

# RECOMMENDATIONS TO THE COMMODITY FUTURES TRADING COMMISSION GLOBAL MARKETS ADVISORY COMMITTEE

BY THE DIGITAL ASSET MARKETS SUBCOMMITTEE 6 March 2024

## DIGITAL ASSETS CLASSIFICATION APPROACH AND TAXONOMY

### Approach for the Classification and Understanding of Digital Assets

A clear, consensus-driven approach to classifying assets and the functions they serve underpins robust markets and effective regulation. The evolving digital asset ecosystem has led many to develop proprietary taxonomies to classify digital assets and their related technology. In recognition of this progress, the Commodity Futures Trading Commission’s Global Markets Advisory Council for Digital Asset Markets (“**CFTC GMAC DAM**”) Subcommittee (the “**Subcommittee**”) has engaged digital asset stakeholders across the broader digital asset ecosystem to build a common approach for the classification and understanding of Digital Assets (“**Approach**”).

This Approach aims to set out consistent language for participants in the digital asset ecosystem to promote innovation, identify and address risk considerations, and enable effective regulatory understanding. With this objective in mind, the Approach builds upon the considerable classification efforts of global prudential standard setters and regional authorities, including the Bank for International Settlements (“**BIS**”), the Financial Stability Board and others.

The Subcommittee recommends this Approach be considered an initial basis for a consensus-driven, functional taxonomy. However, as the digital asset ecosystem continues to evolve, so too will the terminology used to classify it. The Subcommittee will reassess any future developments to provide further recommendations to this Approach, based on the guidance of its members. The Subcommittee seeks to support effective rules and regulations for Digital Assets, and recommends continued collaboration between industry, standard-setting bodies, and the regulatory community.

This Subcommittee highlights that this taxonomy is intended to be used as an aid to help draft future legislation, regulations, policies, procedures, and other situations where a common approach to understanding Digital Assets is needed. However, legislative and rule-making efforts for the creation of a regulatory framework regarding Digital Assets are at different levels of maturity across regions and jurisdictions. As such, the Subcommittee also notes that the Approach is drafted in a jurisdictionally agnostic manner, and does not attempt to clarify defined terms in any specific existing published legislative or regulatory text.

### Approach to Classifying and Understanding Digital Assets

**Definition | Digital Asset:** a controllable electronic record<sup>1</sup>, where one or more parties can exclusively exercise control through transfer of this record **and** where the controllable electronic record itself is uniquely identifiable.<sup>2, 3, 4, 5, 6, 7</sup> Excluded from the definition of Digital Asset are those controllable electronic records that exist in and function solely as part of a financial institution’s books and records.

Broadly, Digital Assets may serve a variety of economic functions such as a store of value, medium of exchange or payment, a means for investment or trading, or a utility to access other goods, governance, or other services. Within those functions, when those assets have the characteristics of regulated instruments that do not qualify as Digital Assets, a specific regulatory framework may already apply, and the Subcommittee believes that digitization does not, as a legal or practical matter, alter the functioning of the product or service, with the result that it is unnecessary to look beyond the existing classification for the regulated instrument.

<sup>1</sup> As defined by UCC 12-102(a)(1)

<sup>2</sup> For an appropriate legal definition of control, we refer readers to Principle 6 of the UNIDROIT Principles on Digital Assets and Private Law or the Uniform Commercial Code (UCC) Article 12 – which are broadly aligned and define control by reference to digital asset, protocol or system conferring on the a person: (the exclusive ability to prevent others from obtaining substantially all of the benefit from the digital asset; (ii) the ability to obtain substantially all of the benefit from the digital asset; and (iii) the exclusive ability to transfer the aforementioned abilities to another person. Specifically, UCC Article 12 defines a Controllable Electronic Record (CER). In this context, control is defined as the holder of a CER having the power to “avail oneself of substantially all the benefit of the record”, “exclusively prevent others from doing so”, and “to be able to transfer control of the record to another party” while being able to “identify oneself as holding those powers”; International Standards Organization, ISO/TC 307, 2016

<sup>3</sup> The Subcommittee highlights that efforts to define Digital Asset to date have often focused on the underlying technology and/or technical attributes of said technology. For this Approach, the Subcommittee has aimed to consider a technologically-agnostic approach, to ensure the forward applicability of the definition

<sup>4</sup> Miller, Tokenizing Financial Assets – A Legal Approach, 2023

<sup>5</sup> BIS, A Blueprint for the future monetary system, June 2023.

