

## Session 15: Post class test solutions

- b. False.** There is a trade off to extending project life. You get a higher terminal value replacing salvage value, but have to settle for lower cash flows over the project life. The net effect can be positive or negative.
- c. \$15 million.** The first step in solving this problem is to compute the after-tax cash on the investment:  
$$\text{NPV} = \$5.97 = \text{CF} (\text{PV of annuity, 8\%, 5 years}) - \$10 \text{ million}$$

Solving for the cash flow, we get cash flow = \$ 4 million

Since the depreciation each year is \$ 2 million, the after-tax operating income on this project has to be \$ 2 million/ year.

If the project is a perpetuity, I would assume that capital expenditures = depreciation, resulting in cash flow = \$ 2 million

$$\text{NPV} = 2 / .08 - \$10 = \$15 \text{ million}$$
- c. \$200 million.** To compute the present value of the advertising benefits, I would discount the after-tax cash flow by the cost of capital for the advertising business:  
$$\text{PV of advertising benefits} = 80 (1-.4) / (.10-.02) = \$600 \text{ million}$$
$$\text{NPV of smartphone} = \$600 - \$400 = \$200 \text{ million}$$
- b. Project A.** To make the comparison, you should convert the NPVs into annuities.
  - Annuity for Project A = 55 (PV of annuity, 10%, 10 years) = \$8.95 million
  - Annuity for Project B = 45 (PV of annuity, 8%, 7 years) = \$8.64 million