**Optimal Capital Structure**

**Learning Problems**

**Business Risk at Acme**

Acme Ltd. had the following EBIT in CAD over the last 7-year business cycle:

|  |  |
| --- | --- |
| 2003 | 7,000 |
| 2004 | 9,000 |
| 2005 | 13,500 |
| 2006 | 15,000 |
| 2007 | 16,000 |
| 2008 | 12,000 |
| 2009 | 8,000 |

**REQUIRED:**

1. Calculate the mean, standard deviation, and coefficient of variation of EBIT.

2. What does the coefficient of variation measure?

**Operating Leverage at Acme**

Acme Ltd. has prepared the following income statements in CAD for two different volume levels:

|  |  |  |
| --- | --- | --- |
| Units sold | 10,000 | 12,000 |
| Sales | 32,000 | 38,400 |
| Variable costs | 16,000 | 19,200 |
| Contribution margins | 16,000 | 19,200 |
| Fixed costs | 6,000 | 6,000 |
| EBIT | 10,000 | 13,200 |

**REQUIRED:**

1. Calculate the percentage change in sales and contribution margin. Why are they the same?
2. Calculate the percentage change in EBIT. Why is it higher than the percentage change in sales or contribution margin?
3. Calculate the DOL. What does it measure?
4. Does the DOL remain constant? Explain.
5. How might this DOL be used in Question 1?

# Financial Leverage at Acme

Acme Ltd. has prepared the following income statements in CAD for two different volume levels:

|  |  |  |
| --- | --- | --- |
| Units sold | 10,000 | 12,000 |
| Sales | 32,000 | 38,400 |
| Variable costs | 16,000 | 19,200 |
| Contribution margin | 16,000 | 19,200 |
| Fixed costs | 6,000 | 6,000 |
| EBIT | 10,000 | 13,200 |
| Interest | 1,200 | 1,200 |
| EBT | 8,800 | 12,000 |
| Taxes (40%) | 3,520 | 4,800 |
| Net income | 5,280 | 7,200 |

**REQUIRED:**

1. Calculate the percentage change in EBIT.
2. Calculate the percentage change in EBT. Why is it higher than the percentage change in EBIT?
3. Calculate the DFL. What does it measure?
4. Does the DFL remain constant? Explain.
5. How might this DFL be used in Questions 1 and 2?
6. Calculate the DCL. How might this DCL be used in Questions 1 and 2?

Capital Structure Theories

1. Bricker Ltd.’s debt-to-equity ratio is well above its target level, but it continues to raise new debt financing and uses much of the funds to repurchase its common shares despite an industry slowdown.
2. Allison Inc.’s board of directors instructed the CFO to increase its borrowing after several unprofitable corporate takeovers by management.
3. An equity analyst commented that Hudson Industries’ cash ratio was above the industry average, and its debt-to-equity ratio was well below.
4. Divers Enterprises has not issued new common shares in over 10 years, and its debt-to-equity ratio has been volatile.
5. The CEO of Jasper Ltd. reported in its annual information form that it has a target capital structure but experiences significant variation in its debt-to-equity ratio.
6. Kelso Inc. decided to issue debt instead of equity to finance a new product line expansion, but subsequently experienced a significant increase in its share price.

**REQUIRED:**

1. Which capital structure theory will likely influence the capital structure decision in each of the above scenarios?

**Optimal Capital Structure at Cuthbert**

Damien Johns is the new CFO of Cuthbert Industries. The company has experienced a lot of variability in its capital structure and is uncertain what its optimal capital structure might be. Johns collected a sample of different capital structures over the last six years:

|  |  |  |
| --- | --- | --- |
| **Debt Ratio** | **kc** | **After-tax kd** |
| **21%** | 11.32% | 5.47% |
| **31%** | 11.94% | 5.78% |
| **43%** | 12.45% | 6.19% |
| **51%** | 14.21% | 6.83% |
| **62%** | 16.34% | 7.91% |
| **68%** | 19.78% | 9.54% |