<sup>6</sup> These properties may also be known as the “core” and “service” layer of an asset; BIS, The Tokenization Continuum, April 2023.

<sup>7</sup> This definition does not intend to include all existing electronic records, such as those where existing rules and regulations may apply (e.g., electronic security records). In these instances, they would not meet the standard of control, transfer, unique identifiability, and/or self-referential status outlined in the above definition.

To the extent that the use of technology impacts the operational risk profile, the relevant systems and control requirements that apply to those activities should be adjusted by each institution to monitor, measure, and mitigate risks. For example, there are different types of networks on which Digital Assets may exist.<sup>8</sup> The Subcommittee recognizes the importance to not classify digital assets by reference to the type of database or network type on which they are issued/recorded. Doing so is inconsistent with how financial instruments (and non-financial instruments) today are classified and could have unintended consequences for the application of market regulations. Further analysis of the infrastructure is outside the scope of this document at this current time and will be considered in further work by the **Subcommittee**.

Given the nature of Digital Assets, regulators and standard-setting bodies should consider key features beyond economic function to classify these assets and determine what regulatory framework, if any, is adequate. This is similar to how frameworks, such as those that are used for classifying a security or financial instrument, are applied today.

*The features of a Digital Asset include, but are not limited to, how the asset: (1) is issued; (2) holds value, (3) confers rights, (4) has fungibility, (5) can be redeemed, and (6) is recorded in books and records. The Subcommittee has endeavoured to define these features below. Digital Assets in this classification have at least one or more of the features captured in the categories, but it should be noted that there may be features developed in the future that have not yet been contemplated at this time. Similarly, not all Digital Assets classified here, have all these features. This is therefore intended as a starting point designed to support regulators and policymakers to take a use case driven approach to evaluate which types of regulations should apply to which type of assets. As these assets evolve and new ones are created, this classification will need to be evolved.*

For this classification approach, the Subcommittee has identified a defining set of features pertaining to controllable electronic records:

**1. Issuer:**

- a. **Definition:** the entity that issues a Digital Asset or for whom a Digital Asset is being issued by a service provider; the entity upon which the person controlling the Digital Asset may have legal claim, for the value of the asset (which necessarily varies by asset type); some Digital Assets may not have an issuing entity (e.g., a bitcoin)
- b. **Example:** a Central Bank is the “issuer” of a **central bank digital currency (“CBDC”)**<sup>9</sup>.

**2. Mechanism Underpinning Asset Value:**<sup>10</sup>

**a. Pegged:**

- i. **Definition (Pegged):** a Digital Asset attempts to maintain a peg if its market price is referenced to the notional value or amount (as may be applicable) of a different asset, basket of assets, index or any other variable on a consistent basis; the market price may reflect the value of a claim on a particular backing asset or entitlement to a fixed amount of value; the value of “pegged” assets may be enabled through “backing”.<sup>11</sup>

- 1. **Definition (Backing):** an asset or basket of multiple assets that purport to guarantee or fund redemptions of the Digital Asset (note that the assets backing a Digital Asset may consist of various asset classes that could differ from the reference asset of the pegged Digital Asset; for example, the Digital Asset may reference the US Dollar, but the backing assets may include high quality liquid assets such as US Treasuries as cash equivalents held in reserve).

**Example (Pegged & Backed):** many **Stablecoins** are examples of pegged and backed Digital Assets (e.g., pegged to the price of one US Dollar and backed either 100% by cash, or by a combination of cash, cash equivalents, and other assets held in a custody account to maintain the value of the peg).<sup>12</sup>

<sup>8</sup> The Subcommittee notes it has not defined those terms in this Approach because it is beyond the Subcommittee’s scope in exercise and believes including definitions and explanations of varying networks detracts from a simple taxonomy that regulators may use. The Subcommittee will endeavor to create a larger, deeper taxonomy in the future that would include such definitions.

<sup>9</sup> The Subcommittee notes that specific CBDC arrangements may vary across jurisdictions and may not explicitly conform to the digital asset definition set out here.

