WEEK 5 · MODULE 3

Central Banking, Monetary Policy, and FinTech

Financial Institutions and Markets · MF50004.01

Prof. Jiajun Jiang · School of Economics, Fudan University · Semester 1, 2026–2027

Where we left off

Week 4 in brief

Most firms raise external money through intermediaries, because lenders know less than borrowers: adverse selection before the loan, moral hazard after it. Debt saves on monitoring, but limited liability pushes borrowers toward risk. A financial crisis is these problems getting worse at once until lending stops — in 2008, in March 2023, and in China in 2019, when Baoshang's large creditors took losses and the share of banks unable to sell an NCD rose from **8.3% to 43.1%** in eleven days.

This week is about central banks, and about FinTech

Central banks influence the interest rates behind borrowing and asset prices, and provide liquidity when funding markets come under stress. Payment infrastructure enables transactions to be completed, connects financial institutions and supports trust in money. Digital payment systems, CBDC and stablecoins raise questions about settlement, the issuer of a balance and its convertibility.

This week

MEETING 1 · CENTRAL BANKS

1. Central banks and the market for reserves
2. Unconventional tools and the People’s Bank of China

MEETING 2 · PAYMENTS AND DIGITAL MONEY

1. Payment systems and settlement infrastructure
2. CBDC, stablecoins and redemption risk

Meeting 1 follows Mishkin Chapters 9 and 10. Meeting 2 has no textbook chapter; every figure is sourced on its slide.

MEETING 1

Session 1 · Central banks and the market for reserves
Session 2 · Unconventional tools and the PBoC

90 minutes · how central banks set interest rates in the United States, the euro area and China · closes on the People’s Bank of China’s two sets of tools

SESSION 1 · 45 MINUTES

Central banks and the market for reserves

1668 · Riksbank

The oldest central bank, in Sweden. Founded under Parliament after a bank failure

→

1694 · Bank of England

The model for later central banks: buy government debt, settle payments, defend the value of the currency

→

1913 · Federal Reserve

Created after the banking panics of 1873, 1893 and 1907, and built so that no single city would control it

Different origins: a bank failure in Sweden, government finance in England, and repeated banking panics in the United States.

What a modern central bank does

The original three

- Issue banknotes
- Settle payments between banks
- Supervise the banks it settles for

What was added

- Set the price of money — the policy rate
- Lend to banks in a panic, as lender of last resort
- Hold foreign reserves and manage the exchange rate
- Monitor risks across the financial system

UK reform announced in 1997: bank supervision moved to the FSA in 1998. Prudential supervision returned to the Bank's framework in 2013; conduct regulation stayed separate.

The Federal Reserve System

Body	Composition	What it controls
Board of Governors	7 governors; staggered 14-year terms; presidential nomination and Senate confirmation	Reserve rules, approval of discount rates, bank supervision
12 Reserve Banks	Regional institutions; member banks hold statutory stock	Lending to banks, supervision, payment systems
Federal Open Market Committee (FOMC)	7 governors + New York + 4 rotating presidents = 12 votes; meets 8 times a year	The policy rate and the balance sheet
New York Fed trading desk	Carries out operations for the whole system	Implements FOMC open market operations

Power is split three ways on purpose. The FOMC, the body that matters most for interest rates, is not in the 1913 Act: it grew out of practice in the 1920s and was written into law afterwards.

Two designs, two mandates

FEDERAL RESERVE

- **Dual mandate** — maximum employment and stable prices
- Federal and regional bodies; the New York desk carries out operations
- Supervises and regulates banks
- Buys government debt outright

EUROPEAN CENTRAL BANK (ECB)

- **Hierarchical mandate** — price stability is the primary objective
- The ECB and 21 national central banks form the Eurosystem
- Supports other EU economic objectives subject to price stability
- Can buy government bonds in secondary markets; direct government financing is prohibited

Euro area: 21 of the EU's 27 countries. Eurosystem = ECB + their central banks.
ESCB = ECB + the central banks of all 27 EU countries.

ESCB: European System of Central Banks. ECB institutional overview and 2025 strategy; membership in October 2026.

