

Payment Systems Seminar



Central Banking Seminar

October 13, 2000

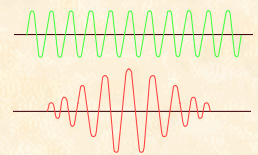
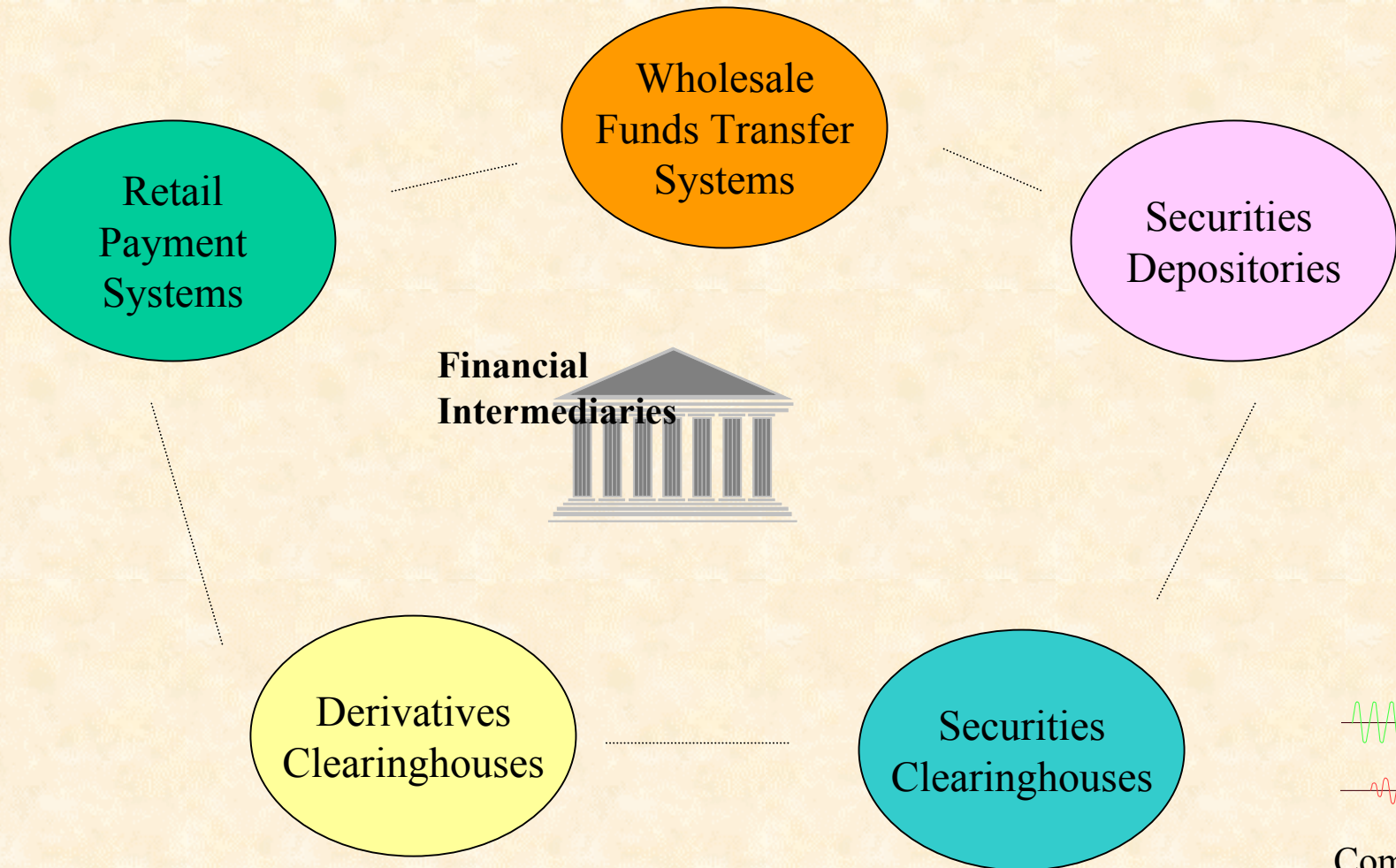
Payments Systems Studies Staff

