Lecture2: Money and Banking from Modern Perspective

- Meaning and definition of Money
- Evolution of the Payments System
- Monetary Aggregates and Money Supply
- Banking and Money
- Modern Banking
- Bank Management

Meaning of Money

- Money (or the "money supply"): anything that is generally accepted in payment for goods or services or in the repayment of debts.
- Money (a stock concept) is different from:
- Wealth: the total collection of pieces of property that serve to store value
- Income: flow of earnings per unit of time (a flow concept)

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Functions of Money

- Unit of Account:
  - used to measure value in the economy
  - reduces transaction costs
- Store of Value:
  - used to save purchasing power over time.
  - other assets also serve this function
  - Money is the most liquid of all assets but loses value during inflation

Functions of Money

- Medium of Exchange:
  - Eliminates the trouble of finding a double coincidence of needs (reduces transaction costs)
  - Promotes specialization
- A medium of exchange must
  - be easily standardized
  - be widely accepted
  - be divisible
  - be easy to carry
  - not deteriorate quickly

Commodity Money versus Fiat Money

- Commodity Money: valuable, easily standardized and divisible commodities (e.g. precious metals, cigarettes).
- Fiat Money: paper money decreed by governments as legal tender.

Payment system

- **Payment system**
  - a system used for transferring money.
  - are used in lieu of tendering cash in domestic and international transactions and consist of a major service provided by banks and other financial institutions.
  - a "system" in the sense that it employs cash and cash-substitutes

Payment system

- Cash substitutes
  - traditional cash substitutes; negotiable instruments such as drafts, e.g., checks, and documentary credits such as letter of credits
  - alternative electronic payment systems such as debit cards, credit cards, electronic fund transfers, internert banking, e-commerce payment systems.
  - Some payment systems include credit mechanisms, but that is essentially a different aspect of payment.

Evolution of the Payments System

- Checks: an instruction to your bank to transfer money from your account
- Electronic Payment (e.g. online bill pay).
- E-Money (electronic money):
  - Debit or check card
  - Stored-value card (smart card)
  - E-cash

