5.a. & b.The ratios and bond rating categories based on reported data follow. Comparing the ratios with those in Exhibit 18-4, we find the implied rating to be "all over the place" ranging (depending on the category) from CCC to A and all points in between. Overall a rating of between BB and BBB would seem to be implied.

Exhibit 18-4 Ratio	*Ratio*	*Implied Rating*	*Calculations*	
			Numerator	*Denominator*
EBIT/interest	2.19	BB	$ 272	$ 124
EBITDA/interest	4.45	BB-BBB	$ 552	$ 124
Free CFO/Total debt	0.12	A-BBB	$ 183	$ 1,477
Return on capital	0.07	B	$ 272	$ 3,648
EBIT/Sales	0.10	<CCC	$ 272	$ 2,802
Long-term debt/capital	0.40	BBB	$1,427	$ 3,598
Total debt/capital (includes STD)	0.40	A	$1,477	$ 3,648

Source: Westvaco financial statements (debt and capital per Chapter 17)

c. The ratios and corresponding Z"-score for Altman's Z"-score model are computed below. The Z"-score of 5.95 implies a rating of BBB (see Exhibit 18-5), similar to that implied by the analysis in parts a. and b.

	Numerator	*Denominator*	*Ratio*	*Weight*	*Ratio X Weight*
Working capital/total assets	$ 313	$4,897	0.06	6.56	0.42
Retained earnings/total assets	$1,608	$4,897	0.33	3.26	1.07
EBIT/total assets	$ 272	$4,897	0.06	6.72	0.37
Book value of equity/total liabilities	$2,171	$2,726	0.80	1.05	0.84
Intercept					3.25
Z" SCORE					**5.95**

Source: Westvaco financial statements (debt and capital as per Chapter 17)

Westvaco's actual rating of A- was higher than the BBB rating implied by the results of parts a through c.

S&P reduced Westvaco's rating to BBB+ in May 2000 and to BBB in June 2001 (see Box 10-3 on page 344). This action supports the opinion of many observers that rating agency actions tend to lag economic changes. Rating agencies have also been accused of being reluctant to make adverse ratings changes because their fees are paid by the corporations whose debt they rate.

6. a.& b.The ratios and bond rating categories based on adjusted data follow. Comparing the ratios with those in Exhibit 18-4, we find the implied rating to be higher than for the reported data. EBIT (and EBITDA) were improved by removal of restructuring costs. Debt was increased slightly but not as much as capital. As a result, solvency ratios (interest coverage and debt to capital) improved. Similarly, return on sales increased as EBIT went up but sales remained the same. The only ratio that deteriorated was return on capital as capital was increased more than EBIT. Overall, the adjusted data imply a rating of BBB+.

Exhibit 18-4 Ratio	*Ratio*	*Implied Rating*	*Calculations*	
			Numerator	*Denominator*
EBIT/interest	2.70	BB-BBB	$ 335	$ 124

EBITDA/interest	4.96	BB-BBB	$ 615	$ 124
Free CFO/Total Debt	0.17	A	$ 262	$ 1,577
Return on capital	0.06	B	$ 335	$ 6,081
EBIT/Sales	0.12	B	$ 335	$ 2,802
Long-term debt/capital	0.25	AA	$ 1,527	$ 6,031
Total debt/capital (incl. STD)	0.26	AAA	$ 1,577	$ 6,081

Source: Chapter 17 analysis of Westvaco – see Exhibits 17-1, 17-2, 17-3 and 17-4. For EBIT, added (pretax) restructuring charges and asset sales (Exhibit 17-3) to reported EBIT.

c.The data in Exhibit 18-4 are based on reported, not adjusted data. Similar adjustments for all companies comprising the sample in Exhibit 18-4 and average ratios based on the revised data may yield the same relative ratings for Westvaco if the positive effect on Westvaco is no greater than for the average company.

d. The adjusted data result in a Z" score of 7.46:

	Numerator	*Denominator*	*Ratio*	*Weight*	*Ratio X Weight*
Working capital/total assets	$ 389	$6,500	0.06	6.56	0.39
Retained earnings/total assets	$ 2,203	$6,500	0.34	3.26	1.10
EBIT/total assets	$ 335	$6,500	0.05	6.72	0.35
Book value of equity/Total liabilities	$ 4,504	$1,996	2.26	1.05	2.37
Intercept					3.25
Z" SCORE					7.46

Exhibit 18-5 on page 664 equates this score to a bond rating between AA and AA+ compared with the BB rating implied by the unadjusted data (see question 5c).

While the cautions about relative ratios discussed in part c also apply to the Z" scores, the higher absolute values of the ratios based on adjusted data do suggest that Westvaco's default risk is lower than it appears from the unadjusted data.

e. For the same reasons discussed in part D, the adjusted data suggest that Westvaco is a stronger company financially than it appears from the unadjusted data with less bankruptcy risk.

7. a. The following table lists the implied ratings from Exhibit 18-4 for the ratios provided.

Company *Actual Rating In Parentheses ()*	*Implied Rating*			
	Total Debt To Capital		*Interest Coverage*	
	1999	*2000*	*1999*	*2000*
Westvaco (A-)	A	BBB - BB	BB	BBB
International Paper (BBB+)	A	BBB - BB	BB	BB
Georgia-Pacific (BBB-)	BB	B	BBB	BB

The data in Exhibit 18P-3 imply ratings that confirm the *relative* rankings of the three companies; i.e. Westvaco is stronger than International Paper (IP) and both are superior to Georgia-Pacific (GP). However, the actual ratings themselves were above those implied by reference to Exhibit 18-4.

b. The data in Exhibit 18P-3 show an increase in the debt to capital ratio for all three companies and, as a result, a potential ratings downgrade. The interest coverage ratio declined for both IP and GP, but rose for Westvaco. Based on these two ratios, all three companies are candidates for downgrades based on 2000 data.

c. If 1999 and 2000 are cyclical peaks, then ratios over an entire business cycle would be expected to be lower. Ratings based only on peak data are likely to be too high.

The fact that 1999 and 2000 were prosperous years may at first seem anomalous given the deterioration described in part b, and may strengthen the argument for the downgrade. More data with respect to changes in sales, profitability, and cash flows would be required to better address this issue.