Seminar Discussion Topics

- I. Payment and Settlement System Landscape
- II. Types of Settlement Systems
- III. Settlement System Models
- IV. Settlement System Risks

Payment System Landscape

Value Transfer Systems



Communication
Networks

Types of Settlement Systems

- Funds settlement systems:
 - Funds Transfer Service (Fedwire), CHIPS
 - ACH, Check
 - Credit Card, ATM/POS
- FX settlement systems:
 - Funds Transfer Service (Fedwire), CHIPS
 - CLS Bank
- Securities settlement systems:
 - DTCC (DTC&NSCC)
 - Securities Transfer Service (Fedwire)
 - GSCC

What is a Payment System?

- A payment is a transfer of monetary value
- A payment system (*legal def.*) is an arrangement which supports the transfer of value in fulfillment of a monetary obligation
- or
- A payment system (*fam. def.*) consists of the mechanisms - including the institutions, people, rules and technologies - that make the exchange of monetary value possible

Types of Payment Systems (Retail)

Small-dollar payments made in goods and services market

- **Cash** (anti-counterfeiting devices, distribution networks, high-speed sorter processors etc.)
- **Checks** (Clearinghouses; e.g. Federal Reserve)
- **Credit Cards** (Operators/Processors; e.g, Visa)
- **EFT** (ACH Operators: e.g., Federal Reserve, NYCHA)
- **Debit Cards, E-Money** (Smart Cards, Digital Cash, Electronic Bill Payment)

Key Terms

Clearing house: An organization that establishes and records obligations arising from the transfer of value and ensures that they are settled according to the rules relevant to such transactions.

Clearance: Process of transferring information and calculating obligations between payer and payee (banks).

- identification
- reconciliation
- confirmation

Settlement: The actual transfer of funds between two parties

Types of Payment Systems (Wholesale Funds Transfer)

*Large-value payments used for corporate payments
and in financial market transactions*

- 1 Large Value Funds Transfer Systems
- 2 Intrabank Funds Transfer Systems

Types of Payment Systems (Wholesale)

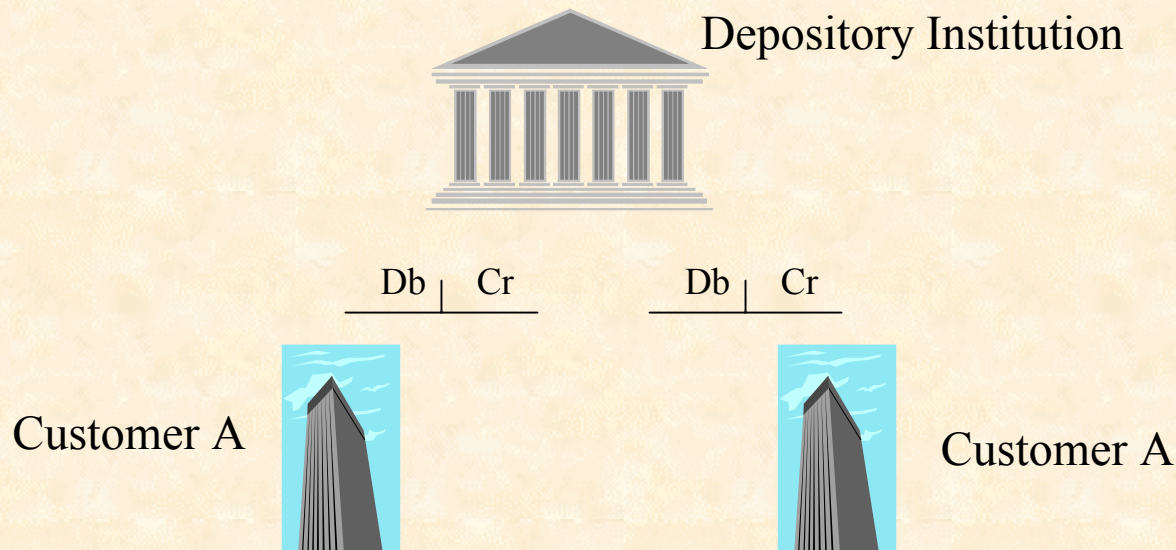
(1) Large-Value Funds Transfer System

- Provides for transfer of large-value payments
- Primarily used by financial institutions
- Transfers are typically more time-critical
- Operates as a clearinghouse
- System often run by central bank

Types of Payment Systems (Wholesale)

(2) Intrabank Funds Transfer System

- Arrangements through which funds transfers are made on the books of one bank on behalf of customers.



