Payments and Fintech

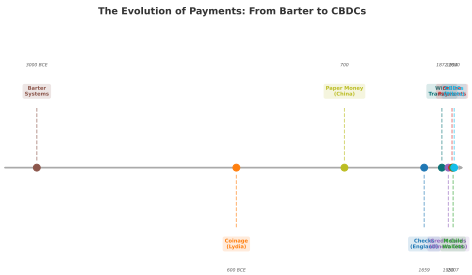
From Cash to Digital: The Transformation of Money Movement

Bridge from Lecture 2

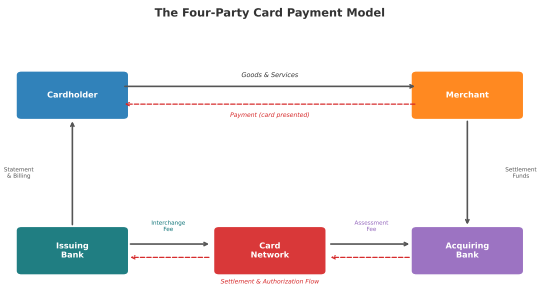
In Lecture 2 we explored the **behavioral** side of fintech: trust, nudging, choice architecture, and the inclusion-protection trade-off.

Now we apply that lens to the largest fintech vertical: **payments**.

- **Choice architecture:** Every payment interface shapes spending behavior — tap-to-pay removes the "pain of paying."
- **Trust:** Consumers entrust payment providers with every transaction. Trust failure here is existential.
- **Inclusion:** Real-time payment rails (UPI, PIX) are the most powerful inclusion infrastructure ever built.



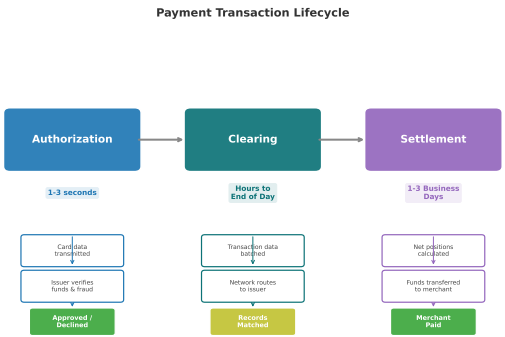
The Four-Party Payment Model



The card payment ecosystem involves four principals:

- **Cardholder** — The consumer who initiates the transaction.
- **Issuer** — The cardholder's bank. Issues the card, extends credit or debit access, bears fraud risk.
- **Acquirer** — The merchant's bank. Processes the transaction, deposits funds, manages merchant risk.
- **Network** (Visa, Mastercard) — Sets rules, routes messages, guarantees interoperability. Does not hold funds.

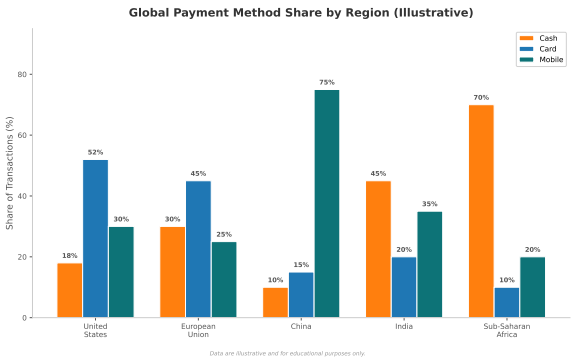
Authorization, Clearing, and Settlement



Every card transaction passes through three stages:

1. **Authorization** (milliseconds) — The issuer verifies the cardholder's identity, checks available funds or credit, and approves or declines. A hold is placed on the amount.
2. **Clearing** (hours to one day) — Transaction details are exchanged between acquirer and issuer via the network. Net positions are calculated.
3. **Settlement** (one to three days) — Actual funds transfer between issuer and acquirer banks. The merchant receives funds minus fees.

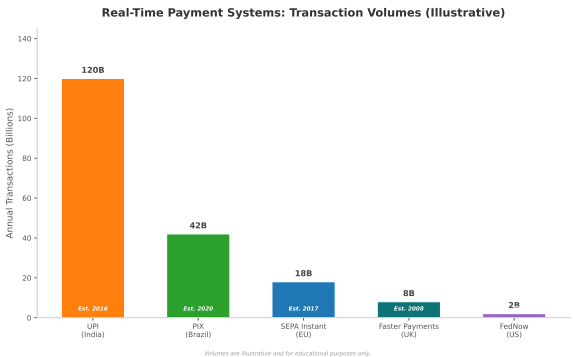
The Global Payment Landscape



Payment mix varies dramatically by region:

- **China:** Mobile payments (Alipay, WeChat Pay) dominate at over 85% of consumer transactions. Cards were leapfrogged entirely.
- **Nordics:** Card and mobile payments exceed 95% of retail volume. Cash infrastructure is actively being dismantled.
- **Germany & Japan:** Cash remains king at 50–60% of point-of-sale transactions despite high wealth and connectivity.
- **Sub-Saharan Africa:** Mobile money (M-Pesa model) serves populations

