AD 717:
Investment Analysis and Portfolio Management

Section A1

Term Project

Stock report on the stock you have been assigned in the beginning of the semester, including:

- Description of the company, including its industry, position in the market, competitors, headwinds and tailwinds, management, etc.
- Determine Beta with the Capital Asset Pricing Model
- Valuation using DCF or DDM, estimating a low, medium, and high share value (depending on your assumptions which you need to justify in your writeup)
- Statement of risks
- Given three investor profiles, explain the suitability of an investment in “your” stock for these investors.

Valuation by Comparables

- Compare valuation ratios of firm to industry averages.
- Ratios like price/sales are useful for valuing start-ups that have yet to generate positive earnings.

Review: Capital Asset Pricing Model

- Expected excess return should account for risk of the security.
- Beta describes the sensitivity of a security to the market:

$$\mathrm{E}(r_i) - r_f = \beta(\mathrm{E}(r_m) - r_f)$$

- Large beta: Aggressive or cyclical stocks
- Low beta: Defensive stocks
- Negative beta: Stock moves opposite to the market.

What is beta? Result of a regression, and it means $\beta = \frac{\mathrm{Cov}(r_i, r_m)}{\mathrm{Var}(r_m)}$.

Market capitalization rate

- Once we know beta, and assuming CAPM is true, we know the required return for a stock to hold it in our portfolio:

$$k = \beta\left(\mathrm{E}(r_m) - r_f\right) + r_f$$

- If the stock is priced correctly, *k* should equal expected return.
- *k* is called the market capitalization rate.

Fundamental analysis

- Fundamental analysis models a company's value by assessing its current and future profitability.
- The purpose of fundamental analysis is to identify mispriced stocks relative to some measure of "true" value derived from financial data.

How?

- Balance Sheet Models
- Dividend Discount Models (DDM)
- Price/Earnings Ratios
- Free Cash Flow Models

Intrinsic Value vs. Market Price

Financial Statements

- Income Statement:
  - Profitability over time
- Balance Sheet:
  - Financial condition at a point in time
- Statement of Cash Flows:
  - Tracks the cash implications of transactions.

Income Statement

Table 19.1

Consolidated statement of income for Hewlett-Packard, 2009

	$ Million	Percent of Revenue
Operating revenues		
Net sales	$114,552	100.0%
Operating expenses		
Cost of goods sold	82,751	72.2
Selling, general & administrative expenses	11,613	10.1
Research & development expenses	2,819	2.5
Depreciation	4,773	4.2
Operating income	12,596	11.0
Other income (expense)	(2,460)	−2.1
Earnings before interest and income taxes	$10,136	8.8%
Interest expense	721	0.6
Taxable income	$ 9,415	8.2%
Taxes	1,755	1.5
Net income	$7,660	6.7%
Allocation of net income		
Dividends	766	0.7
Addition to retained earnings	6,894	6.0

Note: Sums subject to rounding error.

Source: Hewlett-Packard *Annual Report*, year ending October 2009. © 2009 Hewlett-Packard Development Company, L.P.

Balance Sheet

Assets	$ Million	Percent of Total Assets	Liabilities and Shareholders' Equity	$ Million	Percent of Total Assets
Current assets					
Cash and marketable securities	$13,334	11.6%	Current liabilities		
Receivables	19,212	16.7	Debt due for repayment	$ 1,850	1.6%
Inventories	6,128	5.3	Accounts payable	33,862	29.5
Other current assets	13,865	12.1	Other current liabilities	7,291	6.4
Total current assets	$52,539	45.8%	Total current liabilities	$43,003	37.5%
Fixed assets			Long-term debt	13,980	12.2
Tangible fixed assets			Other long-term liabilities	17,299	15.1
Property, plant, and equipment	$11,262	9.8%			
Long-term investments	11,289	9.8	Total liabilities	74,282	64.7
Total tangible fixed assets	$22,551	19.6%	Shareholders' equity:		
Intangible fixed assets			Common stock and other paid-in capital	10,581	9.2
Goodwill	$33,109	28.8%	Retained earnings	29,936	26.1
Other intangible assets	6,600	5.7	Total shareholders' equity	$40,517	35.3%
Total intangible fixed assets	$39,709	34.6%	Total liabilities and shareholders' equity	$114,799	100.0%
Total fixed assets	62,260	54.2			
Total assets	$114,799	100.0%			

Table 19.2

Consolidated balance sheet for Hewlett-Packard, 2009

Note: Column sums subject to rounding error.
Source: Hewlett-Packard *Annual Report*, year ending October 2009.

