Global Reach, Local Depth

Stablecoin Choice Across Chains

Xiang Fang[1] Amy W. Huber[2] Haonan Zhou[1]

[1]University of Hong Kong [2]Wharton

5th CEMLA/Dallas Fed Financial Stability Workshop, November 2026

Motivation

- Fiat currency backed stablecoins have grown rapidly in the past few years
  - In particular, USDC and USDT
- Global brand and use + local adoption on blockchains
  - USDC and USDT circulate on many blockchains
  - Some chains mostly use USDC, some chains split evenly, some mostly use USDT

Motivation

- Fiat currency backed stablecoins have grown rapidly in the past few years
  - In particular, USDC and USDT
- Global brand and use + local adoption on blockchains
  - USDC and USDT circulate on many blockchains
  - Some chains mostly use USDC, some chains split evenly, some mostly use USDT
- **Research question**: What sustains this fragmentation?
  - Chain characteristics: e.g., transaction fees
  - Global coin attributes: e.g., peg stability, issuer credibility, liquidity
  - Local **coin-chain** conditions: e.g., supply, liquidity, acceptance

Motivation

- Fiat currency backed stablecoins have grown rapidly in the past few years
  - In particular, USDC and USDT
- Global brand and use + local adoption on blockchains
  - USDC and USDT circulate on many blockchains
  - Some chains mostly use USDC, some chains split evenly, some mostly use USDT
- **Research question**: What sustains this fragmentation?
  - Chain characteristics: e.g., transaction fees
  - Global coin attributes: e.g., peg stability, issuer credibility, liquidity
  - Local **coin-chain** conditions: e.g., supply, liquidity, acceptance
- Would **greater interoperability eliminate the differences in choice?**
  - Greater interoperability: Equalizing coin-chain conditions
  - Implications for currency competition and digital-currency issuance

This paper: Data and Stylized Facts

- **Novel data**: nearly 200 million wallets across eight blockchains
  - Transaction histories and balances, with filters for **end-user activity**
  - Weekly frequency, from 2018 onward
  - Augmented with wallet location (continental) information for a subset
- **Stylized facts about stablecoin adoption**
  - Persistent choice
  - New wallets drive transaction volumes
  - Broaden usage over time
  - Distinct usage patterns across chains
  - Local coin-chain level conditions matter for adoption

This Paper: Model, Estimation, Counterfactual and Implications

- **Model:** Wallets choose a stablecoin and precautionary balances given transaction needs. Choices depend on global coin attributes and local coin–chain conditions.

This Paper: Model, Estimation, Counterfactual and Implications

- **Model:** Wallets choose a stablecoin and precautionary balances given transaction needs. Choices depend on global coin attributes and local coin–chain conditions.
- **Estimation:** Global carrying costs are lower with higher reserve quality and greater CEX trading volume. Local liquidity is higher with more active wallets and DEX protocols.

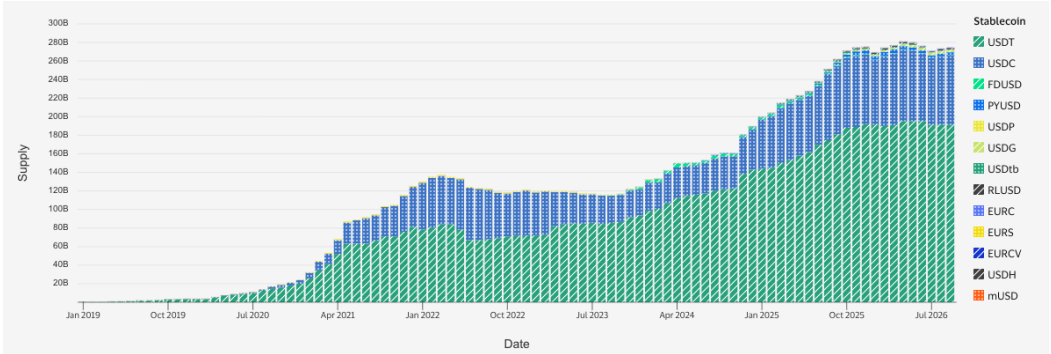
This Paper: Model, Estimation, Counterfactual and Implications

- **Model:** Wallets choose a stablecoin and precautionary balances given transaction needs. Choices depend on global coin attributes and local coin–chain conditions.
- **Estimation:** Global carrying costs are lower with higher reserve quality and greater CEX trading volume. Local liquidity is higher with more active wallets and DEX protocols.
- **Counterfactuals**
  - Equalizing global attributes reduces USDC adoption across chains
  - When chains become interoperable, coins mostly lose their dominance on blockchains. Example: USDC's share on Solana falls from 73% to 41%.

