SB METHODOLOGY PAPERS NO 1

Stablecoin Beat S0/S1/S2 Monetary Aggregates

Specification 1.0

Stablecoin Beat Research

August 2026

JEL E41, E42, G23

Keywords stablecoins, monetary aggregates, tokenized money, claim structure, statistical methodology

DOI 10.5281/zenodo.21861584

Online https://stablecoinbeat.com/papers/sbmp-01/

Abstract

This paper specifies the S0/S1/S2 stablecoin monetary aggregates: a three-tier classification of dollar-denominated stablecoin claims ordered by the number of redemption steps separating the token a holder owns from the base instrument's redemption endpoint, which is an issuer's redemption obligation or a protocol redemption mechanism. S0 measures base stablecoin supply, the native issuer liabilities intended to redeem at or track par. S1 measures represented supply, adding tokenized representations of S0 claims created in other settlement environments. S2 measures extended claims, adding transferable instruments whose principal exposure is a traceable claim on an S0 asset. Each tier is defined both net, deduplicating backing relationships, and gross, counting every simultaneously circulating token layer. The ratio of gross extended claims to base supply, the representation multiplier, measures how much claim structure has been built on each unit of base supply. The specification states the equations, the admission policy for constituent instruments, edge-case rules covering bridge designs, wrapper chains, tranches, rebasing designs, issuer treasury balances, tokenized securities and claims issued in excess of the backing held, and a versioning and revisions policy. The aggregates are published as a maintained daily series.

Keywords: stablecoins, monetary aggregates, tokenized money, claim structure, statistical methodology. **JEL:** E41, E42, G23.

Status of this document

This is version 1.0 of the specification. It is normative: the numbered rules in sections 2 through 5 govern how the published S0/S1/S2 series is compiled, and any figure labelled S0, S1 or S2 by Stablecoin Beat is compiled under a stated version of this document. Section 7 defines how versions change and how published values are revised. Definitions in this document are stated in the present indicative; "is included" and "is excluded" carry normative force.

---

1. Introduction and motivation

Every monetary statistic begins with an ordering choice. The fiat monetary aggregates compiled by central banks, among them the monetary base and the money stock measures M1 and M2, order claims on the banking system by liquidity: currency and transaction deposits first, then instruments that are progressively slower or more costly to convert into means of payment. That ordering follows from the question those aggregates answer, which concerns spending capacity.

Stablecoin supply poses a different question. The instruments are, with few exceptions, transferable on demand and settle in seconds, so a liquidity ordering separates almost nothing: a savings wrapper and the base token it wraps are both liquid, and often trade in the same venues within the same block. What distinguishes them is not how quickly a holder can transact, but how many redemption steps stand between the token held and the point at which redemption is finally satisfied. That point, the **redemption endpoint**, is an issuer's redemption obligation for some designs and a protocol redemption mechanism for others. A holder of a base token has a direct claim. A holder of a bridge-issued representation holds a claim on the representation issuer, which holds the base token. A holder of a savings wrapper over that representation stands one step further out again.

The S0/S1/S2 aggregates therefore keep the familiar three-tier shape and change the ordering principle. Where the fiat hierarchy orders money by liquidity, this hierarchy orders claims by the number of redemption steps separating the token held from the base instrument's redemption endpoint, which we call **claim distance**. The analogy to the monetary base, M1 and M2 is a mnemonic for the nesting property, S0 ⊆ S1 ⊆ S2 in coverage, and not a mapping of economic function. S1 is not a stablecoin M1.

Three properties motivate the design.

Aggregation without double counting requires an explicit layer convention. Total value observable across settlement environments exceeds the total of issuer liabilities, because the same base liability can support a representation on another chain and a wrapper on top of that representation, each with an observable outstanding value. Reporting the observable total as supply overstates issuer obligations. Reporting only issuer obligations discards information about the structure built on them. The aggregates report both on the same base, related by an identity.

The structure itself is the measurement of interest. Claim layering per unit of base supply varies over time and is not visible in any single supply figure. The representation multiplier of section 4 publishes it as a series.

A boundary is only useful if it is stated in advance. The instruments at the outer edge of the hierarchy, yield-bearing wrappers, structured tranches, and tokenized securities that settle in stablecoins, are the fastest growing part of the segment and the easiest to aggregate incorrectly. Section 5 states an admission policy whose default is exclusion; section 3 states the rules it relies on.

The remainder of the paper is organized as follows. Section 2 defines the tiers and their net and gross variants. Section 3 states the edge-case rules. Section 4 defines the representation multiplier and, at equal length, what it does not measure. Section 5 states the constituent admission policy. Section 6 documents measurement and source classes. Section 7 states the versioning and revisions policy. Section 8 sets the framework against prior work on stablecoins and money. Section 9 gives citation forms.

2. Definitions

2.1 Notation

Symbol	Meaning
`t`	Observation day, a calendar date in UTC
`U`	The S0 universe: the set of United States dollar par-denominated base stablecoins in coverage at `t`, per section 6.4
`W`	The admitted wrapper set at `t`, per section 5
`n_i(t)`	Native issuance of base coin `i`, net of unreleased issuer treasury balances, consolidated across settlement environments
`b_i(t)`	Outstanding value of tokenized representations of coin `i` issued in settlement environments other than the one where the corresponding base units are held or immobilized
`x_i(t)`	Documented representation shortfall for coin `i`: the excess of representations outstanding over the base units held against them
`ṽ_j(t)`	Observed outstanding value of admitted wrapper `j`
`ℓ_j(t)`	Documented layer-local excess of wrapper `j`'s claims over the value of its immediate backing claim, per rule R9
`v_j(t)`	Admitted outstanding value of wrapper `j`, equal to `ṽ_j(t) − ℓ_j(t)`
`e(t)`	Total wrapper-layer excess, equal to `Σ_j ℓ_j(t)`
`S0(t)`, `S1(t)`, `S2(t)`	The aggregates, in the net or gross variant indicated
`m(t)`, `m_1(t)`	Representation multiplier and bridge-only multiplier

The two exception terms `x_i` and `ℓ_j` are structurally identical: each is the excess of claims outstanding at one layer over the backing held against them at the layer immediately below. Both are layer-local, so they add without double counting, and they are the only points at which the net measures depart from S0.

All quantities are stated in United States dollars at par for base and representation layers, and at outstanding market value for wrapper layers. The valuation asymmetry is deliberate and is stated in rule R8.

2.2 S0, base stablecoin supply

S0 is the total of native, issuer-recognized stablecoin liabilities intended to redeem at or track par, measured net of unreleased issuer treasury balances and consolidated so that a single liability is counted once regardless of how many settlement environments it circulates in.

```
S0(t) = Σ_{i ∈ U} n_i(t)
```

S0 is the base measure of this hierarchy. It is not the same compilation as the platform's headline supply figure; section 6.7 states the relationship. A holder of an S0 unit holds a claim at claim distance zero: the unit is itself the redemption endpoint, with no intermediate claim in between.

Consolidation across settlement environments is a property of `n_i`, not a separate adjustment. Where a coin's issuance is recorded per environment, the native measure for each environment excludes units issued against base units immobilized elsewhere, so representation flows cancel within the sum and S0 is net by construction.

A redemption endpoint takes one of two forms, and "claim" is used throughout in the broader sense that covers both. An instrument is eligible for S0 if either holds.