<sup>10</sup> “Peg” and “Collateralization” are concepts that have been examined in further detail by BIS and definitions here adapt and expand on existing taxonomic efforts; BIS, CPMI, IOSCO, Application of the Principles for Financial Market Infrastructures to Stablecoin Arrangements, July 2022; BIS, Will the Real Stablecoin Please Stand Up, Nov 2023

<sup>11</sup> Note – the Subcommittee highlights that the term “pegged” implies a consistent and locked reference of notional value. In practice, the secondary market price of a pegged Digital Asset may fluctuate due to trading activity, but this is not a feature unique to Digital Assets. For example, there are fiat currencies that are “pegged” to the US dollar. However, in practice, the exchange rate between the currencies is subject to fluctuation.

<sup>12</sup> The Subcommittee notes that certain forms certain forms of asset-backed securities and/or collective investment schemes may also be considered “backed” based on the specific application of local laws and regulations

**b. Unpegged:**

- i. Definition:** not designed to reference the value of another asset and, therefore, its price is free-floating, determined by market supply and demand for that asset.
- ii. Example:** many **Cryptoassets**, such as bitcoin or ether, are unpegged.

**3. Rights Conferral:**

- a. Definition:** the attribute of a Digital Asset to provide the party (or parties) that control such Digital Asset a legally enforceable claim or rights against the **issuer**. For example, a monetary claim, rights to participate in future revenue distributions, or share in the losses of, or participate in other arrangements by the issuer such as voting, coupon payments, etc.
- b. Example:** the owner of a **Tokenized Security** is conferred the rights to the recurring cashflows it may pay and or any other applicable rights (e.g., voting rights).

**4. Fungibility – Fungible vs. Non-Fungible:**

**a. Fungible:**

- i. Definition:** a Digital Asset with individual units that are interchangeable on a like-for-like basis.<sup>13</sup>
- ii. Example:** Ether is fungible with other Ether tokens.

**b. Non-Fungible:**

- i. Definition:** a Digital Asset with individual units that are not interchangeable on a like-for-like basis; these Digital Assets could also be described as “unique” or “one of a kind”.<sup>14</sup>
- ii. Example:** Non-Fungible Tokens representing individual pieces of art, with unique artistic features (and where price often varies due to these features), and thus cannot be interchanged with other Non-Fungible Tokens; two **Stablecoins** (as defined herein) from different issuers would **not** be fungible.

**5. Redeemability – Redeemable vs. Non-Redeemable:**

**a. Redeemable:**

- i. Definition:** the ability to relinquish ownership of a Digital Asset in exchange for equivalent value in another asset class, such as money.<sup>15, 16</sup>
- ii. Example:** fixed income **Financial Digital Assets** (as defined herein) may be redeemable for their notional value upon maturity; other **Tokenized Securities** (as defined herein) may be redeemable for the underlying traditional security it represents.

**b. Non-Redeemable:**

- i. Definition:** a Digital Asset where no issuer exists, or the issuing entity has no obligation to redeem the asset.
- ii. Example:** Ether is not redeemable for any reference asset.

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<sup>13</sup> BIS, The Technology of Decentralized Finance (DeFi), Jan 2023

<sup>14</sup> BIS, The Technology of Decentralized Finance (DeFi), Jan 2023

<sup>15</sup> The feature of redeemability has been further explored in the context of stablecoin Digital Assets; BIS, Will the Real Stablecoin Please Standup, Nov 2023.

<sup>16</sup> Further, operational redemption procedure, the liquidity of the pool of redemption assets, and the speed of redemption execution (including during periods of market stress) are all characteristics of a Digital Asset that must be considered in determining whether it is redeemable.

## 6. Nature of Record – Digital Twin vs. Digital Native:<sup>17</sup>

### a. Digital Twin:

- i. **Definition:** an electronic controllable record representing an asset that has been immobilized on another system of record, and reconciled with that original system of record to ensure ownership is reflected precisely.<sup>18</sup>
- ii. **Example:** a **Tokenized Alternative Asset** (as defined herein) (such as **Tokenized Real Estate** as defined herein) is a Digital Twin of that alternative asset that has been immobilized on another system of record.

### b. Digital Native:

- i. **Definition:** a Digital Asset representing the primary record of value, that is not recorded on another system of record and does not require reconciliation with another system of record.
- ii. **Example:** a bitcoin is a Digital Native because it is the original record of value that does not need to be recorded elsewhere to verify ownership.

