Post-Class Summary: Traditional Financial Infrastructure

The General Ledger and Double-Entry Bookkeeping

Every financial institution rests on a general ledger: a single source of truth recording all assets, liabilities, and equity. Double-entry bookkeeping requires that every transaction appears as a debit in one account and a credit in another, ensuring the books always balance. This is not merely an accounting convention — it is the foundational data-integrity mechanism that makes auditing, reconciliation, and regulatory reporting possible.

Core Banking as Modular Architecture

A core banking system is the central platform through which a bank manages its product engines — deposits, lending, payments, foreign exchange, and fee collection — all sharing a common ledger. The architecture follows a hub-and-spoke pattern: the ledger is the hub, and each product module is a spoke. Because every module depends on the same underlying data, replacing or upgrading any single component requires careful coordination, which is why core banking modernisation is almost always incremental rather than wholesale.

The Three Stages: Initiation, Clearing, Settlement

A payment passes through three distinct stages. Initiation is the sending of a message — an instruction to pay. Clearing is the process by which payment instructions are exchanged between institutions and net obligations are calculated. Settlement is the final, irrevocable transfer of funds between accounts, typically in central bank money. Risk lives in the gap between initiation and settlement: until settlement is complete, neither party has certainty.

Netting as Liquidity Optimisation

When many institutions owe each other money simultaneously, settling each obligation individually (gross settlement) demands enormous liquidity. Netting reduces the total value that must actually move. Bilateral netting offsets obligations between two parties; multilateral netting offsets obligations across an entire group, dramatically reducing the cash needed. The tradeoff is timing: netting requires accumulating transactions before calculating nets, introducing delay and the risk that a participant defaults before settlement.

SWIFT and Correspondent Banking

SWIFT is a messaging network, not a payment system. It transmits standardised financial messages between banks but does not move money. Actual fund transfers rely on correspondent banking: a hub-and-spoke network in which banks hold accounts (nostro and vostro accounts) with each other. A cross-border payment may pass through several correspondent banks before reaching its destination, each adding time, cost, and a layer of counterparty exposure.

Herstatt Risk and Payment-versus-Payment

Foreign exchange transactions involve two currency legs that may settle in different time zones and through different systems. If one leg settles but the other does not — because the counterparty fails between the two settlements — the paying party loses the full principal. This is Herstatt risk, named after the bank whose failure in the mid-seventies first exposed it. The solution is payment-versus-payment (PvP): both legs settle simultaneously or neither does. CLS Bank operates on this principle, linking settlement of both currencies so that neither is released without the other.

The Trust Hierarchy

Modern finance operates on a layered trust hierarchy. At the top sits the central bank, issuing the safest form of money (reserves) and acting as lender of last resort. Commercial banks hold accounts at the central bank and issue their own form of money (deposits) backed by that relationship. Apps, fintechs, and payment providers sit on top of commercial banks, accessing the payment system through them. Every fintech innovation, from digital wallets to stablecoins, either builds on this hierarchy or attempts to reshape it — but none operates entirely outside it.

The Four-Party Card Model

A card transaction involves four parties: the cardholder, the issuing bank (which issued the card), the acquiring bank (which serves the merchant), and the card scheme (which sets rules and routes authorisations). When a cardholder taps a card, the scheme routes an authorisation request to the issuer, which approves or declines in real time. But authorisation is not settlement — the merchant does not receive funds until the acquirer and issuer settle, typically days later through a batch clearing process.

Key Terms

General ledger
A master record of all financial transactions within an institution, organised by account.

Double-entry bookkeeping
The principle that every transaction must be recorded as both a debit and a credit, keeping the books in balance.

Core banking system
The central software platform managing a bank's accounts, products, and ledger.

Initiation
The first stage of a payment: sending the instruction.

Clearing
The second stage: exchanging instructions between institutions and calculating net obligations.

Settlement
The third stage: final, irrevocable transfer of funds between accounts.

Bilateral netting
Offsetting mutual obligations between two parties so only the net difference is settled.

Multilateral netting
Offsetting obligations across multiple parties simultaneously, reducing total settlement flows.

RTGS Real-time gross settlement — each payment settles individually and immediately in central bank money.

DNS Deferred net settlement — payments are batched, netted, and settled at designated times.

Correspondent banking
An arrangement in which banks hold accounts with each other to facilitate cross-border payments.

SWIFT
A global messaging network that transmits standardised financial instructions between banks (it does not move money).

Herstatt risk
: The risk that one leg of a foreign exchange transaction settles while the other does not, due to counterparty failure.

Payment-versus-payment (PvP)
: A settlement mechanism ensuring both legs of an FX trade settle simultaneously or not at all.

CLS
: Continuous Linked Settlement — a system that eliminates Herstatt risk by settling both FX legs simultaneously.

Trust hierarchy
: The layered structure of money and trust: central bank money at the top, commercial bank money below, and app-layer money at the bottom.

Looking Ahead

The infrastructure described in this summary is what every emerging financial technology either builds upon or seeks to replace. Central bank digital currencies propose giving citizens direct access to central bank money, potentially compressing the trust hierarchy. Stablecoins attempt to replicate the trust properties of bank money without relying on a bank. Decentralised finance envisions replacing clearing houses and correspondent banks with smart contracts that settle automatically. None of these innovations can be properly evaluated without first understanding the system they aim to transform — which is precisely what this lecture covers.