The first is an identifiable redemption obligation, legal or technical. A fiat-backed stablecoin whose issuer undertakes to redeem at par satisfies it legally; a design whose redemption is enforced by contract code satisfies it technically. What matters is that an identifiable counterparty or mechanism stands behind redemption at par.

The second is primary par issuance where the redemption path is protocol-mediated rather than legally personified. A collateralized design in which any holder can retire units against collateral through an open mechanism has no obligor in the legal sense and is nonetheless a base instrument: units are issued at par against value, and the path back to that value is defined and open.

Both describe instruments at claim distance zero, since in both the unit held is the endpoint. Neither admits an instrument that fails the par test, and neither admits a representation or a wrapper. The constituent registry records which prong admits each base instrument.

2.3 S1, represented stablecoin supply

S1 adds tokenized representations of S0 claims: units issued in one settlement environment against base units held or immobilized in another, whose holder's redemption path runs through the representation issuer rather than directly to the base issuer. S1 is reported in two variants.

```
S1_gross(t) = S0(t) + Σ_{i ∈ U} b_i(t)
S1_net(t)   = S0(t) + Σ_{i ∈ U} x_i(t)
```

The gross variant counts every simultaneously circulating token layer. The net variant deduplicates the backing relationship: immobilizing one base unit to issue one representation creates no additional dollar claim on the base issuer, so the two layers net to one.

The net identity reduces to `S1_net(t) = S0(t)` whenever every representation is fully backed, which is the normal state. The shortfall term `x_i` is non-zero only in the case set out in rule R2, the single circumstance in which represented supply measured net departs from base supply.

2.4 S2, extended stablecoin claims

S2 adds transferable instruments whose principal economic exposure is a traceable claim on an S0 asset: savings receipts, staking receipts, lending-vault shares, and tranches over such claims. Admission requires a documented redemption path resolving to exactly one base coin, per section 5.

```
v_j(t)      = ṽ_j(t) − ℓ_j(t)
S2_gross(t) = S1_gross(t) + Σ_{j ∈ W} v_j(t)
S2_net(t)   = S1_net(t) + e(t),   where e(t) = Σ_{j ∈ W} ℓ_j(t)
```

The gross variant counts every circulating layer that constitutes a claim on the base. Wrapper value in excess of the backing claim the arrangement holds, `ℓ_j`, is not such a claim: rule R9 excludes it from the admitted value `v_j`. The gross measures are a total of represented claims on the base, not of everything observable in the segment.

In the net variant, depositing a base unit into a wrapper creates no additional claim on the base issuer, so wrapper layers net out and only `e(t)` remains. Absent a documented excess, `S2_net(t) = S1_net(t) = S0(t)`.

Version 1.0 publishes S0, S1 gross, S2 gross and the multipliers of section 4 as measured series. S1 net and S2 net are **conditional accounting identities**: conditional on the full-backing assumption that section 6.5 states is not independently verified. Their exception terms, `x_i` and `ℓ_j`, are recognized only on documented evidence reaching the compiler under rules R2 and R9, and are otherwise zero. An unmeasured exception term is not evidence that no exception exists, and the net measures should be read as what they are: identities that hold if the backing they assume is in fact present.

2.5 Layers, tiers and the non-overlap requirement

The specification distinguishes two objects that are easily conflated.

A **claim layer** is a classification of instruments. Each admitted instrument is assigned to exactly one layer, determined by its claim distance: base units to the base layer, representations to the representation layer, wrappers to the wrapper layer.

A **tier** is an aggregate. Each tier includes all layers up to its boundary, so the tiers are cumulative in coverage, `S0 ⊆ S1 ⊆ S2`, while the layer assignment beneath them is exclusive. An instrument contributes to every tier at or beyond its layer, and to each of them once.

R0. Non-overlap with the base record. An instrument is admitted as a representation or a wrapper only if its units are not already included in the base coin's native issuance record. Where an issuer's own reporting consolidates a variant token into the circulating supply of the base coin,

that variant is part of S0 and is neither a representation nor a wrapper, irrespective of its technical design.

Rationale. Layer counting is only meaningful against a base measured once. R0 puts the burden on the compiler to check the base record before admitting a layer.

2.6 Worked example: one base unit through three tiers

Take 100 units of a base coin, issued and outstanding. Of those units, 30 are immobilized in a lock-and-mint bridge, against which 30 representation units circulate in a second settlement environment. A savings vault holds 21 units: 20 deposited by holders and 1 received as yield paid in the base coin. Wrapper shares worth 21 units circulate against the vault's holdings. The tiers read:

Measure	Value	Composition
S0	100	Base issuance, consolidated, including the 30 immobilized and the 21 held by the vault
S1 gross	130	100 base plus 30 representations
S1 net	100	Representations fully backed, so `x = 0`
S2 gross	151	130 plus 21 of admitted wrapper value
S2 net	100	Wrapper claims fully backed by base units the vault holds, so `ℓ = 0` and `e = 0`
`m`	1.51	`S2_gross / S0`
`m_1`	1.30	`S1_gross / S0`

The 30 immobilized base units are counted in S0 and their representations again in S1 gross; the 21 units held by the vault are counted in S0 and the wrapper shares against them again in S2 gross. This is layer counting, not error: the gross measures count claim structure, the net measures count issuer obligation.

The yield unit illustrates rule R9. Yield paid in the base coin moves an already outstanding unit into the vault, raising the vault's holdings and the wrapper's value together. Wrapper claims of 21 stand against base holdings of 21, so the net measures stay at S0. Accrued yield raises S2 gross and the multiplier and does not enter `e`.

---

3. Edge-case rules

Each rule below is normative. Rule statements are given first, followed by the rationale and, where the treatment is not self-evident, the observable that decides the case.

RULE R1

R1. Bridge design: lock-and-mint against burn-and-mint

Rule. A cross-environment transfer that immobilizes base units in one environment and issues representation units in another creates a second claim, and the representation units are counted in `b_i`. A cross-environment transfer that extinguishes base units in the origin environment and issues canonical units in the destination environment creates no second claim: the destination units are native issuance and are counted in `n_i`. Burn-and-mint transfers contribute nothing to `b_i` and therefore leave S1 gross unchanged relative to S0.

Rationale. The distinguishing observable is whether the origin units survive the transfer. Under lock-and-mint they survive, immobilized but outstanding, and two tokens exist against one redemption obligation. Under burn-and-mint they do not, and one token exists against one obligation, in a different place. The same issuer may operate both designs for one coin, so the classification is made per environment pair, not per coin.

Consequence for interpretation. Migration from lock-and-mint to burn-and-mint designs reduces S1 gross relative to S0 with no change in issuer obligations. Sections 4.3 and 7 require this to be stated wherever a movement in the multiplier is described.

RULE R2

R2. Under-collateralized representation: the one case S1 net departs from S0

Rule. Where representations of coin `i` outstanding exceed the base units held against them, the excess is recognized in `x_i(t)` from the date the shortfall is documented, and `S1_net(t)` exceeds `S0(t)` by the total of such excesses. Recognition requires documented evidence of the shortfall. Representation units that continue to circulate after a shortfall is recognized remain in `b_i` at par and are not written down to their market value.

Rationale. This is the only circumstance in which the net variants carry information that S0 does not. Recognizing the shortfall on documented evidence rather than on price keeps the aggregate a claim measure: a representation trading below par may reflect a collateral shortfall or a constraint on the redemption route, and the two are not distinguishable from price alone.

