

AFM 121

GLOBAL FINANCIAL MARKETS

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Last Revision: February 19, 2015

Table of Contents

Todo list	i
1 Overview of Financial Systems	1
2 The Corporation	2
3 Raising Capital	4
4 Buying and Selling Securities	5
4.1 Margin on Purchase	6
4.2 Short Selling	7
5 Market Efficiency	8
5.0.1 Behaviour of Individual Investors	8
6 Time Value of Money	8
7 Interest Rates	10
8 Bonds	10

Future Modifications

Create a table instead	3
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1 Overview of Financial Systems

Money can't buy happiness but it sure can rent it for a long time.

Definition 1.1. Finance is a branch of economics concerned with resource allocation, management acquisition, and investment. Art of managing assets.

Quote. There's nothing better to do than making money by doing absolutely jack

Banks attract deposits (safe, interest), and issue loans (diversity risk, interest).

Definition 1.2. Spread is the difference between deposit interest and loan interest for banks.

Note. Investment banking offer transaction and advisory services for a commission.

Definition 1.3. A **market** is for lenders and investors to provide capital to borrowers and businesses.

Definition 1.4. Organic cash flow is what a company generates on its own.

Quote. Financial markets allow buyers and sellers to come together.

Note. Financial facilitate price formation, and increase competition amongst buyers and sellers. Too much power can lead to decreased competition.

- Physical mechanism for money and ownership to transfer from buyer to seller.
- Aims to increase economic efficiency.
 - Reduce search costs
 - Reduce transaction costs
 - Diversification of risk

Definition 1.5. Financial intermediaries provide services to buyers and sellers. They also provide liquidity by buying or selling as needed to bridge the time difference between buyer and seller arrival.

- Banks, Trust companies, Investment Banks, Asset Management Firms
- Individuals may not have the time to perform adequate due diligence. Financial intermediaries analyze the investments for a fee.

Definition 1.6. Moral hazard: Buyers and sellers may have different incentives and financial intermediaries.

Definition 1.7. Financial regulation: OSFI oversees Canadian banks. Focus on proficiency, assets, and activities.

Definition 1.8. Central banks are responsible for the entire financial system. Controls money supply through open market operations and overnight interest rates. Lender of last resort.

Quote. Central banks have direct impact on unemployment and the economy.

2 The Corporation

Definition 2.1. Sole proprietorship is a business owned and run by one person.

Advantages: Easy to create

Disadvantages:

- Unlimited liability
- Same entity
- Limited life
- Difficult to transfer ownership

Definition 2.2. Partnership is similar to a sole proprietorship but with more than one owner.

- Income is taxed at personal level
- All partners have unlimited personal liability
- Partnership ends with death or withdrawal of any single partner.

Quote. A partnership consists of both general partners and limited partners.

Definition 2.3. General partners have the same rights and liability as partners in a regular partnership.

Definition 2.4. Limited partners have limited liability.

- Death or withdrawal does not dissolve partnership
- Interest in business is transferable
- Have no management authority and cannot be legally involved in managerial decisions.

Definition 2.5. A corporation is a legal entity separate from its owners. The corporation is solely responsible for its own obligations, and owners are not liable. Corporations must be legally formed.

- Ownership of a corporation is represented by shares of stock
- Sum of all ownership value is called equity
- No limit to number of shareholders

- Owners are able to receive dividends.
- Dividends are taxed twice (Corporate and personal tax)

Create a table instead

Definition 2.6. Income trusts are flow through entities where all income produced by the business flows to the investors, and no earnings are retained in the business. They are not taxed. In 2006, government changed taxation of businesses and income trusts are taxable. Real Estate Income Trusts continue to have no tax at the business level.

The board of directors directly control the corporation, not owners.

Shareholder wealth maximization is the goal that generally unites shareholders.

Principle-Agent Problem

- Separation of ownership and control
- Managers may act in their own interest
- Solution is to tie management's compensation to firm performance.

Definition 2.7. Hostile takeover: Low stock prices may entice a corporate raider to buy enough stock so that they have enough control to replace the current management.