This Paper: Model, Estimation, Counterfactual and Implications

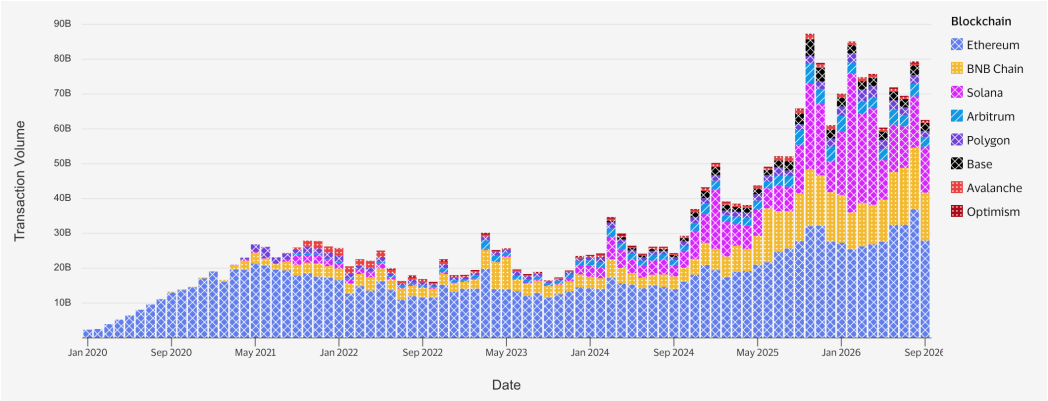
- **Model:** Wallets choose a stablecoin and precautionary balances given transaction needs. Choices depend on global coin attributes and local coin–chain conditions.
- **Estimation:** Global carrying costs are lower with higher reserve quality and greater CEX trading volume. Local liquidity is higher with more active wallets and DEX protocols.
- **Counterfactuals**
  - Equalizing global attributes reduces USDC adoption across chains
  - When chains become interoperable, coins mostly lose their dominance on blockchains. Example: USDC's share on Solana falls from 73% to 41%.
- **Implications:** Local ecosystems offer entrants a path to adoption. Greater interoperability can weaken that advantage and raise barriers to entry.

The state of stablecoins



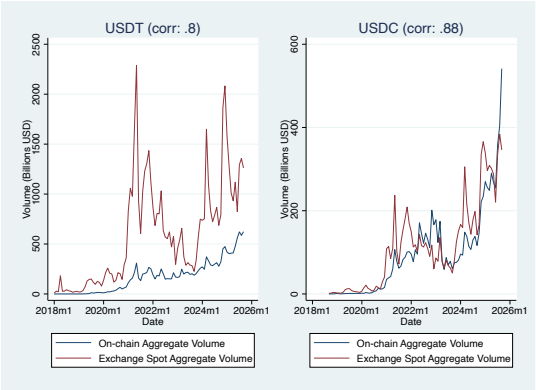
Takeaway: USDC and USDT dominates the stablecoin market

The state of stablecoins

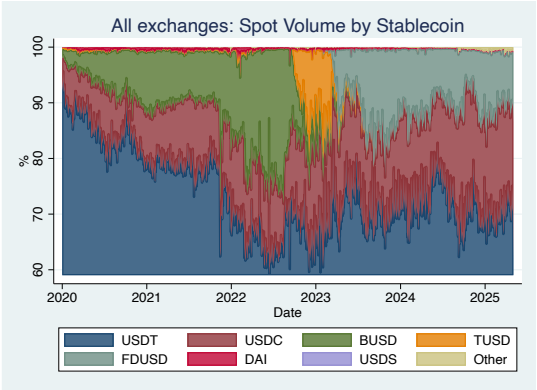


Takeaway: Stablecoin transaction activities grow from Ethereum to many different chains

The state of stablecoins



On-chain vs. exchange spot volume



Exchange volume share

Takeaway: USDT dominates off-chain usage of stablecoins

Data

- **On-chain, wallet-level holdings**: Allium
  - Post-transaction balances for each address-token pair
  - Weekly transaction volumes, counts, and week-end balances

Data

- **On-chain, wallet-level holdings**: Allium
  - Post-transaction balances for each address-token pair
  - Weekly transaction volumes, counts, and week-end balances
- **Chain and token selection**: eight blockchains, 100+ token contracts
  - Arbitrum, Avalanche, Base, BSC, Ethereum, Optimism, Polygon, Solana
  - Main analysis: USDT (Tether) and USDC (Circle)

Data

- **On-chain, wallet-level holdings**: Allium
  - Post-transaction balances for each address-token pair
  - Weekly transaction volumes, counts, and week-end balances
- **Chain and token selection**: eight blockchains, 100+ token contracts
  - Arbitrum, Avalanche, Base, BSC, Ethereum, Optimism, Polygon, Solana
  - Main analysis: USDT (Tether) and USDC (Circle)
- **Characteristics**
  - Global coin attributes: exchange volumes, prices, lending yield, reserve quality
  - Local chain feature: transaction fees
  - Local coin-chain characteristics: Active contracts, DEX balance and protocol accounts, active wallets