Consequence for interpretation. A recognized shortfall does not change S0, because the base issuer's obligation is unchanged. It changes the relationship between the tiers.

RULE R3

R3. Wrapper-of-wrapper chains and tranches

Rule. Each circulating layer in a chain of claims is counted once in the gross variants at its admitted outstanding value, provided every layer satisfies the admission policy of section 5 and the chain resolves through a finite sequence of documented redemption steps to exactly one base coin. Where a tranche structure issues claims whose total value exceeds the value of the underlying claim on the base coin, the excess is governed by rule R9.

Rationale. A senior tranche over a staking receipt is at claim distance three: the tranche redeems into the receipt, the receipt into the base coin, the base coin into the issuer's reserves. Counting both the tranche and the receipt in S2 gross is not double counting, because two distinct transferable claims are outstanding. Deferring tranche value above the underlying to rule R9 keeps S2 a measure of claims on the base rather than of exposure created against it.

Consequence for interpretation. Chain depth raises the multiplier mechanically. A rise driven by a new layer over existing claims is a change in layering, not a signal about the base.

RULE R4

R4. Rebasing designs

Rule. The accrual design of a wrapper does not affect its treatment. A rebasing wrapper, whose unit balance grows while its unit price stays at par, and a share-price wrapper, whose unit balance is fixed while its unit price grows, are both measured at outstanding value, so accrued yield enters the gross measures in both cases. A rebasing instrument that is fungible with its base coin and consolidated into that coin's circulating supply record is part of S0 under rule R0 and is not a wrapper.

Rationale. Measuring outstanding value rather than principal deposited makes the two designs comparable, which an aggregate spanning both requires. The cost is that S2 gross includes accrued yield, disclosed in rule R8 and not netted out, because separating principal from accrued yield is not observable for every admitted instrument. Yield accrued in units of the base coin does not create an excess under rule R9: it raises the arrangement's holdings and its claim value together, and those units are already outstanding in S0.

RULE R5

R5. Unreleased issuer treasury balances

Rule. Authorized but unissued units, and units held by the issuer or an affiliate that carry no external holder's redemption claim, are excluded from `n_i` and therefore from every tier. Where an issuance record reports both a minted quantity and a circulating quantity, the circulating quantity is used. Where a record reports only a minted quantity, the coin's treatment is recorded in the coverage documentation of section 6.4, which governs the S0 universe. The admission criteria of section 5.1 govern the wrapper set and do not apply to base coins.

Rationale. A unit with no external holder creates no claim, and treasury balances move in large discrete steps that would otherwise print as supply events. The fiat aggregates apply the same convention: the Federal Reserve's M1 counts currency outside the Treasury, the Federal Reserve Banks and the vaults of depository institutions.

RULE R6

R6. Tokenized treasuries and fund shares

Rule. Instruments whose backing is a portfolio of securities, including tokenized treasury bills, tokenized money market funds and tokenized bond funds, have no stablecoin in their claim lineage and are excluded from every tier. Subscription or redemption settled in a stablecoin does not create stablecoin lineage: settlement currency is not backing. These instruments constitute an adjacent segment and are reported separately from the hierarchy.

Rationale. The holder of a tokenized treasury fund share holds a claim on securities, mediated by a fund structure. The chain terminates in the security, not in a stablecoin redemption endpoint, so no claim distance to an S0 asset is defined. Admitting them would make S2 an aggregate of dollar-denominated tokenized assets, a different and larger object.

Consequence for interpretation. The exclusion is definitional. The adjacent segment may be compared with S0; it is not added to it.

RULE R7

R7. Composite strategies and primary issuance

Rule. An instrument whose backing spans multiple base coins or multiple asset classes is excluded until its claim can be attributed to exactly one base coin. An instrument that constitutes its own primary issuance, with no parent stablecoin in its lineage, is a candidate for the S0 universe under the coverage rules of section 6 and is never a wrapper.

Rationale. S2 is compiled per base coin so the wrapper total reconciles against the base it claims; an unattributable claim would enter as an unverifiable residual. Exclusion is reversible, and any change is recorded under section 7.

RULE R8

R8. Valuation basis

Rule. Base units and representation units are measured at par. Wrapper units are measured at outstanding market value. Where a base or representation unit trades away from par, the aggregate is unchanged, because the tiers measure claims rather than the market value of claims.

What the resulting statistic is called. Because wrappers enter at market value, the quantity section 4 defines is **market-valued claim layering**. That name is part of the specification. A wrapper trading above or below the redemption value of its underlying claim enters S2 at what it trades for, so S2 gross and the multiplier measure the market value of the claim structure outstanding, not the base units it could redeem into.

Rationale. Par measurement of the base makes S0 a measure of issuer obligation. Market-value measurement of wrappers makes rebasing and share-price designs comparable under rule R4, which are otherwise not measurable on one scale.

The recognized alternative. Applying each instrument's conversion rate to its outstanding units would yield a redemption-valued variant of the same hierarchy. It is a legitimate second reading, differing from this one whenever a wrapper trades away from the value of its underlying claim. It is deferred rather than rejected, on a standing rule that nothing is published that is not collected: conversion rates are not in collection. Section 7.5 records it as a candidate for a future minor version.

Tranche implication. Under the same label, a tranche admitted through rule R3 enters at the market value of the tranche claim rather than at its share of the underlying redemption value. Where the two diverge, the divergence is inside the statistic by construction.

RULE R9

R9. Claims in excess of the immediate backing claim

Rule. `ℓ_j(t)` is a **layer-local** excess: the amount by which the claims issued by an arrangement exceed the value of the immediate backing claim they are issued against, where that backing claim is itself an admitted instrument and its own backing resolves recursively until the chain terminates in S0. The excess is not a claim on the layer below. It is excluded from the admitted value `v_j(t)` and therefore from S2 gross, and it is recognized in `e(t)` from the date it is documented. Two sources are covered: capital contributed to the arrangement in assets other than its backing claim, and claims issued against the arrangement in excess of the backing it holds, including the tranche case of rule R3. Yield accrued in units of the backing claim is not an excess.

Observable. The comparison is between the arrangement's outstanding claim value and its holdings of its immediate backing claim, as documented by the arrangement's own reporting. Recognition requires documented evidence, on the same standard as rule R2.

Boundary against rule R8. A market price above the value of the immediate backing claim is not `ℓ_j`. `ℓ_j` arises only from documented issuance or exposure in excess of the backing claim, which is a divergence in the quantity or contractual amount of claims, never in their market valuation. Market-price premiums and discounts are inside the market-valued claim layering statistic that rule R8 defines, and outside the excess-issuance concept that rule R9 defines. The two rules therefore partition cleanly: R8 owns valuation effects, R9 owns quantity effects.

Why layer-local. Measuring each excess against its immediate backing rather than against S0 is what makes the exception terms additive. A wrapper two steps from the base is backed by a wrapper that may itself carry an excess; measured against S0, the lower excess would be counted again inside the upper one. Layer by layer, each term captures only what its own layer adds, so `Σ_i x_i + Σ_j ℓ_j` is the total incremental excess with no double counting through a chain. The recursion terminates because every admitted chain is finite and resolves to S0 under rule R3.

`ℓ_j` is thus the wrapper-layer counterpart of the representation shortfall `x_i`, which is itself layer-local. The net measures depart from S0 where claims exceed the backing held against them, and nowhere else.