Cash Flow Statement

	$ Million
Cash provided by operations	
Net income	$ 7,660
Adjustments to net income	
Depreciation	4,773
Changes in working capital	
Decrease (increase) in receivables	(549)
Decrease (increase) in inventories	1,532
Increase (decrease) in other current liabilities	580
Changes due to other operating activities	(617)
Total adjustments	$ 5,719
Cash provided by operations	13,379
Cash flows from investments	
Gross investments in tangible fixed assets	(3,695)
Investments in other fixed assets	104
Investment in other assets	11
Cash provided by (used for) investments	$(3,580)
Cash provided by (used for) financing activities	
Additions to (reductions in) long-term debt	(2,766)
Net issues (repurchases of) shares	(3,303)
Dividends	(766)
Other	162
Cash provided by (used for) financing activities	$(6,673)
Net increase in cash	3,126

Table 19.3

Statement of cash flows for Hewlett-Packard, 2009

Source: Hewlett-Packard *Annual Report*, year ending October 2009. © 2009 Hewlett-Packard Development Company, L.P.

Accounting?!

Economic earnings

- Sustainable cash flow that can be paid to stockholders without impairing productive capacity of the firm

Accounting earnings

- Affected by conventions regarding the valuation of assets

Benchmarking – consider comparable figures

- Compare the company's ratios across time.
- Compare ratios of firms in the same industry.
- Cross-industry comparisons can be misleading.

	Margin ×	ATO =	ROA
Supermarket chain	2%	5.0	10%
Utility	20%	0.5	10%

Table 19.7

Differences between profit margin and asset turnover across industries

Other comparability problems

- Accounting Differences
  - Inventory Valuation
  - Depreciation
- Inflation and Interest Expense
- Fair Value Accounting
- Quality of Earnings
- International Accounting Conventions

Intrinsic value

- The intrinsic value (IV) is the “true” value, according to a model.
- The market value (MV) is the consensus value of all market participants

Trading Signal:

IV > MV Buy

IV < MV Sell or Short Sell

IV = MV Hold or Fairly Priced

How do we find it?

Dividend Discount Models (DDM)

- Owning stock is owning claim to future earnings, which will be paid out to investors via dividends and / or reinvested to keep growing

$$V_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \ \ldots$$

- V_0: current value; D_t: dividend at time t; k: required rate of return
- DDM says the stock price should equal the present value of all expected future dividends into perpetuity.
- Math leads to:

$$V_0 = \frac{D_0(1+g)}{(k-g)} = \frac{D_1}{(k-g)}$$

Dividend Discount Models (DDM)

Example:

A stock just paid an annual dividend of $3/share. The dividend is expected to grow at 8% indefinitely, and the market capitalization rate (from CAPM) is 14%.

$$V_0 = \frac{D_0(1+g)}{(k-g)} = \frac{D_1}{(k-g)}$$

$$V_0 = \frac{D_1}{k-g} = \frac{\$3.24}{.14-.08} = \$54$$

Implications:

The constant-growth rate DDM implies that a stock's value will be greater:

1. The larger its expected dividend per share.
2. The lower the market capitalization rate, *k*.
3. The higher the expected growth rate of dividends.

The stock price is expected to grow at the same rate as dividends.