What is a securities settlement system?

- A security is an instrument issued by financial entities to raise money i.e, stock, U.S. treasury, bond, option, and futures
- A securities settlement system is the mechanism by which the purchase of a security is paid for and by which title is transferred from the seller to the buyer.

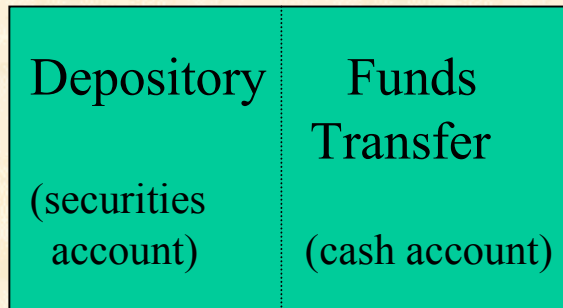
Types of Securities Settlement Systems (Securities Depositories)

Settlement Systems

- Facility for holding securities
- Provides for the transfer of ownership in securities versus payment.
- Securities depository integrated with a money transfer system
- Securities are typically processed electronically (i.e. by means of book-entry).
- Payment transactions are substantial and time critical

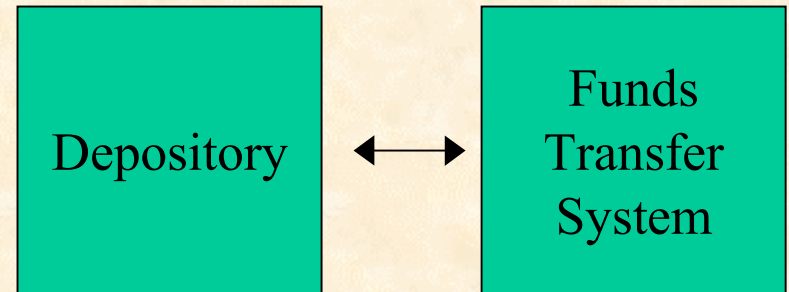
Types of Securities Settlement Systems (Securities Depositories)

Model A Integrated



(e.g., Fedwire)

Model B Linked



(e.g., DTC)

Types of Securities Settlement Systems (Securities clearinghouse)

Provides centralized matching and clearing of securities transactions

- Can reduce settlement volumes by providing multilateral netting of the financial obligations for settlement.
- Can reduce settlement costs (e.g., liquidity and collateral savings)
- Can increase the scope for trading as there is a single central counterparty and anonymous (e.g., screen-based) trading.
- Typically linked with central securities depositories where security settlement will occur.
- Funds settlement typically occurs over the books at designated settlement banks, e.g., commercial banks.

Settlement System Models

Real-Time Gross Settlement Systems (RTGS)

- Settlement occurs in “real-time”
 - Processing and final settlement occur on a continuous basis throughout the processing day
- Settlement occurs on a “gross” basis
 - Each payment is processed individually
- Provides for intra-day, immediate “finality”
 - Payments are irrevocable and unconditional, therefore not subject to reversals

Settlement System Models

RTGS Systems (cont.'d)