Boundary against rule R7. The admission policy already excludes instruments whose backing spans multiple asset classes, so a wrapper admitted under section 5 holds a single admitted backing claim whose lineage resolves to one base coin. R9 covers the residual cases that policy permits: capital contributed as a buffer or junior support, and claims issued in excess of assets held. An arrangement whose backing becomes multi-asset in substance is a candidate for removal under R7, not for R9.

> **Status in version 1.0.** `ℓ_j` is recognized on documented evidence and is not compiled as a measured series. Section 6.5 records which monitoring checks are capable of surfacing a non-zero value, and section 6.6 records the limitation.

---

4. The representation multiplier

4.1 Definition

```
m(t)   = S2_gross(t) / S0(t)
m_1(t) = S1_gross(t) / S0(t)
```

`m(t)` is the representation multiplier: the total value of circulating stablecoin claim layers per unit of base stablecoin supply. Because wrapper layers enter at market value under rule R8, the quantity it measures is market-valued claim layering. `m_1(t)` is the bridge-only multiplier, which isolates the representation layer from the wrapper layer and is published alongside it because the two layers have different coverage and different observables.

By construction `m(t) ≥ m_1(t) ≥ 1`. A reading of 1.0 describes a segment in which every stablecoin unit is held directly against its issuer, with no representation and no wrapper layer outstanding. Readings above 1.0 measure how much claim structure has accumulated on the same base.

`m` is published only for observation days on which the wrapper layer is covered. Where wrapper coverage is absent for a day, `m` is not published for that day and `m_1`, which requires only the representation layer, is published alone. The two multipliers therefore run over different windows, and a comparison across them states which window each figure comes from.

4.2 Interpretation

The multiplier is a measure of **claim layering**. It counts the value of transferable claims outstanding at claim distance one or greater, per unit of base supply.

A rise means representation or wrapper value has grown faster than base supply, so more claim layers are outstanding per unit of issuer obligation; a fall means the reverse. The level says how many units of circulating claim exist per unit of base, and so how much of the segment's observable value a measure that added every token together would count twice.

The multiplier decomposes additively into the two channels that produce it:

```
m(t) = 1 + [ Σ_i b_i(t) / S0(t) ] + [ Σ_j v_j(t) / S0(t) ]
           representation channel     wrapper channel
```

The identity holds exactly, so the two channels account for any movement in `m` without a residual, and `m_1` is its first two terms. The decomposition is published with the series.

Decomposition is not attribution. Rule R1 records that a shift between bridge designs moves the representation channel with no change in issuer obligations; rule R3 records that a new layer over existing claims moves the wrapper channel. A description of a movement in `m` states which channel moved and the coverage boundary of that channel, and does not assign a cause.

4.3 What the multiplier is not

The multiplier resembles the fiat money multiplier in form only. The following statements are part of the specification.

It is not a solvency or reserve-adequacy signal. A high multiplier is consistent with every layer being fully backed, and a multiplier of 1.0 is consistent with a base coin whose reserves are impaired. The multiplier is compiled from outstanding quantities and contains no information about the quality of any issuer's reserves. No threshold of `m` is a warning level, and none is published.

It is not leverage. Under rule R9, value created by leverage within a wrapper structure is excluded from the S2 gross wrapper total and recognized separately. The layers the multiplier counts are, in the normal case, fully backed claims on the same base: the same obligation represented more than once, not borrowed against more than once.

It is not liquidity or velocity. No component is a transaction measure. Two segments with the same multiplier may differ arbitrarily in turnover.

It is not money creation. Under the net identities of section 2, the layers the multiplier counts sum to no additional claim on the base issuer, except for the documented cases recognized under rules R2 and R9. Deposit creation changes the aggregate quantity of claims; representation and wrapping change the number of tokens through which an unchanged quantity of claims is held.

It is not a redemption-value measure. Wrapper layers enter at market value under rule R8, so a wrapper trading away from the value of its underlying claim moves the multiplier without any change in the claim structure. The statistic is market-valued claim layering, and a redemption-valued reading is a different statistic that section 7.5 records as a candidate rather than a restatement of this one.

It is not comparable across coverage boundaries. A change in the coverage of either measure moves the ratio. Section 7 requires a coverage change to be recorded in the constituent-change log and the affected window marked in the series.

4.4 Worked example: the published series

The example below is quoted from a single stated vintage of the published series, and every figure in it is reproducible from the downloadable series for that date.

Observation date 8 August 2026.

Measure	Level	Per unit of S0
S0	$288.1bn	1.00000
Representations, `Σ b_i`	$19.3bn	0.06698
S1 gross	$307.4bn	`m_1` = 1.06698
Admitted wrapper value, `Σ v_j`	$8.4bn	0.02921
S2 gross	$315.8bn	`m` = 1.09619

The decomposition of section 4.2 reads, at this observation date:

```
m = 1 + 0.06698 + 0.02921 = 1.09619
```

Components are shown to five decimal places so that the identity closes at the precision at which it is stated. The published series carries the multiplier rounded to four decimal places, 1.0962, and carries the three levels unrounded, so a reader can reproduce every figure in this table from the download.

Read with section 4.3: the figure states how much market-valued claim structure circulates on each unit of base supply, and nothing about the backing of any layer.

The published series for this vintage agrees with a recomputation from the underlying issuance records under the constituent rules in force: constituent map version 2, coverage-consistent S2 admission under criterion A2, and case-normalized membership testing.

---

5. Constituent admission policy

5.1 The default is exclusion

An instrument is not part of S2 because it is dollar-denominated, because it is yield-bearing, or because it is economically similar to an admitted instrument. Admission is by explicit entry in the maintained constituent map. An instrument absent from the map is excluded, and its absence is a compilation state rather than a judgment about the instrument.

A1. Documented redemption path. Admission requires a redemption path to exactly one base coin, documented by the issuing arrangement, resolving through a finite sequence of steps each of which is itself documented. The path is what admits the instrument; the correlation of its price with a base coin does not.

A2. Single-base attribution and base coverage. The base coin to which an instrument's claim resolves is recorded on the entry, and the instrument is compiled into S2 only on vintages

where that base coin is inside S0 coverage. An admitted entry whose base is outside coverage on a given day contributes nothing to S2 on that day: its value would otherwise raise the numerator of the multiplier while its base contributed nothing to the denominator. The condition is evaluated per vintage and published per entry, so an entry enters the compilation on the first day its base is covered, without the admission decision being revisited.

A3. Finite chain. Each step in the chain is documented, and the chain terminates in a base coin. Rule R3 governs multi-step chains and tranches.

5.2 Relation vocabulary

Each admitted entry records the form of the claim, drawn from a controlled vocabulary. The vocabulary is part of the specification, and additions to it are version changes under section 7.

Relation	Claim form
`savings`	Savings-vault share redeemable into the base coin
`staked`	Staking receipt redeemable into the base coin, possibly after a stated waiting period
`lending-vault`	Lending-pool share denominated in and redeemable into the base coin
`structured-tranche`	Tranche over one of the above claim forms, resolving to the base coin under rule R3

A stated redemption waiting period does not affect admission or the tier assignment, because the hierarchy orders by claim distance and not by liquidity. Waiting periods are recorded on the entry.

5.3 Confidence vocabulary

Each admitted entry records a confidence grade. The grade governs how the entry may be used, not whether it is compiled: every admitted entry is compiled, since a series whose constituents varied with an internal judgment would not be reproducible from the published map.

