2 2022.

The total volume for PAXG includes a verified 35% of transparent volume, with the rest remaining unreported and hence unverified. This is slightly better than that of USDC. Market adoption of PAXG has been a little slower than that of other stablecoins due to the nature of the reserves for Paxos. That said, PAXG is available on a number of exchanges, with Binance leading all with 25% of total PAXG volume.



Nomics - PAXG Volume Data

Risk Profile

Compared to the majority of the cryptocurrency market, Paxos is one of the few blockchain-based platforms to actually have verified regulatory compliance. NYDFS regulates and approves of the financial functionality of PAXG, giving investors a rare piece of true security.

Paxos is also routinely audited by third party sources that carry high level credentials to ensure that PAXG is fully backed at all times by an equivalent holding in gold. The gold is stored in regulated and secure vaults, operated by the Paxos Trust Company.

Due to the unique nature of a commodity-backed stablecoin, Paxos maintains core partnerships with a large number of highly valuable institutions situated within the gold market. All of these features help to establish a low-risk background for PAXG.

Tether Gold (XAUT)

Key Metrics

- Total market cap: $458 million
- Circulating supply: 246,000 XAUT
- Stablecoin market cap ranking: 13th
- Total crypto market cap ranking: 115th

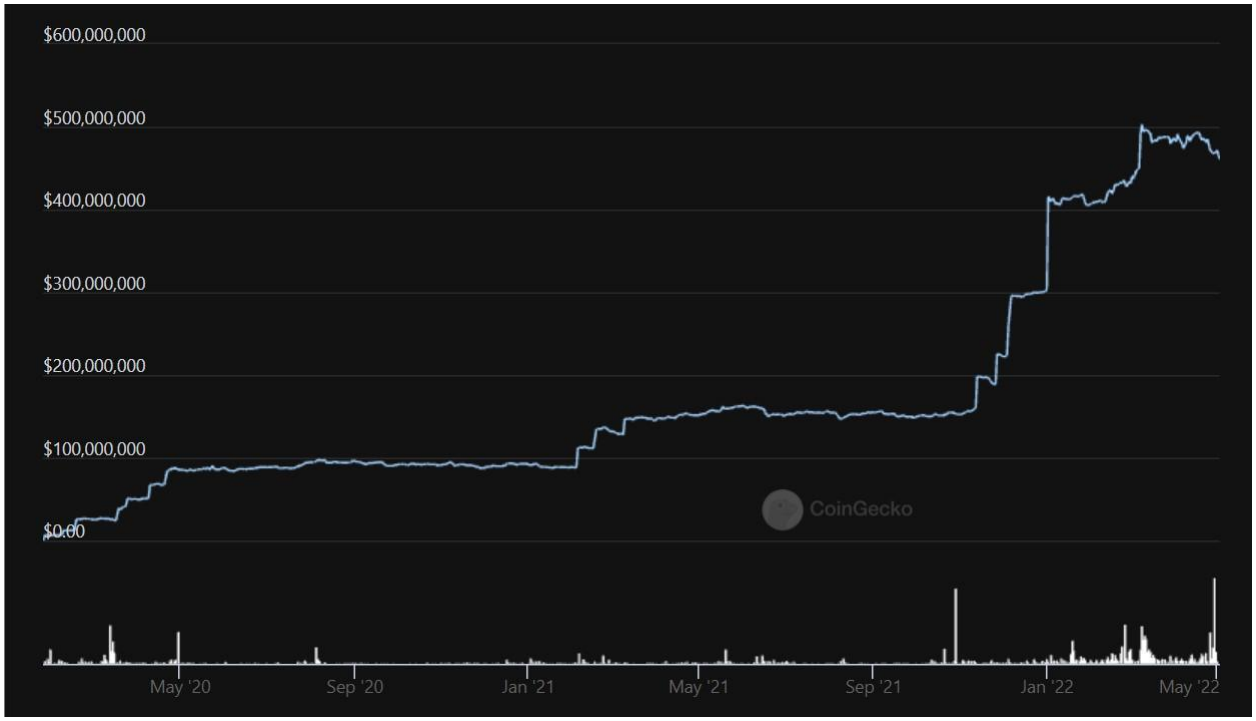
Opposite profile of USDT, Tether Gold (XAUT) has a substantially better public record. XAUT is very similar to PAXG, with key differences in the management and security between the two tokens.

XAUT is backed by physical gold which is stored in a secure vault in Switzerland. The gold is the same quality as PAXG - London Good Delivery Bars. XAUT is less redeemable than PAXG as it takes a full verification process by Tether itself to approve actual redemptions for gold.

The minimum purchase amount even allowed for XAUT is 50 fine troy ounces or approximately $90,000. Comparatively, PAXG has a minimum purchase amount of around $20, a massive difference. Tether Gold is also exclusively available through exchanges only directly aligned with Tether Holdings itself, including Bitfinex, FTX, and Celsius.

Overview

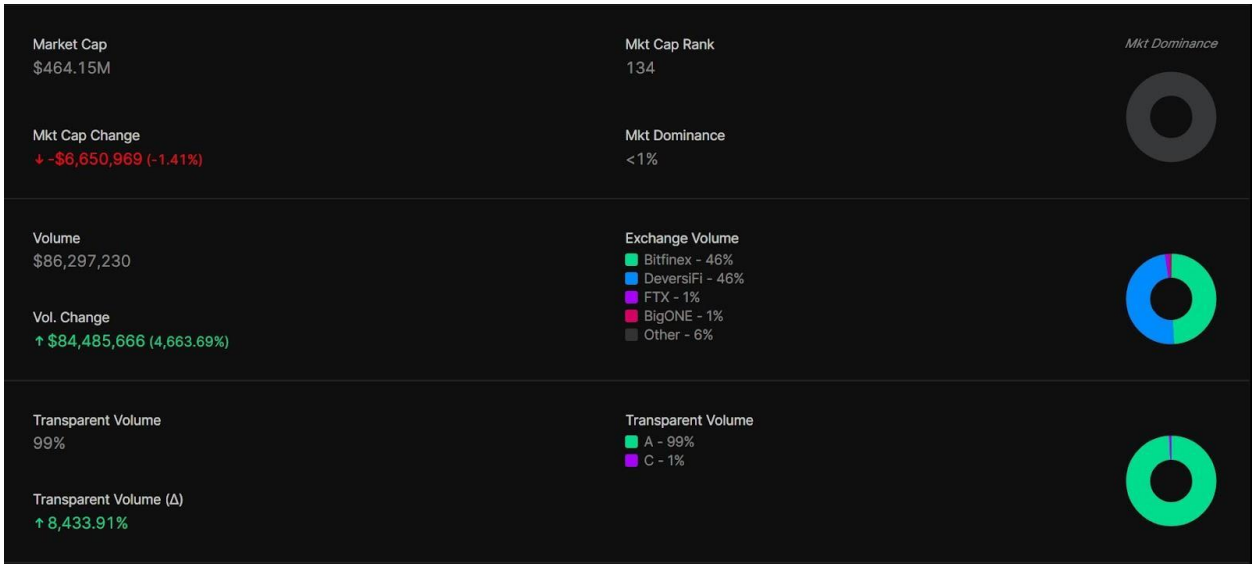
Similar to PAXG, XAUT is tethered directly to the price of gold. Overall, XAUT has a smaller market cap of only ~$400 million and sits as the 138th largest cryptocurrency by market cap. This $400 million is spread across a circulating supply of roughly 250,000 XAUT.



XAUT Market Cap - CoinGecko

Of all the stablecoins, XAUT has one of the highest grades for volume transparency. It is estimated by Nomics that XAUT has a transparent volume percentage of 89%-99%, giving it an 'A' grade and making it well verified.

Bitfinex and DeversiFi dominate the volume game for XAUT, controlling around 35% of the volume each. Notably, the decentralized exchange Uniswap is responsible for around 10% of total XAUT volume. The only fiat currency available to transact with XAUT is the USD.



XAUT Volume Data - Nomics

Risk Profile

No different than the USD Tether stablecoin (USDT), XAUT provides the investor absolutely no guarantees that the equivalent amount of value in reserves (in this case gold) is stored to back the token. Once again, without high level audits, an investor is simply relying on the promises of Tether Holdings.

It is also worth noting again that because of the high minimum buy-in, a majority of investors are already priced out. XAUT also has a much more complicated redemption process. Tether Holdings states that to be eligible to exchange XAUT tokens for physical gold, the investor must first be verified through an account with TG Commodities Limited. This opens the obvious possibility that an investor gets denied when attempting to exchange tokens for gold.

Gold itself provides, arguably, a safer peg than even the USD does (as the price of gold is more stable than comparative inflation rates). However, the underlying risk of the token itself is where XAUT has a distinct disadvantage to its sister token of PAXG.

On-Chain

Stablecoins utilizing on-chain collateral means that they are backed by other cryptocurrencies or on-chain derivatives. This keeps the entirety of the stablecoin and its reserves on the blockchain and therefore, distributed to all users to verify. Stablecoins on-chain are able to exist without a central entity through the use of smart contracts on the blockchain itself. This is what allows users to engage in peer-to-peer transactions and exchange stablecoins for other assets.

This makes on-chain stablecoins more decentralized than tokenized or off-chain stablecoins. On-chain stablecoins routinely use a strategy of over-collateralization to prevent “depegging” events and protect the token holders from wild market volatility.

Over-collateralization means that the underlying value of the collateral exceeds the market cap value. This is often required by decentralized lending protocols, such as Aave. To prevent liquidations, and subsequently damage to the protocol, users must over-collateralize their borrowings.

