

Stablecoin ecosystem primer

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Summary

- Stablecoins are a rapidly growing part of the digital asset ecosystem categorized into three subsectors in the DAR Industry Taxonomy Stable & Fiat Backed sector: fiat collateralized stablecoins, crypto collateralized stablecoins, and algorithmic, non-collateralized stablecoins.
- Tether (USDT) is the most utilized stablecoin with a market capitalization of over \$30 billion.
- Dai (DAI), the most utilized crypto-collateralized stablecoin, continues to gain popularity.
- Regulators and Central Banks around the world are paying closer attention to stablecoins.
- A number of Central Banks are launching or considering sponsoring a central bank digital currency (CBDC).

A stablecoin is a digital asset that attempts to peg its value to a target price in order to achieve price stability. Stablecoin demand comes primarily from digital asset traders and investors who seek to maintain volatility-resistant stable valuations while replicating the instant processing and settlement abilities of cryptocurrencies.



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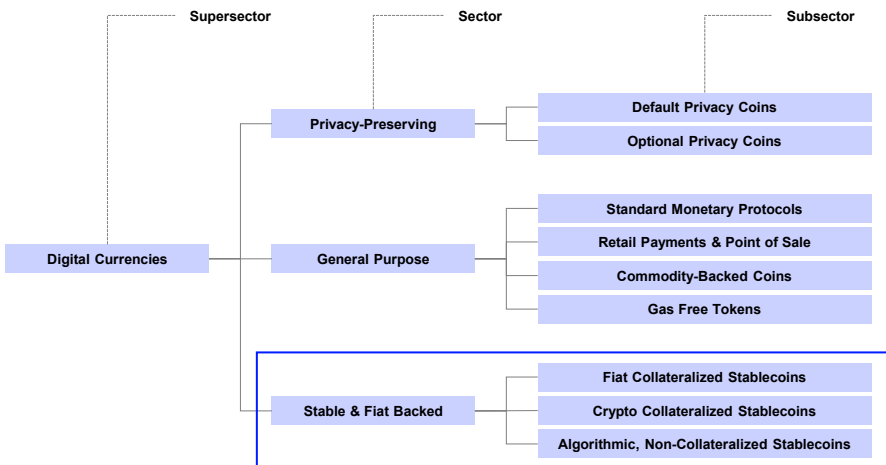
Overview

This report highlights growth and public initiatives related to digital assets, blockchain, or distributed ledger technologies (DLT) in the stablecoin sector. Our report is compiled from Digital Asset Research’s (DAR) data sources, public sources, media reports, and press releases, and, while wide-ranging, it does not necessarily include every initiative related to the sector.

Stablecoin definition

A stablecoin is a digital asset that attempts to peg its value to a target price in order to achieve price stability. Stablecoin demand comes primarily from digital asset traders and investors who seek to maintain volatility-resistant stable valuations while replicating the instant processing and settlement abilities of cryptocurrencies.

Figure A – Stablecoins in the DAR industry taxonomy



Source: Digital Asset Research

DAR Stablecoin subsector definitions

Fiat Collateralized Stablecoins: Stablecoins backed by a pool of fiat collateral held by a centralized custodian.

Crypto Collateralized Stablecoins: Stablecoins where collateral is posted in the form of a digital asset, often in a multi-signature (multisig) smart contract that can clawback assets as a result of volatility in the collateralized asset.

