Business Valuation

Learning Problems

**Income Approach (DDM) at Rebel**

Rebel Company is considering issuing additional equity to finance its expansion. The market price of its common share is currently CAD 110, but the company would like to verify this price to determine if it is a suitable time to raise new financing. The following data is available:

|  |  |
| --- | --- |
| Beta | 2.1 |
| 20-year risk-free rate | 4.0% |
| S&P 500 return | 9.5% |
| 3-year analyst consensus dividend growth forecast | 7.0% |
| Current dividend | CAD 10.00 |

Rebel assumes a long-term dividend growth rate of 3.0%.

**REQUIRED:**

1. Estimate the intrinsic value of Rebel’s shares using a 2-stage income approach (DDM). Should Rebel issue new shares now?
2. Rebel is uncertain of some of its inputs and has decided to do a best and worst-case scenario analysis using the following data:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Best** | **Baseline** | **Worst** |
| Return in high-growth period | 9.0% | 7.0% | 5.0% |
| Length of high-growth period | 4 years | 3 years | 2 years |
| Return in mature-growth period | 4.0% | 3.0% | 2.0% |

Will this analysis change Rebel’s decision?

**Estimating Historical Growth Rates**

Kevin Simpson is an equity analyst who is considering Shamrock Systems for inclusion in his firm’s large-cap fund. To estimate the growth rate of dividends in the income approach (DDM), Simpson has collected the following historical earnings per share data for the last two business cycles:

|  |  |
| --- | --- |
| **Year** | **EPS (CAD)** |
| 2005 | 0.46 |
| 2006 | 0.72 |
| 2007 | 0.78 |
| 2008 | 0.96 |
| 2009 | 0.87 |
| 2010 | 1.05 |
| 2011 | 0.76 |
| 2012 | 0.90 |
| 2013 | 0.91 |
| 2014 | 1.27 |
| 2015 | 1.13 |
| 2016 | 1.27 |

**REQUIRED:**

1. Calculate the arithmetic and geometric mean growth rate of EPS from 2005 to 2016. Why should the geometric mean growth rate be used?
2. Recalculate the geometric mean growth rate using regression smoothing. Describe two advantages of this approach.

**Income Approach (DDM) at Amsterdam**

Amsterdam Company is preparing a fairness opinion in response to an offer it has received to buy the company. The following information was collected:

|  |  |  |
| --- | --- | --- |
|  | **High-Growth Stage** | **Stable-Growth Stage** |
| Beta | 1.2 | 1.0 |
| Return on assets | 15.0% | 5.0% |
| Payout ratio | 25.0% | 75.0% |
| Debt ratio | 0.50 | 0.60 |
| Length | 3 years | Infinite |

EPS was CAD 4.50 in the previous year. The risk-free rate is 4.5% and the market risk premium is 5.5%.

**REQUIRED:**

1. Estimate the intrinsic value of Amsterdam’s shares using the 2-stage income approach (DDM).
2. What percentage of Amsterdam’s intrinsic value is accounted for by its terminal value? Does this create any problems for the valuation?

**Income Approach (DDM) at Samantha**

Hal Wipley owns Samantha Company and has hired Jenna Walters, CBV to value his firm as he is contemplating retirement. Walters made the following estimates:

|  |  |  |
| --- | --- | --- |
|  | **High-Growth Stage** | **Stable-Growth Stage** |
| Return on assets | 18.0% | 9.0% |
| Payout ratio | 25.0% | 75.0% |
| Debt ratio | 20.0% | 40.0% |
| Length | 2 years | Indefinite |
| Beta | 1.36 | 1.00 |

Walters expects the high-growth stage to phase into the stable-growth stage evenly over two years before it reaches stable growth in Year 5. Dividends per share are currently CAD 6.40. The risk-free rate is 4.0% and the market risk premium is 5.0%.

**REQUIRED:**

1. Estimate the intrinsic value of Samantha Company’s shares using the 3-stage income approach (DDM).

**Income Approach (FCFE) at Global**

Global Ltd.’s CFO is valuing her company as the first step in an initial public offering. Sales were forecasted for the next three years based on a consensus estimate of industry analysts. The percentage of sales method was used to prepare pro forma financial statements. After three years, the company is expected to grow at the long-term growth rate of the economy.