Wallet selection

Nearly 200 million wallets that plausibly reflect end-user activity

- Start with wallets that ever hold a stablecoin
- Remove labeled entities: exchanges, institutions, DeFi, bridges, bots
- Remove custodial deposit addresses (over 240 million)
- Remove nonrandom addresses: low-entropy EVM, off-curve Solana
- Remove other inorganic activity: internal transfers, high intensity, no gas

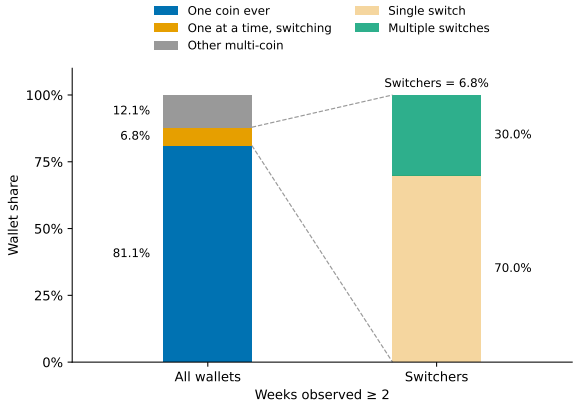
Five stylized facts

1. Stablecoin choices are sticky. Fact 1
2. First-time wallets drive growth and transact more intensively. Fact 2
3. First-time users are increasingly retail-oriented and geographically diverse. Fact 3
4. Stablecoin shares differ across chains and persist over time. Fact 4
5. Local conditions matter for stablecoin growth. Fact 5

Stablecoin choices are sticky

Facts

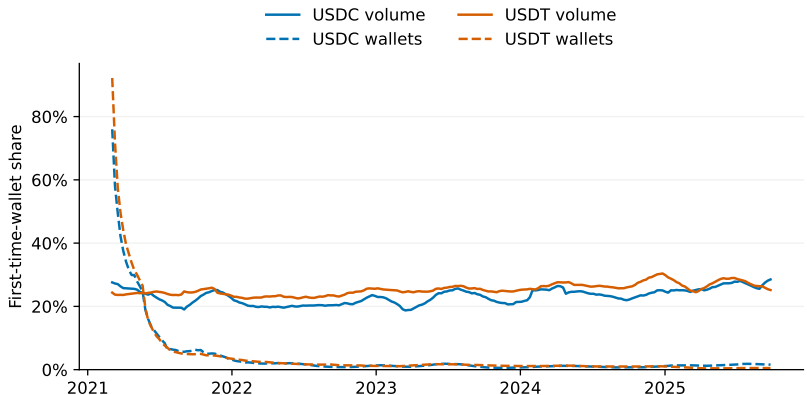
81% use one coin. Among switchers, 70% switch only once.



First-time wallets drive growth

Facts

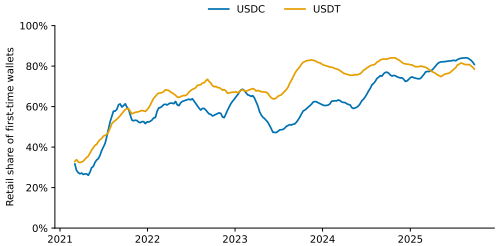
First-time wallets account for 23% of USDC volume and 25% of USDT volume.

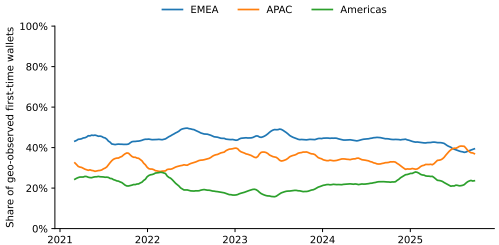


First-time users are increasingly retail and remain geographically diverse

Facts

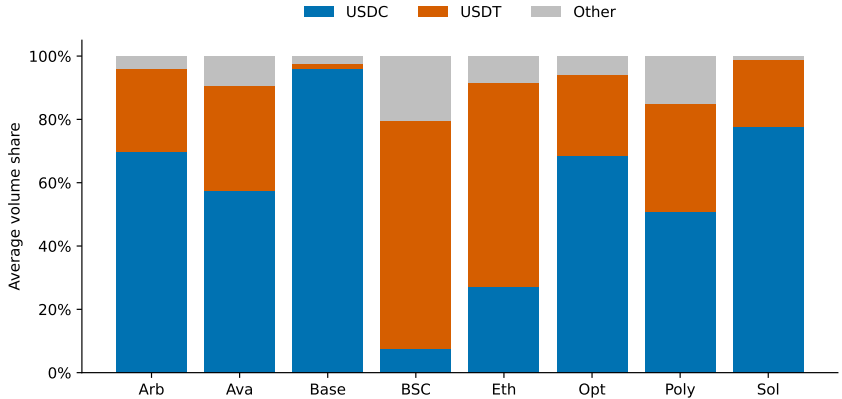
Retail share rises from 32% (33%) to 81% (79%) for USDC (USDT).
September 2025: 39% EMEA, 37% APAC, 24% Americas.