Dai (DAI)

Key Metrics

- Total market cap: $6 billion
- Circulating supply: 6 billion DAI
- Stablecoin market cap ranking: 17th
- Total crypto market cap ranking: 4th

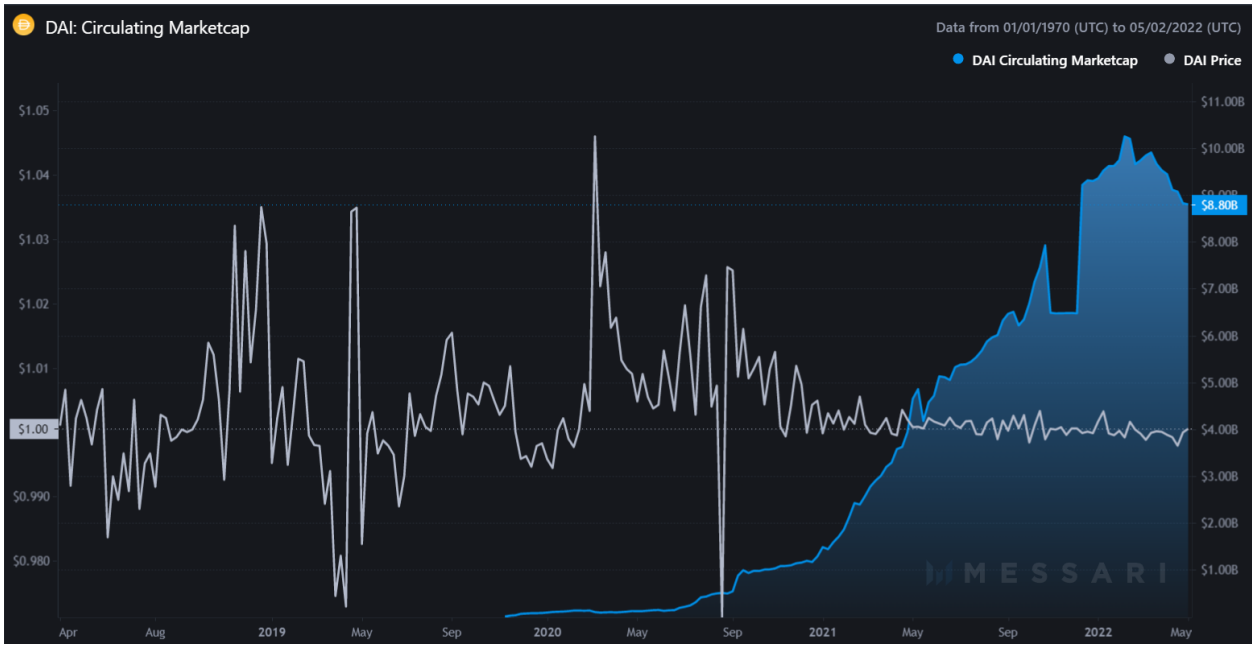
Dai is a stablecoin operated by MakerDAO, a decentralized autonomous organization. MakerDAO serves as a decentralized financial application (DeFi) and more specifically, a peer-to-peer contract lending platform.

DAI is generated when a wallet opens a vault. Collateral is stored in the vault and then DAI is generated and released to the wallet to be used. To protect users and the protocol, MakerDAO requires over-collateralization (currently 170%) that must be maintained.

DAI is managed by the holders of MKR, the governance token representing MakerDAO. Holding MKR gives the holder direct voting power over proposals and protocol changes.

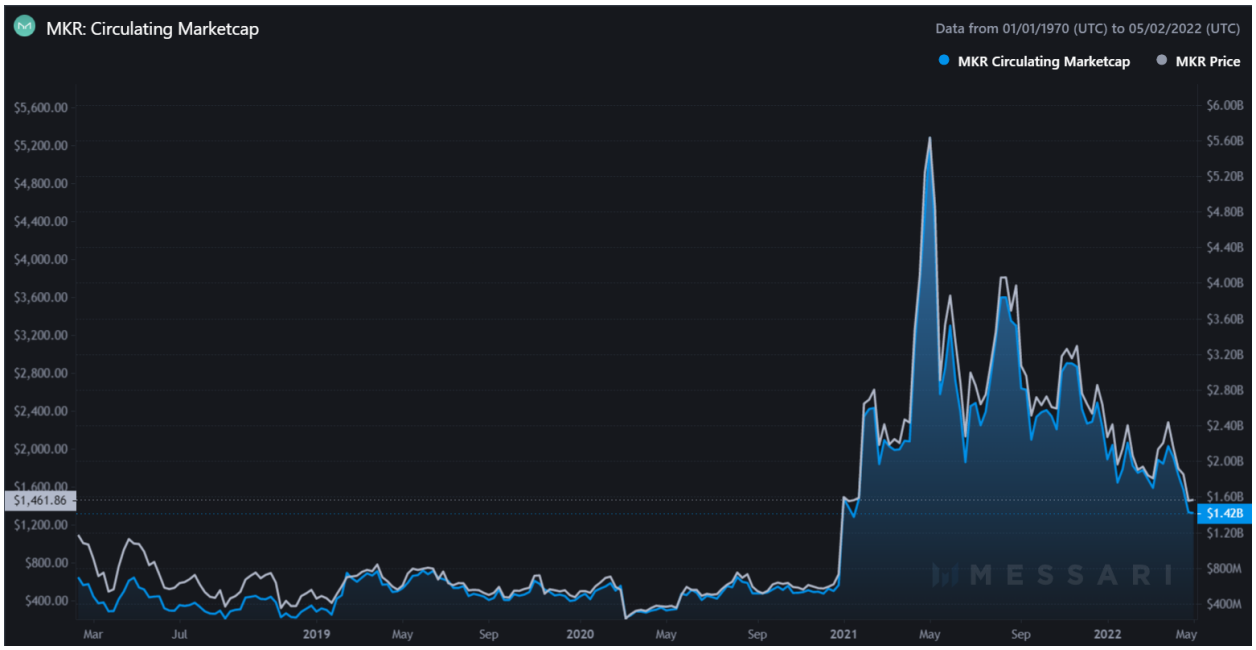
Overview

DAI is the 18th largest cryptocurrency by market capitalization and the fifth largest stablecoin, holding a market cap of ~$8.3 billion as of Q2 2022. Recent market movements have seen DAI actually losing market share during the heightened market volatility of Q2, shedding over 9% off its total market cap.



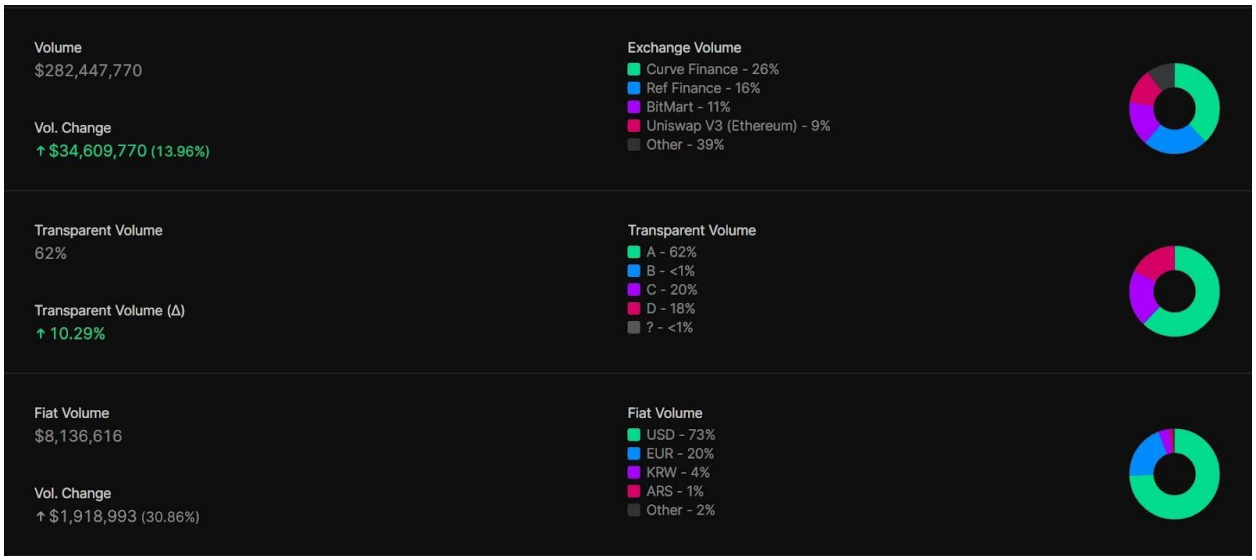
[Circulating Market Cap of DAI vs Price - Messari]

Likewise, the governance token MKR [holds a value of ~$1.3 billion], holding the 77th largest cryptocurrency spot by market cap. There are ~900,000 MKR tokens in circulation following a pause on their burn mechanism. This equates to about ~$1,400 per MKR, roughly 77% down as of Q2 2022 from it's all time high valuation of $6,300 in May 2021.



[Circulating Market Cap of MKR - Messari]

DAI itself posts a transparency grade of ‘B’ according to Nomics, with 62% of all volume being verified. DAI is a globally held cryptocurrency, represented by a number of fiat currencies that includes both the USD and EURO.



