CHAPTER 7

Money Markets

Overview of the Money Market

- Short-term debt market - most under 120 days.
  - A few high quality borrowers; Many diverse investors.
  - Informal market centered in New York City.

- Standardized securities -- one security is a close substitute for another.
  - Good marketability;
  - Large, wholesale open-market transactions.
  - Many brokers and dealers are competitively involved.
  - Payments in ***immediately available funds***.
  - Physical possession of securities seldom occurs - centralized safekeeping.

- Characteristics of Money Market Instruments
  - Low default risk.
  - Short maturity.
  - High marketability.

Economic Role of Money Market (MM)

- Economic Role of Money Market (MM)
  - The money market is a market for liquidity
    - Liquidity is stored in MM by investing in MM securities.
    - Liquidity is bought in MM by issuing securities (borrowing).
  - Liquidity status of commercial banks is reflected
  - Provides market Fed's reserve transactions **(*open market operations*)**
  - Indicator of economic conditions

Major Money Market Instruments Outstanding (December 2005)

Instrument	$ Billions
U.S. Treasury bills	963.9
Short-term municipal securities	105.9
Large, negotiable CDs	1776
Commercial paper	1829.8
Federal funds and security repurchase agreements	2005.6

U.S. Treasury Bills

- T-bill Characteristics
  - Sold on "discount basis"; Maturities up to one year.
  - Considered free of default risk.
  - Minimum denomination usually $10,000.
    - small investors can invest $1,000 through ***Treasury Direct Program***.

- Pricing
  - Quoted at "bank discount rate" (y_d) basis
  - Ex: Suppose T-bill maturing in 91 days trades at $9,800.

$$y_d = \frac{Par - \text{Price}}{Par} \times \frac{360}{\text{Days}} \times 100\% \qquad y_d = \frac{10{,}000 - 9{,}800}{10{,}000} \times \frac{360}{91} \times 100\% = 7.91\%$$

- *WSJ* reports T-Bill yields on "bond equivalent basis"
  - discounted price is denominator; annualized by 365 days.

$$y_{be} = \frac{Par - \text{Price}}{\text{Price}} \times \frac{365}{\text{Days}} \times 100\% \qquad y_{be} = \frac{10{,}000 - 9{,}800}{9{,}800} \times \frac{365}{91} \times 100\% = 8.91\%$$

- Effective Yield (including compounding) = $[(\text{Par/Price})^{365/D} - 1] \times 100\%$.
  $= 10{,}000/9{,}800^{365/D} - 1] \times 100\% = 8.44\%$

T-Bill Quotes

EXHIBIT 7.6
Treasury Bill Quotations

(1)	(2)	(3)	(4)	(5)	(6)
Maturity	**Days to Maturity**	**Bid**	**Asked**	**Change**	**Asked Yield**
Mar 01 07	7	5.08	5.07	+0.03	5.15
Apr 05 07	42	5.08	5.07	+0.01	5.17
May 03 07	70	5.06	5.05	+0.01	5.17
Jun 07 07	105	5.00	4.99	−0.01	5.13
Jul 19 07	147	4.95	4.94	+0.01	5.11
Aug 02 07	161	4.95	4.94	—	5.12

Treasury bill bid and ask prices can be computed from the bid and ask yields and the days to maturity number reported in the *Wall Street Journal.* The discount rate understates the true rate of return on a T-bill. The *Wall Street Journal* also prints the bond equivalent yield, based on the ask yield, so people can better compare T-bill and bond returns.

Source: Wall Street Journal Online, Treasury Quotes, February 21, 2007.

- Q: Can you find the "ask price" on the Jun 07 07 bond?
- A: Use bank discount formula to get: $9,854.45

- Q: Based on this price, verify the "asked yield" is 5.13%!

T-Bills Auctions

- Weekly sale by U. S. Treasury of 4, 13-, and 26-week maturities
  - sold through auctions with both competitive and noncompetitive bids.

- Competitive Bids
  - Specify price and quantity desired.
  - Minimum $10,000 & in multiples of $5,000 above $10,000.
  - Mostly professionals - dealers & banks.
  - Max 35% sold under competitive bids, to ensure competitive secondary mkt.