- How do we estimate the growth rate of the dividends?
  Growth = Return on Equity x Retention Rate

Implications:

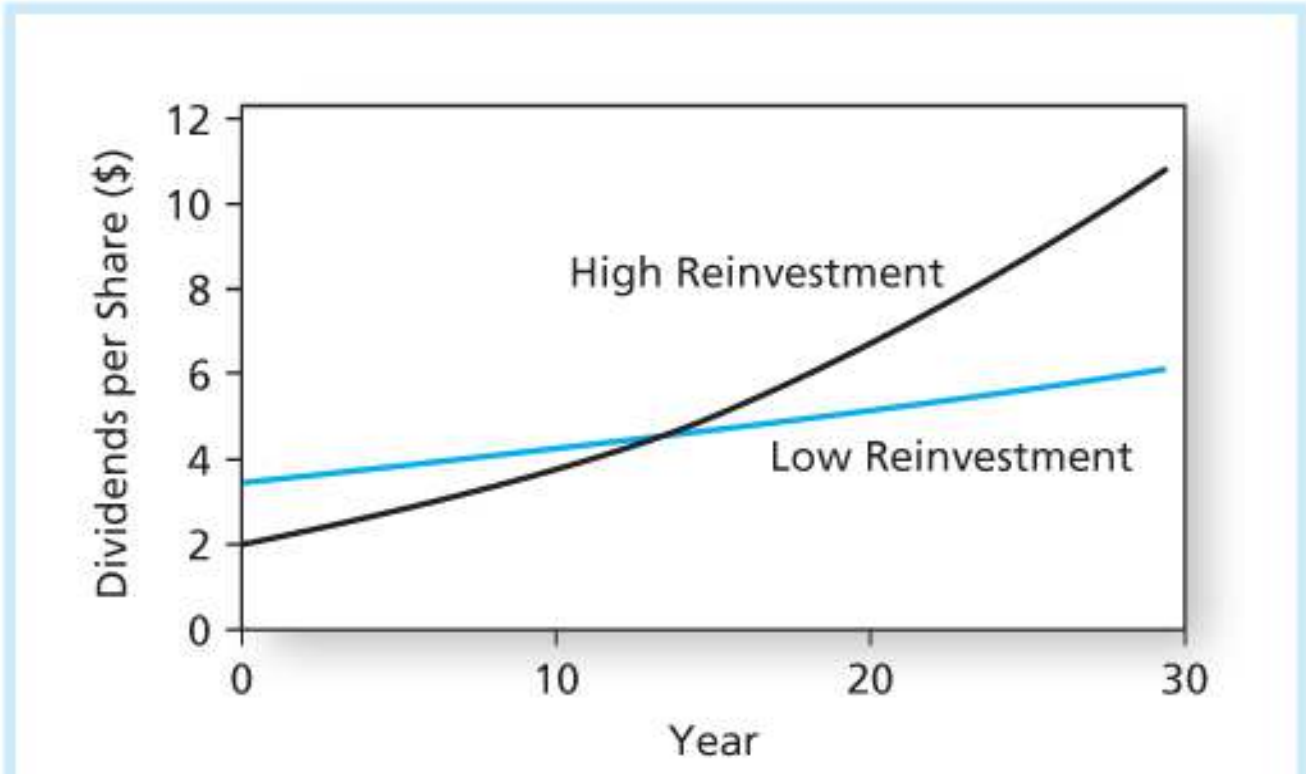

Figure 18.1 Dividend growth for two earnings reinvestment policies

Interpretation

- The value of the firm equals the value of the assets already in place, the **no-growth value of the firm**,
- **Plus** the NPV of its future investments,
- Which is called the **present value of growth opportunities** or **PVGO**.

What happens if the company reinvests its earnings with lower return than its capitalization rate?

Price-to-earnings ratio

The ratio of PVGO to *E/k* is the ratio of firm value due to growth opportunities to value due to assets already in place (i.e., the no-growth value of the firm, *E/k*).

$$\frac{P_0}{E_1} = \frac{1}{k}\left(1 + \frac{PVGO}{E/k}\right)$$

When risk is higher, what happens to P/E?

k increases, so P/E decreases.