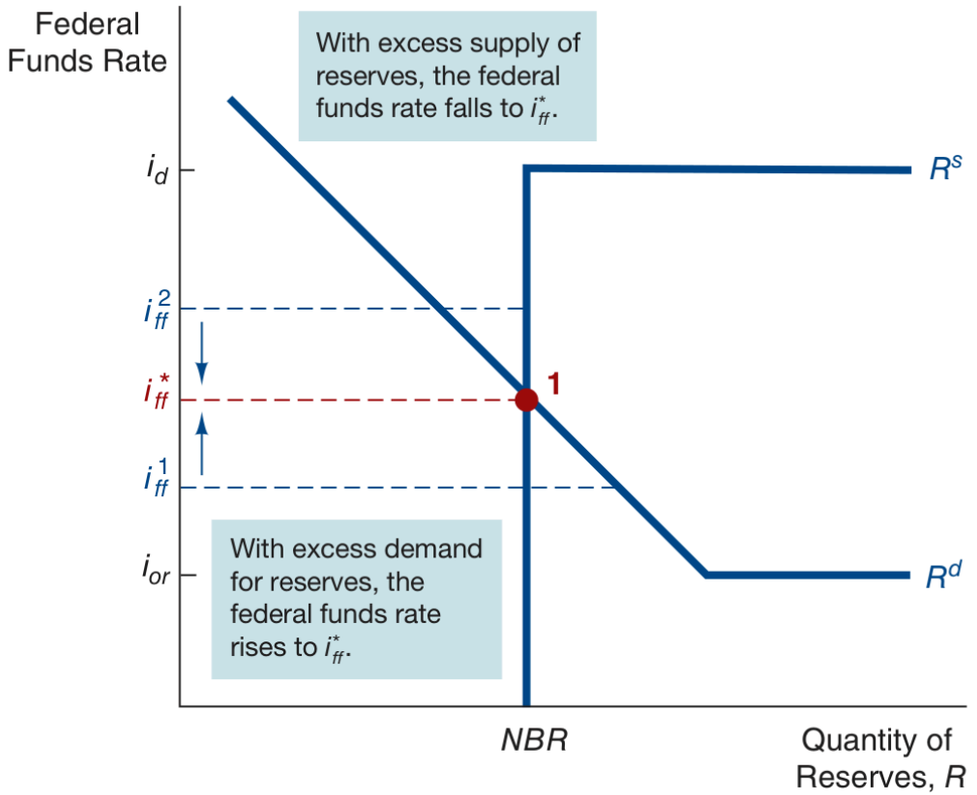
Independence: who sets goals and tools?

	Who sets the mandate?	Who specifies the inflation target?	Instrument independence
Federal Reserve	Congress: maximum employment and stable prices	FOMC: 2% over the longer run	Yes, within law and congressional oversight
ECB	EU Treaty: price stability is primary	ECB: symmetric 2% over the medium term	Yes, protected by the Treaty
People's Bank of China	Law and the State Council	Works within government policy objectives	Partial; State Council oversight

POLL · SHOW OF HANDS · 3 MIN

Should a central bank be independent of the elected government?
Yes / No / Only in how it reaches the goal, never in choosing the goal.