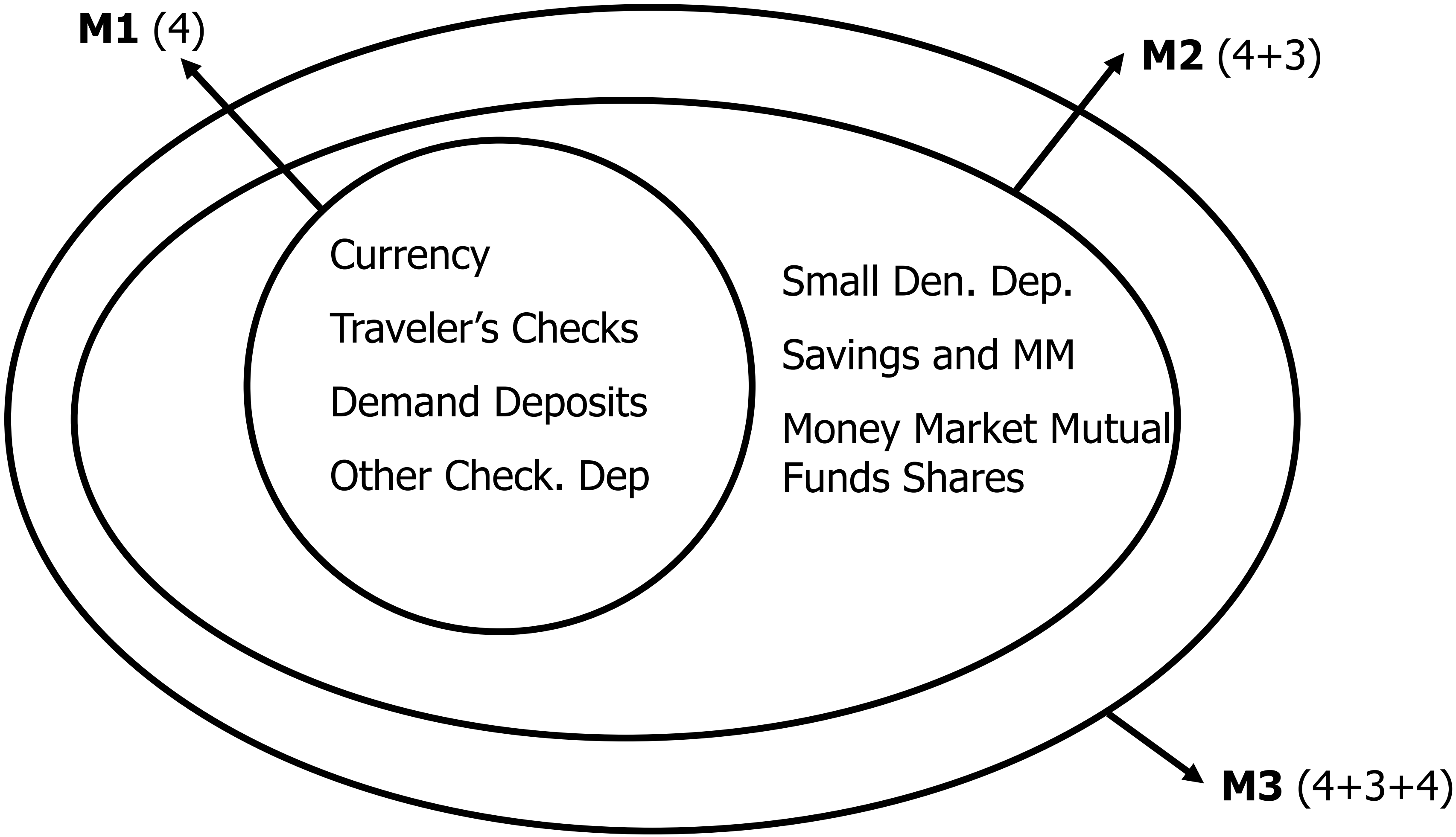
Definition of money in practice

- Definitions of the money supply have, it must be acknowedged, a somewhat arbitrary quality.
- M0 = currency + reserve= high powered money
- M1 (most liquid assets) = currency + traveler's checks + demand deposits + other checkable deposits.
- M2 (adds to M1 other assets that are not so liquid) = M1 + small denomination time deposits + savings deposits and money market deposit accounts + money market mutual fund shares.
- M3 is broader still, including Eurodollar deposits held in offshore markets, and repurchase agreements between banks and other financial intermediaries.

M3 and MZM

- **M3**: M2 plus large and long-term deposits. Since 2006, M3 is no longer tracked by the US central bank. However, there are still estimates produced by various private institutions.
- **MZM**: Money with zero maturity. It measures the supply of financial assets redeemable at par on demand.

Monetary Aggregates



Measuring Money

- How do we measure money? Which particular assets can be called "money"?
- Construct monetary aggregates using the concept of liquidity:
- M1 (most liquid assets) = currency + traveler's checks + demand deposits + other checkable deposits.