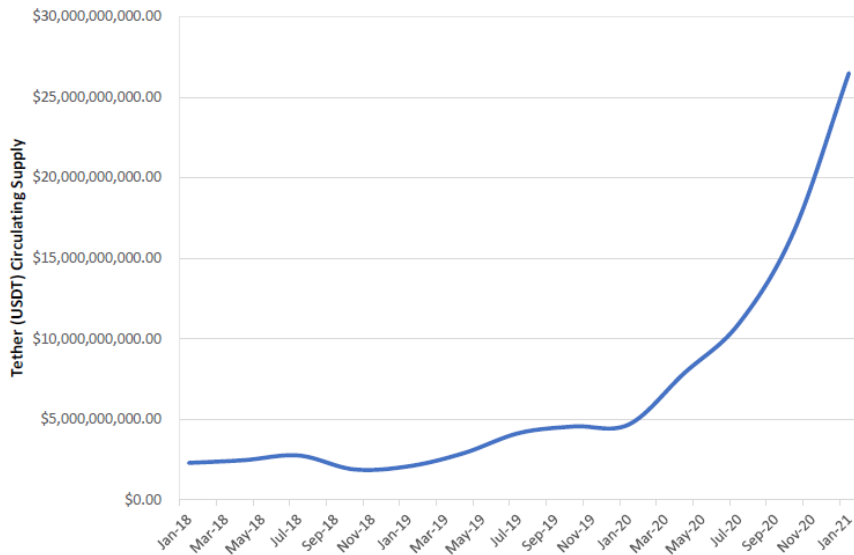
Algorithmic, Non-Collateralized Stablecoins: Stablecoins that do not employ a reserve model to guarantee stability, but instead rely on a purely algorithmic system to value the asset on par with fiat currencies using seigniorage shares.

The most common example of a stablecoin is a digital asset that pegs its value to a fiat currency. This provides market participants with the ability to take profits, hedge, and conduct other financial strategies without ever having to exit the digital asset space. Prior to the existence of a widely used stablecoin, market participants had to sell digital assets back into fiat currencies through spot exchanges, incurring larger fees and slower processing times.

Education

The rapid increase in stablecoin popularity prompted responses from regulators and central banks. Central banks around the world are now discussing and actively exploring the concept of issuing their own CBDC, and regulators such as HM Treasury in the UK and the New York Attorney General's office in the US are paying closer attention to stablecoin providers.

Figure B – Tether (USDT) supply growth



Source: Digital Asset Research, Tether

Types of stablecoins

Market participants actively use multiple types of stablecoins in digital asset markets. Below, we cover five types of stablecoins and their current standing in the industry.

Fiat collateralized

The most common type of stablecoins are backed (or collateralized) by fiat currencies such as the USD, EUR, and others. Fiat currencies or similar assets will be kept in bank accounts or other custodians to support the value either on a 1:1 ratio or on a fractional basis.

The majority of fiat-collateralized stablecoins are controlled by centralized entities, with the most well-known being Tether (USDT) by Bitfinex/iFinex and USD Coin (USDC) by Coinbase and Circle. These centralized entities are responsible for managing the circulation of the stablecoins by destroying existing supply whenever users redeem their Stablecoin for fiat currency and vice-versa.

Crypto collateralized

Crypto-collateralized stablecoins are backed by other cryptocurrencies and promote decentralization by conducting processes on a blockchain without the need for any centralized fiat counterparties.

Unlike traditional finance that relies on credit, crypto-collateralized stablecoins tend to enforce over-collateralization in order to mitigate liquidation risks during volatility events. This means that users need to store a substantially larger amount of capital in the protocol to receive the stablecoin. For example, to receive \$1,000 worth of stablecoins, users might need to deposit \$2,000 worth of cryptocurrencies. This is necessary to withstand price volatility in the digital asset market. If the underlying value of the collateral drops below the peg, the collateral will automatically be liquidated.

Other than transparency and decentralization, one significant advantage of a crypto-collateralized stablecoin is its flexibility. Users can generate, purchase, sell, and interact with blockchain-based applications using crypto-collateralized stablecoins at any moment without the need to contact a specific entity.

The most popular crypto-collateralized stablecoin is DAI by MakerDAO. It is currently the third-largest stablecoin by market capitalization (over \$2 billion) in the digital asset market.

Algorithmic non-collateralized

Algorithmic non-collateralized stablecoins are an innovation that aim to stabilize the price of a token without requiring collateral. These stablecoins use algorithms to adjust and balance the circulating supply of the token, increasing the total supply as the price goes up and vice versa, in order to shift the price of the token toward the target price. To this point, algorithmic stablecoins have not seen much adoption due to their token protocols having trouble maintaining price stability.