The market for reserves: Mishkin Figure 10.1



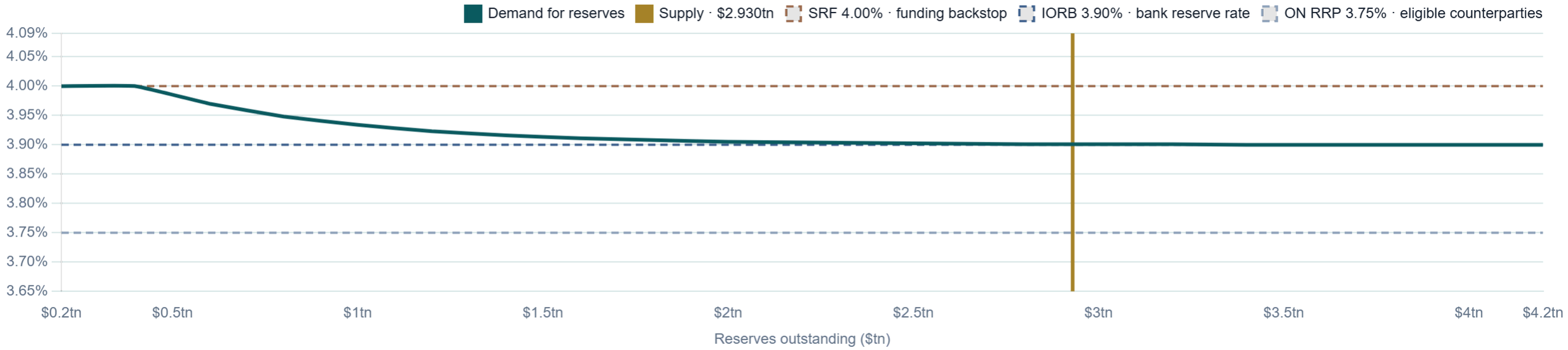
Read the original diagram

- R^d: reserve demand, flat at i_{or}, the interest rate paid on reserves
- R^s: reserve supply, vertical at NBR (nonborrowed reserves), flat at the discount rate i_d
- Point 1: the equilibrium federal funds rate, i_{ff}^*

With scarce reserves, open market purchases shift supply right and lower the overnight rate.

Mishkin & Eakins, Financial Markets and Institutions, 9th Global ed. (2018), Figure 10.1, p. 248. Original figure.

How the Fed sets its rate today: a floor system



3.75–4.00%
TARGET RANGE FOR THE FEDERAL FUNDS RATE

3.90%
IORB — INTEREST PAID ON ELIGIBLE BANK RESERVES

3.75%
ON RRP — INVESTMENT ALTERNATIVE FOR ELIGIBLE COUNTERPARTIES

4.00%
SRF — COLLATERALISED OVERNIGHT FUNDING BACKSTOP

FOMC implementation note of 16 September 2026, effective 17 September. Reserve balances $2.930tn on 23 September 2026.

Four conventional monetary policy tools

Tool	Mechanism in Mishkin Ch. 10	Role in current frameworks
Open market operations	Purchases add reserves; sales remove them	Maintain reserve supply; with ample reserves, administered rates steer the overnight rate
Discount window	Collateralised central-bank loans add borrowed reserves	A liquidity backstop; the standing repo facility provides another secured funding channel
Reserve requirements	A higher ratio raises banks' demand for reserves	US: zero since March 2020. China continues to use the ratio as a policy tool
Interest on reserves	The return on reserve balances creates the lower flat part of reserve demand	A main rate-setting instrument in the Fed's ample-reserves system

Reserve requirements affect liquidity needs and funding costs; they do not mechanically determine bank lending.

SESSION 2 · 45 MINUTES

Unconventional tools and the PBoC

Beyond routine policy-rate changes

When further rate cuts offer limited room, or funding markets break down, central banks can broaden their operations.

Liquidity lending

Expand funding, collateral, counterparties or loan maturities

Asset purchases: QE

Buy securities outright, often in large amounts and at longer maturities

Forward guidance

Explain how future policy depends on economic conditions

Negative rates

Set selected administered interest rates below zero

The tools can be combined. Liquidity lending creates a loan; an asset purchase transfers a security.

QE: asset purchases to lower long-term rates

QE1 · 2008–10	Agency MBS purchases expanded to $1.25tn in March 2009
QE2 · 2010	$600bn of longer-term Treasuries
QE3 · 2012	Initially $40bn of mortgage securities per month
2020–22	Pandemic purchases; total Fed assets peaked near $9tn

Two balance-sheet operations

QE: the central bank buys securities outright.

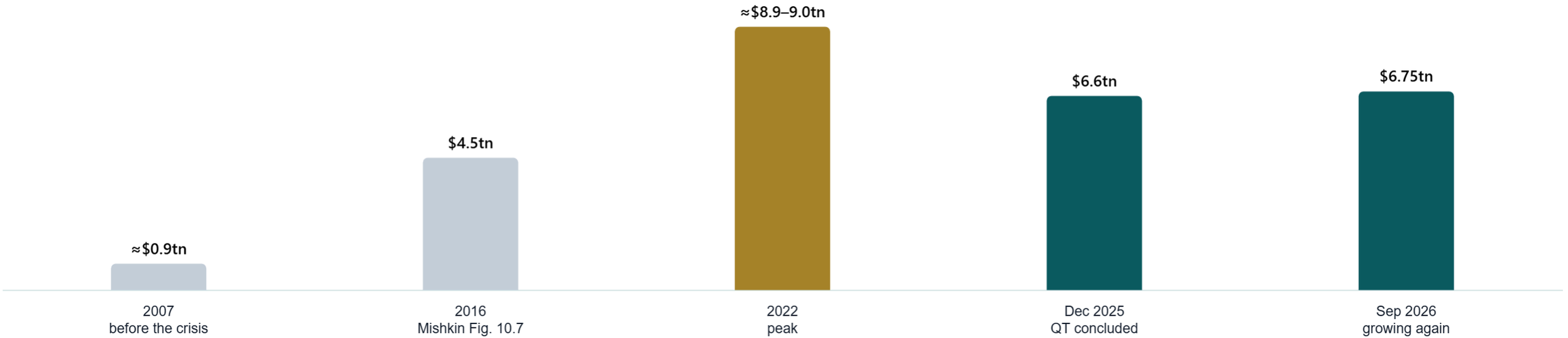
Liquidity lending: it makes a repayable loan, normally against collateral.