Stablecoin shares differ markedly across chains

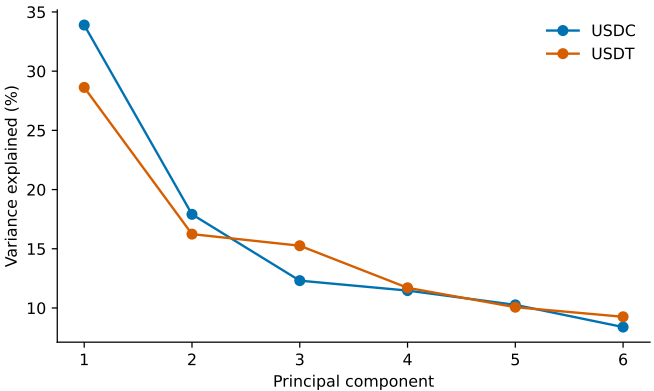
Facts



Stablecoin growth goes beyond global drivers

Facts

The first principal component explains less than 40% of first-time-user volume growth.



A model of stablecoin choice: Setup

- Notation: chain i, coin j, wallet n, week t
- Take the wallet's blockchain as given. Each wallet chooses:
  - One initial coin to use
  - Whether to pay a fixed cost of managing precautionary balances
  - How much balance to hold

A model of stablecoin choice: Setup

- Notation: chain i, coin j, wallet n, week t
- Take the wallet's blockchain as given. Each wallet chooses:
  - One initial coin to use
  - Whether to pay a fixed cost of managing precautionary balances
  - How much balance to hold
- T_{nit}: expected weekly transaction needs on chain i
  - Exogenous; proxied by realized transaction volume in the first week
  - Balances help meet transaction needs

Model setup: Latent states and shocks

- **States**: local liquidity v_{ijt} varies by coin–chain–week; global carrying cost c_{jt} varies by coin and week.

$$v_{ijt} = a + x'_{ijt}\beta + \xi_{ijt}, \qquad c_{jt} = \exp(\alpha_j + y'_{jt}\gamma + \eta_{jt}).$$

$$\xi_{ijt} \sim N(0, \sigma_\xi^2), \quad \eta_{jt} \sim N(0, \sigma_\eta^2), \quad \xi_{ijt} \perp \eta_{jt}.$$

  - Predetermined local characteristics x_{ijt} and global characteristics y_{jt}
  - a: common local intercept; α_j: coin-specific global intercept

Model setup: Latent states and shocks

- **States**: local liquidity v_{ijt} varies by coin–chain–week; global carrying cost c_{jt} varies by coin and week.

$$v_{ijt} = a + x'_{ijt}\beta + \xi_{ijt}, \qquad c_{jt} = \exp(\alpha_j + y'_{jt}\gamma + \eta_{jt}).$$

$$\xi_{ijt} \sim N(0, \sigma_\xi^2), \quad \eta_{jt} \sim N(0, \sigma_\eta^2), \quad \xi_{ijt} \perp \eta_{jt}.$$

  - Predetermined local characteristics x_{ijt} and global characteristics y_{jt}
  - a: common local intercept; α_j: coin-specific global intercept

- **Wallet-specific shocks**
  - κ_n: fixed cost of managing precautionary balances, per unit of T
  - ε_{nijt}: idiosyncratic coin-preference shock

Information and timing

1. Enter chain i; know T, lagged characteristics, and shock distributions
2. Observe coin preferences ε and choose a coin using expected utility

Information and timing

1. Enter chain i; know T, lagged characteristics, and shock distributions
2. Observe coin preferences ε and choose a coin using expected utility
3. Observe private fixed cost κ_n; decide whether to pay it
4. Local and global shocks ξ, η are realized and observed
5. If the cost was paid, choose a balance $d \geq 0$; otherwise hold zero
6. Transactions occur and balances are recorded

Structural parameters: $\theta = (a, \beta, \alpha, \gamma, \bar{\kappa}, \sigma_\xi, \sigma_\eta)$.

Wallet's problem: Optimal balance

- After paying the fixed cost and observing v, c, choose $d \geq 0$ to maximize:

$$U^+(d) = -c\frac{d}{T} - \frac{1}{2}\exp(-v)\left(1 - \frac{d}{T}\right)^2 - \kappa_n.$$

  - $c\,d/T$: carrying cost of balances
  - $\frac{1}{2}\exp(-v)(1 - d/T)^2$: cost of replenishing balances
  - Greater local liquidity v reduces the cost of replenishment

- Optimal balance per unit of transaction needs:

$$\frac{d^*}{T} = [1 - c\exp(v)]_+ \equiv q^*(v, c).$$

  - Larger T raises precautionary balances
  - Larger c or v lowers balances when they are positive

Wallet's problem: Zero-balance decision

- Private fixed cost κ_n is exponential with mean $\bar{\kappa}$.
- Pay the cost when it is below the expected benefit of precautionary balances:

$$\bar{A}_{ijt} = \mathbb{E}_t\left[\tfrac{1}{2}e^{-v_{ijt}}[1 - c_{jt}e^{v_{ijt}}]_+^2\right], \qquad \Pr(\text{do not pay}) = \rho_{ijt} = e^{-\bar{A}_{ijt}/\bar{\kappa}}.$$

- Greater anticipated global concern or local liquidity reduces the expected benefit and raises the probability of a zero balance.