**Global Ltd.**

**Balance Sheet (in CAD thousands)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Actual** | **Projected** | | |
|  | **2009** | **2010** | **2011** | **2012** |
| Current assets | 30,000 | 31,500 | 33,075 | 34,728 |
| Plant and equipment | 90,000 | 101,000 | 112,550 | 124,677 |
| Less: Accumulated depreciation | 60,000 | 69,000 | 78,450 | 88,372 |
| Net plant and equipment | 30,000 | 32,000 | 34,100 | 36,305 |
| Total assets | 60,000 | 63,500 | 67,175 | 71,033 |
|  |  |  |  |  |
| Current liabilities | 10,000 | 10,500 | 11,025 | 11,576 |
| Long-term debt | 40,000 | 42,000 | 44,100 | 46,305 |
| Equities | 10,000 | 11,000 | 12,050 | 13,152 |
| Total liabilities and equities | 60,000 | 63,500 | 67,175 | 71,033 |

**Global Ltd.**

**Income Statement (in CAD thousands)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **2010** | **2011** | **2012** |
| Sales | 200,000 | 210,000 | 220,500 |
| Cost of sales | 120,000 | 126,000 | 132,300 |
| Gross margin | 80,000 | 84,000 | 88,200 |
| Operating expenses | 52,000 | 54,600 | 57,330 |
| Depreciation | 9,000 | 9,450 | 9,922 |
| Earnings before interest and taxes | 19,000 | 19,950 | 20,948 |
| Interest | 4,000 | 4,200 | 4,410 |
| Earnings before taxes | 15,000 | 15,750 | 16,538 |
| Income taxes | 6,000 | 6,300 | 6,615 |
| Net income | 9,000 | 9,450 | 9,923 |

**Other Information**

Global has a beta of 1.3. The 20-year U.S. treasury bond rate is 4.0%, the market risk premium is 5.0%, and the estimated long-term growth rate of the economy is 3.0%.

**REQUIRED:**

1. Estimate the intrinsic value of Global using the 2-stage income approach (FCFE).

**Income Approach (FCFF) at Pulsar**

Heather Johnson is valuing Pulsar Ltd. to determine if it is a suitable take-over target for the investment fund she manages. She has projected key aspects of Pulsar’s performance for the next three years, beginning in 2015, after which she expects the company will grow at the long-term growth rate of the economy. The following data was collected:

**Pulsar Ltd.**

**Income Statement (in CAD thousands)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Actual** | **Projected** | | |
| **2014** | **2015** | **2016** | **2017** |
| Current assets | 30,800 | 34,223 | 36,789 | 38,586 |
| Land, plant and equipment | 136,900 | 155,283 | 172,321 | 187,997 |
| Less: Accumulative depreciation | 61,450 | 71,450 | 82,200 | 93,475 |
| Net plant and equipment | 75,450 | 83,833 | 90,121 | 94,522 |
| Long-term investments | 0 | 7,533 | 17,018 | 28,083 |
| Total assets | 106,250 | 125,589 | 143,928 | 161,191 |
| Current liabilities | 19,850 | 22,056 | 23,710 | 24,867 |
| Long-term debt | 48,000 | 53,333 | 57,333 | 60,133 |
| Common equity | 38,400 | 50,200 | 62,885 | 76,190 |
| Total liabilities and equities | 106,250 | 125,589 | 143,928 | 161,190 |

**Pulsar Ltd.**

**Income Statement (in CAD thousands)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Projected** | | |
| **2015** | **2016** | **2017** |
| Sales | 200,000 | 215,000 | 225,500 |
| Cost of sales | 120,000 | 129,000 | 135,300 |
| Gross margin | 80,000 | 86,000 | 90,200 |
| Operating expenses | 50,000 | 53,750 | 56,375 |
| Depreciation | 10,000 | 10,750 | 11,275 |
| Earnings before interest and taxes | 20,000 | 21,500 | 22,550 |
| Interest | 4,267 | 4,587 | 4,811 |
| Earnings before taxes | 15,733 | 16,913 | 17,739 |
| Income taxes | 3,933 | 4,228 | 4,435 |
| Net income | 11,800 | 12,685 | 13,304 |