Both can create reserve balances. Their assets, terms and policy purposes differ.

Lower long-term rates can reduce mortgage and business financing costs, and raise present values.

Federal Reserve purchase announcements, November 2008 and March 2009; Bernanke, 13 January 2009.

The Fed’s balance sheet, out and back



Growing again, but not as stimulus

Since December 2025 the Fed has bought Treasury bills to keep bank reserves ample while cash in circulation grows. It raised its policy rate in September 2026 while still buying bills.

Federal Reserve H.4.1. Peak about $8.9–9.0tn in 2022; the reduction (quantitative tightening, QT) ended on 1 December 2025 after about $2.4tn; total assets $6.748tn on 23 September 2026.

Forward guidance and negative interest rates

Forward guidance

Explain how future policy depends on economic conditions. Credible guidance can change expected short-term rates and borrowing costs today.

Negative policy rates

Rates below zero can ease financing. Limits include cash substitution and pressure on bank margins when deposit rates cannot fall equally far.

ECB · JULY 2022 EXIT

Inflation risks increased: the deposit rate rose to zero as policy tightening began.

JAPAN · MARCH 2024 EXIT

Stronger wage and price developments supported a move towards sustainable 2% inflation.

The exits reflected changed economic conditions. Negative rates remain a policy option with benefits and limits.

ECB monetary policy decision, 21 July 2022; Bank of Japan framework decision, 19 March 2024.

The People’s Bank of China

The institution

- Founded 1948; commercial banking split off in 1983–84
- A **ministry-level body under the State Council**, China’s cabinet
- Governor nominated by the Premier, confirmed by the National People’s Congress
- Its Monetary Policy Committee is **advisory** and meets quarterly

Six objectives at once

Growth · employment · price stability · balance of payments · financial stability · structural adjustment.

One interest rate cannot reach six goals at once. The useful question is what the PBoC does about that.

Its answer is two sets of tools: one moves the price of money for everyone, the other steers credit to particular borrowers.

The PBoC’s toolkit

Instrument	What it is	What it steers
7-day reverse repo	Daily open market operation	The policy rate — **1.40%** since 8 May 2025
Standing lending facility (SLF)	Short loans to banks, on demand	The ceiling of the rate corridor
Medium-term lending facility (MLF)	Loans to banks, 3–12 months	The *quantity* of funds; no rate announced since March 2025
Pledged supplementary lending (PSL)	Loans to the three state policy banks	Credit to named sectors
Relending	Cheap loans to banks, for lending to set borrowers	The *allocation* of credit
Required reserve ratio (RRR)	Share of deposits held as reserves	Liquidity needs and funding costs; average about **6.2%**
Government bond trading	Outright, from August 2024	Base money; **¥300bn net in H1 2026**

Rate and liquidity tools affect financing conditions; PSL and relending also target the allocation of credit.

PBoC interest-rate reforms, 2024–26

Jun 2024

Governor Pan Gongsheng signals a shift towards the **7-day reverse repo rate** as the main policy rate

Mar 2025

The MLF loses its announced rate; the loan prime rate (LPR), the benchmark for bank loans, now follows the 7-day rate

Jun 2026

Corridor narrowed from **70bp to 50bp**, ±25bp around the policy rate

Now

More attention to overnight market rates, including the interbank repo rate **DR001**

How policy reaches loan rates

Policy rate → interbank funding costs → bank lending rates. Transmission depends on liquidity, competition and credit risk; the loan prime rate (LPR) is a quoted lending benchmark.

Pan Gongsheng, Lujiazui Forum, 17 June 2026 (BIS Review). Administered benchmark deposit and lending rates were replaced earlier; the numerical money-supply (M2) target was dropped after 2018.

