

Seminar

Dividend discount model and its application

1. Vincent Nguyen, an analyst, is examining the stock of British Airways (BAY) as of the beginning of 2008. He notices that the consensus forecast by analysts is that the stock will pay a £4 dividend per share in 2009 (based on 21 analysts) and a £5 dividend in 2010 (based on 10 analysts). Nguyen expects the price of the stock at the end of 2010 to be £250. He has estimated that the required rate of return on the stock is 11 percent. Assume all dividends are paid at the end of the year.
 - A. Using the DDM, estimate the value of BAY stock at the end of 2009.
 - B. Using the DDM, estimate the value of BAY stock at the end of 2008.

2. Justin Owens is an analyst for an equity mutual fund that invests in British stocks. At the beginning of 2008, Owens is examining domestic stocks for possible inclusion in the fund. One of the stocks that he is analyzing is British Sky Broadcasting Group (BSY). The stock has paid dividends per share of £9, £12.20, and £15.50 at the end of 2005, 2006, and 2007, respectively. The consensus forecast by analysts is that the stock will pay a dividend per share of £18.66 at the end of 2008 (based on 19 analysts) and £20.20 at the end of 2009 (based on 17 analysts). Owens has estimated that the required rate of return on the stock is 11 percent.
 - A. Compare the compound annual growth rate in dividends from 2005 to 2007 inclusive (i.e., from a beginning level of £9 to an ending level of £15.50) with the consensus predicted compound annual growth rate in dividends from 2007 to 2009, inclusive.
 - B. Owens believes that BSY has matured such that the dividend growth rate will be constant going forward at half the consensus compound annual growth rate from 2007 to 2009, inclusive, computed in Part A. Using the growth rate forecast of Owens as the constant growth rate from 2007 onwards, estimate the value of the stock as of the end of 2007 given an 11 percent required rate of return on equity.

3. During the period 1960–2007, earnings of the S&P 500 Index companies have increased at an average rate of 8.18 percent per year and the dividends paid have increased at an average rate of 5.9 percent per year. Assume that:
 - Dividends will continue to grow at the 1960–2007 rate.
 - The required return on the index is 8 percent.
 - Companies in the S&P 500 Index collectively paid \$246.6 billion in dividends in 2007.

Estimate the aggregate value of the S&P 500 Index component companies at the beginning of 2008 using the Gordon growth model.

4. Great Plains Energy is a public utility holding company that listed its 4.5 percent cumulative perpetual preferred stock series E on the NYSE Euronext in March 1952. The par value of the preferred stock is \$100. If the required rate of return on this stock is 5.6 percent, estimate the value of the stock.
5. German Resources is involved in coal mining. The company is currently profitable and is expected to pay a dividend of €4 per share next year. The company has suspended exploration, however, and because its current mature operations exhaust the existing mines, you expect that the dividends paid by the company will decline forever at an 8 percent rate. The required return on German Resource's stock is 11 percent. Using the DDM, estimate the value of the stock.
6. Maspeth Robotics shares are currently selling for €24 and have paid a dividend of €1 per share for the most recent year. The following additional information is given:
 - The risk-free rate is 4 percent;
 - The shares have an estimated beta of 1.2; and
 - The equity risk premium is estimated at 5 percent.

Based on the above information, determine the constant dividend growth rate that would be required to justify the market price of €24.

7. Mohan Gupta is the portfolio manager of an India-based equity fund. He is analyzing the value of Tata Chemicals Ltd. Tata Chemicals is India's leading manufacturer of inorganic chemicals, and also manufactures fertilizers and food additives. Gupta has concluded that the DDM is appropriate to value Tata Chemicals. During the last five years (fiscal year ending 31 March 2004 to fiscal year ending 31 March 2008), the company has paid dividends per share of Rs. 5.50, 6.50, 7.00, 8.00, and 9.00, respectively. These dividends suggest an average annual growth rate in DPS of just above 13 percent. Gupta has decided to use a three-stage DDM with a linearly declining growth rate in Stage 2. He considers Tata Chemicals to be an average growth company, and estimates Stage 1 (the growth stage) to be 6 years and Stage 2 (the transition stage) to be 10 years. He estimates the growth rate to be 14 percent in Stage 1 and 10 percent in Stage 3. Gupta has estimated the required return on equity for Tata Chemicals to be 16 percent. Estimate the current value of the stock.
8. You are analyzing the stock of Ansell Limited (ANN), a healthcare company, as of late June 2008. The stock price is A\$9.74. The company's dividend per share for the fiscal year ending 30 June 2008 was A\$0.27. You expect the dividend to increase by 10 percent for the next three years and then increase by 8 percent per year forever. You estimate the required return on equity of Ansell Limited to be 12 percent.
 - A. Estimate the value of ANN using a two-stage dividend discount model.
 - B. Use the H model with a linearly declining growth rate in Stage 1 and estimate the value of ANN
 - C. Judge whether ANN is undervalued, fairly valued, or overvalued.

9. Casey Hyunh is trying to value the stock of Resources Limited. To easily see how a change in one or more of her assumptions affects the estimated value of the stock, she is using a spreadsheet model. The model has projections for the next four years based on the following assumptions.

