

Corporate Finance, Module 24: "Financial analysis"

*EVA and Profitability measures*, practice problems

(The attached PDF file has better formatting.)

A firm's December 31, 20XX, financial statements show the following figures:

	<i>December 31, 20XX-1</i>	<i>December 31, 20XX</i>
Current assets	23	33
Fixed assets	74	77
Current liabilities	15	22
Long-term debt	32	32

In 20XX, the firm's earnings before interest and taxes are 40, its weighted average cost of capital is 8%, the interest rate on its long-term debt is 6%, and the corporate tax rate is 20%. The firm does not raise new equity in 20XX, so the return on equity uses the beginning of the year equity as the denominator.

In this illustration, fixed assets include all non-current assets, long-term debt includes all non-current liabilities, market values equal book values for all items, and the tax expense is pre-tax income times the tax rate.

*Question:* If market values do not equal book values, which should we use?

*Answer:* For accounting measures of profitability, we use book values.

- A. What are total assets for 20XX (beginning of the year and end of the year)?
- B. What are total liabilities for 20XX (beginning of the year and end of the year)?
- C. What is shareholders equity for 20XX (beginning of the year and end of the year)?
- D. What is total capital for 20XX (beginning of the year and end of the year)?
- E. What is the interest expense for 20XX?
- F. What is the tax expense for 20XX?
- G. What is the net income for 20XX?
- H. What is the return on assets for 20XX?
- I. What is the return on capital for 20XX?
- J. What is the return on equity for 20XX?
- K. What is the economic value added for 20XX?

*Part A:* Total assets are current assets plus fixed assets:  $23 + 74 = 97$  at the beginning of the year and  $33 + 77 = 110$  at the end of the year.

*Part B:* Total liabilities are current liabilities plus long-term debt:  $15 + 32 = 47$  at the beginning of the year and  $22 + 32 = 54$  at the end of the year.

*Part C:* Equity is assets minus liabilities:  $97 - 47 = 50$  at the beginning of the year and  $110 - 54 = 56$  at the end of the year.

*Part D:* Total capital is long-term debt plus equity:  $32 + 50 = 82$  at the beginning of the year and  $32 + 56 = 88$  at the end of the year.

*Part E:* Interest expense for 20XX is long-term debt times the interest rate =  $32 \times 6\% = 1.92$ . In practice, the interest expense is shown in the financial statements and does not need to be estimated.

*Part F:* The tax expense for 20XX is the (earnings before interest and taxes minus the interest expense) times the tax rate:  $(40 - 1.92) \times 20\% = 7.616$ . In practice, the tax expense is shown in the financial statements and does not need to be estimated.

*Part G:* The net income for 20XX is earnings before interest and taxes minus interest expense and minus the tax expense:  $40 - 1.92 - 7.616 = 30.464 = (40 - 1.92) \times 80\% = 30.464$

*Part H:* The return on assets for 20XX is (net income + after-tax interest) / total assets at the beginning of the year:  $(30.464 + (1 - 20\%) \times 1.92) / 97 = 32.99\%$

*Part I:* The return on capital for 20XX is (net income + after-tax interest) / total capital at the beginning of the year:  $(30.464 + (1 - 20\%) \times 1.92) / 82 = 39.02\%$

*Part J:* The return on equity for 20XX is net income / equity at the beginning of the year:  $30.464 / 50 = 60.93\%$

*Question:* Why do return on assets and return on capital use (net income + after-tax interest) in the numerator whereas return on equity uses just net income?

*Answer:* Return on assets and return on capital include long-term debt in the denominator, which benefit from the debt tax shields, and these returns are compared with the tax adjusted weighted average cost of capital, which adds back the debt tax shield.

*Question:* The explanation in the text is hard to follow. Do all financial analysts use this procedure?

*Answer:* This procedure is not standard, but the authors believe it is correct. The proper procedure depends on what each return is compared with. For final exam problems, follow the procedure in the textbook, as shown here.

*Part K:* Economic value added for 20XX is (net income + after-tax interest) – (capital at the beginning of the year  $\times$  cost of capital):  $(30.464 + (1 - 20\%) \times 1.92) - (82 \times 8\%) = 25.440$