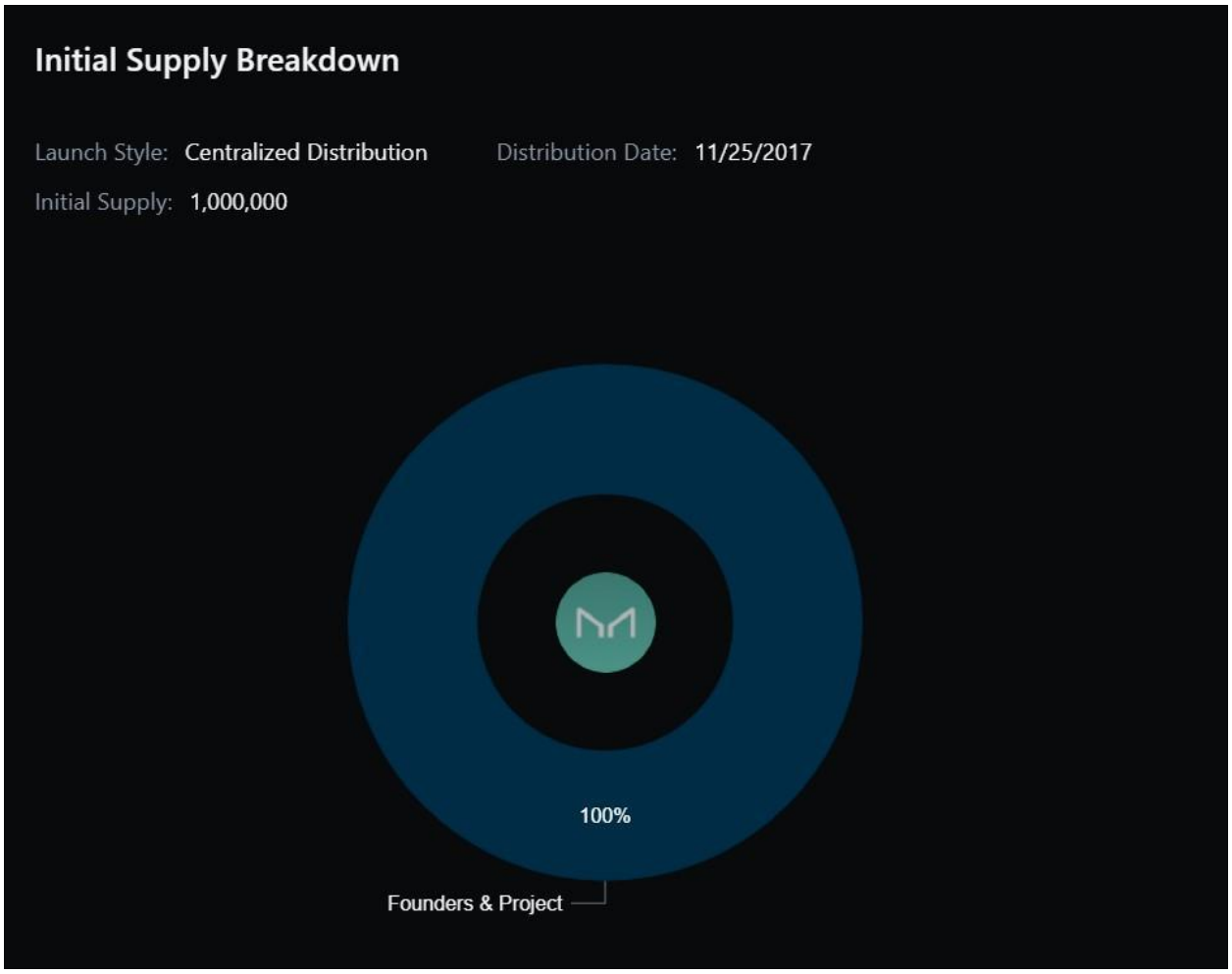
DAI Volume Data - Nomics

Curve Finance is responsible for the most volume at 26% with Ref Finance, BitMart, and Uniswap V3 being the next three largest contributors. The MakerDAO protocol has $13.2 billion in total value locked (TVL), represented by the total value of all tokens being utilized as collateral for DAI.

https://defillama.com/protocol/makerdao/all/USD

Risk Profile

On paper, DAI looks to be a very stable asset in a class of rather shaky prospects. However, DAI has some key drawbacks that cannot be overlooked. First and foremost, MakerDAO is noticeably centralized. The protocol launched through a funding effort that saw venture capitalists (VCs) and investment firms buyout MKR initially.



Initial Supply Breakdown of MKR - Messari

This centralized initial launch of MKR has led to nearly all of the voting rights over DAI being controlled by major investors rather than everyday users of DAI. So, despite DAI being collateralized on-chain, the controlling force behind the stablecoin is not all that decentralized.

Additionally, DAI has struggled to gain traction in the markets and incentive use of the stablecoin as its market cap has dropped significantly over time. MKR peaked in May 2021 and has yet to recover, seeing revenues tumble.

[Declining Revenues of MKR - Token Terminal]

With both the DAI and MKR market caps declining, [pushes are being made in MakerDAO governance] to make an exit strategy faster to implement with new governance proposals.

Ampleforth (SPOT)

Key Metrics

- Total market cap: $72 million
- Circulating supply: 80 million AMPL
- Stablecoin market cap ranking: 25th
- Total crypto market cap ranking: 356th

[Ampleforth (AMPL)] is the very first cryptocurrency to successfully implement protocol volatility into supply rather than price. This means that the existing supply of AMPL is fluid, automatically adjusting daily to move the price of one AMPL to a 2019 USD adjusted for inflation ([currently valued at $1.10 USD]). This is called rebasing.

[AMPL] Ampleforth Rebase History

2022 | ALL | DOWNLOAD CSV

Date	Rebase %	Oracle Rate $	Price Target $	AMPL Total Supply
2022-05-03	-0.5410	1.041	1.100	86,669,779.94
2022-05-02	-0.5410	1.041	1.100	87,141,207.36
2022-05-01	+0.7567	1.173	1.093	87,615,199.04
2022-04-30	+0.7567	1.173	1.093	87,615,199.04
2022-04-29	+0.9717	1.200	1.093	86,957,210.71
2022-04-28	+0.6489	1.165	1.093	86,120,410.66
2022-04-27	+0.6489	1.171	1.093	85,565,167.72
2022-04-26	+0.6489	1.173	1.093	85,013,504.59
2022-04-25	+1.0788	1.215	1.093	84,465,398.20
2022-04-24	+0.7567	1.184	1.093	83,563,887.90
2022-04-23	+0.7567	1.176	1.093	82,936,324.83
2022-04-22	+0.6489	1.165	1.093	82,313,474.75
2022-04-21	0.0000	1.133	1.093	81,782,776.22
2022-04-20	0.0000	1.104	1.093	81,782,776.22
2022-04-19	0.0000	1.074	1.093	81,782,776.22
2022-04-18	0.0000	1.078	1.093	81,782,776.22
2022-04-17	0.0000	1.069	1.093	81,782,776.22
2022-04-16	0.0000	1.085	1.093	81,782,776.22
2022-04-15	0.0000	1.079	1.093	81,782,776.22

Rebasing History of AMPL - Coin Tools

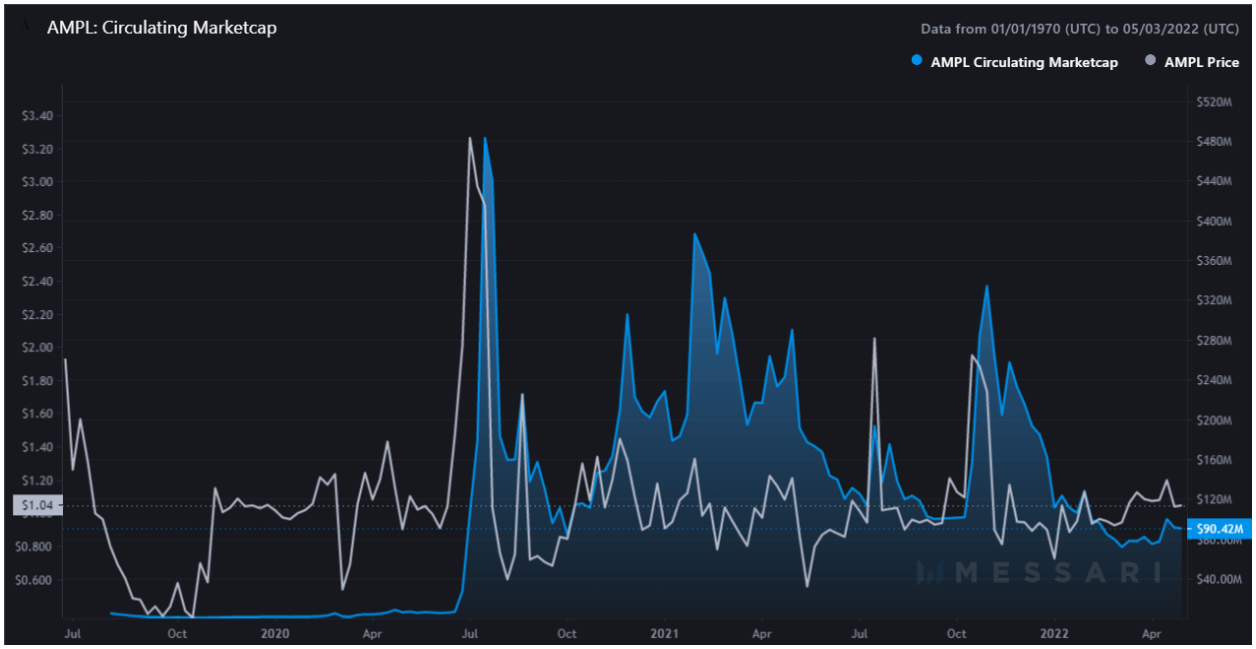
Because of the 2019 USD price peg, AMPL is an inflation-resistant, algorithmic unit of account. Despite the price being relatively stable, AMPL itself is not a stablecoin. Stablecoins attempt to remove volatility entirely while AMPL simply transfers this volatility to supply. Because of this, AMPL serves as the collateral for a coming stablecoin called SPOT.

SPOT will be an on-chain stablecoin, similar to DAI, except it will be collateralized with AMPL and associated derivatives. AMPL itself is decentralized, operating on an algorithm that automatically adjusts the supply daily across all wallets on all blockchains simultaneously. In this regard, AMPL is like a decentralized central bank with the FORTH token being used as governance over the protocol.

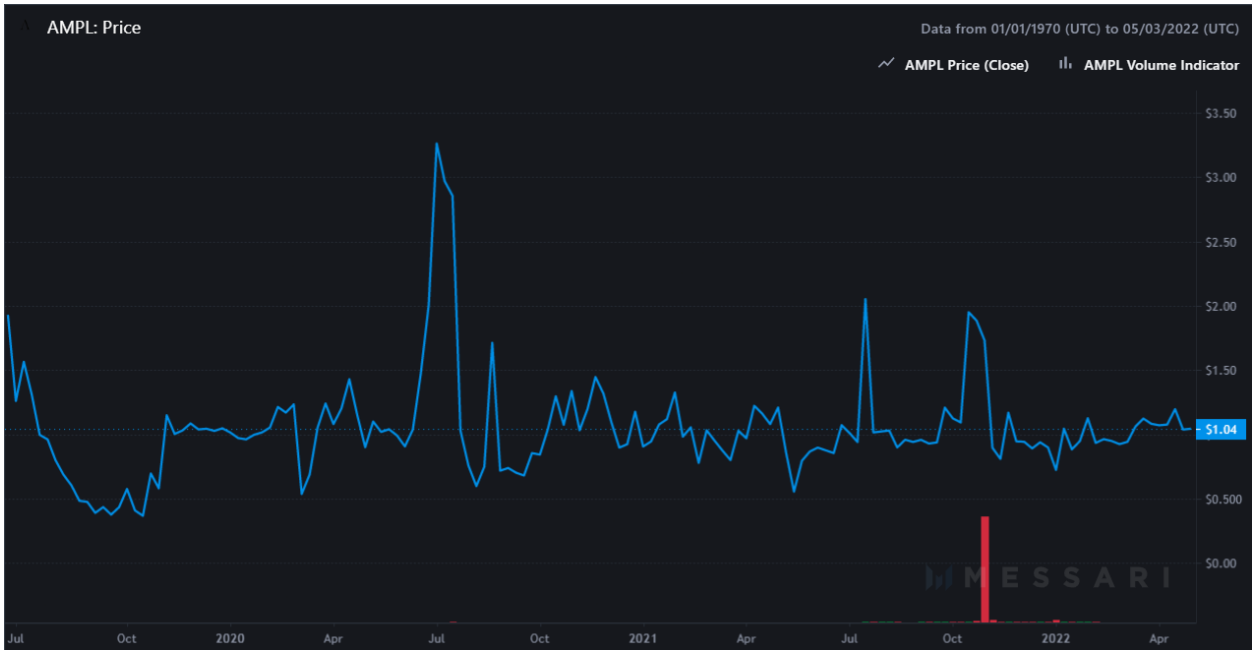
By using AMPL as collateral, this would make SPOT one of the only true decentralized stablecoins to exist on the market and solves the centralization problem for DeFi.