- Non-competitive Bids
  - All non-competitive bids accepted.
  - Specify quantity only; Maximum $5,000,000.
  - Mostly individuals & small investors.
  - Pays ***weighted average price*** of competitive bids accepted.

- Book entry
  - No physical securities: only record entries.
  - Book-entry record keeping
  - Most of marketable Treasury debt is now in book- entry form.

Federal Agencies

- Farm credit agencies -
  - Cooperatively owned system of banks that provide credit to farmers.
  - Includes 12 Federal Land Banks; Can draw of line of credit with Treasury

- Housing credit agencies – provides loans and secondary market for mortgages.
  - Govt National Mortgage Assoc (Ginnie Mae)
  - Govt Sponsored Enterprises (GSE)– privately owned, chartered by Fed govt.
    - Fed National Mortgage Asssoc (Fannie Mae)
    - Fed Home Loan Mortgage Corp (Freddie Mac)
    - Issues own debt, but had authority to draw "line of credit" from Treasury.

- Other agencies
  - Small Bus Assoc;; Veterans Adm; Student Loan Mkt Assoc
  - Tenn Valley Auth - created by congressional charter in May 1933 to provide navigation, flood control, electricity generation, and economic development.

- Federal Financing Bank - buys agency debt and issues own obligations.

Federal Agency Debt

- *Government-owned agencies* have an explicit guarantee of the government.
  - Ginnie Mae back by U.S. Treasury.

- *GSE (*Fannie and Freddie*)* perceived to have an implicit guarantee of govt.
  - Dual mandate
    - promote affordable housing and secondary market for mortgages.
    - Earn profits or shareholders -
  - GSE's grew large because they could borrow cheaply.
  - Lost billions when housing bubble crashed. Treasury "bailed out".
  - Placed into "conservatorship"… now run by Federal govt.
  - Now being used as policy tool to stabilize housing (2009-2010).

- Bond market - $34T Total
  - $7T U.S. Treasury (marketable securities total debt $12T)
  - $9T Mortgage-backed
  - $6.7T Corporate
  - $3T Agencies of the U.S.
  - $2.7T State & Municipal
  - $3.4T Money Market
  - $2.5T Asset-backed

Negotiable Certificates of Deposit

- Characteristics of Negotiable CDs
  - Large time deposits (> $100,000), maturity less than six months.
  - Negotiable - may be sold and traded before maturity.
  - Issued at face value, interest is based on 360-day year.
  - Secondary market deals are for $1 million or more.
  - Interest rates depend on the issuing bank's creditworthiness.
  - Yields are higher than on T-Bills - higher credit risk, lower marketability, and higher taxability.

- Development of the NCD Market
  - First issued by Citibank in 1961.
  - Offset declining demand deposits as a source of funds.

- NCD Market
  - Rate negotiated between buyer and seller.
  - Market is sensitive to rates above or below the market rates.
  - Rates lower for money center banks and tiered upward for regional banks.
  - Purchased mainly by corporate businesses.

Commercial Paper

- Commercial Paper
  - Unsecured corporate debt. Sold at a discount from par.
  - Quoted on discount basis (like T-bills)
  - Maturities are 1 to 270 days; 98% held to maturity.
  - Large denominations -- $100,000 and up.
  - High-quality issuers; Wholesale buyers (few indiv investors)

- Major investors
  - Commercial banks; Insurance co; Nonfinancial business firms.
  - Bank trust departments; State and local pension funds.

- Credit ratings important for commercial paper issuance.
  - Over 95% of issues are in the top two rating categories.
  - Backup lines of credit from banks support or guarantee quality.
  - Banks also act as agents in issuance; Hold notes in safekeeping.

- Placement
  - Directly by sales force of borrowing firm (~ 60 firms).
  - Indirectly through dealers (~ 30 major dealers all in NYC; >500 firms).

Bankers' Acceptances

- Bankers Acceptance
  - Time draft - order to pay in future.
  - Drafts are drawn on and/or accepted by commercial bank (direct liability)
  - Mostly relate to international trade.
  - Secondary market - dealer market.
  - Discounted in market to reflect yield.
  - Standard maturities of 30, 60, or 90 days -max of 180.