Wallet's problem: Stablecoin choice

- Expected value combines the no-balance value and the net benefit of the option to hold precautionary balances:

$$\overline{V}_{ijt} = -\tfrac{1}{2}\mathbb{E}_t[e^{-v_{ijt}}] + H(\bar{A}_{ijt};\bar{\kappa}), \quad H(A;\bar{\kappa}) = A - \bar{\kappa}(1 - e^{-A/\bar{\kappa}}).$$

- Choose the coin maximizing expected value plus an i.i.d. Type-I extreme-value preference shock:

$$P_{ijt} = \frac{\exp(\overline{V}_{ijt})}{\sum_{k\in\mathcal{J}_{it}} \exp(\overline{V}_{ikt})}.$$

- Greater local liquidity raises coin value; greater global concern lowers it.

- For a given change in relative coin values, adoption is most sensitive near equal market shares.

Moment conditions and identification

- **Positive balances:** compare $\log(1-\widehat{q}_{ijt})$ across chains for a given coin and week to identify local slopes; levels inform global slopes. Here $\widehat{q}_{ijt}$ is the mean positive-balance ratio.
- **Zero-balance share:** informs the mean fixed cost $\bar{\kappa}$, conditional on at least one positive balance in the cell.
- **Adoption share:** informs the common local intercept and coin values relative to preference shocks.
- Estimate 15 parameters using 42 moments by joint two-step GMM. ▸ Outcome illustration

Sample selection and tractability

- **Estimation sample**: 56.6 million wallets across eight chains
  - Major-token activity or holdings on the same chain in the adoption week
  - A single USDC or USDT choice in that week
  - Activity in the adopted coin on that chain in at least two observed weeks
  - Exclude the first 12 weeks of each chain–coin pair and retain chain–weeks with at least 500 selected adopters

Sample selection and tractability

- **Estimation sample**: 56.6 million wallets across eight chains
  - Major-token activity or holdings on the same chain in the adoption week
  - A single USDC or USDT choice in that week
  - Activity in the adopted coin on that chain in at least two observed weeks
  - Exclude the first 12 weeks of each chain–coin pair and retain chain–weeks with at least 500 selected adopters
- **Tractability:** transaction needs scale balances; choices and balance ratios do not depend on T.
  - Aggregate wallets into coin–chain–week cells for estimation

Observed global and local factors

All characteristics are lagged one week.

Global (y_{jt}, coin–week)

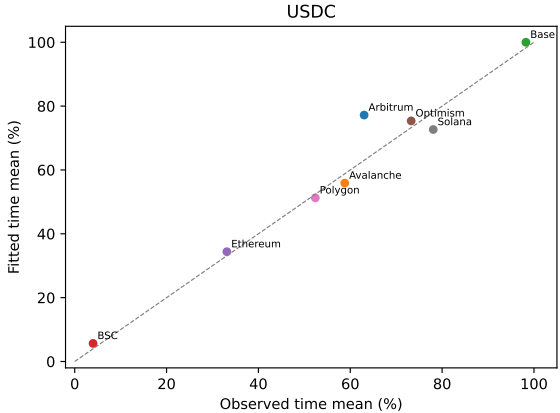
- Lending and borrowing yields
- CEX spot transaction volume
- Reserve share in non-government assets
- Squared peg deviation
- Four-week price volatility

Local (x_{ijt}, coin–chain–week)

- Active contracts (chain-wide)
- Active user base (wallet count)
- DEX pool balances
- DEX protocol count

Model fit: USDC choice shares across chains

The model closely reproduces the ranking of adoption shares across chains.



Estimation results: The role of local conditions

Parameter	Estimate	Robust SE
A. Local coefficients		
Log active contracts	0.0049**	0.0024
Log DEX balance	-0.0330***	0.0023
Log DEX protocol count	0.0888***	0.0082
Log active wallets	0.0560***	0.0035
Observations		3,123

Estimation results: The role of global factors

Parameter	Estimate	Robust SE
B. Global carrying-cost coefficients		
Log-cost intercept: USDT	10.4333***	0.6090
Log-cost intercept: USDC minus USDT	-0.4361***	0.0356
Lending yield	0.0231***	0.0034
Log CEX spot volume	-0.2526***	0.0223
Non-government reserve asset share	0.2707***	0.0537
Squared peg deviation	0.1093	0.3594
Four-week price volatility (bp)	0.0027***	0.0009
Observations		3,123

Estimation results: Structural parameters

Parameter	Estimate	Robust SE
C. Scale and shock parameters		
Common local intercept	-5.4538	0.1343
Mean fixed cost	47.1694	7.2648
Local shock SD	0.3863	0.0073
Global shock SD	0.0526	0.0648
Observations		3,123

Counterfactuals

1. **Equalize global attributes**
   - Give USDC and USDT the same global characteristics and carrying-cost intercept, using their averages.
   - Ask how adoption changes when global differences between the coins are removed.