Overview

As of Q2 2022, SPOT itself has entered formal development. AMPL holds a market cap of ~$100 million, making it the the 400th largest cryptocurrency by market capitalization and by far the smallest included on this list. AMPL is also the third largest rebasing token by market cap, trailing Olympus (OHM) and Redacted Cartel (BTRFLY).

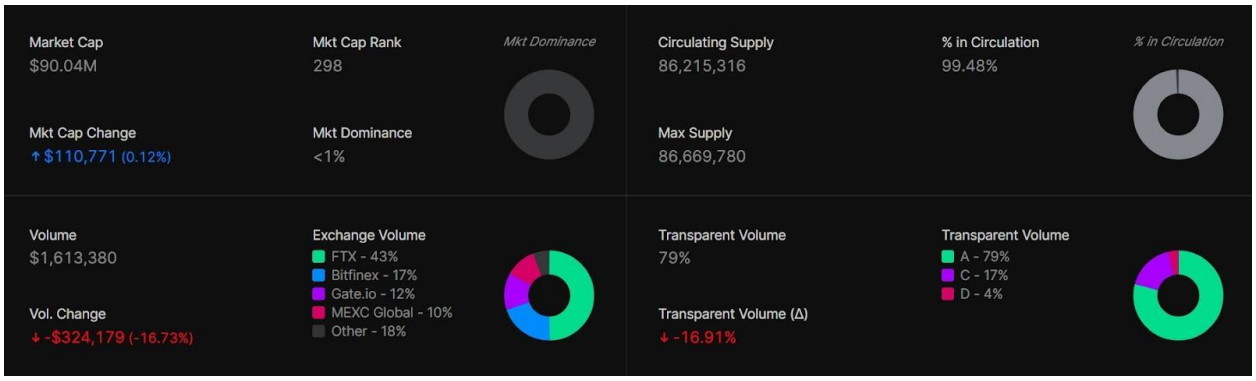


Circulating Market Cap of AMPL - Messari



[Price Stability of AMPL - Messari]

AMPL holds a respectul transparency volume [with 79% of volume being verified], receiving a grade of ‘A’ from Nomics. Only 4% of AMPL’s volume is considered fake or bad volume. Additionally, volume for AMPL is dominated by exchanges, most notably FTX (43%), Bitfinex (18%), and Gate.io (12%).



[AMPL Volume Data - Nomics]

Risk Profile

AMPL has an advantage over other assets, even stablecoins, as it will always keep its peg to the 2019 USD adjusted for inflation through rebasing, giving it durable stability as a unit of account. SPOT will also inherit this quality, potentially more so as it will be backed by stable derivatives as well.

Overall however, AMPL & SPOT are inherently risky. AMPL itself has a small market cap and is not free from potential major volatility in a cryptoeconomy valued at $1.5 Trillion.. There is also a

notable possibility that AMPL never receives the adoption required to make SPOT truly valuable within the cryptocurrency and DeFi space. It is currently unknown how well SPOT will hold its own dollar peg and to what extent price fluctuations will play a role in day to day trading.

Nevertheless, AMPL is integrating a disruptive technology within the stablecoin market. As of Q2 2022, SPOT remains a speculative asset.

Algorithmic

Algorithmic stablecoins or non-collateralized stablecoins are reliant on entirely theoretical concepts to establish a peg rather than backing the asset with some other form of value. Price stability is kept by adjusting the supply of stablecoins on the market automatically while also removing volatility. This is a distinguishing difference from Ampleforth (AMPL), a coin often misidentified as an algorithmic stablecoin.

Algorithmic stablecoins are inherently risky and have a long history of failures. Failures are the result of a depegging event that leads to a bank run and subsequent collapse in value of the stablecoin. Because nothing is backing the asset, bank runs can be catastrophic for the protocol.

The most prominent example of an algorithmic stablecoins is Terra USD (UST).

Terra USD (UST)

Key Metrics

- Total market cap: $1.1 billion (post collapse)
- Circulating supply: 11.3 billion UST
- Stablecoin market cap ranking: 8th
- Total crypto market cap ranking: 59th

Terra was originally founded in 2018 with a vision of incentivizing the mass adoption of decentralized global cryptocurrencies that are inherently digitally price stable to counter state-sponsored fiat currencies around the world.

Terra launched through co-founders Daniel Shin and Do Kwon with the help of 15 different Asian-based companies that helped with the protocol's initial development. Other investors include all of the following:

- 1kx
- Binance Labs
- Coinbase Ventures
- Divergence Digital Currency
- Galaxy Digital
- Huobi Capital

- Mayu Ventures
- Nirvana Capital
- Polychain Capital
- Arrington XRP Capital
- Blockchain.com Ventures
- Delphi Digital
- FBG Capital
- HashKey
- Kenetic Capital
- Multicoin Capital
- Pantera Capital
- Zee Prime Capital

Overview

Terra is a two coin ecosystem split between the stablecoin Terra USD (UST) and LUNA. Terra operates by creating an equilibrium between the UST and LUNA tokens through the incentives of arbitrage.

To mint UST, LUNA must first be purchased and swapped for UST with the LUNA being burned afterwards. This constricts the supply of LUNA, placing upwards price pressure on the token.

Opposite of this, LUNA can be minted by converting over UST tokens which are then burned. This puts upward price pressure on UST. The key here is the gains made through arbitrage, the core incentive for willing investors to take on the associated risks with the tokens.

Arbitrage is simply when a trader is able to profit from slight price discrepancies. For instance, if UST is trading at $0.99, traders have the incentive to burn LUNA for UST at 0.99. When the price of UST rises above $1, traders can then flip that small profit into buying more LUNA.

This two-coin functionality is what allowed Terra USD to maintain its peg and lead Terra to become the third largest stablecoin in the crypto market with an ecosystem valued at $40 billion at its peak.

Risk Profile

The entire Terra Luna ecosystem completely collapsed from May 9 to May 12, 2022 in the single biggest cryptocurrency failure of all time. The cryptocurrency market began experiencing more extreme selling pressure during the later weeks of Q2 2022 which led to a significant decline in LUNA and in Bitcoin. This created a massive problem for Terra. As selling occurred, it depegged the price of UST.

Price Collapse of UST - Messari

Prior to this collapse, the UST stablecoin went through a major stress event in January 2022 after the unraveling of the Frog Nation DeFi ecosystem. This plunged the price of LUNA and forced UST from its dollar peg.

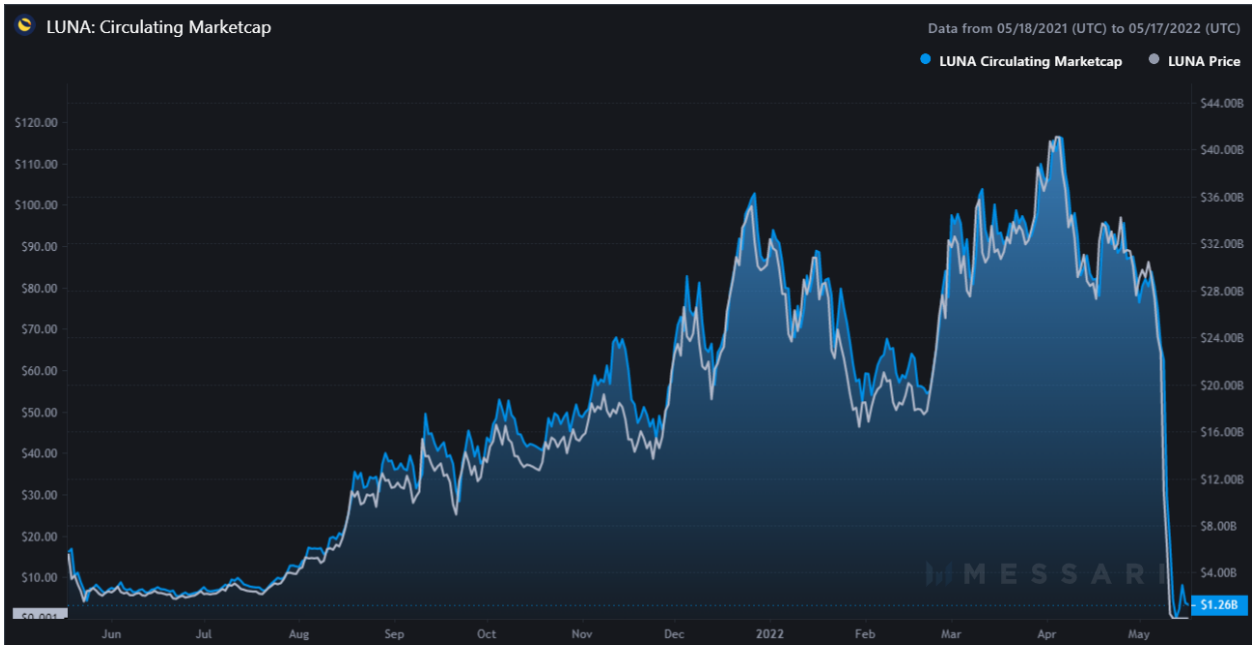
The event actually prompted Terra to raise $1 billion in Bitcoin (BTC) to provide additional collateral to the UST peg. Additional purchases were also in AVAX. That Bitcoin that was purchased and held as collateral was reportedly deployed, but it failed to save the peg of UST.

UST and LUNA achieve equilibrium through the redemption power of burning/minting tokens. If there are more UST tokens in circulation, there are less LUNA and vice versa. The problem that occurred here is because of the depegging and the price of LUNA falling, the redemption cost of gaining LUNA was high.

Put simply:

- Markets declines, causing LUNA to decline and UST to depeg
- Panic ensues and UST tokens are burned for LUNA
- The LUNA is immediately sold due to the collapsing price
- This further destabilizes the UST peg, creating more panic
- Repeat

A ton of LUNA tokens were being minted and then thrust back into the market as investors left UST. This made the supply expand rapidly, creating enormous downward pressure on price.