Targeted lending: benefits and risks

−25bp

on *every* structural tool from 19 January 2026; one-year relending 1.50% → 1.25%

¥1tn

of relending set aside for private enterprises

+¥400bn

technology relending quota, now ¥1.2tn; a further ¥500bn for agriculture and small business

Evaluate the mechanism

Cheap central-bank funding is conditional on eligible lending. Lower bank funding costs can create new loans, subsidise existing ones, or increase bank margins.

PAIRS, THEN DISCUSSION · 4 MIN

Should the PBoC offer cheap funding for small-firm loans? Give one potential gain, one allocation risk, and a test of whether it creates additional lending.

January 2026 programme terms: gov.cn and chinanews.com. Evaluation framework: BIS, Funding for lending programmes (2023).

MEETING 2

Session 3 · Payment systems and settlement
Session 4 · CBDC and stablecoins

90 minutes · central-bank settlement, payment infrastructure and digital money

Why payment infrastructure matters

SESSION 3 · PAYMENT SYSTEMS

From the central bank to completed transactions

- Provide the settlement asset and accounts
- Operate core systems and oversee payment arrangements
- Support the liquidity needed to complete payments

Why the rest of the economy depends on it

- Wages, invoices and asset purchases need usable funds
- One institution’s outgoing payment is another’s incoming liquidity
- Common rules and reliable access support trust and competition

A failure to complete payments can interrupt real transactions and transmit stress between institutions.

CPMI–IOSCO, Principles for Financial Market Infrastructures; BIS, Central banks and payments in the digital era (2020).

Payment instruction, clearing and settlement

1 · Instruction

Identify who pays whom, how much and through which arrangement

→

2 · Clearing

Transmit and reconcile instructions; calculate obligations, including net positions where relevant

→

3 · Settlement

Transfer funds to discharge the obligation

Final settlement

An irrevocable and unconditional transfer under the applicable legal framework.

A customer notification and final interbank settlement can occur at different times.

CPSS, Glossary of Terms Used in Payment and Settlement Systems (2003); CPMI–IOSCO, Principle 8.

One interbank payment on three ledgers

A customer at Bank A pays 100 to a customer at Bank B.

Bank A
Payer's deposit −100
Bank A's reserve asset −100

→

Central bank
Reserve balance of A −100
Reserve balance of B +100

→

Bank B
Bank B's reserve asset +100
Payee's deposit +100

Two different kinds of money

The customers hold claims on their banks. The banks settle their mutual obligation using balances at the central bank.

The customer deposit is a bank liability; the reserve balance is a central-bank liability.

Illustrative bank balance sheets; CPMI–IOSCO, Principle 9.

RTGS and net settlement: liquidity and risk

Bank A pays Bank B **100**; Bank B pays Bank A **90**.

REAL-TIME GROSS SETTLEMENT (RTGS)

- Settle the two transfers individually
- Gross payment value: **190**
- Funding is needed when each payment is due

DEFERRED NET SETTLEMENT

- Calculate offsetting obligations
- Net amount: **10 from A to B**
- Manage exposures before final net settlement

Gross value differs from the initial liquidity required

If A starts with 100 and B with zero, A can pay 100; B can then reuse 90 of that receipt.

Liquidity needs depend on timing, incoming payments, intraday credit and the system’s rules.

Illustrative calculation; ECB, Economic Bulletin 3/2021, analysis of settlement balances and liquidity recycling.

The app and the payment infrastructure

Layer	What it does	Questions to ask
Customer interface	Wallet, QR code, card or banking app	Can users and merchants access it?
Scheme and clearing	Messaging, common rules, routing and reconciliation	Which providers can connect, and on what terms?
Settlement	Transfer the settlement asset to discharge obligations	Which money is used, and when is it final?

> **Network effects and interoperability**
>
> A service becomes more useful when more people and merchants can reach one another. Common standards can widen access; closed networks can limit competition.

A convenient interface depends on the institutions, rules and connections underneath it.

BIS, Central banks and payments in the digital era (2020).

China: private payment services and shared infrastructure

Users and merchants

Initiate and receive payments through familiar services

Banks and payment firms

Provide accounts, wallets and customer-facing services

Shared clearing

NetsUnion and UnionPay connect participating institutions

Settlement and oversight

Central-bank accounts, safeguarding rules and supervision

Safeguarding customer funds

PBoC reforms centralised payment institutions' covered customer reserve funds at the central bank, reaching 100% centralised custody in January 2019.