Grade	Meaning	Use
`high`	Redemption path verified from the issuing arrangement's own documentation	Compiled into the series and available for citation individually
`medium`	Claim mechanism is clear, and either base attribution or coverage requires re-verification	Compiled into the series, flagged in the constituent map, and re-verified before the entry is named or relied on in published commentary

An entry does not remain at `medium` indefinitely. Section 7 requires that entries carrying a re-verification flag be resolved or removed at each specification revision.

5.4 Exclusion vocabulary

Excluded instruments are recorded with a reason, so that the boundary can be audited.

Reason	Meaning	Governing rule
`tokenized-treasury`	Claim on securities, no stablecoin lineage	R6
`composite`	Backing spans multiple assets, claim not attributable one step to a single base	R7
`composite-fund`	Claim on a fund share whose portfolio spans multiple assets	R6, R7
`primary-issue`	Own primary issuance, no parent stablecoin	R7
`unclear-lineage`	Documentation insufficient to establish a redemption path	A1

Exclusion under `unclear-lineage` is a documentation state, re-examined as documentation improves; any resulting change is recorded under section 7.

5.5 Coverage boundary

The S0 universe and the admitted wrapper set are both bounded, and the boundary is stated wherever the aggregates appear. Section 6 records the boundary in force and the share of the segment it covers.

A compilation day is admitted only when the constituents that dominate base supply have reported for that day. A day with partial reporting is not published, because a coverage gap in a level series is indistinguishable from a contraction in supply. This is a completeness gate, not an interpolation: missing days are absent, not filled.

6. Measurement and data sources

6.1 Source classes and authority

The compilation applies one authority principle: a single source owns a given data type, a single source supplies a given instrument within a given series, and no series changes source part-way through its history. Where a series necessarily combines data types, the combination is across instruments rather than within one, and it is documented as a composite. Section 6.6 records the composites in the aggregates.

Layer or input	Source class	Role
Base supply, n_i	On-chain issuance records	Per-environment minted, circulating and representation balances, from which the native and bridged decomposition is taken
Representations, b_i	On-chain issuance records	The bridged component of the same decomposition
Wrapper value, $\tilde{v}_j$	Market data	Outstanding value of admitted wrapper instruments
Constituent map	Maintained by Stablecoin Beat Research	Admission, base attribution, relation and confidence per section 5, published and versioned
Reference series	Official sources	Named where used, including Federal Reserve and European Central Bank series, United States Treasury data, and Federal Deposit Insurance Corporation data

Reference series are used for comparison against the aggregates and are never an input to them. The aggregates depend on no reference series.

6.2 Identifier resolution

Constituents are keyed by persistent instrument identifiers rather than by ticker symbol, and the constituent map is joined to the observation record on that identifier. Ticker symbols are not unique across instruments, and a symbol-keyed join either fuses two instruments that share a ticker into one line or silently drops one of them. The wrapper join that compiles S2 is identifier-keyed.

Instrument identity is maintained across renames and migrations by the identifier, not by the display name. A change of an instrument's recorded identifier is a constituent change under section 7.2.

The base and representation layers are compiled from a store that retains the source identifier alongside the instrument symbol. Migrating those joins to identifier-only keying, so that the property stated in the first paragraph holds at every join rather than at the wrapper join alone, is recorded compilation work.

6.3 Observation frequency, timing and latency

Observations are daily. Each observation carries a UTC calendar date, and the daily collection cycle takes the base and representation layers first and the wrapper layer within the same cycle.

The wrapper layer can lag the base layer by one day when a collection cycle is incomplete at the cutoff. Where that occurs, the latest published values of S2 and of m are those of the most recent day on which the wrapper layer is covered, and that day is stated alongside the figure, not

presented as the current day. S0, S1 and `m_1` are published for the current day regardless, because they do not depend on the wrapper layer.

The completeness gate of section 5.5 applies to the base layer: a day on which the constituents that dominate base supply have not reported is not published at all.

6.4 Coverage in force

Peg currency. Version 1.0 of this specification covers claims denominated at par to the United States dollar. `U` contains dollar par claims only, and every figure the specification defines is a dollar aggregate. Claims denominated at par to other currencies are tracked by the platform and are outside this version of the hierarchy. Extending the hierarchy to other peg currencies is recorded in section 7.5 as a candidate for a future minor version, which would require a stated treatment of exchange-rate conversion.

The boundary is enforced at compilation intake: both the daily collection and the historical reconstruction of the issuance record select dollar-pegged instruments, so the store from which S0 is compiled contains dollar instruments by construction. The exclusions below are applied at selection and again at compilation, so an instrument that should not be in `U` is removed at both stages.

The S0 universe. Base coins qualify by a par test, not by self-description: an instrument counts as a base stablecoin when it is designed to hold parity with the reference unit and is a primary issued claim, not a representation of another claim. Testing par behaviour instead of accepting a design label follows Kosse et al (2023), who examine whether stablecoins in fact hold their peg. Instruments designed to appreciate fail the par test and are not base coins: they are wrappers under section 5 where they carry a documented lineage, and excluded under rule R7 where they do not.

Membership is determined by the platform's par universe and not by the composition of any source's own stablecoin list. Four exclusions are applied to the issuance record before compilation, and each restates a rule already in this specification rather than adding a criterion:

Exclusion	Governing rule
A curated set of tokenized treasury and fund instruments	R6
Every instrument admitted to the wrapper set `W`	R0, since a wrapper cannot also be its own base
Instruments flagged as yield-bearing in the product record	R4 read with the par test
Instruments carrying a vintage-frozen non-par verdict	The par test

Membership is frozen per vintage. Once a day's membership is determined it is persisted, and it is not recomputed retroactively as later observations accrue. Membership changes are made explicitly and are logged, which is the compilation counterpart of the no-silent-restatement requirement in section 7.3.

New instruments. The base universe and the wrapper set have opposite defaults. Admission to `W` is by explicit entry, so an unruled instrument is excluded from S2 under section 5.1. The base universe is compiled by exclusion, so an instrument the source begins to list that has been neither classified nor excluded enters S0 on the day it appears. Section 6.5 surfaces such instruments for adjudication.

Adjacent segments. Tokenized commodity claims are outside the hierarchy because they are par to a commodity rather than to a currency. Tokenized securities are outside it under rule R6. Neither is added to any tier.

Coverage. S0 is compiled over the members of `U` for which the issuance record carries the per-environment decomposition, which are the largest dollar par coins. Coverage is measured at each vintage rather than asserted once, as the share of the full dollar par universe compiled from the same source class under the same exclusions. The share is computed by the same run that compiles the series and is published with it, so the coverage figure and the levels it qualifies always describe one vintage and one set of exclusions. At the observation date of 8 August 2026 the covered share is 97.55%.

Representation-layer coverage. The native and bridged decomposition is present for the members of `U` whose issuance record carries it. At the observation date of 8 August 2026 that is the whole of S0 by value, so the representation layer is measured over the same boundary as the base layer. Where a member lacks the decomposition it contributes to S0 and contributes nothing to `b_i`, so the representation boundary lies at or inside the S0 boundary and never outside it.

Minted-only instruments under rule R5. Where the issuance record carries a minted quantity for an instrument but no circulating quantity, rule R5 leaves the instrument out of `n_i`, since a minted quantity alone does not establish that units are held externally. At the observation date of 8 August 2026 no instrument in coverage is in this state.