Currently, the market value of Pulsar’s debt is estimated to be CAD 54,250,000, and the company has no preferred shares. Its long-term investments consist of idle land with a fair value of CAD 34,750,000 that is not being used in operations and does not generate any income. Pulsar’s weighted average cost of capital is 10.2% and its corporate tax rate is 25.0%. The estimated long-term growth rate of the economy is 3.0%.

**REQUIRED:**

1. Estimate the value of Pulsar’s shares using the 2-stage income approach (FCFF).
2. Why was the value of the long-term investment (idle land) included in the valuation?
3. What is the advantage of using the FCFF approach instead of the FCFE approach?

**Normalizing EPS**

Allison Ltd. is a cyclical company that experienced a significant loss in 2016. The CFO decided to normalize EPS to measure the company’s performance better. The period 2010-2015 matches the last business cycle. The following information was collected:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2016** | **2015** | **2014** | **2013** | **2012** | **2011** | **2010** |
| EPS (CAD) | (2.00) | 2.17 | 1.18 | 0.90 | 1.19 | 0.57 | 1.17 |
| BVPS (CAD) | 14.29 | 17.12 | 10.27 | 12.03 | 6.77 | 6.62 | 6.51 |
| ROE (%) |  | 12.70 | 11.53 | 7.45 | 17.66 | 8.55 | 18.04 |

Allison Ltd.’s share closed at CAD 27.45 on January 2, 2017.

**REQUIRED:**

1. Calculate the normalized trailing P/E for Allison based on the average historical EPS during the last business cycle.
2. Redo Part 1 based on the average historical ROE.
3. Which method is more accurate?

**Comparable Market Multiples Approach (P/E) at Regal**

Kathleen Johnson is an equity analyst. She plans to use the average P/E ratio from a group of comparable companies from Regal’s sub-industry to determine whether the company is undervalued, fairly valued, or overvalued. The following data was collected:

|  |  |  |
| --- | --- | --- |
| **Company** | **Price (CAD)** | **Normalized Trailing EPS (CAD)** |
| ABC | 56.67 | 3.14 |
| ACME | 45.91 | 2.09 |
| Widgets | 23.56 | 1.68 |
| Bloggins | 44.78 | 2.99 |

The following earnings data for Regal were available over the last business cycle:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2014** | **2013** | **2012** | **2011** | **2010** | **2009** |
| EPS (CAD) | 5.10 | 4.21 | 2.34 | 1.67 | 2.55 | 3.21 |
| BVPS (CAD) | 18.56 | 20.95 | 16.07 | 29.82 | 20.48 | 19.26 |
| ROE (%) | 27.50 | 20.10 | 14.56 | 5.60 | 12.45 | 16.67 |

In early January 2015, Regal’s share price was CAD 35.56 per share.

**REQUIRED:**

1. Determine whether the shares of Hi-tech are overvalued, fairly valued, or undervalued.
2. Why was normalized EPS used?

3. Indicate two limitations of the analysis based on sub-industry data.

**Historical Average Multiples Approach (P/E) at Lancaster**

On January 20, 2016, an equity analyst studied Lancaster Enterprises. Its share price is currently CAD 52.44, and its 2015 12-month trailing EPS was CAD 4.10. The analyst collected a historical record of its 12-month trailing P/E ratios for the previous business cycle.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **2011** | **2012** | **2013** | **2014** | **2015** |
| P/E ratio | 14.00 | 15.40 | 17.92 | 15.54 | 13.58 |

The consensus analyst estimate is that Lancaster’s 12-month leading EPS will be CAD 4.35 in 2016.

**REQUIRED:**

1. Are the shares of Lancaster overvalued, fairly valued, or undervalued?
2. Why was this valuation approach used?