Customer-fund safeguarding supports trust without making every wallet balance a direct central-bank claim.

PBoC, customer-funds and payment-clearing reforms, 2018–19.

Instant payments can transfer existing bank money

CUSTOMER SIDE

- Accounts at participating banks or credit unions
- Payments and usable receipts around the clock
- The customer continues to hold bank money

INFRASTRUCTURE SIDE · FEDNOW

- Launched **20 July 2023**
- Participating institutions settle through Federal Reserve accounts
- Access, liquidity and operating arrangements support the service

An instant payment service can improve transfers without issuing a new currency to the public.

Federal Reserve, FedNow launch and service FAQ (2023).

Why do technology companies want payments?

Alipay: commerce and wallets · **WeChat Pay**: social messaging and merchants
Douyin Pay: payments within a short-video and commerce platform

Commercial value	How payments can help
Complete the sale	Connect discovery, checkout, refunds and repeat purchases
Data and merchant relationships	Observe completed payments; offer analysis, coupons and merchant services
Fees and customer retention	Earn payment/service fees and keep transactions within the ecosystem
Customer funds held temporarily	Historically attractive for interest and bargaining power; use now constrained by safeguarding rules

Customer funds are obligations to users; they are not freely available operating cash.

Alipay, WeChat Pay and Douyin merchant documentation; PBoC (2019); State Council payment regulation (2024).

Case — build a payment service or partner?

SITUATION A Chinese commerce platform already accepts Alipay and WeChat Pay. It is considering a licensed payment business of its own.

BUSINESS CASE Closer control of checkout, transaction data and merchant services could strengthen its core business.

COSTS Licensing, fraud losses, compliance, reliable operations and customer-fund protection require resources.

PAIRS, THEN DISCUSSION · 3 MIN

Would you build or partner? Give one commercial reason and one cost. As a central banker, which safeguard would you require?

The firm values revenue and customer retention; public authorities also value safety, access, competition and privacy.

Hypothetical decision informed by Alipay, WeChat Pay and Douyin services and China's payment regulation.

Ledgers: who can update the record?

SESSION 4 · DIGITAL CURRENCY

A **ledger** records balances or ownership and the transfers that change them.

CENTRALISED AUTHORITY

- An authorised operator maintains the accepted record
- Users rely on its rules, controls and accountability
- Copies across servers can improve resilience

DECENTRALISED VALIDATION

- Participants check updates under shared rules
- A consensus mechanism resolves competing histories
- Security depends on that mechanism and its assumptions

Ask separately who validates transfers, who issues the money and who can change the rules.

Bitcoin white paper (2008); BIS, The technology of retail CBDC (2020); Federal Reserve, CBDC security (2022).

Why Bitcoin uses a blockchain

The problem: two attempts to spend the same coin

Alice sends the same coin to Bob and to Carol. Valid signatures show authorisation; the system still needs one accepted spending history.

Broadcast
Transactions reach the network; nodes check the rules

→

Propose blocks
Miners use proof of work to add linked batches of transactions

→

Agree on a history
Nodes follow the valid chain with the greatest accumulated work

Confirmation becomes harder to reverse as work accumulates; security still depends on network, computing-power and key-management assumptions.

Nakamoto (2008), sections 2–4 and 11; Bitcoin developer guide; Federal Reserve (2022).

Who controls the ledger and the money?

Balance or token	Who validates the record?	Issuance and holder's claim
Bank deposit	The bank and its authorised systems	Bank liability; the bank credits and debits accounts
Bitcoin	Open network under proof-of-work rules	Protocol issuance; no issuer promises fiat redemption
USDC · fiat-backed stablecoin	Can use public-chain validators	Circle issues/redeems; token controls include address blocking
CBDC · standard definition	Central operator or approved validators, depending on design	Central-bank liability and issuance authority

A public blockchain can carry a centrally issued token. Distributed recordkeeping does not remove issuer authority.

BIS (2021); Bitcoin protocol documentation; Circle, USDC terms and token-contract design.

What a CBDC adds to a payment system

RETAIL CBDC

- Public access to a digital central-bank liability
- Possible roles in cash choice, inclusion and payment competition
- Wallets and services can be supplied by intermediaries

WHOLESALE CBDC

- Use by eligible financial institutions
- Potential changes to settlement access or functionality
- Can support new links between money and asset transfers

Existing reserves are already digital. Assess what changes in access, functionality and interoperability.