[Collapse of LUNA Market Cap - Messari]

[Collapse of LUNA Price to Zero - Messari]

The price of UST fell to as little as $0.08 (92% loss of value), with LUNA collapsing in price from an all time high of $119 USD just one month ago to a price point of $0.0001 - essentially a 100% total collapse in value. In total, Terra Luna saw an ecosystem previously worth $40 billion disappear from the protocol in just 72 hours, making this the single largest cryptocurrency collapse of all time.

Central Bank Digital Currencies (CBDCs) - Centralized Digital Currencies

Central Bank Digital Currencies (CBDCs) are a state-sponsored emerging technology that would see payment systems fully digitalized, becoming a new form of digital bank money that can be held as reserves at central and commercial banks.

The rise of cryptocurrencies and stablecoins has prompted inquiries into the philosophy of money, something that nation-states are now considering with state currencies like the USD, EURO, and others.

In short, CBDCs built for general purpose might serve as an complementary alternative to cash or simply a replacement. CBDCs can have a variety of internal characteristics, such as varying levels of anonymity, function, and use case.

As smart contract platforms continue to mature, volume is dominated heavily by stablecoins. CBDCs would be a direct competitor to the space, competing for market share of total global digital currencies and possibly pulling away adoption from stablecoins (and the cryptoeconomy itself).

As of Q2 2022, many of the world's largest nations now have at least begun research & development on a potential CBDC token.

CBDC development can be broken down and summarized by progress, including the following categories:

- Fully Launched CBDCs
- CBDCs in Testing
- Nations Conducting CBDC Research

Fully Launched

As of Q2 2022, there are nine different nation-states with a fully functioning central bank digital currency. The following represents an overview of fully launched CBDCs:

Eastern Caribbean (DCash)

Key Metrics

- Total GDP: $6.65 billion (combined)
- Population: ~650,000 (combined)
- GDP per capita: $10,230 (average)
- World Ranking by GDP: ~158th

Overview

The Eastern Caribbean Currency Union (ECCU) developed and launched the world's very first digital currency in March 2021, naming the new currency DCash. The ECCU is made up of eight different Caribbean-based nation-states, including the following:

- Anguilla
- Antigua and Barbuda
- Commonwealth of Dominica
- Grenada
- Montserrat
- Saint Lucia
- Saint Vincent and the Grenadines
- Saint Christopher (St Kitts) and Nevis

The digital currency itself is issued and managed by the Eastern Caribbean Central Bank (ECCB). Through a collaboration with the company Bitt, DCash was developed and officially launched through a historic first transaction between the ECCB Headquarters in Saint Christopher (St Kitts) and Nevis to DCash wallet holders in three other countries.

In January 2022, DCash went completely down, with the central bank calling it a 'region-wide service interruption' on 14 January 2022. From there, DCash entered back into development that included updates such as:

- Enhanced certificate management processes
- Version update of Hyperledger Fabric (core of DCash platform)

DCash officially resumed services in March 2022 with improved functionality, though demonstrates the importance of uptime for future central bank digital currencies. Despite this unfortunate downtime, DCash has demonstrated to the rest of the world that digital currency unions are not only feasible, but potentially far more efficient.

As of Q2 2022, Anguilla is the only member nation to not adopt DCash.

Nigeria (e-Naira)

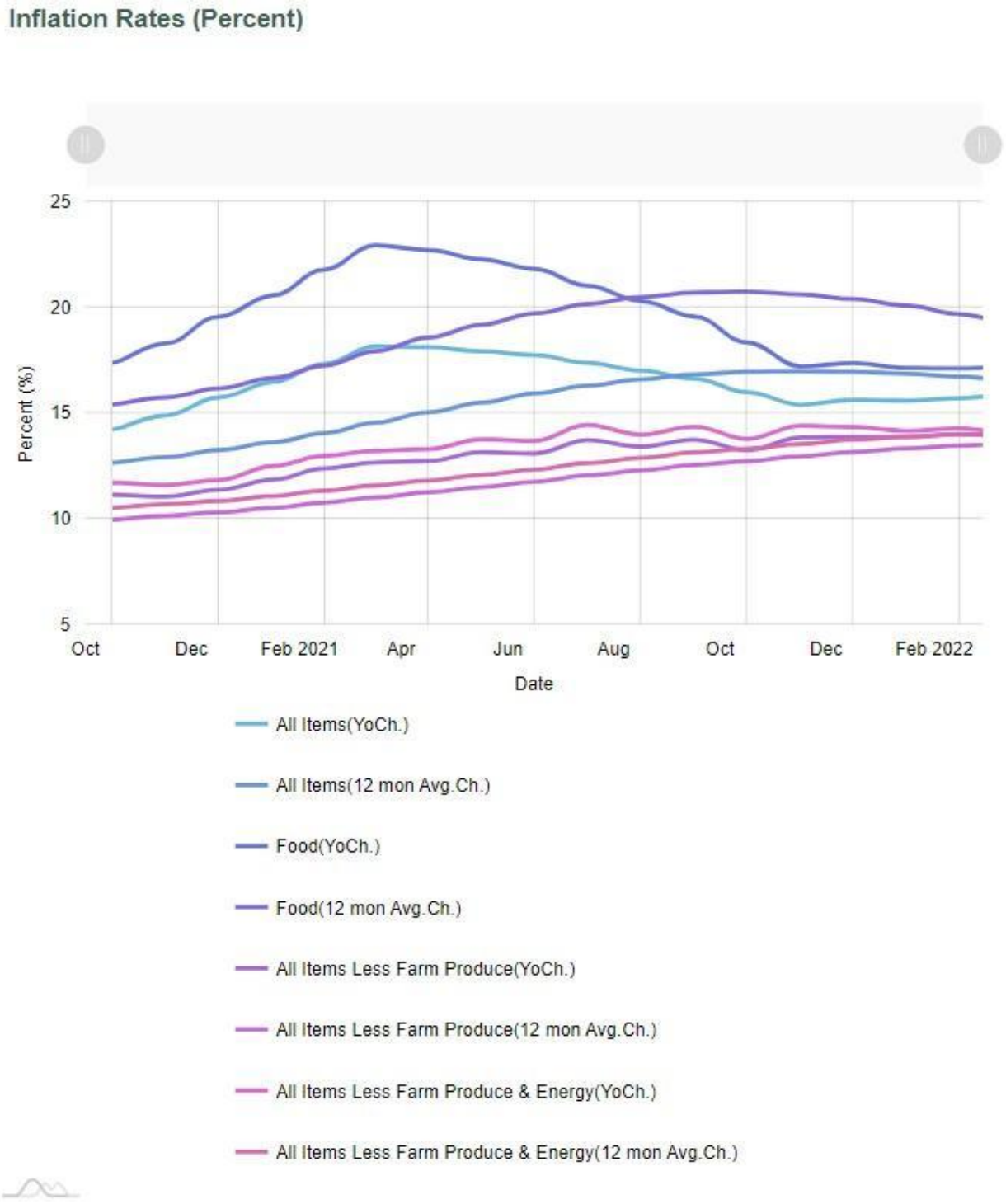
Key Metrics

- Total GDP: $432 billion
- Population: ~206 million
- GDP per capita: $2,097
- World Ranking by GDP: 31st

Overview

Developing and launching the very first CBDC in Africa, Nigeria launched e-Naira in October 2021 after banning other cryptocurrencies from being used by businesses in the nation. The Central Bank of Nigeria (CBN) oversaw the development, launch, and now management of the CBDC.

Due to high inflation rates in Nigeria, many citizens had essentially given up on Naira cash and instead chose to switch to cryptocurrencies like Bitcoin to facilitate day to day business transactions. Since then, the government worked diligently to reverse that trend with e-Naira, offering citizens more currency stability at the cost of government surveillance through monitoring.



Nigerian Inflation Rates - CBN

While the government hasn't made cryptocurrencies illegal (large reason why a reported ⅓ of the Nigerian citizens have invested in crypto), banning businesses from utilizing crypto ensures all of that generated value stays within Nigerian borders.

Nigeria has already had over half a million citizens register their national IDs and download the e-Naira wallet to be eligible to acquire and transact with e-Naira. It has been stated by the CBN that a higher level of identification corresponds with a greater transaction limit. The lowest of these tiers is a max of 50,000 e-Naira (~$120) per day with low level bank accounts getting roughly 4x that at 200,000 e-Naira.

Just like the Eastern Caribbean, Nigeria also leveraged a partnership with Bitt to support the development of the CBDC. Bitt was brought onboard to fasttrack the initial development and pilot phases of the CBDC, citing Bitt's previous work as suitable for launching e-Naira as a retail-based digital currency.

The Bahamas (Sand Dollar)

Key Metrics

- Total GDP: $9.91 billion
- Population: ~393,000
- GDP per capita: $25,194
- World Ranking by GDP: 147th

Overview

The Central Bank of The Bahamas officially launched the Sand Dollar project in December 2019 on the island of Exuma, paving the way forward for the CBDC to expand across the country by 2020.

The Sand Dollar is the very first country-wide CBDC to ever launch and has now become the Central Bank's focal point for expanding its interoperability with different wallet providers. This would help advance The Bahamas within digital payment systems.

The Sand Dollar itself is a digital representation of the original Bahamian Dollar (B$) bank notes. Like all CBDCs, it is regulated, centralized, and private. It is also more advanced than other fully launched CBDCs as it has support for both retail and wholesale payments.

The Central Bank of the Bahamas initiated the research, development, and launch of the Sand Dollar in collaboration with NZIA Limited, a decentralized wireless payment systems provider.

It was reported in November 2021 that there was "north of $300,000" delegated in Sand Dollars already in circulation being exchanged between ~20,000 individuals.

