Session 16: Equity Valuation II

Fall 2025

Outline

- A case study: Intel vs. Cisco
- Growth
  - Where does it come from?
  - The value of growth opportunities
- Multi-stage growth

Case Study: Intel vs. Cisco

Intel (INTC)

- Price: 24.03
- # shares: 5.25
- Mkt cap: $126.2 billion
- Earnings (12 m): 2.18
- **P/E ratio: 11.02**

Cisco (CSCO)

- Price: 17.38
- # shares: 5.38
- Mkt cap: $93.5 billion
- Earnings (12 m): 1.17
- **P/E ratio: 14.85**

Why are the P/E ratios so different?

Risk: INTC vs. CSCO

What are their required rates of return, given a 3% risk-free rate and a 6% equity risk premium?

INTC

- Beta = 0.97

CSCO

- Beta = 1.12

What P/E ratio does the zero-growth DDM predict?

Growth: INTC vs. CSCO

What are their plowback (retention) ratios?

INTC

- Earnings: 2.18
- Dividends: 0.73

CSCO

- Earnings: 1.17
- Dividends: 0.18

Growth forecasts

- Growth: 5.61%
- Growth: 8.60%

What PE ratio does the GGM predict?

Where Does Growth Come From?

It is not enough for a company to simply retain earnings, it also needs to use them productively. It matters what you do with the earnings. A company's **Return on Equity** (ROE) measures how productive the investment projects are at that company.

- Growth rate $g = b \cdot ROE$
  - b: the fraction of earnings you retain (and reinvest)
  - ROE: the return on that investment
- ROE = return on equity
  - Inside the firm (not from the CAPM)
  - IRR of equity investment in projects
  - Beware financing (capital structure) effects

ROE: MSFT vs. INTC

What are the implied ROEs?

INTC

- Growth: 5.61%
- Retention: 66.5%

CSCO

- Growth: 8.60%
- Retention: 84.6%

Bottom line: Cisco has much higher P/E ratio than Intel because its ROE and retention rate are higher!

Forward-Looking P/E Ratio

- Price divided by forward-looking earnings

$$P_0 = \frac{D_0(1+g)}{k-g} = \frac{D_1}{k-g} = \frac{(1-b)E_1}{k-b(ROE)} \Leftrightarrow \frac{P_0}{E_1} = \frac{1-b}{k-b(ROE)}$$

- Sensitivity of price-earnings ratio w.r.t. b
  When should I retain more earnings?

$$\frac{\partial P_0/E_1}{\partial b} = \frac{ROE-k}{[k-b(ROE)]^2}$$

Growth Opportunities

- P_0 = PV(future dividends)
  = PV(future net cash flows from assets in place)
  +NPV(new projects)
  = E_0/k + PVGO
- INTC vs. CSCO

- Firms
  - Use the CAPM to compute the required return
  - Use this discount rate to compute NPV
  - Capital budgeting: take positive NPV projects

Two-Stage DDM

- The Gordon growth model assumed that the growth rate of earnings is **constant forever**. This is a serious simplification. It seems important to incorporate a stage of fast growth, in which pay-out ratio is low (retention is high), and a stage of slower growth, when the payout ratio is high. This is how we often think of the life-cycle of a company. The company starts out as a fast growing, dynamic enterprise, and as it grows, it matures and the growth rate slows down.

- A good example is Microsoft: for 18 years, Microsoft decided not to pay out any dividend. It grew very fast plowed back all of its earnings. But in Feb 2003 year, Microsoft started distributing dividends. It is no longer considered a growth company (current P/E ratio is 10)

Two-Stage DDM

- A company can grow exceptionally for a while, but at some point the company matures and its growth normalizes. (Why?)
- Suppose that you estimate that a company's growth will reach its "long-run" level of *g* after 3 years. Then, in 2 years its price is

$$P_2 = \frac{E[D_3]}{k-g}$$

and the current value is

$$P_0 = \frac{\mathrm{E}(D_1)}{1+k} + \frac{\mathrm{E}(D_2)}{(1+k)^2} + \frac{P_2}{(1+k)^2}$$

- Instead of estimating the future growth rate, one can estimate future *P/D* ratio or *P/E* ratio

Starbucks

- Suppose at the end of 2005 you estimated
  - SBUX would pay no dividends 2006-09
  - SBUX's 2010 dividend per share will be 0.50
  - After 2010, SBUX's (dividend) growth rate will be 9%
  - SBUX's required return is 10%
- Using the two-stage DDM, what is the fundamental value of SBUX at the end of 2005?

Conclusion

- What matters?
  - Cash flows from assets in place
  - The value of future growth
    - The amount of investment
    - Returns (ROE)
- Nothing lasts forever (especially abnormal growth)

Assignments

- Reading
- Assignments
  - Problem Set 4 due 29th October