Financial Leverage, EPS, and ROE

We will study the effects of financial leverage on EPS and ROE with the following example:

Data for example:

	Current Capital Structure	Proposed Capital Structure
Assets	$20,000	$20,000
Debt	$0	$8,000
Equity	$20,000	$12,000
Debt-to-Equity Ratio	0	.67
Interest Rate	n/a	8%
Shares Outstanding	400	240
Stock Price	$50	$50

EPS and ROE Under Current Capital Structure (No Debt; Unlevered Firm, U)

	Recession	Expected	Expansion
EBIT	$1,000	$2,000	$3,000
Interest	$0	$0	$0
Net income	$1,000	$2,000	$3,000
EPS	$2.50	$5.00	$7.50
ROA	5%	10%	15%
ROE	5%	10%	15%

All of the assets are financed with equity, since the firm has zero debt.

Let us consider the Recession scenario:

Return on Assets (ROA) is calculated as $1,000/$20,000 = 5%.

Return on Equity (ROE) is also calculated as $1,000/$20,000 since all of the assets are financed with equity in this unlevered firm under the Current Capital Structure.

EPS and ROE Under Proposed Capital Structure (Levered Firm, L)

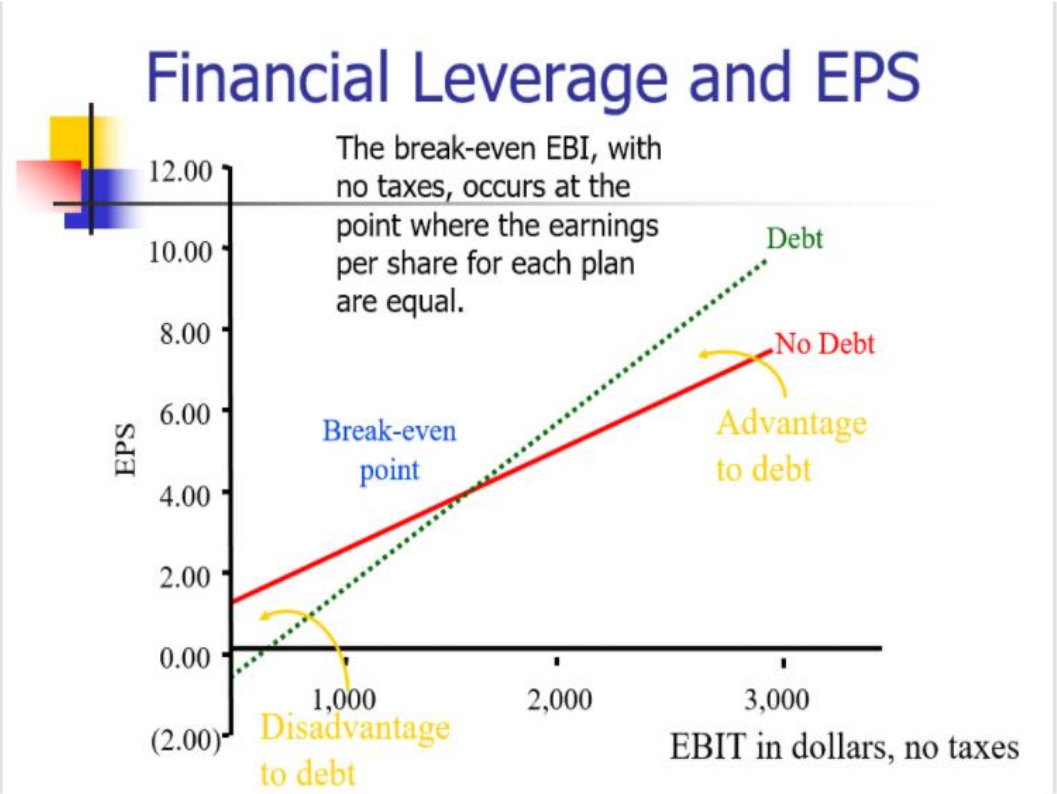
($8,000 of debt financing at 8% interest)

	Recession	Expected	Expansion
EBIT	$1,000	$2,000	$3,000
Interest	640	640	640
Net income	$360	$1,360	$2,360
EPS	$1.50	$5.67	$9.83
ROA	5%	10%	15%
ROE	3%	11%	20%

Compare EPS for the Current and Proposed capital structures. Notice that EPS is lower in a recession and is higher in an expansion when debt financing is used. In other words, debt financing makes EPS more volatile. In the example above, when the economy is expanding, the firm's shareholders do better with a levered (i.e., Proposed) capital structure. When a recession occurs, the firm's shareholders do worse with a levered (i.e., Proposed) capital structure. Leverage focuses risk on the shareholders, due to the fact that the fixed financing claims, such as interest expense, are paid before dividends. The lenders have a higher priority claim to the cash flows of the firm than the stockholders. You may remember from the prerequisite courses that stockholders are referred to as the residual claimants, since they are paid last.

For the Recession scenario, Return on Assets (ROA) stays at 5%, but Return on Equity (ROE) is now $360/$12,000 = 3%.

Study the diagram below. It details EPS at various levels of EBIT for our example firm. Or, take a look at Figure 16.2 in the assigned textbook.



Financial Leverage and EPS

Notice on the graph that the (green dotted) line representing the levered firm is steeper than the (red solid) line that represents the unlevered firm. EPS changes more for a given change in EBIT when debt financing is used.

Also notice the point where the lines representing the levered firm and "no debt" firm intersect. This is the point where managers should be indifferent between the two capital structures, with respect to EPS. The assigned textbook refers to this as the "breakeven point." I prefer to call it the "indifference point," because it is the EBIT level at which managers would be indifferent between the two capital structures with respect to EPS. You may calculate the indifference point by setting the EPS equations for the two capital structures equal to each other, with EBIT being the unknown variable, X.

$$(X - 0)/400 = (X - 640)/240$$

$$240\ X = 400\ X - 256{,}000$$

$$-160\ X = -256{,}000$$

$$X = 1{,}600$$

So far, we have been looking at the effect of leverage on EPS. We have seen that increasing leverage increases risk. EPS is more volatile when the firm finances with debt. We need to look further to answer the question of what capital structure maximizes the value of the stockholder's equity or the firm.