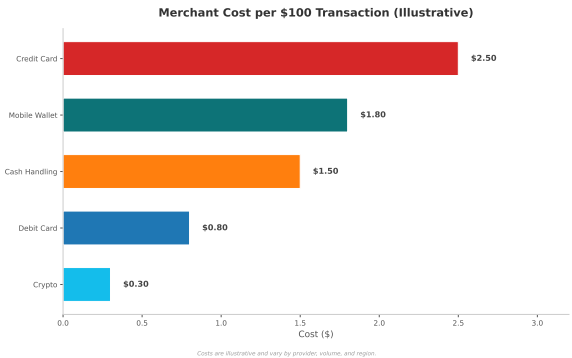
The Rise of Real-Time Payments



Real-time payment systems have emerged as national infrastructure:

- **UPI** (India, 2016) — Unified Payments Interface. Account-to-account, interoperable, zero-fee for consumers. Over 400 million users.
- **PIX** (Brazil, 2020) — Central bank mandated. Reached 150 million users in under two years. Free for individuals.
- **FedNow** (USA, 2023) — The Federal Reserve's instant payment rail. Late entrant in a card-dominated market.
- **Faster Payments** (UK, 2008) — Pioneer of 24/7 settlement. Fifteen

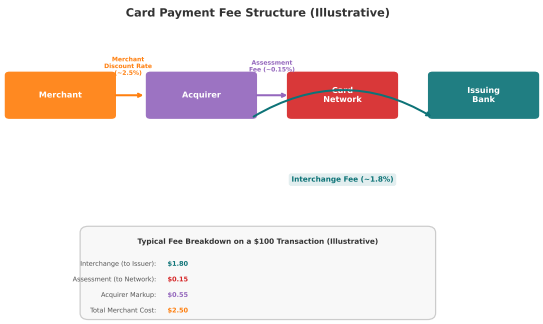
The Merchant Cost Burden



The cost of accepting payments varies dramatically by method:

- **Cash:** 0.5–1.5% (handling, security, insurance, shrinkage). Often underestimated.
- **Debit card:** 0.5–1.0% in regulated markets (EU); 0.5–1.5% in the US (post-Durbin).
- **Credit card:** 1.5–3.5% (interchange + network fees + acquirer margin). Premium and rewards cards cost more.
- **Mobile wallet:** 0–1.5%, depending on underlying funding (UPI is zero; Apple Pay passes through card fees).

Interchange Fees Explained



The interchange fee is the largest component of the merchant discount rate. It flows from the **acquirer to the issuer** on every transaction:

- **Economic rationale:** Compensates the issuer for fraud risk, interest-free period (credit cards), and the cost of maintaining the cardholder relationship.
- **Set by networks:** Visa and Mastercard publish interchange schedules with hundreds of rate categories based on card type, merchant category, and transaction method.
- **Not negotiable:** Individual merchants cannot negotiate interchange rates

Payment Regulation: Durbin and PSD2

Durbin Amendment (USA, 2010):

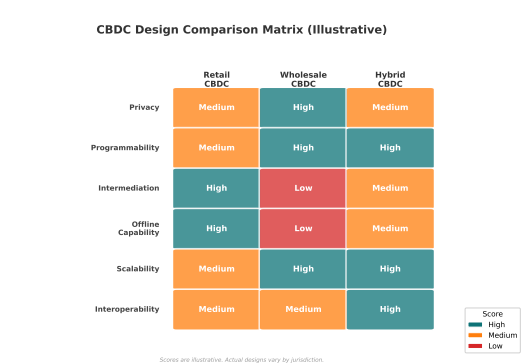
- Capped debit interchange for large banks at ≈21c + 0.05% (down from 44c average — a 45% reduction).
- Routing mandate: merchants must have access to two unaffiliated debit networks per card.
- Intended: USD 6–8B in annual merchant savings.
- Unintended: Banks eliminated free checking and debit rewards; credit interchange rose as issuers shifted incentives — the **waterbed effect**.

PSD2 (EU, effective 2018):

- **Open Banking:** Banks must provide API access to authorized third-party providers (TPPs) with customer consent.
- **PISPs** can initiate payments directly from customer accounts, bypassing card networks entirely — near-zero cost for merchants.
- **Strong Customer Authentication (SCA):** Two-factor auth for payments above EUR 30. Conversion rates initially fell 20–30% before exemption strategies matured.

Global Comparison

CBDCs and a Payment Evaluation Framework



CBDC design dimensions:

- **Retail vs. Wholesale:** Public digital cash vs. interbank settlement.
- **Account-based vs. token-based:** Identity-linked vs. bearer instrument

Five questions to evaluate any payment system:

1. **Who bears the cost?** Visible to payer, hidden in prices, or government-subsidized?
2. **What is settlement finality?** Seconds, hours, or days?
3. **How does it handle failure?** Who absorbs fraud losses and errors?
4. **Who is excluded?** Bank account, smartphone, identity documents required?
5. **What behavioral effects does it create?** Spending awareness up or