Counterfactuals

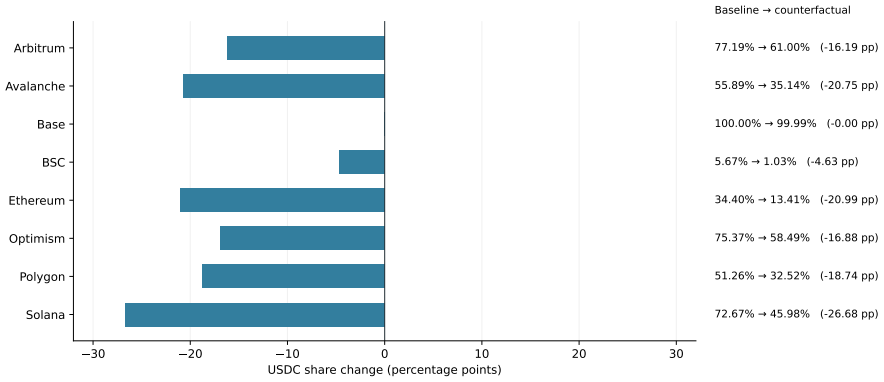
1. **Equalize global attributes**
   - Give USDC and USDT the same global characteristics and carrying-cost intercept, using their averages.
   - Ask how adoption changes when global differences between the coins are removed.
2. **Make chains interoperable**
   - Pool each coin's active users, DEX balances and DEX protocol counts across chains where it is available.
   - Keep global coin attributes and chain-level activity at their observed values.

Compare adoption shares with those predicted by the model using observed global and local characteristics.

Counterfactual: Equalize global attributes

USDC's predicted adoption share falls across chains.

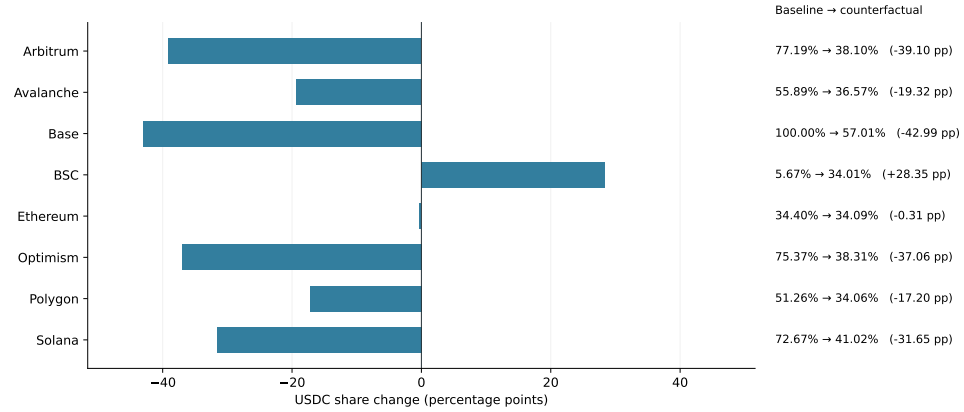
Same global change, different effects: local liquidity and initial market shares differ across chains.



▸ Coin intercept ▸ CEX volume ▸ Reserve assets

Counterfactual: Make chains interoperable

USDC's share falls on chains where it has a strong local presence.



▸ User base sharing

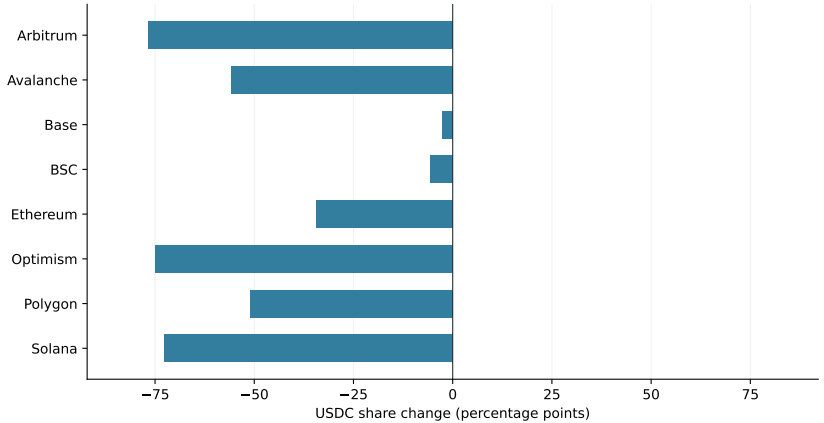
Conclusion

- **Local coin-chain conditions sustain fragmented adoption.**
  - Equalizing these conditions largely removes cross-chain differences
- **Local ecosystems offer a path to entry.**
  - Entrants can build supply, liquidity, and acceptance on one chain
  - They need not initially match incumbents' global attributes
- **Interoperability changes how currencies compete.**
  - Weakening local advantages may raise barriers to entry
  - Relevant for private issuers and central banks designing digital currencies