BIS, CBDC chapter (2021); ECB, proposed digital-euro design.

CBDC design: access, privacy and bank funding

Choice	Potential gain	Trade-off
Distribution through banks and payment providers	Existing customer services and compliance capacity	Define responsibilities and fair access
Holding limits or no interest	Reduce incentives to move deposits out of banks	Limit convenience as a store of value
Offline functionality and privacy safeguards	Contingency use and transaction privacy	Security, loss controls and reconciliation
Interoperability standards	Broader merchant and provider reach	Governance and implementation costs

The proposed digital euro illustrates these choices; privacy and resilience depend on the design.

ECB, FAQs on the digital euro, proposed design; checked 21 October 2026.

e-CNY bank wallets under the 2026 framework

e-CNY is China’s digital renminbi system.

Commercial-bank wallet balances

- Account-based liabilities of the operating bank
- Registered balances earn demand-deposit interest from **1 January 2026**
- Deposit-insurance treatment and reserve requirements

What changed

Governor Pan confirmed in October 2026 that e-CNY’s positioning had shifted from cash to deposit money.

These bank-wallet balances are claims on commercial banks. The standard CBDC definition instead refers to a direct central-bank claim.

Keeping a balance as a bank liability does not eliminate bank liquidity or insolvency risk.

Bank of China, 31 December 2025; government framework explanation, January 2026; Pan Gongsheng, 19 October 2026.

Stablecoins: backing, redemption and usable payments

ILLUSTRATIVE RESERVE POOL

Assets worth $100

Cash and short-term government assets

Quality and access matter during redemption.

TOKENS OUTSTANDING

100 tokens targeting $1 each

Issuance and redemption connect tokens to dollars.

Rights and eligible channels depend on the issuer.

Follow the complete payment

Obtain tokens → transfer → convert if needed → redeem or sell for usable funds.

Continuous token transfers can coexist with fees, FX exposure and delays entering or leaving the network.

The redemption promise and the market price can diverge when access, liquidity or confidence is impaired.

Illustrative pool; FSB (2023), Recommendation 9; Circle, USDC terms and reserve disclosures.

Case — USDC and SVB, March 2023

USDC is a dollar-referenced stablecoin issued by Circle.

$3.3bn	**≈8%**	**$0.86**
USDC RESERVES DEPOSITED AT SVB	OF TOTAL RESERVES, AS REPORTED BY CIRCLE	SECONDARY-MARKET TROUGH REPORTED BY FED RESEARCHERS

SITUATION	SVB failed on 10 March. Reserve access was disrupted; primary-market redemptions were constrained over the weekend.
FRICTION	Token transfers continued while access to bank dollars and redemption was impaired.
RECOVERY	Authorities protected SVB depositors on 12 March; redemptions resumed on 13 March.

PAIRS, THEN DISCUSSION · 4 MIN

On that Saturday, would your merchant app accept USDC at $1, or temporarily accept bank dollars only? Explain the risk and the cost of your choice.

Circle, March 2023 reserve updates; Federal Reserve FEDS Notes, 17 December 2025.

Main takeaways

What we covered

1. Central banks, independence and the market for reserves
2. Unconventional tools and the PBoC
3. Payment systems, shared infrastructure and platform incentives
4. Ledgers, CBDC, stablecoins and the rights behind balances

The points to remember

- Policy implementation uses reserves and administered interest rates
- Targeted funding needs evidence of additional useful lending
- Transfers of **100** and **90** have gross value **190** and a net amount of **10**
- Payment firms value data and merchant relationships; customer funds need safeguarding
- Separate ledger validation from issuance and redemption authority
- At-par redemption depends on legal rights and usable access to funds

Questions to Think About

1. How can a delayed incoming payment create a liquidity problem for another bank?
2. How would you test whether targeted central-bank funding creates additional useful lending?
3. Why might a commerce platform want its own payment service? Where could its incentives conflict with public objectives?
4. Can a stablecoin run on a public blockchain and still have a central issuer? Does full reserve backing ensure it always trades at par?

Use the ledger example and the two cases to support your reasoning.