Private company stablecoins

Some large firms are trying to create their own stablecoins that can potentially replace parts of the existing financial infrastructure if the projects become successful. The most notable example is Facebook's digital currency, Diem (previously known as Libra). Diem aims to build a network that enables financial services for people around the world, including those who are unbanked. This initiative by Facebook [has been viewed with caution by lawmakers and regulators](#).

Central Bank Digital Currency

A central bank digital currency (CBDC) is a blockchain-based token issued by a central bank to represent a fiat currency. The discussion surrounding CBDCs first started as cryptocurrencies around the world [gained traction](#), causing a potential threat to the existing traditional banking system. See **Appendix 1.0** for a detailed breakdown of CBDCs.

In emerging markets with weaker fiat currencies, cryptocurrencies may pose an additional threat to the sovereignty of the existing fiat currency, especially as they become more popular amongst citizens. Recently, the Nigerian Central Bank [banned cryptocurrencies](#) because of crypto's strength in the country.

Stablecoin snapshot

Name	Ticker	Collateral	Launched	Custody & reserves	Background developments	Free model
Tether	USDT	Fiat backed	2014	Bank	Tether aims to keep a fixed 1:1 exchange ratio with the USD. In 2019, Tether updated its disclosure statement explaining that it is no longer backed by 100% USD, but by a combination of reserves (fiat, cash, loans, etc.).	Tether charges 0.1% per fiat deposit/conversion into Tether and either \$1,000 or 0.1% (the greater one) for withdrawal. It also charges a \$150 non-refundable verification fee. Whitepaper: Tether: Fiat currencies on the Bitcoin blockchain
USD Coin	USDC	Fiat backed	2018	Bank	USD Coin is a fiat-backed stablecoin created by Coinbase and Circle to address the need for stronger transparency and governance. It keeps a 1:1 peg to the USD and issues a publicly available monthly attestation to prove 100% reserves.	Coinbase and Circle do not charge any fee for USDC related services, but third-party fees might apply (bank, blockchain fee, etc.). Whitepaper: Centre Whitepaper
Dai	DAI	Crypto backed	2017	Smart Contract	Dai is a stablecoin native to the MakerDAO ecosystem. Unlike most stablecoins, DAI is backed by crypto assets that are deposited into smart-contract vaults. It has been considered a pioneer in creating a fully crypto native way to stabilize a token's value.	The Maker Protocol charges a stability fee that continuously accrues to the generated Dai balance of a user's Vault. The Stability Fee is continuously compounding interest at a growth rate of x% per second. When the Stability Fee is set to 2%, for example, a user who put in 100 Dai, will have 102.00 at the end of the year, and 104.04 at the end of year two. Historically, the Maker Protocol has struggled to maintain its 1:1 peg to USD, which increased the stability fee from 0.5% to 19.5% at times. Whitepaper: The Maker Protocol: MakerDAO's Multi-Collateral Dai (MCD) System
Binance USD	BUSD	Fiat backed	2019	Bank	Binance USD is a fiat-backed stablecoin created by Binance and Paxos. It keeps a 1:1 peg to the USD held in Paxos-owned US bank accounts. The stablecoin quickly gained popularity because of its integration with the Binance exchange.	Binance and Paxos do not charge any fee for Binance USD related services, but third-party fees might apply (bank, blockchain fee, etc.). Whitepaper: Binance Exchange whitepaper
TrueUSD	TUSD	Fiat backed	2017	Bank	TrueUSD is a fiat-backed stablecoin created by TrustToken. It keeps a 1:1 peg to the USD and is currently one of the first stablecoins to provide real-time attestation on its website.	TrustToken does not charge any fee for TrueUSD related services, but third-party fees might apply (bank, blockchain fee, etc.). Whitepaper: True USD Whitepaper
HUSD	HUSD	Fiat backed	2019	Bank	HUSD is a fiat-backed stablecoin created by Stable Universal (Huobi) and Paxos. It keeps a 1:1 peg to the USD held in Paxos-owned US bank accounts. It was initially launched as a Stablecoin solution for Huobi exchange.	STCoins does not charge any fee for HUSD related services, but third-party fees might apply (bank, blockchain fee, etc.). Whitepaper: NA