Definition 2.8. Stakeholders are those who have an interest in the corporation, and includes shareholders and debt holders.

- Employees
- Customers
- Suppliers
- Community

Definition 2.9. Corporate Bankruptcy Process:

- Reorganization
- Liquidation
- Debt holders
- Equity holders

Definition 2.10. Primary market is the initial transaction between corporation and investors.

Definition 2.11. Secondary market is the trades of existing stock between investors.

3 Raising Capital

Definition 3.1. **Angel investors** are individual investors who buy equity in small private firms.

Definition 3.2. **Venture capital firm** is a limited partnership that specializes in raising money to invest in the private equity of young firms. usually charge a substantial fee (usually 20%).

Definition 3.3. **Venture capitalist** is a general partner in the venture capital firm.

Definition 3.4. **Private equity firms** are similar to venture capital firm but invest in more established firms.

Definition 3.5. **Institutional investors** (eg: Pension funds) are active investors in private companies.

Definition 3.6. **Sovereign Wealth Funds** are pools of money controlled by a government, and play an active role in the private equity market. Largest limited partners in global private equity markets. Usually raised from royalty, or taxes.

Definition 3.7. An **underwriter** is an investment banking firm that manages a security issuance and designs its structure. Eg: IPO.

Definition 3.8. **Exit strategy** is how investors will realize the return from their investments.

- Acquisition
- IPO

Definition 3.9. An IPO is the first time a company sells shares.

- **Primary offering:** new shares
- **Existing shares:** existing shares

Types of Offerings

Definition 3.10. **Best-Efforts:** Underwriter does not guarantee stock is sold, but tries to sell the stock for the best price. Typically all or nothing.

Definition 3.11. **Fire Commitment:** Agreement between underwriter and an issuing firm in which the underwriter guarantees that all shares are sold.

Definition 3.12. **Auction IPO:** Takes bids from investors and then sets price that clears the market.

4 Buying and Selling Securities

Types of Brokers

- Full-service brokers
- Discount brokers
- Deep-discount brokers
- Online brokers - Provide investment information, and allow customers to place buy and sell orders over the internet.

Quote. When dealing with brokers, advice is not expected. Legal duty to act in customer's best interest. Any disputes will be settled by arbitration.

Definition 4.1. Canadian Investor Protection Fund: Is an insurance fund covering investors' brokerage accounts when member firms experience financial difficulties

Types of Brokerage Accounts

- **Cash account** - Securities are paid for in full
- **Margin account** - securities can be bought and sold short on credit

Definition 4.2. The **margin** is the portion of the value of an investment that is not borrowed.

Definition 4.3. The interest on the borrowed portion is the broker's **call money rate**.

Definition 4.4. The **maintenance margin** is the margin amount that must be present at all times. When the margin drops below it, the broker can demand more funds through a **margin call**.

$$\text{Margin} = \frac{\text{Mkt value of shares} - \text{Margin loan}}{\text{Market value of shares}}$$

$$\text{Maintenance margin level} = \frac{P \cdot \# \text{ of shares} - \text{Amount borrowed}}{P \cdot \# \text{ of shares}}$$

$$P = \frac{\text{borrowed}/\# \text{ of shares}}{1 - \text{Maintenance margin level}}$$

4.1 Margin on Purchase

Example 4.1. Your margin account requires:

- an initial margin of 50%, and
- a maintenance margin of 30%
- A Share in Miller Moore Equine Enterprises (MM) is selling for \$50.
- You have \$20,000, and you want to buy as much MM as you can.
- You may buy up to $\$20,000 / 0.5 = \$40,000$ worth of MM

Assets		Liabilities & OE	
800 Shares	40000	Margin Loan	20000
		Account Equity	20000
Total	40000	Total	40000

If shares fall to \$35, then the new market value of the shares is $800 \times 35 = 28000$.

Assets		Liabilities & OE	
800 Shares	28000	Margin Loan	20000
		Account Equity	8000
Total	28000	Total	28000

New margin would become $\frac{8000}{28000} \approx 29\%$. Since this value is lower than the maintenance margin, a margin call would be expected.

