**ENG 111 Week 6 Discussion**

1**.** After spending $1,000,000, R&D of Zargo Inc. produced good results on a new, stronger and lighter material. Zargo Inc. has decided to integrate this new material in its production line and sell a new line of protective helmets that can be used by athletes or by police enforcement. New helmets will sell for $875 and have a variable cost of $430 per helmet. Zargo has spent $150,000 for a marketing study that determined the company will sell 60,000 units per year for seven years. The marketing study also determined that the company will lose sales of 12,000 units of its high-priced helmets. The high-priced helmets sell at $1,100 and have variable costs of $620. The company will also increase sales of its cheap helmets by 15,000 units. The cheap helmets sell for $400 and have variable costs of $210 per set. The fixed costs each year will be $9,300,000. The plant and equipment required will cost $29,400,000 and will be depreciation a straight-line basis. The new helmets will also require an increase in net working capital of $1,400,000 that will be returned at the end of the project. The tax rate is 40 percent, and the market rate is 14%.

What is the NPV?

The marketing study and the research and development are both sunk costs and should be ignored.

OCF including side effects: We will calculate the sales and variable costs first. Since we will lose sales of the expensive clubs and gain sales of the cheap clubs, these must be accounted for as erosion. The total sales for the new project will be:

|  |  |  |
| --- | --- | --- |
|  | Sales |  |
|  | New helmets | $875 ´ 60,000 = $52,500,000 |
|  | High-priced helmets | $1,100 ´ (–12,000) = –13,200,000 |
|  | Cheap helmets | $400 ´ 15,000 = 6,000,000 |
|  |  | $45,300,000 |

For the variable costs, we must include the units gained or lost from the existing clubs. Note that the variable costs of the expensive clubs are an inflow. If we are not producing the sets any more, we will save these variable costs, which is an inflow. So:

|  |  |  |
| --- | --- | --- |
|  | Var. costs |  |
|  | New helmets | –$430 ´ 60,000 = –$25,800,000 |
|  | High-priced helmets | –$620 ´ (–12,000) = 7,440,000 |
|  | Cheap helmets | –$210 ´ 15,000 = –3,150,000 |
|  |  | –$21,510,000 |

The pro forma income statement will be:

|  |  |  |
| --- | --- | --- |
|  | Sales | $45,300,000 |
|  | Variable costs | 21,510,000 |
|  | Fixed costs | 9,300,000 |
|  | Depreciation | 4,200,000 |
|  | EBT | $10,290,000 |
|  | Taxes | $4,116,000 |
|  | Net income | $6,174,000 |

Using the bottom up OCF calculation, we get:

OCF = NI + Depreciation = $6,174,000+ 4,200,000

OCF = $10,374,000

NPV = –$29,400,000 – 1,400,000 + $10,374,000(PVIFA14%,7) + $1,400,000/1.147

NPV =–$29,400,000 – 1,400,000 +$44,486,874 + 559,492 = $14,246,366

**2.** Consider two projects with the following cash flow:

|  |  |  |
| --- | --- | --- |
| Year | Project A | Project B |
| 1 | 1,000 | 3,000 |
| 2 | 1,000 | 1,000 |
| 3 | *x* | 1,000 |

Which of the following is **true** concerning these two projects?

1. If interest rate is 10%, Project A has a higher NPV for any *x* greater than 3,000.
2. Regardless of the rate, project B is STRICTLY MORE valuable if *x* = 3,000.
3. Regardless of the value of *x,* if the payback period method accepts Project B, it would also accept Project A.
4. Regardless of the value of *x,* if the payback period method accepts Project A, it would also accept Project B.
5. None of the above.

3**.** A company would like to grow 10% next year. After preparing its pro-forma statements, it obtains a negative external financing need. Then we know that:

1. Company does not have any debt.
2. Company does not have any equity.
3. The maximum rate that company can grow using only its internal funds is greater than 10%.
4. The maximum rate that company can grow by keeping its debt to equity ratio is less than 10%.
5. None of the above.

4. A project will bring money for 4 years after its initial investment of $10,000. In each of the first 3 years cash flow will be $X, and in 4th year, it will be $6,000. If the payback period of this project is 3 years and 2 months, what is NPV given APR is 10%?

*(10,000-3X) = 6000 \* (2months/12months)*

*X = 3,000*

*NPV = -10,000 + 3,000/1.1 + 3,000/1.12 + 3,000/1.13 + 6,000/1.14*

*NPV = $1,558.64*