Entries outside base coverage under criterion A2. An admitted wrapper whose base coin is outside `U` on a given vintage is excluded from the compilation for that vintage. The exclusion makes the multiplier of section 4 literally true as written: every instrument in the numerator has its base in the denominator, so `m` is the ratio of one population's claim layers to that same population's base.

The condition is a coverage state, not an admission error: each affected entry satisfies criterion A1, and each base is a par claim the issuance decomposition does not currently reach. The entries remain admitted, are disclosed per vintage through a published base-coverage flag, and enter the compilation on the first vintage their base is covered.

The flag is computed at each vintage, not recorded in the map. Base coverage moves as the decomposition's targets move, so a curated flag would describe the day it was written and not the day being compiled.

6.5 Reconciliation and monitoring checks

The compilation is guarded by deterministic checks that run daily and report into an operational digest. Checks in force:

Completeness. The gate of section 5.5, which withholds a day whose dominant constituents have not reported.

Cross-source agreement. For instruments present in both the issuance record and market data, the two measures of outstanding value are compared. A widening difference indicates that one of them has drifted from its stated basis.

Series continuity. Detection of discontinuities in published series at boundaries where a compilation input changes in coverage or vintage.

Headline reconciliation. Daily comparison of the headline supply figure against S0 per section 6.7, and across the surfaces that state it, so one number appears everywhere. The difference is computed at compilation time and published with the series; where the headline figure is unavailable it is recorded as absent rather than carried forward.

Coverage. The coverage share of section 6.4 is computed by the compilation itself and published with the series it describes, so a coverage claim and the levels it qualifies cannot come from different vintages or different constructions.

Unclassified instruments. Symbols present in the most recent day of the issuance record that are neither classified as par members nor excluded under section 6.4 are listed for adjudication. An instrument that a source begins to list reaches a reviewer within a day instead of shaping S0 unremarked.

No check in force surfaces a non-zero x_i under rule R2 or a non-zero ℓ_j under rule R9. Both are recognized on documented evidence reaching the compiler; neither is detected by the compilation. Section 6.6 records the consequence.

6.6 Known limitations of the measurement

The aggregates are a composite across source classes. S2 combines base and representation values taken from issuance records with wrapper values taken from market data. The composition is across instruments, which the authority principle of section 6.1 permits.

The valuation bases differ by layer. Rule R8 measures base and representation layers at par and wrapper layers at market value. The multiplier is therefore a ratio whose numerator contains a market-valued component and whose denominator does not.

Accrued yield is inside S2 gross. Per rule R4, the wrapper layer's value grows with accrued yield even when no new deposit occurs. No principal-only variant is published.

The exception terms are unmeasured. x_i under rule R2 and ℓ_j under rule R9 are recognized on documented evidence, and no monitoring check currently surfaces either. The net measures are therefore conditional accounting identities rather than measured quantities: they hold con-

ditional on full backing, which the compilation does not independently verify. This is the most consequential limitation in the section, and it is why section 2.4 publishes the gross measures as the measured series.

Coverage of the representation layer is bounded. The native and bridged decomposition is published for the coins it covers, and the bridge-design effect of rule R1 operates within that boundary.

Survivorship in snapshot-derived inputs. Where an input series was reconstructed backwards from instruments present at reconstruction time, instruments that ceased to exist before that date are absent from the reconstructed window. The aggregates draw their base layer from issuance records that retain instruments after they cease circulating, and the wrapper layer from market data that does not. The wrapper layer is therefore the affected component, and its coverage begins in April 2025. Wrapper instruments that ceased to circulate before that date are absent from the compiled wrapper total, which bounds S2 gross and the multiplier below for the earliest part of the window rather than above.

The base and representation layers extend earlier than the wrapper layer, which is why `m_1` is published over a longer window than `m` under section 4.1. A comparison of `m` across the boundary at which wrapper coverage begins compares two different coverages and is not a comparison of claim layering.

Structural breaks at input boundaries. Where an input's coverage widened at a known date, series derived from it carry a break at that date that reflects coverage rather than the segment. Affected windows are marked under section 7.4.

6.7 Relation to the headline supply measure

The platform publishes a headline stablecoin supply figure across its surfaces. S0 and the headline figure are two compilations of the same base concept, and they are not the same number. This section states the relationship, because a reader will encounter both.

Membership is shared. Levels are not. Both measures draw membership from the same par universe: an instrument that fails the par test, or that is a wrapper, or a claim on securities, is in neither. What differs is the source class that supplies the level and the coverage that source provides. S0 takes levels from the issuance record, which carries the per-environment decomposition the hierarchy requires and covers the largest dollar par coins. The headline figure takes levels from market data over the full par universe, including instruments too small to appear in the issuance decomposition.

Two things differ, and both are stated wherever the figures appear. Coverage is one: the headline universe is broader in the tail and spans peg currencies beyond the dollar, while `U` is dollar-only under section 6.4. Source class is the other, carrying the measurement difference between issuance recorded on chain and market value observed in trading venues.

Neither figure is a restatement of the other. The specification does not claim that S0 is the headline total, and the published methodology does not either. Each figure states its universe and its source class where it appears.

The two are reconciled daily. An automated check compares them against a published tolerance. A difference above 10% is reported as a finding, and a difference above 20% is treated as requiring immediate investigation. The tolerance is set against the structural difference the two compilations are expected to show, which is 3.51% at the observation date of 8 August 2026, so the reporting threshold sits at approximately three times the structural difference and the investigation threshold at approximately six times.

The structural difference is not a constant. It is computed against the headline figure at compilation time and published with the series, so it moves with the coverage of either compilation, and the thresholds above are stated as multiples of a quantity that is itself published rather than as absolute levels chosen once.

The reconciliation is a defect signal about the compilation, not a finding about the segment: a widening difference means one of the two compilations has drifted from its stated universe.

---

7. Versioning and revisions

Canonical status rests on how a series changes, not on how it is first defined.

7.1 Specification versions

The specification carries a two-part version. A **minor version** change, 1.0 to 1.1, adds a rule, adds a term to a controlled vocabulary, or clarifies an existing rule, while leaving the definitional core of the tiers intact. A **major version** change, 1.x to 2.0, redefines a tier, changes the ordering principle, or changes the treatment of a layer in a way that alters what the aggregate measures.

Each version has a dated document of record and a persistent identifier, and superseded versions remain retrievable. A figure labelled S0, S1 or S2 carries the version under which it was compiled.

7.2 Constituent changes

The constituent map is versioned, dated and published. Every change is recorded in a constituent-change log with the effective date, the instrument, the direction of the change, and the governing rule or admission criterion. Changes recorded include additions to the admitted set, removals, changes of recorded base coin, changes of relation, changes of confidence grade, and changes of exclusion reason.

A constituent change is a change to the series definition for the days it affects, and is treated as such under section 7.3.

The log is published alongside the constituent map and opens before this specification was frozen. Its first entry records a correction to the base universe: instruments constituting claims on securities, which rule R6 places outside the hierarchy, had been entering S0 because the universe rule was under-enforced at compilation, not because any source reported them incorrectly. The entry states the change, the affected window, the effect on the published level, and the classification of the revision.

7.3 Revisions

Published values are not silently restated. A published value changes only through a dated revision, and a revision is accompanied by a note identifying the affected series and window. Earlier vintages of the series remain retrievable.

Revisions are classified as follows.

Constituent revisions, arising from a change recorded under section 7.2. The affected window is stated.

