AFM 121

GLOBAL FINACIAL MARKETS

PROFESSOR G. BLAIR • WINTER 2014 • UNIVERSITY OF WATERLOO

Last Revision: April 6, 2015

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Future Modifications

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 wth 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 ownersip 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 contol to replace the current manaegment.

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 investmnts.

- 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 × $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

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.

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 6.0.1. 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 6.0.2. 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 6.0.3. Future value of an annuity:

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

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 6.0.4. 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:

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

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 defalt-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**.

9 Financial Statements

Definition 9.1. Financial statements are firm-issued accounting reports with past performance information. They are filed with the provincial securities commission. Interim financial statements are quarterly while annual reports are annual.

Definition 9.2. Auditor is a neutral third party that checks the validity of a firm's financial statements.

Types of Financial Statements

- Balance Sheet
- Statement of Comprehensive Income
- Statement of Cash Flows
- Statement of Changes in Equity
- Notes including accounting policies

9.1 Balance Sheet

Definition 9.3. A **balance sheet** is a snapshot at a specific point in time of a firm's financial position.

$$\text{Assets} = \text{Liabilities} + \text{Shareholder's Equity}$$

- **Assets:** Current assets (cash, securities, inventory, prepaids), long-term assets (PPE & goodwill)

- **Liabilities:** Current liabilities (current portion of long term-debt, payables), long-term liabilities (lease,bond)
- **Shareholder's Equity:** Book value may be negative. Market value is the value of the shares outstanding and cannot be negative.

Ratio.

$$\text{Net Working Capital} = \text{Current assets} - \text{current liabilities}$$

Definition 9.4. Liquidation value is the value of the firm if all assets were sold and liabilities were paid.

Ratio.

$$\text{Market to book ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$$

Ratio.

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Ratio.

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash}$$

Ratio.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio} = \frac{\text{Current Assets - Inventories}}{\text{Current Liabilities}}$$

9.2 Income Statement

Definition 9.5. The **income statement** lists a firm's revenues and expenses over a period of time.

Ratio.

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares Outstanding}}$$

Profitability Ratios

$$\text{Gross Margin} = \frac{\text{Gross profit}}{\text{Sales}}$$

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Sales}}$$

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Total Sales}}$$

Ratio.

$$\text{Asset Turnover} = \frac{\text{Total Sales}}{\text{Total Assets}}$$

Ratio.

$$\text{Accounts Receivable Days} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$$

Definition 9.6. EBITDA (earnings before interest, taxes, depreciation, and amortization) reflects the cash a firm has earned from its operations.

Leverage Ratios

- Operating income / Interest expense
- EBIT / Interest Expense
- EBITDA / Interest Expense

Investment Returns

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}}$$

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Ratio.

$$\text{Price Earning Ratio} = \frac{\text{Market Capitalization}}{\text{Net Income}} = \frac{\text{Share Price}}{\text{Earnings per Share}}$$

9.3 Statement of Cash Flows

- **Operating Activities:** Adjusts net income by non-cash items relating to operating activities.
- **Investing Activities:** Capital expenditure & marketable securities
- **Financing Activities:** Changes in borrowing, payments of dividends

9.4 Other Financial Statement Information

- Management Discussion and Analysis (MD&A)
- Statement of Shareholder's Equity
- Statement of Comprehensive Income
- Notes to the Financial Statements

———— MIDTERM ENDS HERE ————————————- Half mc, half problems 90 mins All on computer

10 Valuing Stocks

10.1 Dividend-Discount Model

The **dividend-discount model** accounts for potential cash flows for an investment include the sale of stock (capital gain), and the dividend.

Example 10.1. Suppose you expect a stock to pay dividends of 0.56 per share and trade for 45.60 per share at the end of the year. If the investments with equivalent risk has an expected return of 6.8%, what is the most you would pay?