Appendix

Equalize coin intercepts

Back



Baseline → counterfactual

77.19% → 0.43% (-76.76 pp)

55.89% → 0.06% (-55.83 pp)

100.00% → 97.30% (-2.70 pp)

5.67% → 0.00% (-5.66 pp)

34.40% → 0.02% (-34.38 pp)

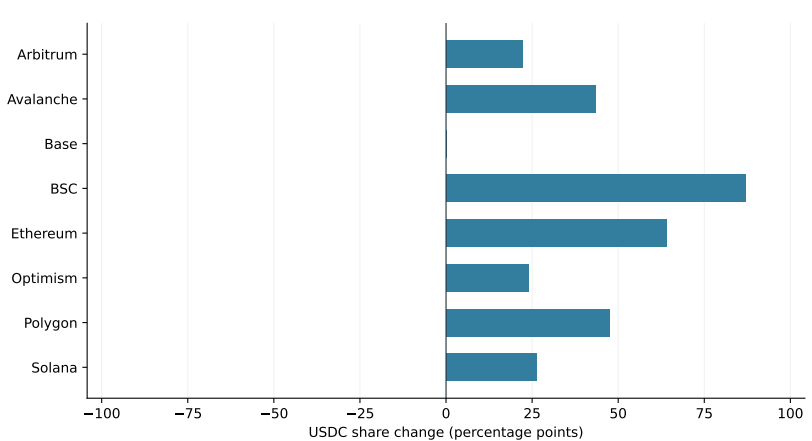
75.37% → 0.32% (-75.05 pp)

51.26% → 0.31% (-50.95 pp)

72.67% → 0.04% (-72.62 pp)

Equalize CEX spot volume

Back



Baseline → counterfactual

77.19% → 99.53% (+22.34 pp)

55.89% → 99.34% (+43.45 pp)

100.00% → 100.00% (+0.00 pp)

5.67% → 92.52% (+86.85 pp)

34.40% → 98.57% (+64.17 pp)

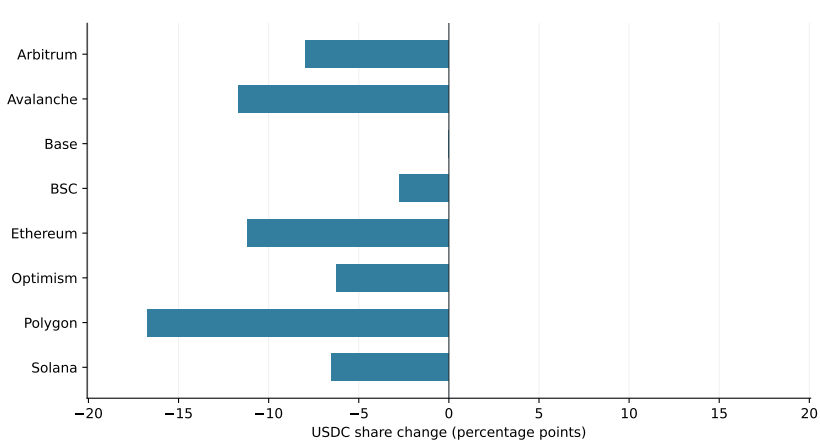
75.37% → 99.32% (+23.95 pp)

51.26% → 98.72% (+47.46 pp)

72.67% → 98.93% (+26.26 pp)

Equalize non-government reserve shares

Back



Baseline → counterfactual

77.19% → 69.22% (-7.97 pp)

55.89% → 44.19% (-11.70 pp)

100.00% → 100.00% (-0.00 pp)

5.67% → 2.92% (-2.75 pp)

34.40% → 23.21% (-11.19 pp)

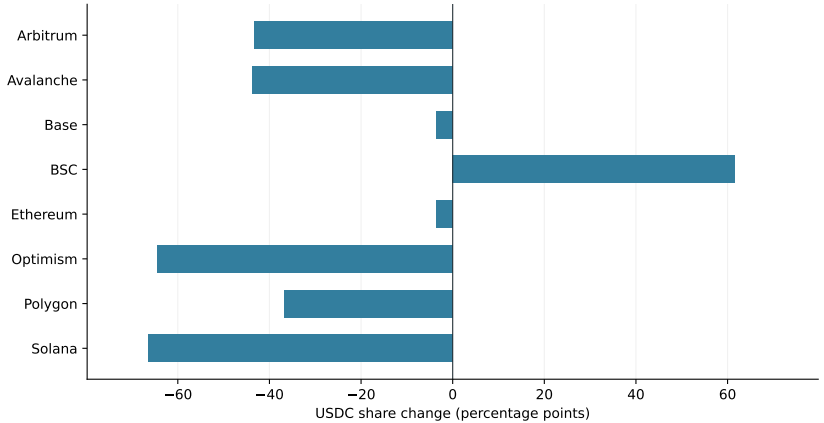
75.37% → 69.11% (-6.26 pp)