**REQUIRED:**

1. Estimate Cuthbert’s optimal capital structure. Discuss any limitations of the approach.

Analyzing Capital Structure at ABC

|  |  |
| --- | --- |
| **ABC Company Ltd.**  **Income Statement**  **For the Year Ending December 31, 2010** | |
|  | **2010** |
| Sales  Cost of sales  Gross margin  Operating expenses  Salaries  Wages  Rent  Depreciation  Telephone  Repairs and maintenance  Miscellaneous  Total operating expenses  Income before interest and taxes  Interest expense  Income taxes  Net income | 450,000  235,000  215,000  50,000  81,000  25,000  10,000  1,500  6,000  2,000  175,000  39,500  25,000  3,000  11,500 |

|  |  |
| --- | --- |
| **ABC Company Ltd.**  **Balance Sheet**  **For the Year Ending December 31, 2010** | |
|  | **2010** |
| Current assets  Cash  Term deposits  Accounts receivable  Inventory  Prepaid expenses  Total current assets  Capital assets  Land  Building  Equipment  Less: Accumulated depreciation  Total fixed assets  Total assets  Current liabilities  Bank loan  Accounts payable  Current portion of long-term debt  Total current liabilities  Long-term liabilities  Bond payable  Shareholders’ equity  Common shares  Retained earnings  Total liabilities and shareholders’ equity | 18,000  35,000  7,000  90,000  2,000  152,000  50,000  200,000  175,000  (102,000)  323,000  475,000  15,000  60,000  20,000  95,000  180,000  10,000  190,000  475,000 |

The following industry average ratios are available:

Debt ratio 0.40

Long-term debt to total capitalization 0.25

Times interest earned 4.00

Fixed charge coverage ratio 3.50

ABC must make a yearly CAD 20,000 principal payment on its bonds payable. The tax rate is 40%.

**REQUIRED:**

1. Evaluate the capital structure of ABC Company.
2. Comment on the usefulness of the ratios used to analyze ABC’s capital structure.

# Analyzing Capital Structure at Delisle, Didsbury, Harmony

An equity analyst is examining the use of financial leverage at three companies.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ratios** | **Delisle** | **Didsbury** | **Harmony** | **Industry**  **Average** |
| Long-term debt to total capitalization | 15% | 20% | 35% | 25% |
| Fixed charge coverage ratio | 9 | 11 | 8 | 9 |

**REQUIRED:**

1. Evaluate the use of financial leverage by Delisle, Didsbury, and Harmony.
2. What factors should users be cautious of when using industry average ratios to evaluate a firm’s optimal capital structure?

# Analyzing Capital Structure at Deluxe

|  |  |
| --- | --- |
| **Deluxe Drug Stores Ltd.**  **Income Statement**  **For the Year Ending December 31, 2010** | |
| Sales | 760,000 |
| Variable costs | 550,000 |
| Contribution margin | 210,000 |
| Fixed costs |  |
| Selling, general, and administration | 160,000 |
| Depreciation | 14,000 |
| Earnings before interest and taxes | 36,000 |
| Interest | 15,000 |
| Earnings before taxes | 21,000 |
| Income taxes | 8,400 |
| Net income | 12,600 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Deluxe Drug Stores Ltd.**  **Balance Sheet**  **December 31, 2010** | | | | |
| Current assets |  | Current liabilities |  |
| Cash | 8,143 | Accounts payable | 54,449 |
| Receivables | 5,596 | Notes payable | 7,711 |
| Inventory | 148,554 | Other | 49,170 |
| Other | 11,608 | Total current liabilities | 111,330 |
| Total current assets | 173,901 | Long-term bonds | 103,662 |
| Fixed assets, net | 132,609 | Shareholders' equity | 91,518 |
| Total assets | 306,510 | Total liabilities and equities | 306,510 |

Deluxe sold 10,000 units in 2010. Deluxe makes no annual principal payments on its bonds and is not leasing any of its capital assets. The following industry average ratios are available:

Long-term debt to total capitalization 0.65

Fixed charge coverage ratio 4.00

**REQUIRED:**

1. Calculate the following ratios for Deluxe Company:

Long-term Debt to Total Capitalization

Fixed Charge Coverage Ratio

1. Analyze Deluxe’s use of financial leverage.
2. Calculate the DOL, DFL, and DCL for Deluxe Company.
3. What do the DOL and DFL measure?
4. If Deluxe had a DOL that was well above the industry average, how would this likely affect its DFL? Assume the DCL approximates the industry average.