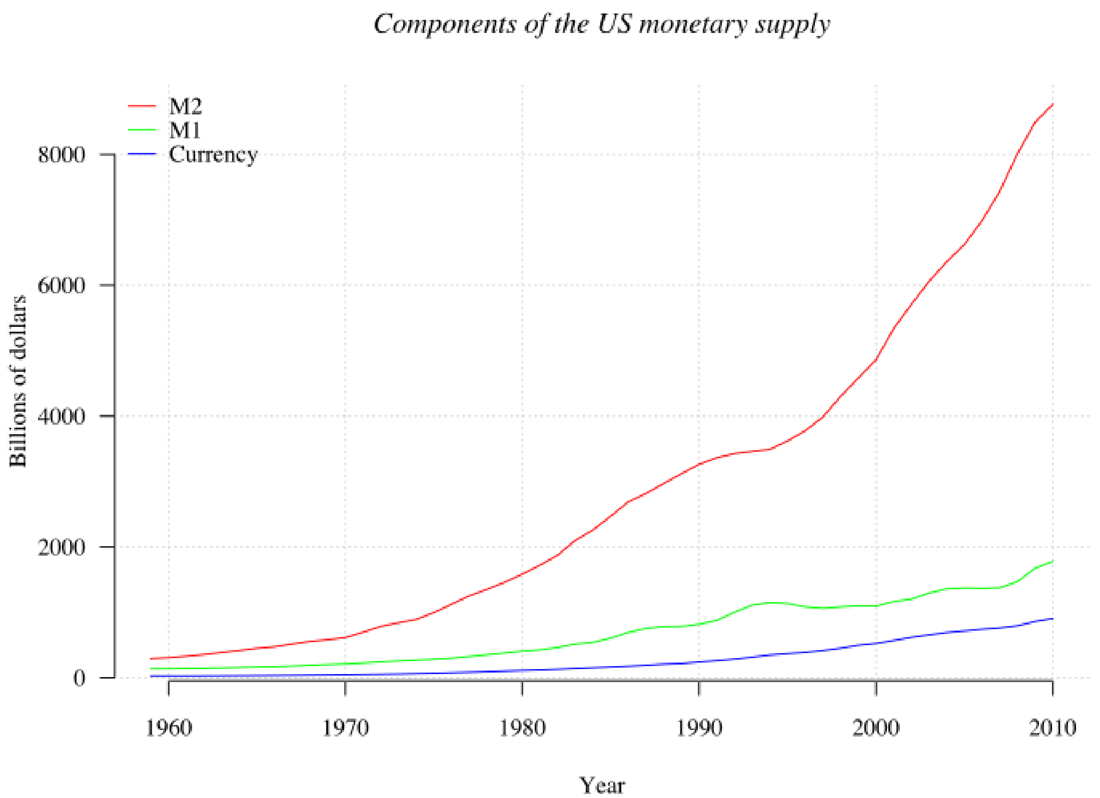
Measuring Money

- M2 (adds to M1 other assets that are not so liquid) = M1 + small denomination time deposits + savings deposits and money market deposit accounts + money market mutual fund shares.