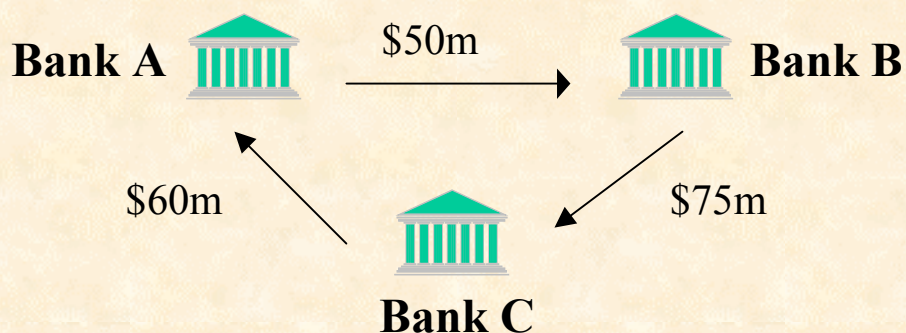
Examples:

- Fedwire Funds Transfer & Securities Settlement Service
- Securities transfers processed through DTC

Settlement System Models

Multilateral Net Settlement Systems

- Banks continually send payment instructions to system; system continually “nets” participants’ positions
- What is netting?
 - Offset participant obligations such that a single net position is produced for each participant



Net Settlement Amounts

Bank A: owed \$10m (net creditor)

Bank B: owes \$25m (net debtor)

Bank C: owed \$15m (net creditor)

Settlement System Models

Multilateral Net Settlement Systems (cont.'d)

- Settlement occurs at 1 or more pre-specified times during day, usually at the end of the processing cycle
 - Participants with net debit positions make payments; system makes payments to participants with net credit positions
- Finality is achieved upon completion of settlement
- Examples:
 - NSCC, old CHIPS

Settlement System Models

Hybrid Settlement Systems

- Combines features of RTGS and Net settlement systems
 - For example, a hybrid settlement system may *net* participants' positions (thereby achieving liquidity savings) . . .
 - and provide for settlement throughout the processing day such that *intraday finality* is achieved (thereby limiting payment system risk)
- Examples:
 - New CHIPS

Settlement System Models

Delivery Versus Payment

- Delivery of security occurs only if payment of funds occurs
- Examples
 - Fedwire Securities Settlement Service

Settlement System Models

Delivery Versus Payment (cont.'d)

- System provides a mechanism for ensuring delivery of securities if and only if payment of funds is made.
- **Model 1:** Linked gross, simultaneous settlement of securities transfer and corresponding funds transfer.
- **Model 2:** Gross settlements of securities transfers, followed by end-of-day net settlement of funds transfers.
- **Model 3:** Parallel multilateral net settlement of securities and funds transfers.

May be done through a clearinghouse.....

Settlement System Models

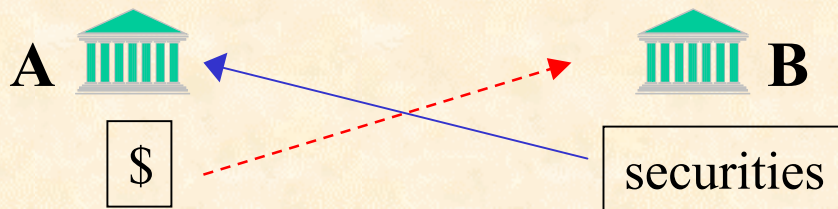
Payment Versus Payment

- Payment in one currency occurs only if payment occurs in other currency
- Examples
 - Continuous Linked Settlement Bank (CLSB)

Settlement System Risk

Settlement Risk: the risk that the completion of individual transfers does not take place as expected

- ***Credit Risk:*** risk that a party to a trade does not meet an obligation when due or at any time thereafter, i.e.. default



Settlement System Risk

- ***Liquidity Risk***: risk that a party to a trade will not settle its obligation for full value when due, but at some unspecified time thereafter
 - its counterparty meanwhile may have other obligations to complete and thus may need to cover/finance the shortfall (e.g. borrow, liquidate assets)
 - source of risk: usually temporary in nature, e.g.. operational problem

Settlement System Risk

- ***Operational Risk***: risk of problems associated with operational factors in the settlement process
 - sources: natural disaster, human errors, fraud; failure in computer systems, infrastructure

- ***Systemic Risk***: risk that the failure of 1 participant to meet obligations when due may cause other participants to fail to meet their obligations
 - 1 institution's failure may lead to a domino effect
 - the disruption of a large number of payments may lead to broader effects on economic activity