**Analyzing Capital Structure at Jones**

Jones Company hired a financial analyst to review its use of financial leverage. Based on a Worst-Case Scenario, the following table was prepared:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ratio** | **Current** | **Recommendation** | **Industry Average** |
| Fixed charge coverage ratio | 1.5 | 3.6 | 3.0 |
| Long-term debt to total capitalization | 50% | 20% | 30% |
| DOL | 1.5 | 1.5 | 1.2 |
| DFL | 1.7 | 1.2 | 1.6 |
| DCL | 2.6 | 1.8 | 2.0 |

The current column contains ratios based on the company’s financial statements, while the recommendation column recalculates the ratios based on the worst-case scenario analysis.

**REQUIRED:**

1. Analyze Jones’ capital structure.

**Analyzing Capital Structure at Amsterdam**

Amsterdam Company hired a financial analyst to review its use of financial leverage. Based on a worst-case scenario, the following table was prepared:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ratio** | **Current** | **Recommendation** | **Industry Average** |
| Fixed charge coverage ratio | 2.5 | 3.5 | 3.0 |
| Long-term debt to total capitalization | 50% | 30% | 53% |
| DOL | 1.6 | 1.6 | 1.8 |
| DFL | 2.3 | 1.5 | 2.4 |
| DCL | 3.7 | 2.4 | 4.3 |

The current column contains ratios based on the company’s financial statements, while the recommendation column recalculates the ratios based on the worst-case scenario analysis.

**REQUIRED:**

1. Analyze Amsterdam’s capital structure.

Practical Capital Structure Considerations

1. Delisle Ltd. has considerable loss carryforwards accumulated after a lengthy industry slowdown and will not likely have to pay income taxes for several years.
2. Chilliwack Industries is 55% owned by its founder, Quinton Carruthers.
3. Tamara Jones is the CEO of Tremblay Ltd., who will receive 100% of her compensation from stock options that vest over the next three years.
4. Inkster Enterprises produces specialized microprocessors for use in various industrial and consumer products.
5. Edstan Ltd. is a new start-up that produces valves for the petroleum and natural gas industry using primarily general-purpose industrial lathes.
6. Phillips Consolidated has a revolving credit agreement with the Bank of Montreal that requires it to maintain an A credit rating or higher.
7. Benjiro Industries has received a takeover offer from a large European conglomerate, but management does not support the buyout due to potential job losses.
8. BC Hydro is 100% owned by the Province of British Columbia and is planning to develop several new hydroelectric projects to reduce the province’s dependence on fossil fuels.
9. Rolston Enterprises is an R&D company that currently earns royalty income on several patented technologies in the computer industry.
10. Timmins Electric has seen its share price rise by over 20% in the last year due to a government tax cut.

**REQUIRED:**

1. Indicate whether the company would favour lower or higher borrowing in each of the above scenarios.

**Unleveraged and Leverage Beta**

Boswal Inc. is a manufacturing company. Its shares do not trade publicly, so it has decided to calculate the average beta of a group of public companies in the industry. The following data was collected:

|  |  |  |
| --- | --- | --- |
| **Firm** | **Beta** | **Debt-to-Equity (%)** |
| River Crossing | 1.31 | 35.0 |
| Atlas Manufacturing | 1.26 | 22.0 |
| Innovative Technologies | 1.26 | 24.0 |
| Hanson Brothers | 1.14 | 10.0 |
| West Coast Fabrication | 1.16 | 27.0 |
| Average | 1.23 | 24.0 |

Boswal has a debt ratio of 0.30. The industry has an average tax rate of 25.0%.

# REQUIRED:

1. Estimate a leverage-adjusted beta for Boswal Company.
2. What proportion of its leveraged beta is due to business risk and financial risk?

**Analyzing Capital Structure at NFI Group**

**REQUIRED:**

1. Access the most recent financial disclosures (annual financial statements, notes to the financial statements, MD&A, and annual information form) for NFI Group found in the investor relations section of its website or through SEDAR.
2. Analyze the firm’s capital structure from 2015 to 2018 and provide justifications for any changes. Include the long-term debt to total capitalization and fixed burden coverage ratios over this period.
3. Prepare a 200-word submission describing the findings in Part 2.
4. Respond to the posts of at least three classmates.