Education

Name	Ticker	Collateral	Launched	Custody & reserves	Background developments	Free model
Paxos Standard	PAX	Fiat backed	2018	Bank	Paxos Standard is a fiat-backed Stablecoin created by Paxos, a New York-regulated financial institution. It keeps a 1:1 peg to the USD.	Paxos does not charge any fee for Paxos' stablecoin-related services, but third-party fees might apply (bank, blockchain fee, etc.). An account will incur a monthly charge of \$2 if it maintains a non-zero balance and has no issuance or redemption activity for 12 months or longer. Whitepaper: Paxos Whitepaper
Ampleforth	AMPL	None	2020	Smart Contract	Ampleforth is an algorithmically-stabilized stablecoin that aims to peg its value 1:1 to the USD by fluctuating the token supply. It rebases daily at 1:00 pm EST and alters the token supply depending on its price at the time of rebase. This mechanism means that if an individual owns 1% of the network, that person will still own 1% even if the supply shifts.	Ampleforth does not charge any fees. Whitepaper: Ampleforth: A New Synthetic Commodity
Terra	LUNA	Fiat backed	2019	Bank and Smart Contract	Terra is a blockchain protocol created by Terraform Labs. It issues fiat-backed Stablecoins (KRW, USD, etc.) that are pegged to multiple fiat currencies while also utilizing LUNA to ensure its price stability. The LUNA token is a stabilizing crypto asset that is algorithmically governed in order to help maintain the value of stablecoins issued by Terra.	Terra charges transaction fees to miners ranging from 0.1 - 1%. These fees are used to power the network and ensure price stability of the various stablecoins within the Terra ecosystem. Whitepaper: Terra Money: Stability and Adoption

Price and volume analysis

Tether is the most utilized stablecoin in the digital asset market. As of February 19, 2021, the fiat-collateralized stablecoin has a market capitalization north of [\\$33.7 billion](#), a **617% increase** from [\\$4.7 billion](#) on February 19, 2020. Despite being the most popular stablecoin, Tether's price still deviates from its \$1.00 peg from time-to-time, especially during extreme volatility periods or whenever there is a regulatory concern pertaining to the stablecoin.

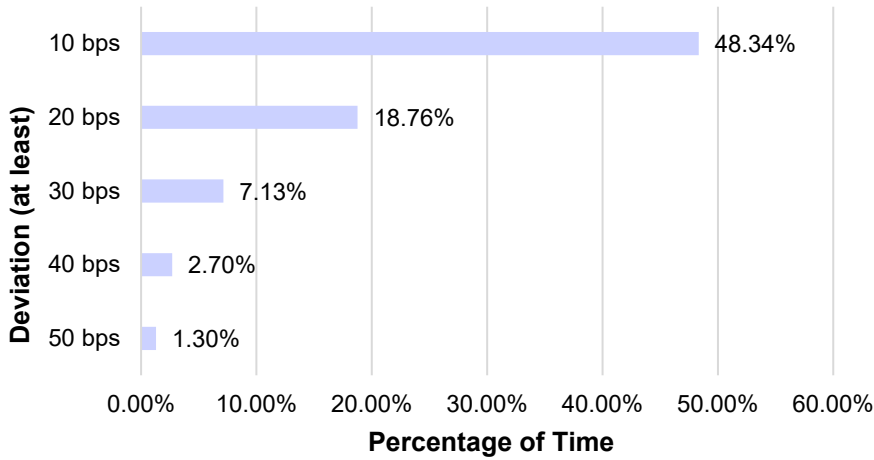
The price data in our analysis and featured in Figures C, D, E and F was taken from January 1, 2020 to February 19, 2021.