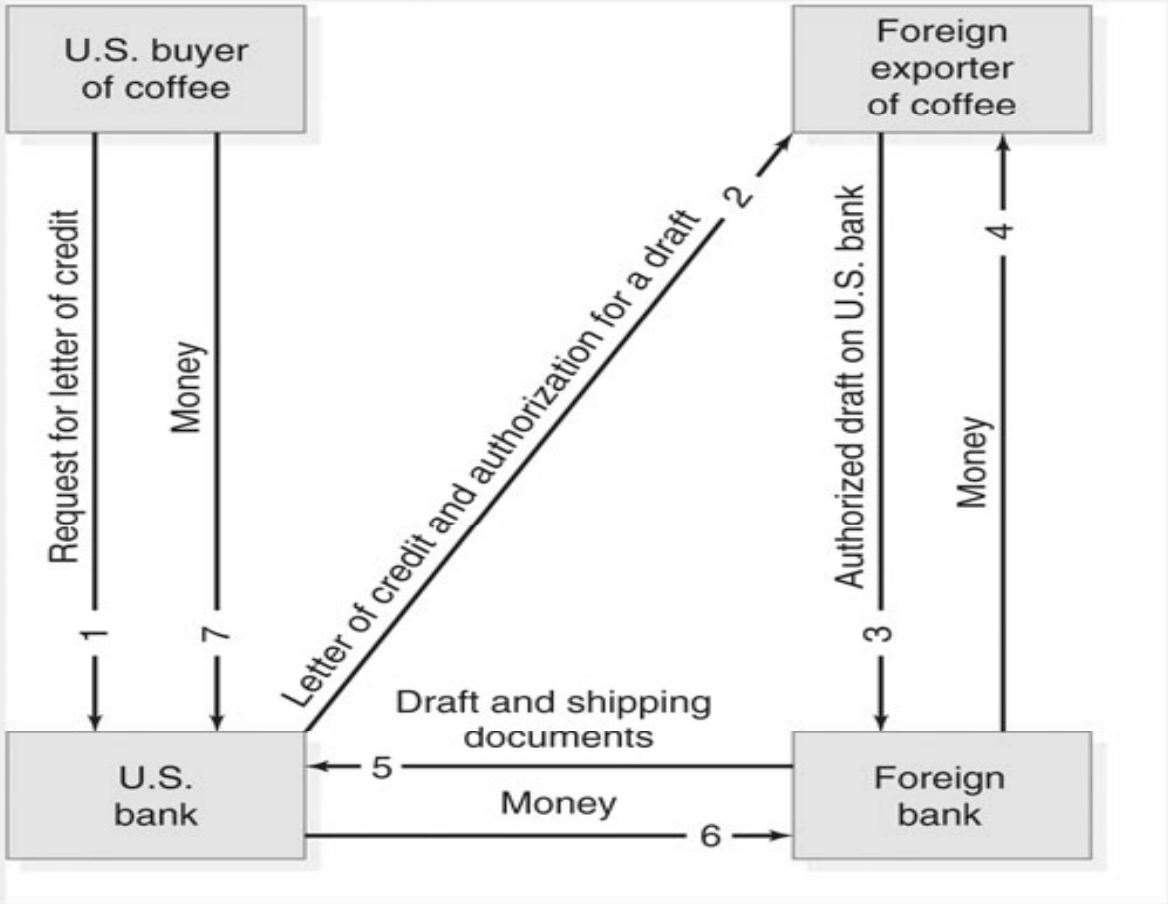
- Creation of B.A.
  Importer purchases goods from foreign exporter, payable in future.
  Importer needs financing; exporter needs assurance of payment in future.

- Importer's bank writes irrevocable letter of credit for exporter
  - Specifies purchase order; Authorizes exporter to draw time draft on bank.
  - Importer's bank accepts draft (liability to pay) and creates B.A.

- Advantages of a BA:
  - Exporter receives funds by selling BA in market.
  - Exporter eliminates foreign exchange risk.
  - Importer's bank guarantees payment of draft in future.