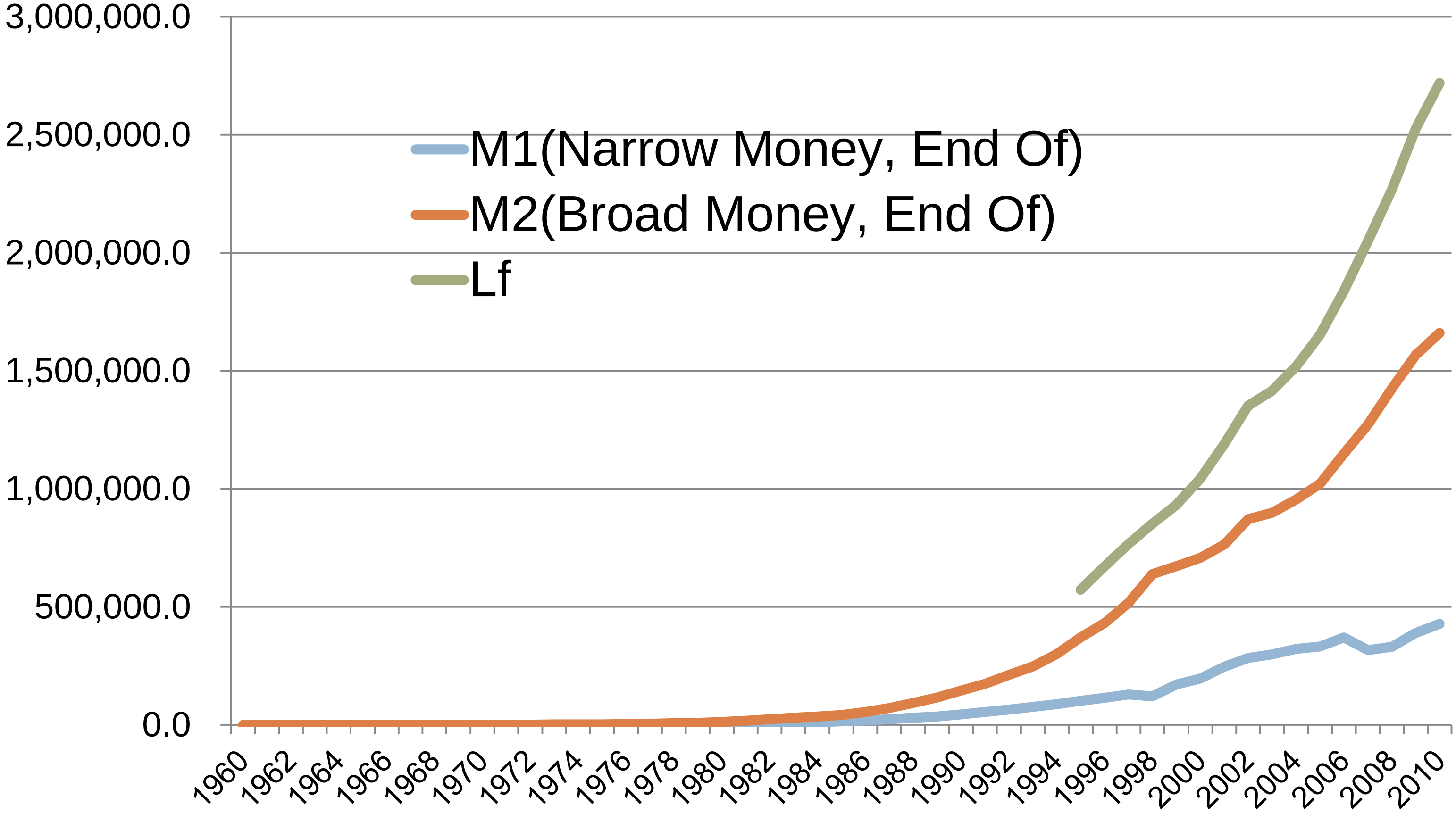
M1 vs. M2

- Does it matter which measure of money is considered?
- M1 and M2 can move in different directions in the short run (see figure).
- Conclusion: the choice of monetary aggregate is important for policymakers.

US Money supply



Money Supply in Korea



Money Supply and Economy

- Monetary exchange equation, Irving Fisher, in 1911
  - ***MV = PQ***
  - M the total dollars in the nation’s money supply
  - V the number of times per year each dollar is spent
  - P the average price of all the goods and services sold during the year
  - Q the quantity of assets, goods and services sold during the year

Monetarism

- **Monetarism**
  - a tendency in economic thought that emphasizes the role of governments in controlling the amount of money in circulation.
  - It is the view within monetary economics that variation in the money supply has major influences on national output in the short run and the price level over longer periods and that objectives of monetary policy are best met by targeting the growth rate of the money supply.

Monetarism and Milton Friedman

- Monetarism and Milton Friedman
  - Milton Friedman was among the generation of economists to accept Keynesian economics and then criticize it on its own terms.
  - Friedman and Anna Schwartz wrote an influential book, *A Monetary History of the United States, 1867-1960*, and argued that "inflation is always and everywhere a monetary phenomenon.“
  - The central idea of monetarism originates as fas bak as John Law in 18C

Monetarism and Banking

- Monetarism and Central Banking
  - Friedman advocated a central bank policy aimed at keeping the supply and demand for money at equilibrium, as measured by growth in productivity and demand.
  - The former head of the United States Federal Reserve, Alan Greenspan, is generally regarded as monetarist in his policy orientation.
  - The European Central Bank officially bases its monetary policy on money supply targets.

Banking and Money

- Banks' deposit creation and money
  - Banks' deposit by chain reaction is a key to the modern concept of money
  - It is crucially related with the fractional reserve banking system introduced in 18C Europe.
  - Thus, the money supply is closely related with the structure of modern banks, and their activities.
  - Modern banking system consist of commercial banks, investment banks, and central banks.
  - Their activities are interconnected in financial markets.

Basic Banking: Cash Deposit

First National Bank		**First National Bank**	
Assets	Liabilities	Assets	Liabilities
Vault Cash +$100	Checkable deposits +$100	Reserves +$100	Checkable deposits +$100

- Opening of a checking account leads to an increase in the bank's reserves equal to the increase in checkable deposits

Basic Banking: Check Deposit

First National Bank			
Assets		Liabilities	
Cash items in process of collection	+$100	Checkable deposits	+$100

When a bank receives additional deposits, it gains an equal amount of reserves; when it loses deposits, it loses an equal amount of reserves

First National Bank				Second National Bank			
Assets		Liabilities		Assets		Liabilities	
Reserves	+$100	Checkable deposits	+$100	Reserves	-$100	Checkable deposits	-$100

Basic Banking: Making a Profit

First National Bank			
Assets		Liabilities	
Required reserves	+$100	Checkable deposits	+$100
Excess reserves	+$90		

First National Bank			
Assets		Liabilities	
Required reserves	+$100	Checkable deposits	+$100
Loans	+$90		

- Asset transformation: selling liabilities with one set of characteristics and using the proceeds to buy assets with a different set of characteristics
- The bank borrows short and lends long

Liquidity Management: Ample Excess Reserves

Assets		**Liabilities**	
Reserves	$20M	Deposits	$100M
Loans	$80M	Bank Capital	$10M
Securities	$10M		

Assets		**Liabilities**	
Reserves	$10M	Deposits	$90M
Loans	$80M	Bank Capital	$10M
Securities	$10M		

- Suppose bank's required reserves are 10%
- If a bank has ample excess reserves, a deposit outflow does not necessitate changes in other parts of its balance sheet

Liquidity Management: Shortfall in Reserves

Assets		**Liabilities**	
Reserves	$10M	Deposits	$100M
Loans	$90M	Bank Capital	$10M
Securities	$10M		

Assets		**Liabilities**	
Reserves	$0	Deposits	$90M
Loans	$90M	Bank Capital	$10M
Securities	$10M		