Solution.

$$P_0 = \frac{Div_1 + P_1}{1 + r_g} = \frac{0.56 + 45.60}{1.0680} = 43.13$$

$$\text{Dividend Yield} = \frac{0.56}{43.13}$$

$$\text{Capital Gains Yield} = \frac{45.6 - 43.13}{43.13}$$

Definition 10.1. In a Constant Divdend Growth Model, the price is equivalent to

$$P_0 = \frac{Div_1}{r_E - g}$$

Definition 10.2. The dividend discount model discounts both the dividend and the capital gain to predict the current price of a stock.

$$P_0 = \frac{Div_1}{1 + r_g} + \frac{Div_2}{(1 + r_g)^2} + \cdots + \frac{Div_n}{(1 + r_g)^n} + \frac{P_1}{(1 + r_g)^n} = \sum_{t=1}^{\infty} \frac{Div_t}{(1 + r_e)^t}$$

Note. The dividend here is the dividend at the end of **year 1**, not year 0.

Quote. Most banks in Canada have a dividend payout ratio of around 40-50 percent.

10.2 Constant Dividend Growth

The simplest forecast for a firm's future dividends states that they'll grow at a constant rate forever. This is simply a perpetuity.

$$P_0 = \frac{Div_1}{r_e - g}$$

$$r_e = \frac{Div_1}{P_0} + g$$

10.3 A Simple Model of Growth

Definition 10.3. The **Dividend Payout Ratio** is teh fraction of earnings paid as dividends each year.

$$Div_1 = EPS_t \times \text{Dividend Payout Rate}_t$$

Note. Assuming shares outstanding is constant, the firm can increase dividends in three ways

- Increase net income
- Increase dividend payout ratio
- Decrease shares outstanding

and it can do one of two things with its earnings:

- Pay them out to investors
- Retain and reinvest

$$\text{Changes in Earnings} = \text{New Investment} \times \text{Return on New Investment}$$

$$\text{New Investment} = \text{Earnings} \times \text{Retention Rate}$$

$$\text{Earnings growth Rate} = \frac{\text{Changes in Earnings}}{\text{Earnings}}$$

$$g = \text{Retention Rate} \times \text{Return on New Investment}$$

Quote. Constant dividend growth model to value is stack cannot be used of growth rate is not constant.

Example 10.2. EPS for a company was $\$2$ per share in the past year, and are expected to grow at a rate of 20% per year until the end of year 4. At that point, investments will be cut and 60% of its earnings will be paid as dividends and growth will slow down to a long-run rate of 4%. If the cost if capital is 8%, what is the value of the share today.

Solution. From year 4 onwards, the company's dividends will grow at the expected long-run rate of 4% per year, and the constant dividend growth model can be used to project price at teh end of year 3.

$$Div_4 = \frac{2 \times (1.20)^4}{0.6} = 2.49$$

$$P_3 = \frac{Div_4}{r_e - g} = \frac{2.49}{0.08 - 0.04} = 62.25$$

Then apply the dividend discount model with this terminal value

$$P_0 = \frac{Div_1}{1 + r_e} + \frac{Div_2}{(1 + r_e)^2} + \frac{Div_3}{(1 + r_e)^3} + \frac{P_3}{(1 + r_e)^3} = \frac{62.25}{(1.08)^3} = 49.42$$

Note. There is a tremendous amount of uncertainty associated with forecasting a firm's dividend growth rate and future dividends. Small changes in teh assumed rates can lead to large changes in the estimated stock price.

10.4 Share Repurchases and Total Payout Model

Definition 10.4. Share repurchase is where a firm uses excess cash to buy back its own stock.

The total payout model is

$$P_0 = \frac{PV(\text{Future Dividends and Repurchases})}{\text{Shares Outstanding}_0}$$

Simply discount the total payout, and divide by the current number of shares outstanding.

10.5 Discount Cash Flow

This determines the value of the firm to all investors, including both equity and debt holders.

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} + \text{Cash}$$

$$\text{Free Cash Flow} = EBIT \times (1-i) + \text{Depreciation} - \text{Capital Expenditures} - \text{Changes in Net Working Capital}$$

$$V_0 = PV(\text{Future Free Cash Flow of Firm})$$

$$P_0 = \frac{V_0 + \text{Cash}_0 - \text{Debt}_0}{\text{Shares Outstanding}_0}$$

10.6 Method of Comparables

Notes are incomplete and will not be finished because exam is open book and based on Excel calculations