- Sales will be \$300 million in Year 1.
- Sales will grow at 15 percent in Years 2 and 3 and 10 percent in Year 4.
- Operating profits (EBIT) will be 17 percent of sales in each year.
- Interest expense will be \$10 million per year.
- Income tax rate is 30 percent.
- Earnings retention ratio would stay at 0.60.

The per-share dividend growth rate will be constant from Year 4 forward and this final growth rate will be 200 basis points less than the growth rate from Year 3 to Year 4.

The company has 10 million shares outstanding. Hyunh has estimated the required return on Resources' stock to be 13 percent.

- A. Estimate the value of the stock at the end of Year 4 based on the above assumptions.
- B. Estimate the current value of the stock using the above assumptions.

The following information relates to Questions 10 - 16

June Withers is analyzing four stocks in the processed food industry as of 31 December 2017. All stocks pay a dividend at the end of each year.

Ukon Corporation

Withers estimates a required rate of return for Ukon Corporation of 8% and notes that the dividend for 2017 was EUR 2.315 per share. Her first valuation approach is a basic two-stage dividend discount model (DDM), with dividends growing at a rate of 5% from 2018 through 2021, after which time dividends will grow at a sustainable rate of 3%. Her second valuation approach is the H-model, assuming that dividend growth of 5% in 2018 declines linearly during the years 2019 through 2021 to the 3% growth rate after 2021. Her dividend growth assumptions are summarized in Exhibit 1.

Exhibit 1. Ukon Corporation Dividend Growth Assumptions, by Model

Model	Time Period	Rate
Two-stage DDM	2018 through 2021	5%
	Beginning 2022	3%

H-model	2018	5%
	2019 through 2021	Declining linearly to 3.5%
	Beginning 2022	3%

Venus Company

Withers has assembled the data on Venus Company in Exhibit 2. After analyzing competitive pressures and financial conditions in the industry, she predicts that Venus Company will lose market share because of new entrants, but will stabilize within a few years. The required rate of return for Venus Company is 8%. Beginning with a per share dividend of USD 3.15 in 2017, she develops two scenarios regarding the growth of dividends of Venus Company. The scenarios are in Exhibit 2 and are summarized as follows:

In Scenario 1, the growth rate will fall in a linear manner over the years 2018 through 2021 from 8% to 4%. Using the H-model, she calculates a value of USD 58.79 per share of Venus Company stock.

In Scenario 2, the growth rate falls from 8% in 2017 to 6% in 2018 and 2019, to 5% in 2020 and 2021, and then to a sustainable rate of 3% for 2022 and beyond.

Exhibit 2. Venus Company Dividend Growth Scenarios

Scenarios	Time Period	Rate
Scenario 1	2018 through 2021	Declining linearly to 4%
	Beginning 2022	Remaining stable at 4%
Scenario 2	2018 and 2019	6%
	2020 and 2021	5%
	Beginning 2022	Remaining stable at 3%

Wakuni Corporation

Withers evaluates Wakuni Corporation and uses recent financial data from Exhibit 3 to calculate a sustainable growth based on the DuPont model. In addition to this estimate, she performs a sensitivity analysis on the sustainable growth rate whereby the dividend payout ranges from 0% to 10% and the return on equity ranges from 8% to 12%.

Exhibit 3. Selected Data for Wakuni Corporation (JPY billions)

Net income	43,923
Sales	423,474
Total assets, average during year	486,203
Shareholders' equity, beginning of year	397,925
Dividends paid	1,518

10. Based on Exhibit 1, when Withers applies the first valuation approach to Ukon Corporation, the estimated value of the stock at the end of the first stage represents the:

- a. present value of the dividends beyond year 2021.
- b. present value of the dividends for years 2018 through 2021.
- c. sum of the present value of the dividends for 2018 through 2021 and the present value of dividends beyond year 2021.

11. Using her first valuation approach and Exhibit 1, Withers's forecast of the per share stock value of Ukon Corporation at the end of 2017 should be closest to:

- a. EUR 48.
- b. EUR 50.
- c. EUR 51.

12. Using Withers's assumptions for the H-model and the basic two-stage dividend discount model, the forecasted Ukon stock price at the end of the year 2021 for the H-model should be:

- a. lower than the basic two-stage model.
- b. the same as the basic two-stage model.
- c. higher than the basic two-stage model.

13. Under her Scenario 1 and based on Exhibit 2, the required rate of return that Withers used for Venus Company stock valuation is closest to:

- a. 8.0%.
- b. 9.6%.
- c. 10.0%.

14. Under Scenario 2 and based on Exhibit 2, Withers estimates that the value of the Venus Company stock to be closest to:

- a. USD 69.73.

b. USD 71.03.

c. USD 72.98.

15. Using the data in Exhibit 3, Withers can estimate the sustainable growth of the Wakuni Corporation as being closest to:

a. 10.66%.

b. 11.04%.

c. 14.05%.

16. Withers's sensitivity analysis of Wakuni Corporation should produce a range of sustainable growth estimates between:

a. 0.0% and 1.2%.

b. 7.2% and 12.0%.

c. 8.0% and 13.3%