Pilot & Testing

As of Q2 2022, there are15 different nation-states with CBDCs that have completed development and are now in the pilot/testing phase prior to public release. The following represents an overview of CBDCs that have entered testing from different regions:

China (e-CNY)

Key Metrics

- Total GDP: $14.72 trillion
- Population: ~1.4 billion
- GDP per capita: $10,434
- World Ranking by GDP: 2nd

Overview

Leading the way for established, global economies, China launched its CBDC token in April 2020. By Q1 2022, the digital currency pilot has been utilized across 11 different regions of China, including:

- Beijing
- Zhangjiakou
- Shenzhen
- Suzhou
- Chengdu
- Xiong'an
- Shanghai

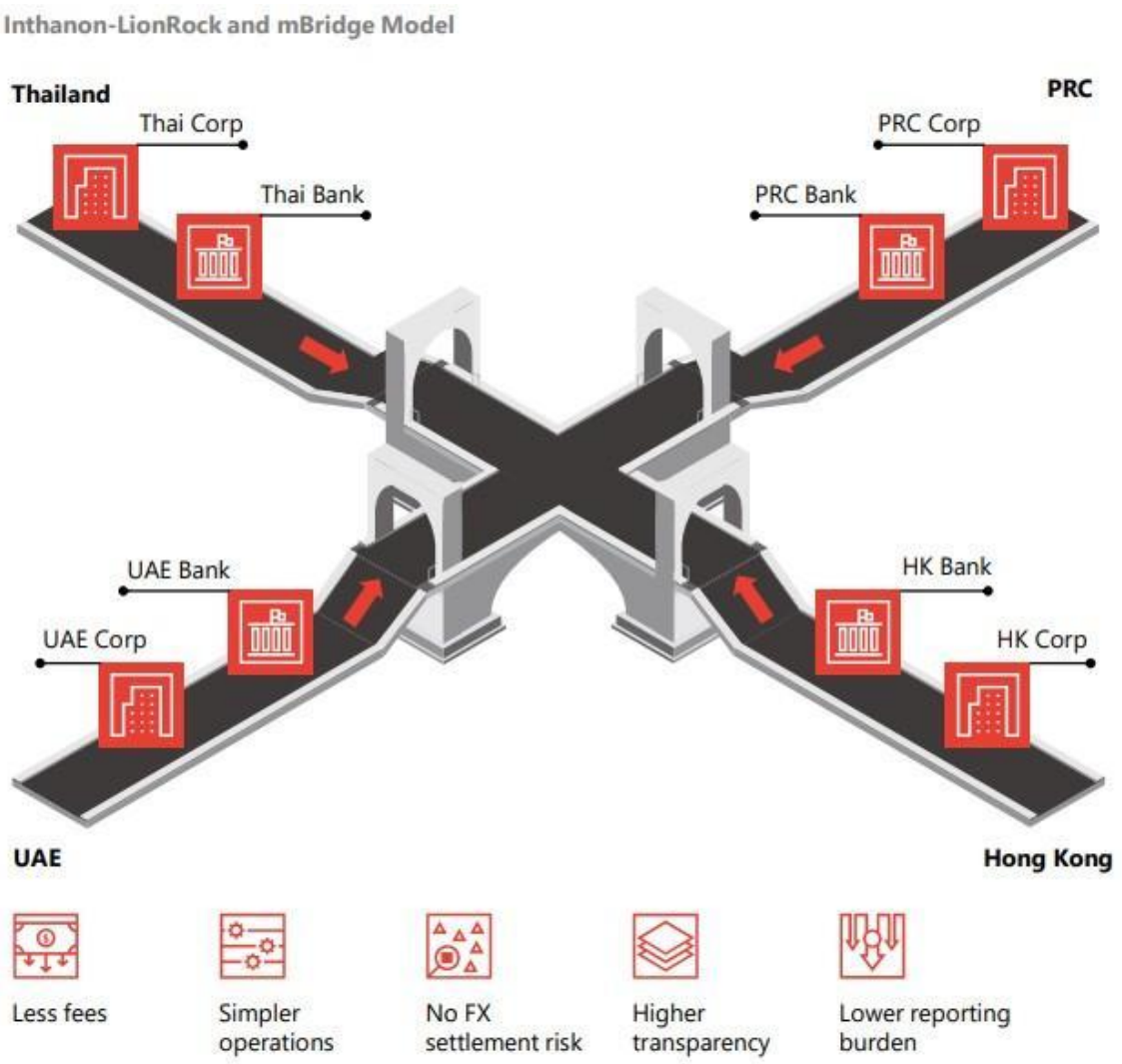
Since the initial launch into four different cities, commercial banks have been able to run tests on conversions, payments, and other functionalities through the digital Yuan (e-CNY). The pilot program has been expanding ever since.

The People's Bank of China (PBOC), the controlling organization behind the e-CNY, provided a progress report in July 2021 followed by an announcement that in October 2021, there were an estimated 123 million personal wallets created to go along with 9.2 million corporate digital yuan wallets. Transactions to date in October 2021 were estimated to be over $8 Billion. This makes China's CBDC token the most highly utilized in the world.

In 2022, China has been pushing for cross-border and international adoption of the digital yuan. China has cited a previous failure to push the yuan outside of the country as the reason for its overall weakness versus other fiat currencies like the USD or EURO.

So, China is planning an expansion to other major Chinese cities & territories such as Hong Kong as of Q2 2022. It also leveraged the 2022 Beijing Winter Olympics as a testing ground for foreign nationals to use the currency.

In February 2022, a joint project between the PBOC and the central banks of Thailand, the United Arab Emirates, and Hong Kong to create the Multiple Central Bank Digital Currency (m-CBDC) Bridge.



bis.org

This project is essentially the very first usable testing of interoperability between CBDCs, reimagining the traditional global economy as a direct digital counterpart to the cryptoeconomy.

Russia (Digital Ruble)

Key Metrics

- Total GDP: $1.48 trillion
- Population: ~144 million
- GDP per capita: $10,126
- World Ranking by GDP: 11th

Overview

The Bank of Russia announced its desire to develop a CBDC in October 2020. Following an initial prototype phase, Russia officially launched its pilot program for the digital ruble in Q1 2022.

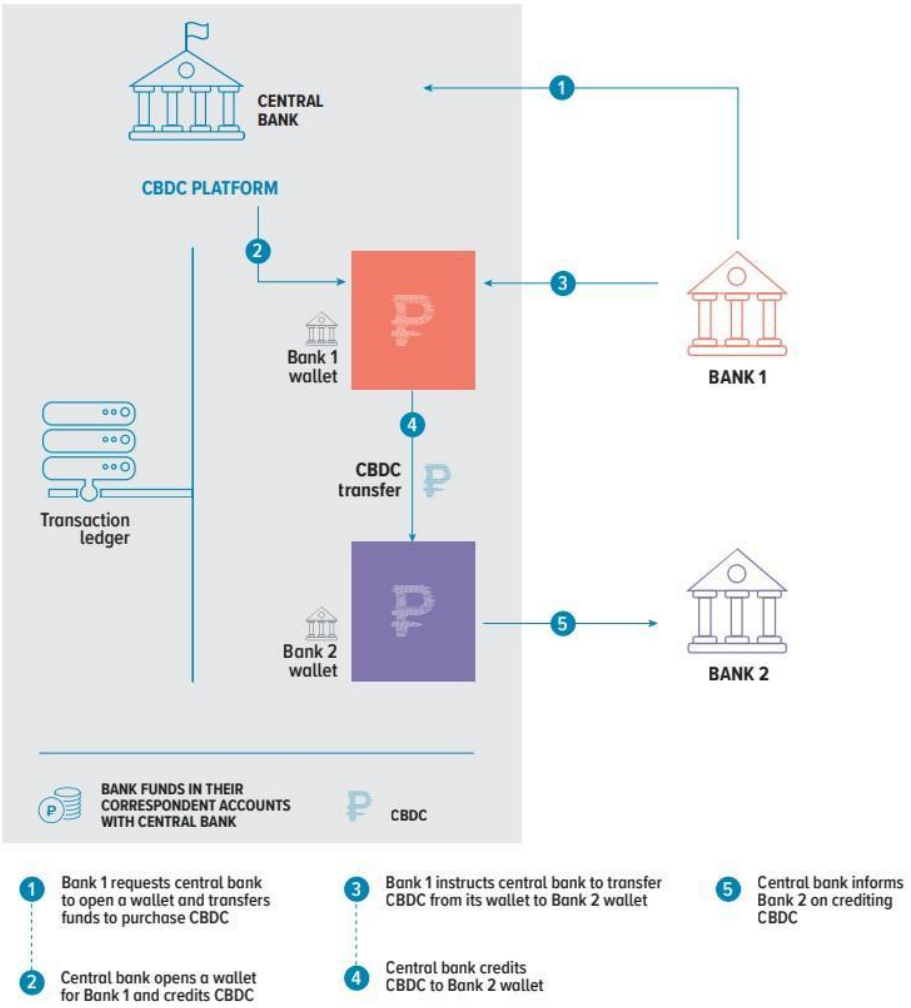
Early concerns had been raised by Russian-based businesses as the technology appeared too centralized and/or would force commercial banks to compete more directly with the central bank.

Despite these concerns, the Bank of Russia stated that a CBDC would greatly dissolve Russia's dependence on the US Dollar, something that Russia has carried the desire to improve upon for some time through previous action. In Q2 2022, this would allow Russia to better bypass international sanctions due to the Invasion of Ukraine.

The digital ruble itself is to be based on a hybrid platform that combines elements of a distributed ledger. The central bank established partnerships with 12 different commercial banks:

- Ak Bars Bank
- Alfa Bank
- JSC Bank
- VTB
- Gazprombank
- Tinkoff Bank
- Promsvyazbank
- Rosbank
- Sberbank
- SKB-bank
- Bank SOYUZ
- TKB bank

Chart 4.1



[Digital Ruble Consultation Paper - Bank of Russia]

In February 2022, [Russia announced that two different banks] had successfully completed digital ruble transfers through mobile banking applications, showcasing that Russia's CBDC is in fact functional.

An additional effort to stabilize its currency, Russia has [reintroduced the ruble to the gold standard] by backing the currency with gold reserves.