Note. The required margin would be $30\% \times 28000 = 8400$. The investor would be required to pay \$400 in order to keep the security. As a result, the margin loan would drop to \$19600.

Quote. When calculating the percentage that was gained or lost, the numbers are based off of the invested amount, not the total (investment + loan). In the previous example, any gain or loss would be calculated based on the 20000 invested, and not the 40000.

Example 4.2. Suppose you want to buy 300 shares of Pepsico, Inc. (PEP) at \$55 per share.

- Total cost: \$16,500
- You have only \$9,900 so you must borrow \$6,600.
- Your initial margin is $\$9,900 / \$16,500 = 60\%$.
- Suppose your maintenance margin is 40%. At what price will you receive a margin call?

Solution. Here, the asset amount is unknown, and must be calculated. Since maintenance margin is 40%, then loan represents 60%. Assets would be $\frac{6600}{0.6} = 11000$. Now drawing the table (technically the table isn't needed, but it's easier to see this way):

Assets		Liabilities & OE	
300 Shares	11000	Margin Loan	6600
		Account Equity	4400
Total	11000	Total	11000

Solving for an individual share: $\frac{11000}{300} = \$36.67$.

Definition 4.5. Hypothecation is the act of pledging securities as a collateral against a loan.

Definition 4.6. Street name registration is an arrangement where the broker registers as the owner of the security.

Definition 4.7. An investor takes a **long** position if he/she expects the price of a stock to go up. A **short** position anticipates the price to go down.

Definition 4.8. Short interest is the amount of common stock held in short positions.

4.2 Short Selling

Quote. Always draw out a balance sheet for easier calculations.

Example 4.3. An example for short selling:

- You short 100 shares of Verizon Communications (VZ) at \$30 per share.
- Your broker has a 50% initial margin and a 40% maintenance margin on short sales.
- The value of stock borrowed that will be sold short is: $\$30 \times 100 = \$3,000$

Assets		Liabilities & OE	
Sales Proceeds	3000	Short Position	3000
Initial Margin Deposit	1500	Account Equity	1500
Total	4500	Total	4500

If price goes down to \$20, then the new short position would be at $100 \times 20 = 2000$.

Note. Assets and liabilities will remain the same.

Assets		Liabilities & OE	
Sales Proceeds	3000	Short Position	2000
Initial Margin Deposit	1500	Account Equity	2500
Total	4500	Total	4500

$$\text{Margin: } \frac{2500}{2000} = 125\%$$

Example 4.4. If the price goes up to \$40, then the short position would be at $100 \times 40 = 4000$.

Assets		Liabilities & OE	
Sales Proceeds	3000	Short Position	4000
Initial Margin Deposit	1500	Account Equity	500
Total	4500	Total	4500

The margin would be at $\frac{500}{4000} = 12.5\%$. The required margin would be $40\% \times 4000 = 1600$. The investor would have to pay \$900 to keep the short sale. This amount would be added to initial margin deposit.

Stock Market Order Types

- Market order
- Limit order
- Stop order - Convert to market order once certain price is reached
- Stop limit order - Convert to limit order once certain price is reached

5 Market Efficiency

According to CAPM, investors should hold risk-free assets in combination with the market portfolio of all risky securities.

5.0.1 Behaviour of Individual Investors

- Usually have an underdiversification and portfolio bias. Familiarity Bias. Relative Wealth Concerns.
- Overconfidence Bias. Sensation seeking.
- If individuals depart from the CAPM in random ways, then the departures will most likely cancel out. Individuals will also hold market portfolio (no diversification) in aggregate, and there will be no effect on market prices.
- Individuals are more likely to buy companies that are in the news, or had extreme returns. Stock returns tend to be higher on a sunny day at the location of the stock exchange.
- Takeover Offers: Usually companies have to pay premium to takeover company. Price will likely go up.

Definition 5.1. Disposition Effect: Investors holding on to losing stocks and selling stocks that made a gain.