- Reserves are a legal requirement and the shortfall must be eliminated
- Excess reserves are insurance against the costs associated with deposit outflows

Liquidity Management: Borrowing

Assets		**Liabilities**	
Reserves	$9M	Deposits	$90M
Loans	$90M	Borrowing	$9M
Securities	$10M	Bank Capital	$10M

- Cost incurred is the interest rate paid on the borrowed funds

Liquidity Management: Securities Sale

Assets		**Liabilities**	
Reserves	\$9M	Deposits	\$90M
Loans	\$90M	Bank Capital	\$10M
Securities	\$1M		

- The cost of selling securities is the brokerage and other transaction costs

Liquidity Management: Federal Reserve

Assets		**Liabilities**	
Reserves	$9M	Deposits	$90M
Loans	$90M	Borrow from Fed	$9M
Securities	$10M	Bank Capital	$10M

- Borrowing from the Fed also incurs interest payments based on the discount rate

Liquidity Management: Reduce Loans

Assets		Liabilities	
Reserves	$9M	Deposits	$90M
Loans	$81M	Bank Capital	$10M
Securities	$10M		

- Reduction of loans is the most costly way of acquiring reserves
- Calling in loans antagonizes customers
- Other banks may only agree to purchase loans at a substantial discount

Asset Management: Three Goals

- Seek the highest possible returns on loans and securities
- Reduce risk
- Have adequate liquidity

Asset Management: Four Tools

- Find borrowers who will pay high interest rates and have low possibility of defaulting
- Purchase securities with high returns and low risk
- Lower risk by diversifying
- Balance need for liquidity against increased returns from less liquid assets

Liability Management

- Recent phenomenon due to rise of money center banks
- Expansion of overnight loan markets and new financial instruments (such as negotiable CDs)
- Checkable deposits have decreased in importance as source of bank funds

Capital Adequacy Management

- Bank capital helps prevent bank failure
- The amount of capital affects return for the owners (equity holders) of the bank
- Regulatory requirement

Off-Balance-Sheet Activities

- Loan sales (secondary loan participation)
- Generation of fee income. Examples:
  - Servicing mortgage-backed securities.
  - Creating SIVs (structured investment vehicles) which can potentially expose banks to risk, as it happened in the subprime financial crisis of 2007-2008.

Off-Balance-Sheet Activities

- Trading activities and risk management techniques
  - Financial futures, options for debt instruments, interest rate swaps, transactions in the foreign exchange market and speculation.
  - Principal-agent problem arises

Off-Balance-Sheet Activities

- Internal controls to reduce the principal-agent problem
  - Separation of trading activities and bookkeeping
  - Limits on exposure
  - Value-at-risk
  - Stress testing

Modern Banking

- Deposit taking and lending
  - Based on Fractional Reserve Banking System
- Bank Balance Sheet
  - Liabilities
    - Checkable deposits
    - Non-transaction deposits
    - Borrowings
    - Bank capital
  - Assets
    - Reserves
    - Cash items in process of collection
    - Deposits at other banks
    - Securities
    - Loans
    - Other assets

Management problems of modern banks

- Liquidity Management
- Asset Management
- Liability Management
- Capital Adequacy Management
- Risk management:
  - Credit Risk
  - Interest-rate Risk
  - Liquidity Risk

Asset, Credit, Money and Banking

- Asset, Credit, Money
  - How much, and which components, are related with money?
  - Why do they exist?
  - Substitutes or complements?
- What are the links between banks and other financial institutions like central banks, securities company or insurance companies?
  - What are theoretical rationale behind them?
  - What are historical background behind them?

Historical background for the different banking systems

- **Historical background for the different banking systems**
  - Italian banking techniques were improved significantly in the financial centers of Northern Europe in 16-18C.
  - But in the same period, Spain, France lagged unexpectedly far behind.
  - In particular, Spain, cursed with an abundance of precious metal, mighty Spain failed to develop a sophisticated banking system, relying instead on the merchants of Antwerp for Short-term cash advances against future silver deliveries.

The relation between money and credit

- Monetary concept in in Spain
  - Misunderstanding for the relation between money and credit
  - The idea that money was really about credit, not gold or silver metal, never quite caught on in Madrid.
  - Indeed, the Spanish crown ended up defaulting on all or part of its debt no fewer than fourteen times between 1537 1696.
  - With all the silver in Potosi could not make Spain a secure credit risk. In the modern world, power would go to *the bankers*, not *the bankrupts*.