Saudi Arabia / United Arab Emirates (Project Aber)

Key Metrics

- Total GDP: $1 trillion (combined)

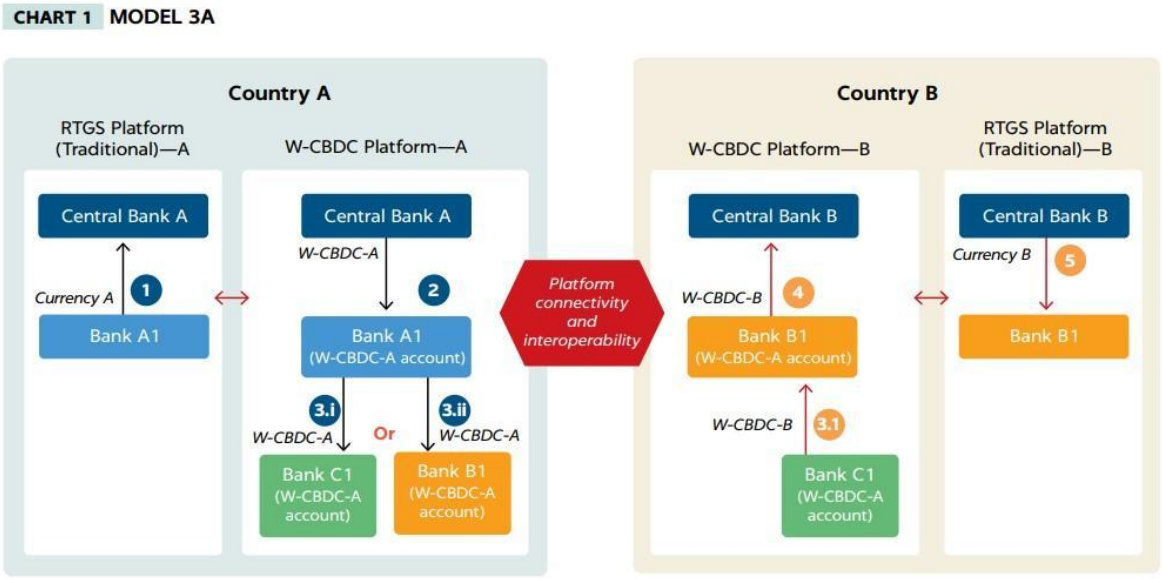
- Population: ~44 million (combined)
- GDP per capita: $22.727 (average)
- World Ranking by GDP: ~20th

Overview

Both the central banks of Saudi Arabia and United Arab Emirates (UAE) announced their intentions to co-found a CBDC for the Middle East, calling it Project Aber. Announced in January 2019, the project aims to utilize distributed ledger technologies (DLTs) to facilitate and improve cross-border transactions.

CBDCs for Cross-Border Payments - World Bank

The two central banks outlined in an overview report that the viability of a shared digital currency was sound and that distributed ledgers offered many improvements over centralized payment systems, citing easier trade and cross-border commercial bank transfers.



Example model of CBDC-based cross-border payments - World Bank

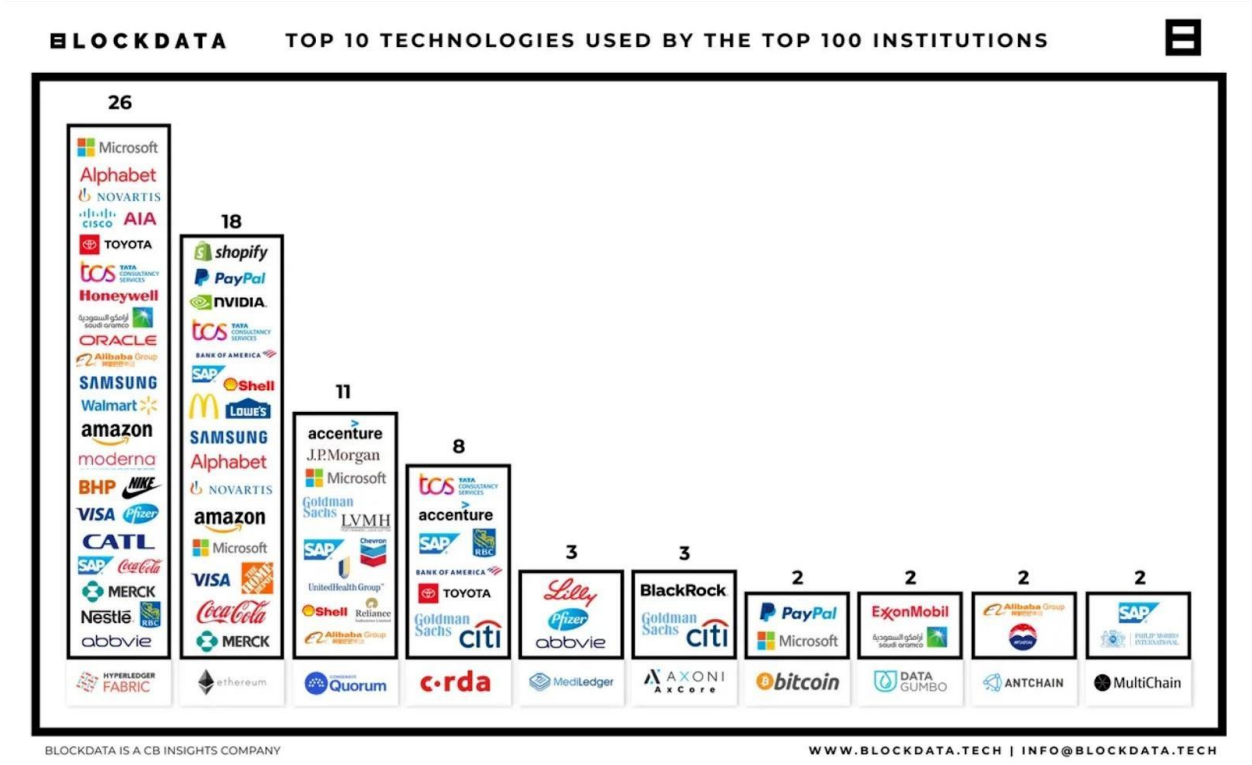
Aber uses three different transfer channels to move the CBDC tokens through. They are:

- **Primary Channel -** This is the main ledger channel in which all banks participate. It requires 5 out of 8 participants to endorse a transaction to add it to the ledger.

- **Bilateral Channel -** Bilateral is the peer-to-peer channel that facilitates transactions between two commercial banks (or central bank) directly, requiring only the two sides to endorse a transaction.

- **Private Channel -** This serves as a private channel between commercial banks and the central bank to make private requests such as redeem requests (exchanging in CBDC tokens for another currency)

Project Aber was built on Hyperledger Fabric, an open-source, permissioned distributed ledger technology (DLT) tied to IBM and Linux. Hyperledger is the most popular DLT chosen among top blockchain institutions.



blockdata.tech

Fabric provides scalability and security for platforms using it, allowing for private transactions or confidentiality in contracts. This makes it a suitable choice for Project Aber, as the CBDC will be tied to sensitive data and private transactions associated with the Saudi Arabia and UAE governments.

To date, the project itself is still being heavily tested and remains a pilot program.

South Africa (Project Khokha, Project Dunbar)

Key Metrics

- Total GDP: $335 billion
- Population: ~59 million
- GDP per capita: $5,655
- World Ranking by GDP: 36th

Overview

Project Khokha was originally founded and launched in 2018 to explore the use of distributed ledger technologies for payment settlements in South Africa. This is now referred to as PK1.

The Intergovernmental Fintech Working Group (IFWG) of South Africa announced in February 2021 of its intentions to launch Project Khokha 2 (PK2) - a project meant to explore CBDCs and blockchain technologies for wholesale transactions in South Africa. More specifically, PK1 explored the feasibility of deploying DLTs and PK2 includes direct studies on the impact to payment systems, trading, settlement clearing, and other core functionalities of banking systems.

Figure 1: Conceptual design of the Project Khokha 2 proof-of-concept

DLT network	wCBDC Zone	Khokha Hub			
Technology	R3 Corda	BitFair (A Cosmos implementation)			
Description	The overall network managing wholesale central bank money (wCBDC) on DLT, including the (i) Admin Console; (ii) Engine; and (iii) DLT network.	The Khokha Hub DLT network enabled the issuance of, and trade in, debenture tokens. The final design meant that it fulfilled the role of a trading platform, (de)centralised securities depository, securities settlement system and elements of a payment system. The Khokha Hub served as a token trading platform (TTP) enabling interoperability with other DLT platforms such as the wCBDC Zone through a software bridge.			
Ownership, Governance and Operator	SARB (central)	Envisioned to be a consortium* of market participants (decentralised) in the POC, with the Khokha Council serving as the governance structure. Any market participant may propose business logic (modules) which the Council votes on to determine whether it is implemented on the platform. * Theoretically, any of the market participants could establish such a DLT-based market infrastructure under a more centralised structure.			
		Software bridge			
Component	wCBDC DLT network	Debenture token module network	Khokha Token module	Debenture maturity engine (module)	Decentralised exchange module
Prototype brief	wCBDC	Debentures on DLT	Wholesale digital settlement token (wToken)	Debentures on DLT	Debentures on DLT
Tokens	wCBDC	Debenture token (a security token)	Khokha Token		Fractionalised Debt at Maturity (FDM) Token
Component/ module development and oversight	SARB	The SARB's Financial Markets Department (FMD)	Consortium of central banks	FMD	Secondary market participant (could be anyone)
Access	Settlement banks	Debenture buyers (commercial banks)	Debenture buyers (commercial banks)	Debenture buyers (commercial banks)	Debenture buyers (commercial banks)
Description	wCBDC tokens are used to purchase debenture tokens in the primary market	Debenture tokens are issued in the primary market	Khokha Tokens are used to purchase debentures in the secondary market. The Khokha Token is a commercial bank settlement asset/ token	Discharges debenture maturity obligations	Enabling trade in the secondary market

Project Khokha 2 - IFWG

This was followed by an announcement by the South African Reserve Bank (SARB) of a coming feasibility study that received a major update in Q2 2022. PK2 brought together multiple major operating South African banks, including the following:

- FirstRand
- Absa
- Standard Bank
- JSE Limited
- Nedbank

The project was headed by the IFWG as an Innovation Accelerator Project and has since reached conclusion, with SARB making the following technical observations:

- Porting of wCBDCs (wholesale CBDC) was possible but included associated complications and risks, such as creating a split when technical/operational and legal settlements took place

- wCBDCs as riskless settlement assets was fundamental as it facilitated payments and reduced liquidity risk within the debenture token market

It was also noted by researchers in the Q2 2022 report that the issuance of wCBDC tokens required additional work and study to understand all the implications of how these technologies would be assessed in policy-making or regulatory frameworks.

In addition to PK2, South Africa has also engaged in a joint study called Projet Dunbar. This project was created to develop prototype interoperability platforms to facilitate the cross-border payments of multiple CBDC tokens.

Project Dunbar is being led by the Bank of International Settlements Innovation Hub and includes the following parties:

- South African Reserve Bank (SARB)
- Reserve Bank of Australia (RBA)
- Monetary Authority of Singapore (MAS)
- Bank Negara Malaysia (BNM)

Similar to the Multiple Central Bank Digital Currency (m-CBDC) Bridge project being built by China, Thailand, the UAE, and others, Project Dunbar is establishing the framework for global trade, transacting, and cross-border settlements through CBDCs on distributed ledgers.