Note: There may be tokenized arrangements (e.g., in the case of tokens representing a fractionalized interest in a security) that may not be wholly categorized by one of these two features. In these instances, this attribute may not be relevant.

In addition to the attributes that help set out the nature of a Digital Asset, there are other attributes related to a Digital Asset's **intended use case** or **function** that may also be effective tools to understand when seeking to classify them. The Subcommittee notes that the primary objective of this document is to set out definitions. Any relevant regulatory understanding should also account for and vary based on these characteristics. These include:

- **Types of users/holder types** (e.g., *retail vs. wholesale*);
- **intended end user** (e.g., *consumer product vs. financial product*); and
- **the entity that serves as the custodian** (e.g., *regulated depository institution*), if any.

## Classification of Digital Assets

### A. Money or Money-Like Digital Assets

For a Digital Asset to be classified as money or a money-like Digital Asset it must meet one of the following three conditions: reliable store of value, medium of exchange, and unit of account.

#### Digital Money

1. **Central Bank Digital Currencies (CBDC):** digital tokens representing a claim on a central bank for a fixed amount of central bank money denominated in a single currency; also, a liability of a central bank, with no credit or liquidity risk. It may or may not be programmable.<sup>19, 20, 21</sup>
  - a. **“General Purpose” or “Retail” CBDC:** a CBDC that is specifically designed for use in transactions and holdings by **individuals** and/or small and medium-sized enterprises;
  - b. **“Wholesale” CBDC:** a CBDC that is specifically designed for wholesale use in transactions and holdings by regulated financial institutions and could be used in the facilitation of regular financial markets functions (e.g., settlement of securities transactions).

<sup>17</sup> The Subcommittee notes that these terms are important to the classification of Digital Assets as they provide context as to the various record-keeping approaches that may be used to record ownership.

<sup>18</sup> Note: A Digital Twin Digital Asset can be issued after the asset it represents has been created. The Digital Twin does not need to be created at the same time.

<sup>19</sup> BIS, Central Bank Digital Currencies: System Design & Interoperability; BIS Technology of Retail Central Bank Digital Currency, Mar 2020; BIS, Central Bank Digital Currencies, Mar 2018

<sup>20</sup> Board of Governors of the Federal Reserve System, CBDC, Apr 2023

<sup>21</sup> In some jurisdictions, CBDCs may be classified as legal tender.

The Subcommittee notes that as specific CBDC arrangements vary by jurisdiction, the attributes of a **Retail CBDC** and **Wholesale CBDC** may also necessarily vary (e.g., fungibility between the two types).

## 2. Bank Deposits:

- a. **Tokenized Deposits:** digital tokens that represent an existing record of a traditional ownership claim for a bank deposit on the token-issuing bank or depository institution, for a fixed amount of commercial bank money denominated in a single currency.<sup>22</sup>
- b. **Deposit Tokens:** transferable digital tokens issued by a licensed depository institution which evidence a deposit claim against the token-issuing bank or depository institution, for fixed amount of commercial bank money or fiat cash denominated in a single currency.<sup>23</sup>

The Subcommittee notes that this definition should be considered in the context of the applicable legal framework and local regulations of a given jurisdiction. The intent of the definition drafted here is to reflect a global perspective.

3. **“Reserve-Backed” Digital Currencies:** a privately issued (e.g., by a financial market infrastructure provider) digital token where the value of the issued token is **backed** by central bank reserves.<sup>24</sup>

## Money-Like Digital Assets

4. **Stablecoins:** privately-issued, money-like, digital token that aims to maintain a stable value relative to a **peg** specified by a reference asset(s) and designed to minimize value fluctuations relative to these reference assets(s). They are **not** issued by a central bank. They must also be at least **fully backed by** one or more assets specified under the specific regulatory framework, including:<sup>25, 26</sup>
  - a. Cash: to one or a combination of fiat currencies
  - b. Securities: low risk, highly liquid securities such as those classified as High-Quality-Liquid Assets (“**HQLA**”) under the BCBS LCR30 framework (e.g., US Treasury Bills)<sup>27</sup>

The Subcommittee notes that to meet the classification standard of a **Stablecoin**, the **issuer** should provide for the timely redemption of the **Stablecoin**, including during times of market-wide or **issuer**-specific stress (e.g., redemption demands that may exceed the available liquidity for backing assets, or other events that could potentially call into question the solvency of the **issuer**). In practice, the means by which this is achieved may vary.