Before Next Class

Required

- Mishkin & Eakins — Chapters 9 and 10 for central banking
- Mishkin & Eakins — Chapters 11 and 12 for the money and bond markets, 26 and 29 October

Optional sources for today

- CPMI–IOSCO — Principles 8, 9 and 17: finality, settlement money and operational risk
- FSB (2023) — Recommendation 9 on stablecoin redemption
- Nakamoto (2008) — Bitcoin, sections 2–4; Circle — USDC terms

Monday 26 October: money markets. Thursday 29 October: bond markets.

References

- Mishkin & Eakins (2018). *Financial Markets and Institutions*, Chapters 9–10.
- CPSS (2003), *Glossary*; CPMI–IOSCO (2012), *Principles for Financial Market Infrastructures*, especially 8, 9 and 17.
- Alipay, WeChat Pay and Douyin, merchant documentation; State Council, payment regulation (2024).
- Nakamoto (2008), *Bitcoin*; Circle, USDC token-contract design; Fed, CBDC security (2022).
- Federal Reserve (2023). FedNow launch and FAQ; FEDS Notes (17 December 2025), USDC and SVB.
- PBoC (2019). Customer-fund and clearing reforms; Pan Gongsheng (2026), speeches of 17 June and 19 October.
- Bank of China (31 December 2025), e-CNY interest notice; government-hosted framework explanation (January 2026).
- BIS (2021). *CBDCs: an opportunity for the monetary system*; ECB, proposed digital-euro FAQ.
- FSB (2023). *Global Stablecoin Recommendations*; Circle, reserve updates of 13 and 15 March 2023 and USDC terms.

APPENDIX

Optional depth

Overnight-rate bounds, operating frameworks and dated source snapshots.

Appendix — where an overnight secured rate should trade

The arbitrage bounds

A bank with reserves can earn i_{IORB} risk-free, so it lends in the repo market only at $r \geq i_{\text{IORB}}$. A money fund cannot hold reserves but can use the overnight reverse repo facility, so it lends only at $r \geq i_{\text{ONRRP}}$. Anyone short of cash who can use the standing repo facility borrows there at i_{SRF}, so never pays more. Together:

$$i_{\text{ONRRP}} \;\leq\; r_{\text{repo}} \;\leq\; i_{\text{SRF}}$$

31 October 2025: the upper bound broke

Repo traded as high as **4.27%** during the day against a facility rate of **4.00%**, and banks borrowed $50.35bn at the facility, the most up to that date. The bound holds only if using the facility costs nothing extra. In practice it uses balance-sheet space at month-end and carries a reputational cost, so the true condition is $r_{\text{repo}} \leq i_{\text{SRF}} + c$, and c cannot be seen until the bound is tested.

Appendix — three operating frameworks

	Federal Reserve	ECB	PBoC
Stance rate	Target range 3.75–4.00%	Deposit facility 2.50%	7-day reverse repo 1.40%
Operating target	Effective fed funds rate	€STR (overnight)	DR001
Regime	Floor, ample reserves	Narrow corridor (15bp)	Corridor 50bp since June 2026
Ceiling	SRF and discount window, both 4.00%	Marginal lending facility	SLF
Reserve requirement	0% since 26 March 2020	1% of eligible liabilities	Weighted average ~6.2%; floor 5%
Balance sheet	QT ended Dec 2025; buys bills	Running off	Bond trading; ¥300bn net, H1 2026
Conditional funding	Emergency programmes have included PPPLF	Targeted longer-term funding has been used	Relending, PSL; −25bp Jan 2026

Fed figures effective 17 September 2026; ECB 16 September 2026; PBoC as at September 2026.

Appendix — examples and dated snapshots

Item	Value or scope	Reference date
Interbank example	A pays 100; B pays 90; bilateral net amount 10	Illustration
Payment customer funds	Prescribed custody; appropriation, borrowing and pledging prohibited	Regulation effective 1 May 2024
USDC at SVB	$3.3bn, about 8% of reserves; access disrupted, not an eventual $3.3bn loss	Mar 2023
FedNow	Instant payment service; customer bank-money claims retained	Launched 20 Jul 2023
Bank e-CNY wallets	Registered balances earn interest; bank-liability implementation	2026 framework
First-meeting Fed snapshot	3.75–4.00% target; IORB 3.90%; reserves $2.930tn	17–23 Sep 2026
First-meeting PBoC snapshot	7-day reverse repo 1.40%; relending 1.25%	Jan–Sep 2026

Historical events and snapshots retain their stated dates; primary sources are identified on the relevant slides.