Research & Development

As of Q2 2022, there are over 50 different countries with CBDCs that have either entered development or at least in the research phase. The following represents an overview of CBDCs that have entered testing from different regions:

Brazil

Key Metrics

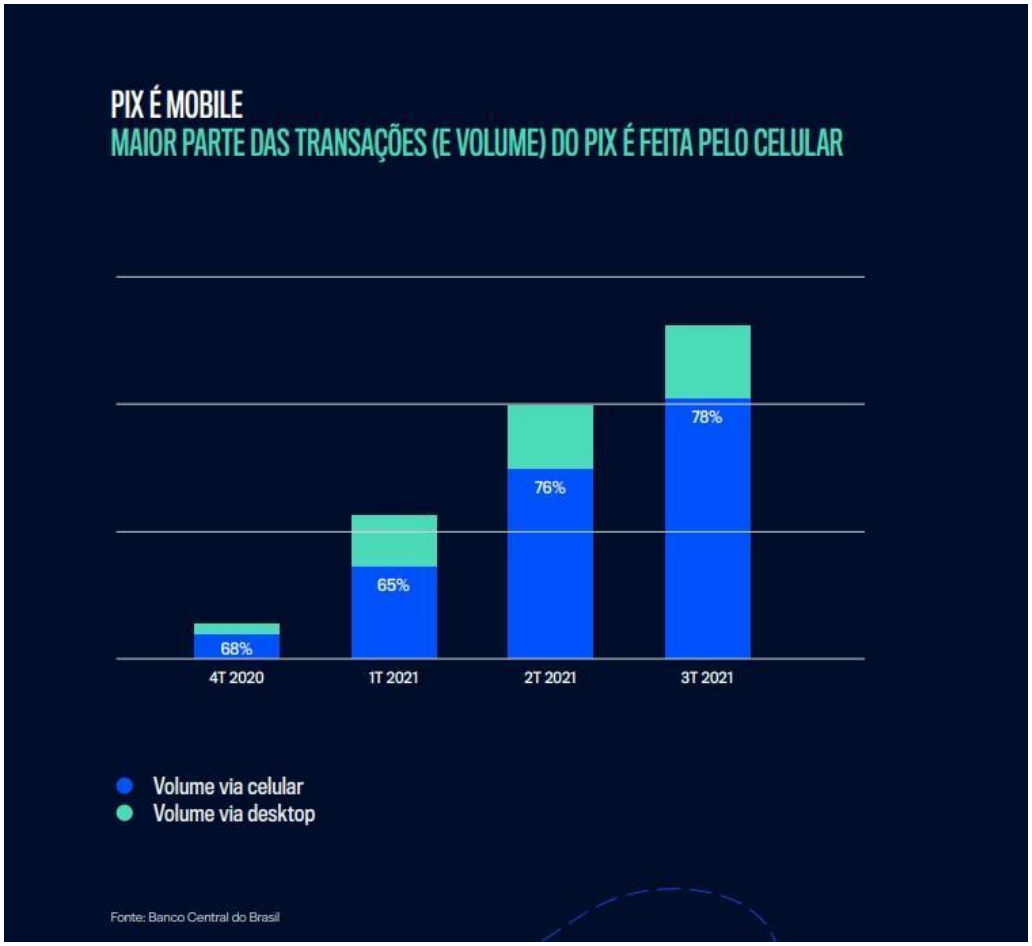
- Total GDP: $1.44 trillion
- Population: ~212.5 million
- GDP per capita: $6,796
- World Ranking by GDP: 10th

Overview

The Central Bank of Brazil (Banco Central do Brasil or BCB) announced in May 2021 its intentions to explore the possibility of digitizing the Brazilian Real, the native currency to the country.

For Brazil's expanding economy, the implementation of digital payments services would allow the BCB to improve the efficiency of its payment systems and establish a methodology to provide banking services to Brasilians who lack access.

The BCB stated that it intends to research, develop, initiate a pilot project, and then fully launch a CBDC for REAL Digital within two to three years of its June 2021 announcement. The intentions for Brazil to develop a CBDC come on the heels of its official launch of PIX payment systems, an overarching modernization of the country's payment structure. PIX has 87 million users.



PIX Payment System Growth - EBANX

The BCB formed multiple partnerships in which to develop and launch support for REAL Digital. These strategic partnerships were formally made public in a Q2 2022 update from President of the BCB Roberto Campos Neto.

They include:

- Mercado Bitcoin (CEX)
- ConsenSys (software)
- Aave (crypto lending protocol)
- Visa
- Microsoft

In April 2022, Neto also announced that Brazil would launch an operational CBDC pilot program in the later half of 2022, aiming for Q3 or Q4. It was also stated that Brazil had intentions to develop usable smart contract technologies, though cryptocurrencies were off Brazil's radar as far as payment options were concerned.

Germany

Key Metrics

- Total GDP: $3.85 trillion
- Population: ~83 million
- GDP per capita: $46,252
- World Ranking by GDP: 4th

Overview

The central bank of Germany - Deutsche Bundesbank of the Republic of Germany - helped to facilitate the passing of a cryptocurrency law in 2020 that paved the way for German commercial adoption of blockchain technologies and crypto payment systems.

Bundesbank has long outlined the “undesirable” qualities of CBDCs as a digital payment solution and is instead engaged in research and development on the use of distributed ledgers alongside traditional fiat financial applications.

The use of blockchain technology powered by smart contracts is helping Germany to approach the digital payments problem from a more democratic approach, taking a different route versus other world leaders.

In addition to investigations into DLTs and smart contract applications, Germany has also been an active participant in experiments with a digital Euro within the European Central Bank system (ECB).

India

Key Metrics

- Total GDP: $2.66 trillion
- Population: ~1.4 billion
- GDP per capita: $1,927
- World Ranking by GDP: 5th

Overview

India has long been known for its strict takes on cryptocurrencies and decentralized applications - more so than that of its neighbor China. In 2019, the government of India introduced a law banning the use of all cryptocurrencies, corresponding with hefty prison terms and large fines for violations.

The country has flip flopped on the issue since 2019, with different proposals being introduced through 2021 into 2022. This comes on the heels of the Reserve Bank of India announcing in March 2021 of its plans to eventually introduce a digital currency to India tied to the Rupee.

In February 2022, the Indian government officially backpedaled from its original harsh stance on the private cryptocurrency market and formally recognized cryptocurrency trading. The catch here was the introduction of a substantial 30% tax on all virtual asset transfers, a move that prompted many crypto-related organizations to move operations out of India.

The digital rupee would inherit all of the same qualities as the rupee itself and serve as a complementary currency rather than a 1:1 replacement for cash. This CBDC is in full development and is expected to be released as a pilot sometime in late 2022 or 2023.

Shri Shaktikanta Das, the governor of the Reserve Bank of India, acknowledged in the March 2021 address that "FinTech is expected to challenge the financial sector with innovations and its exponential growth" and went on to say that the importance of digital payment systems is prevalent in India and elsewhere in post-pandemic world.

Japan

Key Metrics

- Total GDP: $5.06 trillion
- Population: ~126 million
- GDP per capita: $40,193
- World Ranking by GDP: 3rd

Overview

In April 2021, the Bank of Japan (BOJ) officially announced its intentions to kick start a proof of concept phase for the development of a CBDC that would be tied into its native currency, the Yen. Japan initially started its preliminary research on digital payment options and CBDCs in October 2020 in an address made by the BOJ.

In March 2022, the BOJ confirmed the completion of its first phase of CBDC testing. The second phase of testing has already commenced, with Japan choosing to focus primarily on retail use cases over wholesale applications. A commercialized version of Japan's CBDC is anticipated to be available sometime in 2023.

Notably, Japan is approaching CBDCs with haste and as a strictly complementary option in addition to offline cash. There is a particularly heavy use of cash within Japan that can be tied to the widespread disruptions caused by the 2011 earthquake and tsunami that cost Japan $199 billion (16.9 trillion yen), destroyed more than 120,000 buildings, and took nearly 20,000 lives.

United Kingdom

Key Metrics

- Total GDP: $2.76 trillion
- Population: ~67 million
- GDP per capita: $41,059
- World Ranking by GDP: 6th

Overview

The Bank of England announced a partnership with the HM Treasury in April 2021 to explore the potential implications and road map to developing a CBDC token for the United Kingdom (UK). This led to the creation of the CBDC Engagement Forum and CBDC Technology Forum.

These organizations are specifically tasked with:

- Coordinating the exploration of objectives, use cases, opportunities, and risks of a UK CBDC
- Guide design features of a CBDC
- Support the assessment of an overall case for developing (or not developing) a CBDC for the UK
- Monitor international CBDC developments

The Bank of England followed up this announcement with the release of a tentative CBDC road map to further conduct research on the development of a CBDC. At this stage, however, the UK is still strictly in the research phase of this endeavor.

United States

Key Metrics

- Total GDP: $20.95 trillion
- Population: ~331.5 million
- GDP per capita: $63,206
- World Ranking by GDP: 1st

Overview

The United States Federal Reserve released a report outlining thorough research and the implications of a US-CBDC in January 2022. The report itself makes no reference to the confirmed development of a CBDC, but conversations amongst top figures such as Treasury Secretary Janet Yellen and Federal Reserve Chairman Jerome Powell have made headway to a potential coming USD-based CBDC.

In March 2022, the Biden Administration officially passed an executive order pertaining to digital assets that calls for a full government effort to research, develop, and implement a USD-CBDC.

Specifically, the executive order (in relation to digital assets) calls for the following:

- Protect US consumers, investors, and businesses
- Protect US and global financial stability by mitigating systemic risk
- Mitigate illicit finance
- Promote US leadership in tech and economic competitiveness to reinforce US leadership in the global financial system
- Promote access to safe and affordable financial services
- Support FinTech advancements
- Explore a US central bank digital currency

As of Q2 2022, the United States remains only in the research phase of CBDC development and has not indicated a full commitment to the development of a digital currency.

Summary

There has been a major global effort to introduce digital currencies into various economies over the last several years. This has been split into two different developing entities - decentralized cryptocurrencies in the form of stablecoins (cryptoeconomy) and state-sponsored central bank digital currencies (CBDCs) for use in the greater global economy.

As of Q2 2022, there is an adoption race between the two for market share over global money supplies. CBDCs or similar payment currencies are being explored by countries representing over 90% of global GDP and billions of individuals. The cryptoeconomy remains a $1 trillion + market with decentralized blockchain networks experiencing exponential growth.

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