The Subcommittee also notes that **Stablecoin** issuers use different asset classes to maintain parity with the value of the reference asset. For issuers who hold higher-risk backing assets or no backing assets in the collateral reserve, such as Cryptoassets (as defined in Section D), **the Subcommittee would not classify these as Stablecoins**. This is due to the potential for incremental liquidity risk and volatility that could lead to a loss of confidence in the issuer’s ability to provide for the timely redemption of the Stablecoin. Further, this loss of confidence may lead to secondary market effects affecting the parity of the **Stablecoin** to the reference asset, also known as a “depegging” event. The Subcommittee would instead classify such digital assets as **Other Cryptoassets**.

The Subcommittee further notes that some **Stablecoin** issuers use algorithms to automate the processes that manage supply and demand of stablecoins in relation to the value of the underlying backing reserve. This mechanism has been commonly conflated with the “**Cryptoassets**” category described above and as “algorithmic stablecoins,” which may not have **any backing assets** and purport to solely maintain a peg through use of supply and demand mechanics.<sup>28</sup>

The Subcommittee highlights that in some **Stablecoin** arrangements, issuers may use an algorithm to manage their backing reserve. Such an approach in itself gives rise to the same types of risks as manual reserve management and is not a differentiated

<sup>22</sup> For tokenized deposits, the ultimate record of ownership will continue to be maintained elsewhere.

<sup>23</sup> The Subcommittee notes that (a) and (b) should not be considered new forms of money, but are subject to the same standards as traditional deposits.

<sup>24</sup> The Subcommittee notes that these tokens may also be referred to as Synthetic CBDCs

<sup>25</sup> BIS, CPMI, IOSCO, Application of the Principles for Financial Market Infrastructures to Stablecoin Arrangements, July 2022; BIS, Will the Real Stablecoin Please Stand Up, Nov 2023

<sup>26</sup> The Subcommittee notes that in some arrangements, the specific combination of assets used to back a Digital Asset it may change its nature. For example, certain Digital Assets that are backed by physical gold and other commodities may be classified as digital derivatives in certain jurisdictions.

<sup>27</sup> BIS (BCBS), Liquidity Coverage Ratio (High-quality liquid assets), Dec 2019

<sup>28</sup> BIS, CPMI, IOSCO, Application of the Principles for Financial Market Infrastructures to Stablecoin Arrangements, July 2022; BIS, Will the Real Stablecoin Please Stand Up, Nov 2023

characteristic of a **Stablecoin** arrangement. Rather, it is the determination of whether a backing reserve exists and, if so, whether the assets chosen to be held in this backing reserve are of sufficient quality so as to support the liquidity, timely redeemability, and peg maintenance requirements of the **Stablecoin** arrangement.<sup>29</sup>

Ultimately, the **backing** of a **Stablecoin** must consist of assets of a sufficient quality to effectively mitigate liquidity risk and maintain a stable **peg**. In practice, the exact means of **backing Stablecoins** may vary.

## B. Financial Digital Assets<sup>30</sup>

Typical use cases include financial investment, financial return, and access to capital markets.

### 1. Securities (and other financial instruments):

- a. **Tokenized Security: a Digital Twin** token that represents an underlying security or financial instruments issued on a different platform (e.g., a traditional CSD or registrar), where such representation itself satisfies the definition of a security/financial instrument under local law.
- b. **Security Token: a Digital Native** token that satisfies the applicable regulatory definition of a security or financial instrument under local law.

### 2. Derivatives:

- a. **Tokenized Derivative: a Digital Twin** token that represents an underlying derivative instrument issued and recorded on a different platform, where such representation itself satisfies the definition of a derivative under local law.
- b. **Derivative Token: a Digital Native** token that satisfies the applicable regulatory definition of a derivative instrument under local law.