Figure C – Maximum and minimum deviation in 2020

Tether (USDT) statistics	
Minimum	\$0.74703
Maximum	\$1.24851
Average	\$1.00074

Source: Digital Asset Research

Figure D – Percentage of time USDT deviates from \$1

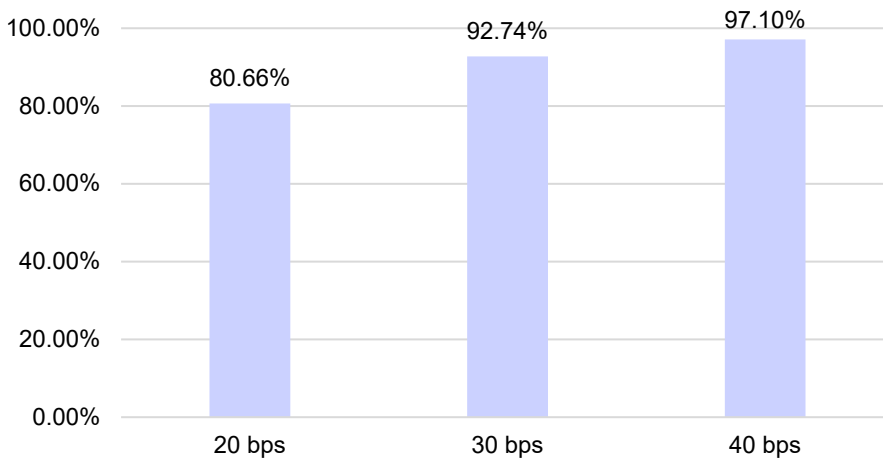


Source: Digital Asset Research

Tether deviations tend to stay under 40 bps

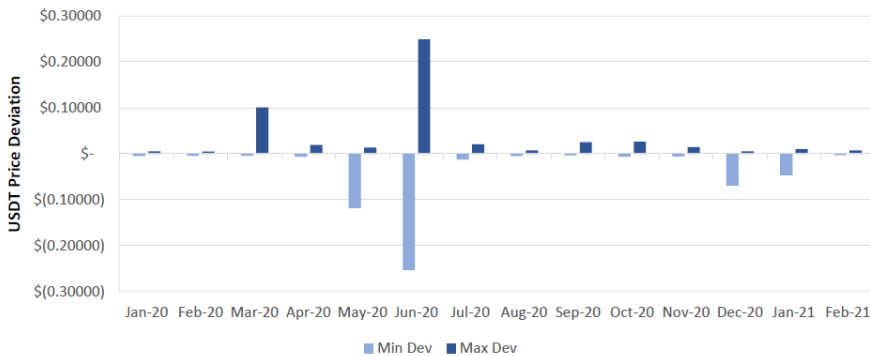
Our analysis shows that Tether price deviation stayed **under 40 bps 97.10% of the time in the past 14 months**. This is despite the digital asset market experiencing record trading activities due to Bitcoin's price appreciation.

Figure E – Percentage of time USDT deviation stays under 20, 30, and 40 bps



Source: Digital Asset Research

Figure F – Monthly maximum and minimum deviation

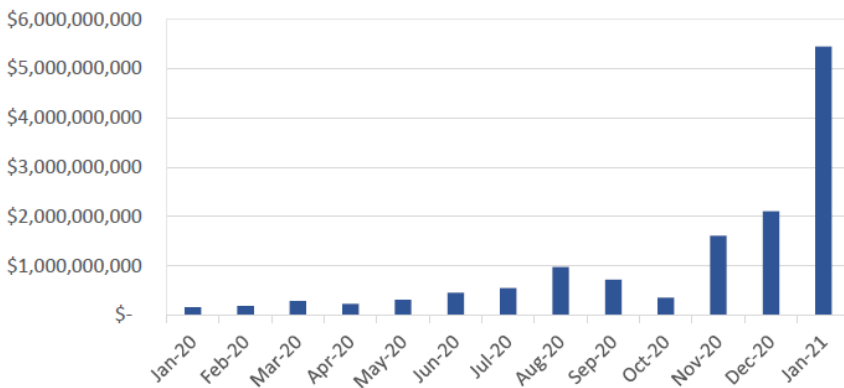


Source: Digital Asset Research

Volume grows alongside the industry market cap

Unsurprisingly, Tether volume grew alongside total digital asset market capitalization, with a significant increase in January 2021 as Bitcoin broke its all-time high.