6 Time Value of Money

Quote. Solve for the unknown between present value, future value, # periods, periodic interest, and periodic payment.

Definition 6.1. Time value of money is the equivalent value of two cash flows and two different points in time.

Quote. It is only possible to compare or combine values at the same point in time.

Theorem 6.1. Future value and present value:

$$FV = C \cdot (1 + r)^n, PV = \frac{C}{(1 + r)^n}$$

Definition 6.2. **Net Present Value** is the cash inflows (benefits) subtract the cash outflows (costs).

Definition 6.3. The value of a **perpetuity** is the cash flow divided by the interest rate. $PV = \frac{C}{r}$.

Theorem 6.2. **Present value of an annuity formula:**

$$PV = P \left(1 - \frac{1}{(1 + r)^n} \right)$$

If there is no payment upfront,

$$PV = C \times \frac{1}{r} \left(1 - \frac{1}{(1 + r)^n} \right)$$

Theorem 6.3. Future value of an annuity:

$$C \times \frac{1}{r} ((1 + r)^n - 1)$$

Definition 6.4. If an investment is **growing**, then there is a market rate of growth attached as well. This growing interest must be subtracted when calculating present value.

Theorem 6.4. Present value of a growing perpetuity:

$$PV = \frac{C}{r - g}$$

Present value of a growing annuity:

$$PV = \frac{C}{r - g} \left(1 - \left(\frac{1 + g}{1 + r} \right)^n \right)$$

Definition 6.5. Future value at a time of last payment of an n-period growing annuity:

$$FV = \frac{C}{r - g} [(1 + r)^n - (1 + g)^n]$$

We can just memorize PV formula, and compound it to obtain FV.

Definition 6.6. The **internal rate of return** is the interest rate that sets the net present value of cash flows equal to zero.

7 Interest Rates

Definition 7.1. The **Effective Annual Rate** is equivalent to the percentage that will calculate the total amount of interest that will be earned if interest is compounded annually.

Note. To convert EAR to a monthly rate, $R = (1 + EAR)^{\frac{1}{12}} - 1$.

Definition 7.2. The **annual percentage rate** indicates the amount of simple interest earned in one year.

Note. To convert APR to monthly rate, $R = \frac{APR}{12}$

Note. To determine how much of a payment was dedicated towards principal and how much towards interest, subtract the outstanding balance from principal. This number will be money dedicated towards principal. Then subtract this number from the sum of the payments so far, and it'll be the amount dedicated towards interest payment.

8 Bonds

Definition 8.1. Basic terminology:

- A **bond certificate** states the terms of the bond.
- The **maturity date** is the final repayment date.
- The **term** is the time remaining until repayment date.
- The **coupon** is the promised interest payments. This is given as APR.
- **Face value** is the notional amount used to compute interest payments. In theory, it is what the bond should be worth at the end of the interest payments.
- The **coupon payment** will be the same every period. It is simply the face value multiplied by the coupon rate.

Definition 8.2. **Zero coupon bonds** do not make coupon payments, so they are discounted more than regular bonds. **Treasury Bills** are zero-coupon bonds with a maturity of up to a year.

Definition 8.3. The **yield to maturity** is the discount rate that sets the PV of the bond payments equal to the current market price of a bond.

Definition 8.4. **Spot Interest Rate** is another term for a default-free, zero-coupon yield.

Definition 8.5. **Coupon bonds** pay regular coupon interest payments, and pay the face value at maturity.

Note. To solve for coupon bonds, RATE is YTM, NPER is the # of periods, PMT is coupon, PV is negative of value of bond currently, and FV is the face value.

Quote. Make sure both coupon payments and yield to maturity are the same time frame!

Definition 8.6. Bond price:

- **Discount** - Price is less than FV
- **Par** - Price is equal to FV.
- **Premium** - Price is greater than FV

Note. There is an inverse relationship between interest rates and bond prices.

Quote. The sensitivity of a bond's price to changes in interest rates is directly correlated to the bond's **duration**.