51.26% → 34.53% (-16.73 pp)

72.67% → 66.13% (-6.53 pp)

Share each coin's user base across chains

Back



Baseline → counterfactual

77.19% → 33.86% (-43.33 pp)

55.89% → 12.13% (-43.76 pp)

100.00% → 96.36% (-3.64 pp)

5.67% → 67.27% (+61.60 pp)

34.40% → 30.84% (-3.56 pp)

75.37% → 10.97% (-64.40 pp)

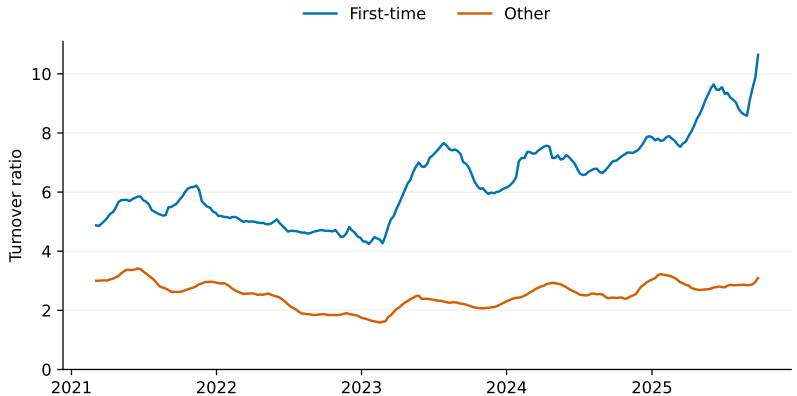
51.26% → 14.48% (-36.78 pp)

72.67% → 6.18% (-66.49 pp)

Fact 2: First-time wallets transact more intensively

Facts

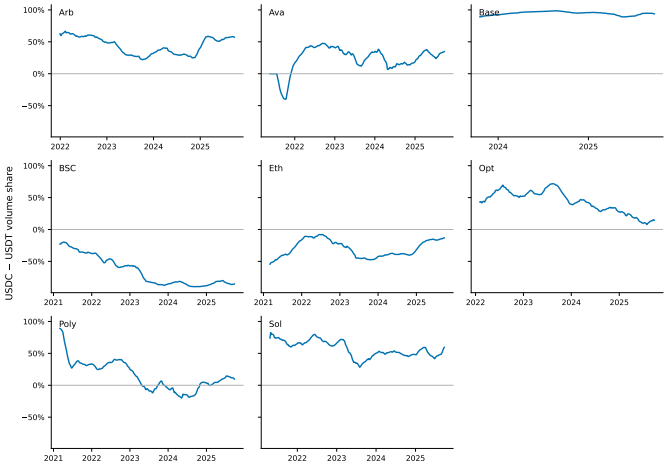
Turnover is 1.6 times other users' in March 2021, rising to 3.4 times by September 2025.



Fact 4: Differences often persist over time

Facts

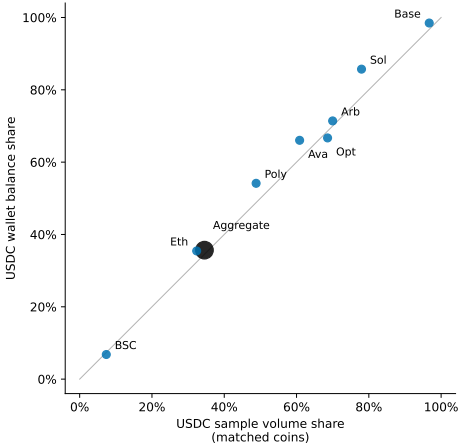
A particular coin dominates a chain all the time.



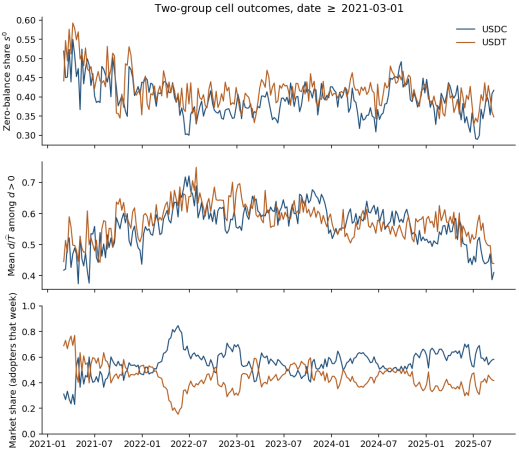
Fact 4: Balance shares track transaction-volume shares

Facts

Balance share and transaction volume share line up, both at the chain level and the aggregate level.



Three dimensions of outcomes: An illustration



Back