Figure G – Tether volume across DAR vetted and watchlist exchanges



Source: Digital Asset Research

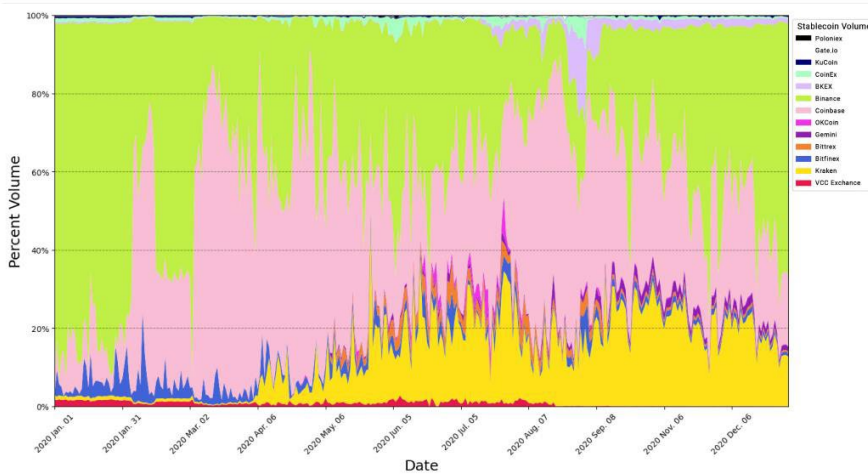
See **Appendix 2.0** for details about DAR vetted and watchlist exchanges

DAI’s popularity

DAI, the most popular crypto-collateralized stablecoin, has continued to gain popularity with multiple exchanges supporting the stablecoin, as shown in Figure H.

Binance and Coinbase dominated DAI volume throughout 2020 in comparison to other Vetted and Watchlist Exchanges (See **Appendix 2.0** for definitions of DAR Vetted and Watchlist Exchanges) that have non-trivial DAI pairs trading volume, while Kraken saw a significant uptick of DAI volume beginning in April 2020.

Figure H – DAI volume breakdown 2020



Source: Digital Asset Research

Appendix

1.0 Central bank digital currency initiatives

Country	Name	Region	Status	Summary
Bahamas	Sand Dollar	Caribbean	Live	The Sand Dollar project was launched in 2019 and went live on October 20, 2020. It was created to reduce the physical security risks associated with cash usage. The Sand Dollar is now available for all residents of The Bahamas and can be utilized at any establishment with a central bank approved electronic wallet.
Belarus	—	Europe	Pilot	Belarus’ central bank announced its pilot program on June 12, 2020. It began allowing 12 commercial and state-owned banks to issue digital tokens and utilize them to conduct business.
Cambodia	Bakong	Asia	Pilot	Cambodia’s central bank launched Bakong on October 28, 2020. It is a real-time interbank payment system built on blockchain technology but does not involve the exchange of central bank-backed tokens.
China	DCEP	Asia	Pilot	China held the second lottery of its CBDC on December 12, 2020. The trial was held in the city of Suzhou and followed a similar mechanism as the previous trial in Shenzhen back in October 2020.
Eastern Caribbean	DXCD	Caribbean	Pilot	The Eastern Caribbean Central Bank (ECCB) launched its pilot program on March 12, 2019. The ECCB is currently inviting the public to register for CBDC access as it prepares for the second phase of the pilot.
Lithuania	LBCoin	Europe	Pilot	The Bank of Lithuania (BoL) launched LBCoin on July 11, 2020. The BoL started working on the project in March 2018 to assess the potential of a blockchain-based CBDC. The project is currently entering the final phase of the trial.
Marshall Islands	Marshallese Sovereign	Caribbean	Pilot	The Marshall Islands first revealed its digital currency plan in February 2018. It aims to create an independent coin that will circulate alongside the USD with a built-in supply mechanism targeting a fixed growth rate of 4% per year.
Sweden	E-krona	Europe	Pilot	The Riksbank first announced its intention to create a pilot program for E-krona in December 2019. The central bank chose to work with Accenture and is currently in a pilot process running from February 2020 to February 2021.