Source revisions, arising from a restatement in an input record.

Compilation revisions, arising from a correction to the compilation itself.

Routine same-day updating of the current observation is not a revision.

7.4 Vintage notes

Where a series has been revised, the affected window carries a vintage note. Vintage notes state what changed and when, in neutral terms, and do not explain why the underlying data changed.

Permitted forms:

> Figures for [window] were revised on [date]. The revision reflects a constituent change recorded in the constituent-change log for [effective date]. The previous vintage remains available.
>
> Figures for [window] were revised on [date] following a restatement in an input record. The previous vintage remains available.
>
> No observation is published for [date]. Constituent reporting for that day did not meet the completeness requirement of section 5.5.

A vintage note does not characterize or attribute the cause of an input restatement, and does not describe its effect as material or immaterial.

7.5 Candidate additions to a future minor version

Recorded so that the boundary of version 1.0 is explicit: a redemption-valued variant of the hierarchy under rule R8, which enters when instrument conversion rates enter collection;

extension of the hierarchy to non-dollar peg currencies; publication of `e` as a measured rather than definitional term; a per-base-coin multiplier alongside the segment aggregate.

---

8. Related work and provenance

8.1 Prior work

The analogy between stablecoins and forms of money is established in the policy and academic literature, and this specification does not claim it.

Central bank and standard-setter work sets stablecoins against the functions of money and the requirements of settlement assets. The Bank for International Settlements (2023, 2025) examines whether privately issued tokenized monies preserve the singleness of money, and assesses stablecoins against the tests of singleness, elasticity and integrity. The Committee on Payments and Market Infrastructures and IOSCO (2022) apply financial market infrastructure standards to systemically important stablecoin arrangements performing a transfer function. The Financial Stability Board (2023) sets out high-level recommendations for the regulation, supervision and oversight of global stablecoin arrangements. Arner, Auer and Frost (2020) set out principles for regulating stablecoins and the risks that motivate them, spanning financial stability, market integrity and consumer protection.

Two works classify the field. Adrian and Mancini-Griffoli (2019) classify means of payment along four attributes: type, claim or object; value, fixed or variable in redemption; backstop, government or private; and technology, centralized or decentralized settlement. They expressly exclude the identity of the issuer from the framework. Bullmann, Klemm and Pinna (2019) classify stablecoin designs along issuer accountability, decentralization of responsibilities, and what underpins the asset's value, yielding a taxonomy organized primarily around the stabilization mechanism.

The closest antecedents apply a hierarchy of claims to this asset class directly. Aldasoro, Mehrling and Neilson (2023) analyse stablecoins through the money view, which orders monetary instruments by their distance from ultimate settlement. They identify a second layer in the stablecoin hierarchy where one stablecoin is collateralized by another, and they treat cross-chain bridge protocols as dealers standing between two ledgers. Wu (2026) extends the same lens to decentralized finance as a whole, assigning tokens to tiers by their derivation from base assets and defining a layering multiplier, the ratio of total mapped claims to base-tier value, in explicit analogy to the money multiplier.

The relationship between those works and this specification is stated in section 8.2.

The academic literature on stablecoins as private money is likewise established. Gorton and Zhang (2023) set stablecoins against the historical experience of privately issued bank notes trading at time-varying discounts from par. A second strand examines the redemption and arbitrage path directly: Ma, Zeng and Zhang (2025) on the concentration of redemption rights

among a small set of authorized participants, and Lyons and Viswanath-Natraj (2023) on peg-sustaining arbitrage. Related work studies run dynamics (Liu, Makarov and Schoar, 2023) and the design conditions under which a peg can be maintained, including the credibility of a repurchase commitment (d'Avernas, Maurin and Vandeweyer, 2026).

On the construction of aggregates, the relevant antecedents are in monetary statistics rather than in the digital-asset literature. The International Monetary Fund's Monetary and Financial Statistics Manual and Compilation Guide (2016) is the methodological source for the practices this specification follows: consolidation, the exclusion of issuer-held balances, stating an institutional coverage boundary, and a formalized revisions policy. The Federal Reserve's money stock measures apply the same practices in a published series, and the exclusion rule of section 3 has a direct analogue there: M1 counts currency outside the Treasury, the Federal Reserve Banks and the vaults of depository institutions, so units held by the issuing authority are outside the aggregate. Friedman and Schwartz (1970) and Barnett (1980) argue that the construction of a monetary aggregate, which instruments it admits and how their quantities are combined, is a modelling choice to be defended rather than a natural fact. Friedman and Schwartz put the point directly: the choice "cannot be made by any single set of hard and fast rules", and "the test of the choice is in the results". That is the position section 1 takes as its starting point.

8.2 What is claimed and what is not

The following is stated precisely, because the value of the priority record depends on its being defensible.

Not claimed. That stablecoins resemble money, or that stablecoin claims can be tiered, is prior art, in the sources of section 8.1 and elsewhere. This specification claims neither. Two antecedents are named specifically, because they are the closest. Aldasoro, Mehrling and Neilson (2023) apply a hierarchy of claims to stablecoins and identify a layer in which one stablecoin is collateralized by another. Wu (2026) assigns tokens to tiers by derivation and defines a layering multiplier, the ratio of mapped claims to base-tier value, in analogy to the money multiplier. Neither the hierarchy applied to this asset class, nor the ratio of layered claims to a base, is claimed here.

Claimed. The operationalization: the tier boundaries S0, S1 and S2 as defined in section 2, restricted to stablecoin-rooted claims rather than to tokens generally; the net and gross duality applied at every tier, with the net identities and their exception terms stated explicitly; the constituent admission policy with exclusion as its default; the edge-case rules of section 3, including the bridge-design rule and the partition between valuation and quantity effects; and the compilation of all of the above as a maintained daily series with a versioned specification, a constituent-change log and a revisions policy.

Provenance. Stablecoin Beat introduced the S0/S1/S2 stablecoin monetary aggregates in 2026: the labelled three-tier boundaries restricted to stablecoin-rooted claims, the net and gross duality at every tier, the admission policy with exclusion as its default, and their compilation as a maintained daily series under a versioned specification.

8.3 Reuse

The specification and the series are available for reuse under the terms in section 9. Reuse of the framework, including the tier names, the multiplier and the admission policy, is invited, with citation of this document as the source of the definitions on the same terms as any published statistical methodology.

References

Adrian, T. and T. Mancini-Griffoli (2019): "The rise of digital money", IMF FinTech Notes, No 19/001.

Aldasoro, I., P. Mehrling and D.H. Neilson (2023): "On par: a money view of stablecoins", BIS Working Papers, No 1146, November.

Arner, D., R. Auer and J. Frost (2020): "Stablecoins: risks, potential and regulation", BIS Working Papers, No 905.

Bank for International Settlements (2023): "Blueprint for the future monetary system: improving the old, enabling the new", Annual Economic Report 2023, Chapter III.

Bank for International Settlements (2025): "The next-generation monetary and financial system", Annual Economic Report 2025, Chapter III.

Barnett, W.A. (1980): "Economic monetary aggregates: an application of index number and aggregation theory", Journal of Econometrics, 14(1), 11–48.

Board of Governors of the Federal Reserve System: Money Stock Measures, Statistical Release H.6.

Bullmann, D., J. Klemm and A. Pinna (2019): "In search for stability in crypto-assets: are stablecoins the solution?", ECB Occasional Paper Series, No 230.