The Subcommittee highlights that traditional derivative contracts which provide exposure to an underlying Digital Asset (e.g., bitcoin futures) are out of the scope of this document and not considered here, regardless of settlement type (e.g., physically or net in cash).<sup>31</sup>

## C. Alternative Digital Assets

Typical use cases include representation of interest in a good or non-financial asset

1. **Tokenized Alternative Assets: Digital Twin** tokens representing an interest in, entitlement to, or claim on, an alternative (or non-security) asset (or claim on the issuing entity for the asset, where applicable), where such representation itself satisfies the definition of such interest, entitlement, or claim under local law; these alternative digital assets may include:
  - a. Tokenized Physical Commodities (e.g., wheat, oil, corn);
  - b. tokenized Real Estate; or
  - c. other Tokenized Assets of Goods (e.g., carbon credits, art, intellectual property rights, and intangible, discrete assets that only exist in digital form on a programmable ledger platform).

If certain activities are performed on a tokenized non-financial asset, **the classification category may change**. For example, in the case of Tokenized Real Estate, fractionalization may convert the Alternative Digital Asset to a Financial Digital Asset.

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<sup>29</sup> The Subcommittee also highlights that certain characteristics such as the maturity profile of any non-cash assets held as backing for a stablecoin, and the auditability of a Stablecoin's backing, are important factors in mitigating liquidity risk, ensuring timely redeemability, and maintenance of a peg.

<sup>30</sup> This category encompasses different regulated instruments from a legal perspective, which may attract different regulatory treatment amongst themselves and across jurisdictions.

<sup>31</sup> The Subcommittee notes that, in practice, derivatives that provide for physical delivery of a Digital Asset, may be classified differently by applicable regulators, according to local law, in some cases depending on whether the contract is an exchange-traded derivative subject to an established regulatory regime or an over-the-counter derivative.

## D. **Cryptosets** (often referred to as **Cryptocurrencies**)<sup>32</sup>

Typical use cases include a network-specific medium of exchange, unit of account for transaction fees, speculative investment, and branded store of value.

1. **Platform Cryptoassets: non-redeemable Digital Native** tokens, with **no rights conferred** against the **issuer** (if one exists), that may be exchangeable for specified value, is hard-coded into any underlying platform and must serve one or both of the following functions:
  - a. Cryptographic economic incentive to maintain and secure to network or application infrastructure including preservation of processing throughput (e.g., through payment of “gas fees” or staking); or
  - b. universal medium of exchange of the underlying network infrastructure.

Examples of **Platform Cryptoassets** include bitcoin or ether tokens

2. **Other Cryptoassets: non-redeemable Digital Native** tokens, with **no rights conferred** against the **issuer** (if one exists), that are used as a speculative investment.

Examples of **Other Cryptoassets** include “meme-coins” such as shiba inu coin.

As all **Cryptoassets** are not pegged to the value of a reference asset, do not represent ownership or other legal claim against a company or other type of issuer, nor guaranteed by a regulated financial institution, their value is driven by market dynamics and/or supply and demand mechanics.

## E. **Functional Digital Assets**

Typical use cases include governance or access to a specific infrastructure or app, and specific functional utility.

1. **Functional Digital Assets:** digital tokens that **cannot be exchanged for value** issued (where applicable) to provide the owner of the token with a specific utility such as:
  - a. Application-specific governance rights, voting weights, or decision-making authority; and
  - b. record of entitlement right to rewards or revenue from a specific application or community.

As the Digital Asset ecosystem continues to evolve, the Subcommittee recognizes that there may be additional functions or utilities that are not contemplated at this time, and as such expects this classification category to continue to evolve over time.

## F. **Settlement Controllable Electronic Records**

Typical use cases include digital record-keeping, particularly in facilitation of financial transactions.

1. **Settlement Tokens:** digital tokens where such representation itself does not satisfy the definition of a security bank deposit, nor financial instrument under local law and is used solely to transfer or record ownership or perform other middle/back-office financial functions (e.g., collateral transfer, recording of ownership); often exists temporarily, typically for the length of the transaction it facilitates. This may be called the “books-and-records” use case, and a **Settlement Token** would not be considered as Digital Asset as defined herein.

## G. **Other Digital Assets**

The Subcommittee recognizes the potential for future innovation and has retained this bucket for new developments that may arise in the digital assets ecosystem.