Tracing a Banker's Acceptance Transaction

EXHIBIT 7.11
The Sequence of a Banker's Acceptance Transaction



This exhibit shows a possible sequence for creating a banker's acceptance. However, there are many ways to create acceptances, and to do so requires a great deal of specialized knowledge on the part of the accepting bank.

Federal Funds

- Federal funds - Short-term interbank loans
  - Market for depository institutions.
  - Most liquid of all financial assets - Most are one-day, unsecured loans.
  - Related to monetary policy implementation.
  - Bookkeeping entry -interest paid separately.
  - Traded in Immediately Available Funds.

- Funds funds "rate"
  - Yields related to the level of excess bank reserves.
  - Originally a market for excess reserves
    Now source of investment (federal funds sold) and continued financing (federal funds purchased).
  - Fed Reserves influences Fed Funds rate through open mkt operations.

Repurchase Agreements (Repo)

- Repo - Sale of security with agreement to buy it back later at higher price.
  - Difference in prices is interest; Negotiated market rate.
  - Securities serve as collateral; so repo rates usually lower than funds rate.

- Reverse Repo – Purchase of security with agreement to resell later at given price.

- Repo Market
  - Used by Federal Reserve in open market operations.
  - Used by govt securities dealers to secure funds to invest in Treasury bonds.
  - Used by banks to finance liquidity; invest excess funds; pay interest to firms.

- Repo: Comm bank needs cash for 3 days. Agrees to sell T-bonds for $1M and repurchase $1,000,145.

- Reverse Repo: Comm bank buys T-bonds from corp firm for $1M, agrees to sell back for $1,000,145 in 3 days.

$$y_{repo} = \frac{P_{repo} - P_0}{P_0} \times \frac{360}{\text{Days}} \times 100\% \qquad y_{repo} = \frac{1{,}000{,}145 - 1{,}000{,}000}{1{,}000{,}000} \times \frac{360}{3} \times 100\% = 1.74\%$$

Money Market Position of Major Participants

EXHIBIT 7.12

Money Market Balance Sheet Position of Major Participants

	Commercial Banks		Federal Reserve System		Treasury Department		Dealers and Brokers		Corporations	
Instrument	A	L	A	L	A	L	A	L	A	L
Treasury bills	■		■			■	■		■	
Agency securities	■		■				■		■	
Negotiable CDs		■					■		■	
Commercial paper		■					■		■	■
Banker's acceptances	■	■	■				■		■	
Federal funds	■	■								
Repurchase agreements	■	■	■				■	■	■	

Commercial banks are both important investors in and issuers of money market instruments.

Note: A = Assets, L = Liabilities.

Commercial Banks in Money Mkt

- Most important participant in the MM –
  - Due to fluctuations in loans and deposits banks need MM securities to provide sources and uses of liquidity.

- Bank assets or investments
  - Treasury bills.
  - Agency securities.
  - Bankers' acceptances (from other banks).
  - Federal Funds sold.
  - Reverse repurchase agreements

- Bank liabilities or borrowing
  - Negotiable CDs.
  - Commercial paper.
  - Bankers' acceptances.
  - Federal Funds purchased.
  - Repurchase agreements (securities sold under agreements to repurchase).

Federal Reserve in the Money Markets

- Fed Reserve in money markets.
  - MM securities are the major asset category of the Fed.
  - Open-market operations (buying and selling of MM securities by Fed) is the primary tool for implementing monetary policy.
    - Purchase - increases member bank reserves.
    - Sale - decreases member bank reserves.

- Dealers in U.S. securities
  - Purchase new Treasury debt and resell it (primary market).
  - "Make" secondary market by buying/selling (dealer) securities.
  - Purchases are financed by repurchase agreements or fed funds.
  - Dealers have small capital base and are highly leveraged.

- Money Market interest rates
  - Due to similarities in general characteristics, various MM instruments are close substitutes in investment portfolios.
  - MM interest rates tend to move together over time.
  - Deviations from traditional spreads are often eliminated by ***arbitrage***.