Education

Country	Name	Region	Status	Summary
Ukraine	E-hryvnia	Europe	Pilot	The National Bank of Ukraine (NBU) completed a two-month pilot program in February 2019. Thus far, there have been no notable new initiatives, indicating that it is not a priority for the NBU.
Uruguay	Billete Digital	South America	Pilot	The Central Bank of Uruguay completed its pilot program in April 2018. Thus far, there have been no new announcements and the next steps remain unclear.
South Korea	—	Asia	Pilot	The Bank of Korea launched its 22-month pilot program in April 2020. It is currently in Phase 2 with a plan to begin distribution in 2021.
Thailand	—	Asia	Pilot	The Bank of Thailand (BOT) started its pilot project in August 2018. The project entered Phase 3 in July 2020 as the BOT partners with big businesses to test the payment prototype system.

Countries in CBDC research process vs. exploration process

Country	Name	Region	Status
Brazil	Digital Fiat Currency	South America	Research
Denmark	E-krone	Europe	Research
ECB	Digital Euro	Europe	Research
France	Digital Euro	Europe	Research
Iceland	Rafkrona	Europe	Research
Indonesia	E-rupiah	Asia	Research
Israel	E-shekel	Middle East	Research
Japan	Digital Yen	Asia	Research
Malaysia	E-ringgit	Asia	Research
New Zealand	CBDC Series	Oceania	Research
Russia	E-rouble	Europe	Research
South Africa	Electronic Legal Tender	Africa	Research
Switzerland	E-franc	Europe	Research
Tunisia	E-dinar	Africa	Research
Turkey	—	Middle East	Research
United Kingdom	E-pound	Europe	Research
United States	Digital Dollar	North America	Research

Country	Name	Region	Status
Australia	E-AUD	Oceania	Exploration
Bahrain	—	Middle East	Exploration
Canada	—	North America	Exploration
Curacao en Sint Maarten	—	Caribbean	Exploration
Egypt	—	Africa	Exploration
Ghana	—	Africa	Exploration
Hong Kong SAR	—	Asia	Exploration
India	—	Asia	Exploration
Jamaica	—	Caribbean	Exploration
Kazakhstan	—	Asia	Exploration
Lebanon	—	Middle East	Exploration
Mauritius	—	Africa	Exploration
Norway	E-krone	Europe	Exploration
Pakistan	—	Asia	Exploration
Philippines	Digital Peso	Asia	Exploration
Rwanda	—	Africa	Exploration
Trinidad and Tobago	—	Caribbean	Exploration

Research

Countries that have a publicly reported CBDC scope of study, possibly including comments on the motivation, goals, and conclusion of the research. Examples: A country looking into the appropriate consensus mechanism for its CBDC, a country aiming to steadily diminish the use of banknotes, etc.

Exploration

Countries that are in the process of preparing to study a CBDC or are looking into a CBDC without a publicly reported scope or goal.

2.0 DAR exchange status definitions

	Terminology definitions
Disqualified Exchanges	Digital Asset Exchanges that fail to meet DAR vetting process requirements, such as failing data science tests for manipulation, qualitative diligence, or a liquidity threshold.
Vetted Exchanges	Digital Asset Exchanges that have passed all of DAR's quantitative and qualitative criteria. These are considered the most trustworthy exchanges that are not known to report inflated volumes and have robust policies and practices in place to prevent manipulative behavior by customers.
Watchlist Exchanges	Digital Asset Exchanges that have passed only DAR's preliminary vetting, which includes data science testing and some qualitative diligence. These exchanges are not known to report inflated volumes or have manipulated transactions but may not have institutional policies and practices in place in order to prevent future manipulation and pass full vetting.

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