Price-to-earnings ratio

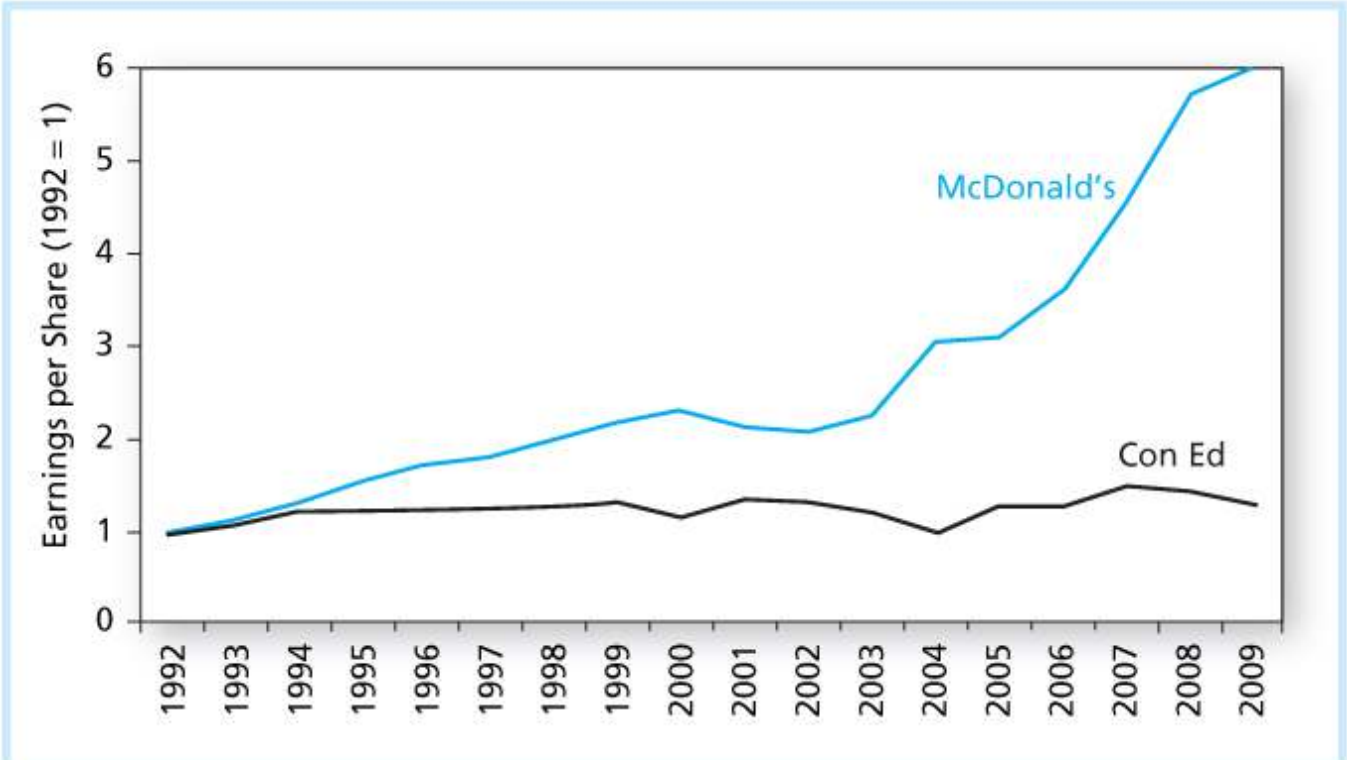

Figure 18.4 Earnings growth for two companies

Price-to-earnings ratio

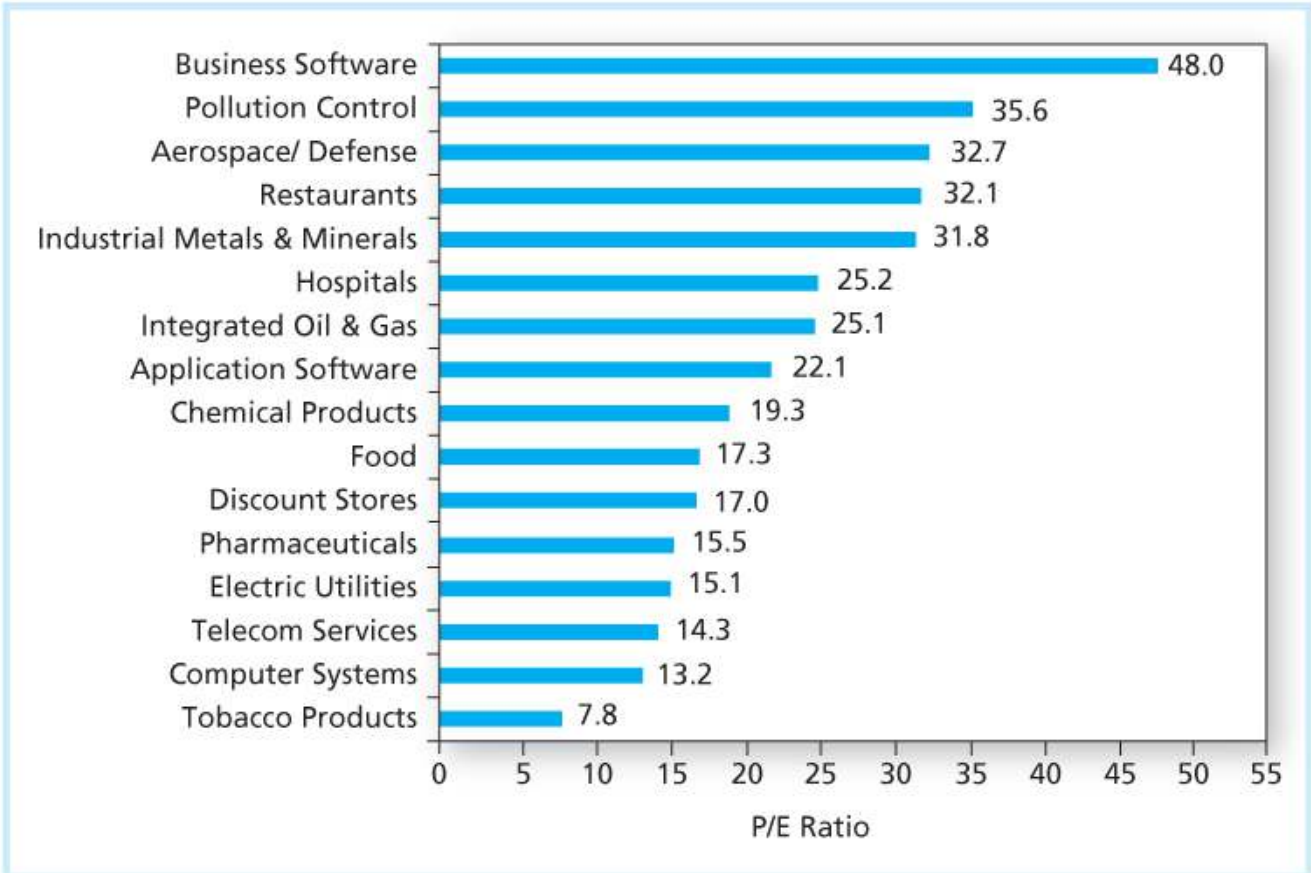

Figure 18.6 P/E ratios for different industries

Source: Data collected from Yahoo! Finance, January 5, 2010.

Discounted Cash Flow

Value of a company is the discounted sum of all future cash flows from today until eternity.

Worksheet!

Free cash flow to the firm, FCFF, equals:

- After tax EBIT
- Plus depreciation
- Minus capital expenditures
- Minus increase in net working capital

Discounted Cash Flow

What did we miss in our analysis?

- We looked at the FCF from 2023 and discounted it.
- But hopefully, the company is still around after 2023, otherwise many of our assumptions would have been bad assumptions.
- Consider the terminal value.
  - EBITDA multiple approach: use comparable multiple.
  - Treat 2023 FCF like we did for our dividend with *(1+g)/(k-g)* to consider it as a perpetuity.
    Enterprise value: present value of all cash flows and perpetuity.
    Subtract debt and add cash.

Homework:

Finish DCF for MSFT and run DCF and DDM for