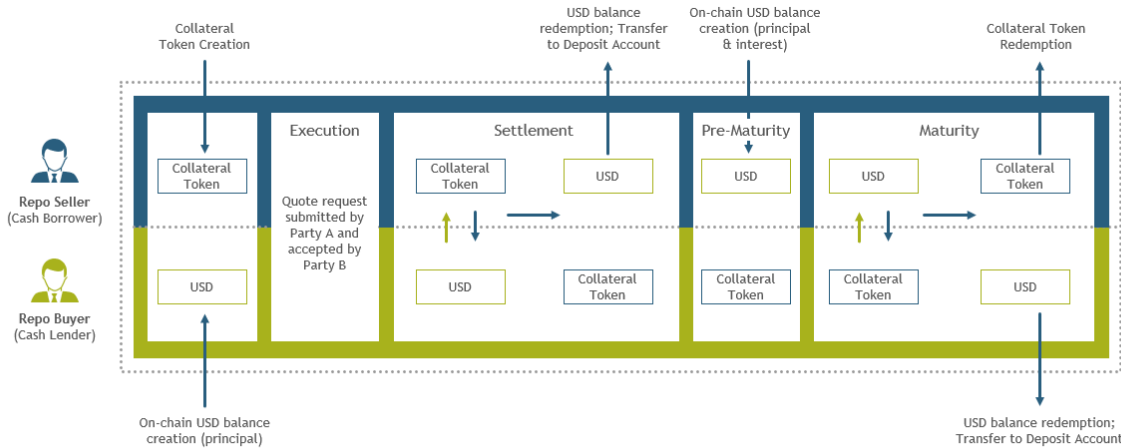
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<sup>32</sup> The Subcommittee notes that while Cryptocurrencies is the term used to classify these Digital Asset’s in practice, these Digital Assets typically do not meet the standard required to be considered “currency” and propose an updated classification approach. The Subcommittee also notes that in certain public-sector and private-sector publications, “cryptoasset” and/or “cryptocurrency” has been used as a catchall term for Digital Assets.

## Appendix – Collateral Use Case

In 2020, the Onyx by J.P. Morgan business unit within J.P. Morgan’s Corporate and Investment Bank launched Onyx Digital Assets, a private permissioned distributed ledger technology (“DLT”) platform. The Digital Financing Application is a web-based application on the Onyx Digital Assets platform that enables J.P. Morgan and clients of their Markets business to settle repos. Unlike other repo platforms, the Digital Financing Application settles repos delivery-versus-payment DvP through the simultaneous exchange of cash and collateral on the Onyx Digital Assets ledger. Operating mainly in the U.S., Onyx had processed repo transactions worth over \$500 billion by end of 2022.<sup>33</sup>

### Exhibit | Illustrative Workflow of DLT-enabled Exchange of Collateral and Cash during a Repo



Source: Adapted from The Future of Distributed Ledger Technology in Capital Markets, J.P. Morgan & BCG, Nov 2022, <https://media-publications.bcg.com/The-Future-of-Distributed-Ledger-Technology-in-Capital-Markets.pdf>

#### How It Works (above):

1. The borrower (the “Repo Seller”) escrows assets to be used as collateral with traditional triparty agents.
2. The lender (the “Repo Buyer”) transfers cash from their traditional demand deposit account (“DDA”) at JPMorgan Chase Bank, NA (“JPMCB”) into a **tokenized bank deposit** issued by JPMCB and maintained on the Onyx Digital Assets ledger
3. Once both participants have their assets in place, the trade details, which include both a “Settlement Time” and a “Maturity Time,” are entered into the application.
4. When the Settlement Time arrives, assets are exchanged, leaving the Repo Seller with cash due to their possession of the **tokenized bank deposit** and the Repo Buyer with an entitlement to the underlying securities, which are still sitting at the triparty agent. The Repo Seller can transfer the cash outside of the Onyx Digital Assets ecosystem to fund settlements, make margin payments or otherwise make use of the proceeds.
5. Prior to the Maturity Time, the cash is transferred back from the Repo Seller’s DDA by redeeming the **tokenized bank deposit** for an equivalent amount of cash. At Maturity, the assets are swapped, and the collateral is left unencumbered.

This new settlement technology has allowed Repo Sellers and Repo Buyers on the Onyx Digital Asset Platform to achieve significant improvement in repo settlement efficiency and take advantage of new transaction types, while staying within the structural framework that has governed repo markets for years.

<sup>33</sup> “Blockchain Brings collateral mobility to traditional assets”, JP Morgan Insights, 2022, <https://www.jpmorgan.com/solutions/treasury-payments/insights/blockchain-onyx-asset-tokenization>