

Problem 11.1. Financial leverage and solvency ratios in the Chemical Industry. Below are financial numbers for the three chemical companies.

	Du Pont	Dow	PPG
Net Income, 2001	\$4,339	\$-385	\$387
Total Equity, 2001	14,452	9,993	3,080
Total Equity, 2000	13,299	9,686	3,080
Total Assets, 2001	40,319	10,308	8,452
Total Assets, 2000	39,426	27,645	9,125
Common Equity, 2001	14,215	9,993	3,080
Common Equity, 2000	13,062	9,686	3,097
Total Liabilities, 2001	25,867	25,522	5,372
Long-term Debt, 2001	5,350	9,266	1,699

a. Calculate the following ratios for 2001:

	Formula	Du Pont	Dow	PPG
Financial Leverage Index	ROE / ROA	287.359%	192.860%	285.341%
Financial Structure Leverage Ratio	Average Total Assets / Average Common Equity	292.353%	192.860%	284.556%
Debt / Equity	Total Liabilities / Total Equity	178.986%	255.399%	174.416%
Long-term Debt / Equity	Long-term Debt / Total Equity	37.019%	92.725%	55.162%

b. Evaluate the financial leverage and credit risk of these companies, including a rating from 1-10.

	Du Pont	Dow	PPG
Financial Leverage	3-5	3-5	3-5
Credit Risk	3-5	3-5	3-5

Problem 11.2. Calculating Z-scores in the Chemical Industry. Below are the financial numbers for three chemical companies needed to calculate Altman's Z-score (1983) for 2001 (in millions):

	Du Pont	Dow	PPG
Total current assets	\$14,801	\$10,308	\$2,703
Total current liabilities	8,067	8,125	1,955
Total assets	40,319	35,515	8,452
Retained earnings	13,517	11,112	6,551
Earnings before tax	6,844	35	666
Interest expense	590	733	180
Total stockholders' equity	14,452	9,993	3,080
Total liabilities	23,443	25,522	5,250

- a. Calculate Altman's Z-score for each company and rate each company as failing, healthy or indeterminate.

	Du Pont	Dow	PPG
6.56 x working capital / total assets	1.10	0.40	0.58
3.26 x retained earnings / total assets	1.09	1.02	2.53
6.72 x EBIT / total assets	1.24	0.15	0.67
1.05 x BV of equity / BV of debt	0.65	0.41	0.62
= Z-score	4.07	1.98	4.40
Category	healthy	gray area	healthy

Bond ratings for the chemical companies are:

	Du Pont	Dow	PPG
Moody's	AA3	A1	A1
Standard & Poor's	AA	A	A

- b. Evaluate the credit worthiness of these companies, using Altman's Z-score, bond ratings and previous financial analysis and rate the companies on a 1-10 scale.

	Rating	Explanation
Du Pont	8	Healthy, investment grade bonds
Dow	6	Gray area for Altman's, but investment grade bonds
PPG	7	Healthy, investment grade bonds

- c. Are the signals from Altman's Z-score and bond ratings consistent or not? Explain.