Committee on Payments and Market Infrastructures and International Organization of Securities Commissions (2022): Application of the Principles for Financial Market Infrastructures to stablecoin arrangements: final report, July.

d'Avernas, A., V. Maurin and Q. Vandeweyer (2026): "Can stablecoins be stable?", Management Science, forthcoming.

Financial Stability Board (2023): High-level recommendations for the regulation, supervision and oversight of global stablecoin arrangements: final report, July.

Friedman, M. and A.J. Schwartz (1970): Monetary Statistics of the United States: Estimates, Sources, Methods, National Bureau of Economic Research.

Gorton, G.B. and J.Y. Zhang (2023): "Taming wildcat stablecoins", University of Chicago Law Review, 90(3), 909–971.

International Monetary Fund (2016): Monetary and Financial Statistics Manual and Compilation Guide.

Kosse, A., M. Glowka, I. Mattei and T. Rice (2023): "Will the real stablecoin please stand up?", BIS Papers, No 141.

Liu, J., I. Makarov and A. Schoar (2023): "Anatomy of a run: the Terra Luna crash", NBER Working Paper, No 31160.

Lyons, R.K. and G. Viswanath-Natraj (2023): "What keeps stablecoins stable?", Journal of International Money and Finance, 131, 102777.

Ma, Y., Y. Zeng and A.L. Zhang (2025): "Stablecoin runs and the centralization of arbitrage", NBER Working Paper, No 33882.

Wu, W. (2026): "Tokens all the way down: a money view of decentralized finance", arXiv preprint, 2603.01803, March.

---

9. Citation

9.1 Citing the specification

> Stablecoin Beat Research (2026): "Stablecoin Beat S0/S1/S2 monetary aggregates: specification 1.0", SB Methodology Papers, No 1, August. DOI: 10.5281/zenodo.21861584

9.2 Citing the series

A citation of the series identifies the aggregate, the observation date or window, and the vintage, because the series is revisable under section 7.

> Stablecoin Beat Research: S0/S1/S2 stablecoin monetary aggregates, [series and window], vintage [vintage date], compiled under SB Methodology Papers No 1, specification version 1.0. https://stablecoinbeat.com/charts/aggregates/, accessed [access date].

The bracketed fields are supplied by the citing reader, except the vintage, which is a property of the download and is carried in the series artifact. A citation giving an access date but no vintage does not identify which values were quoted, since section 7.3 permits a published value to change between vintages.

9.3 Data availability and terms

The published series, the constituent record, and the constituent-change log are available at stable addresses, and the series is downloadable in full, not only as displayed values. Each download carries its vintage, so a figure quoted from it can be identified later under section 7.3.

ates, requires attribution to this document as the source of the definitions and to the series as the source of any figures.

Item	Address
This specification	https://stablecoinbeat.com/papers/sbmp-01/
Persistent identifier	https://doi.org/10.5281/zenodo.21861584
Aggregate series, presentation	https://stablecoinbeat.com/charts/aggregates/
Aggregate series, full history	https://stablecoinbeat.com/aggregates-data.json
Constituent record and change log	https://stablecoinbeat.com/charts/aggregates/constituents/
Constituent record, machine-readable	https://stablecoinbeat.com/aggregates/constituents.json

The series is not separately deposited. It is revisable daily under section 7.3, so it is identified by its address together with the vintage carried in the download, which is what section 9.2 asks a citation to state. A deposited snapshot would freeze one vintage and invite citation of a version that the maintained series has moved past.

The constituent record carries the admitted set, the exclusions with their reasons, and the change log on one page, with a machine-readable copy at the address above. The series download carries the coverage block and the per-entry base-coverage flag of section 6.4, so a reader can reproduce the coverage share, the structural difference of section 6.7 and the criterion A2 effect without recompiling.

Appendix A. Index of rules and criteria

Every normative statement in the specification, with the section that states it. A compiler implementing the aggregates can work from this table and the equations of section 2.

Rule	Statement	Section
R0	An instrument is a representation or a wrapper only if its units are not already in the base coin's issuance record	2.5
R1	Lock-and-mint transfers create a second claim and enter `b_i`; burn-and-mint transfers do not and enter `n_i`	3
R2	Representations outstanding in excess of the base held are recognized in `x_i` on documented evidence; the one case S1 net departs from S0	3
R3	Each layer of a claim chain counts once at admitted value, provided the chain resolves in finite documented steps to one base coin	3
R4	Accrual design does not affect treatment; rebasing and share-price wrappers are both measured at outstanding value	3
R5	Authorized-but-unissued and issuer-held balances are excluded from `n_i`	3
R6	Instruments backed by securities have no stablecoin lineage and are excluded from every tier	3
R7	Multi-asset backing is excluded until attributable to one base coin; primary issuance is never a wrapper	3
R8	Base and representation layers are measured at par, wrapper layers at market value; the resulting statistic is market-valued claim layering	3
R9	Claims in excess of the immediate backing claim, layer-local and resolving recursively to S0, are excluded from gross and recognized in `e`; quantity effects only, never market-price divergence	3
A1	Admission requires a documented redemption path to exactly one base coin	5.1
A2	The base coin is recorded on the entry; an entry whose base sits outside `U` is flagged and excluded from S2 for that vintage	5.1
A3	Each step of the chain is documented and the chain terminates in a base coin	5.1

Controlled vocabularies: relation in section 5.2, confidence in section 5.3, exclusion reason in section 5.4. Additions to any of the three are version changes under section 7.1.

Appendix B. Summary of identities

```
S0(t)       = Σ_i n_i(t)
S1_gross(t) = S0(t) + Σ_i b_i(t)
S1_net(t)   = S0(t) + Σ_i x_i(t)
v_j(t)      = ṽ_j(t) − ℓ_j(t)
S2_gross(t) = S1_gross(t) + Σ_j v_j(t)
S2_net(t)   = S1_net(t) + e(t),        e(t) = Σ_j ℓ_j(t)
m(t)        = S2_gross(t) / S0(t)
m_1(t)      = S1_gross(t) / S0(t)
m(t)        = 1 + [Σ_i b_i(t) / S0(t)] + [Σ_j v_j(t) / S0(t)]
```

In the normal case `x_i = 0` and `ℓ_j = 0` for every constituent, so `S1_net(t) = S2_net(t) = S0(t)`. Both are conditional accounting identities, conditional on the full-backing assumption that section 6.5 states is not independently verified. The exception terms are layer-local and therefore additive, and they are recognized only on documented evidence under rules R2 and R9 respectively.

Appendix C. Fields of the published constituent map

The map is the machine-readable form of section 5, and it is published, versioned and dated so that any published figure can be reproduced against the map version in force when it was compiled.

Field	Content
Map version and date	Version integer and the date the version took effect
Admitted entries	One record per admitted wrapper
Entry: identifier	Persistent instrument identifier, the join key of section 6.2
Entry: symbol and name	Display fields, never used as join keys
Entry: base	The base coin the claim resolves to, per criterion A2
Entry: relation	One term from the vocabulary of section 5.2
Entry: confidence	One grade from the vocabulary of section 5.3
Entry: note	The documented redemption path supporting admission under A1
Base-universe exclusions	Instruments excluded from `U` per section 6.4
Excluded entries	One record per considered and rejected instrument
Excluded: reason	One term from the vocabulary of section 5.4

The excluded list is published alongside the admitted set. An instrument in neither list has not been ruled on; section 6.5 lists those for adjudication.