**ENG 111 Week 7 Discussion**

**1.** EB FARNUM Inc. has the following information on its new project.

Per Unit Variable Cost: $4

Financial Break-Even Price (per unit): $9.26

If the variable cost were to go up by 10%, what is the percentage increase needed in price for EB FARNUM Inc. to still financially break even?

Financial break-even condition:

(Price\*Q –VC\*Q-FC-Dep)\*(1-t)-(EAC-Dep) = 0

Solve for P to get Financial Break-Even Price = (EAC – Dep)/(Q\*(1-t))+VC+FC/Q+Dep/Q

Financial break-even price has a derivative of 1 with respect to variable cost.

If VC goes up by 10%, it goes up by $0.4. Therefore, financial break-even price would go up by exactly the same amount to become $9.66.

This is a (9.66-9.26)/9.26 = 4.3% increase.

**2.** Global Sources is a company producing cell phone screens and it has the unit sale price of $42 and the unit variable cost of $12. The accounting break-even and the financial break-even points of Global Sources are 120,000 units and 140,000 units respectively.

Everything else being constant, if the annual fixed costs increase by $600,000 what would be the new accounting and financial break-even points?

Original Accounting Break-Even = (Fixed Costs + Depr.)/(Sales Price-Variable Cost) =1,200

New Accounting Break-Even = (Fixed Costs+$600,000+Depr.)/(Sales Price-Variable Cost)

= (Fixed Costs + Depr.)/(Sales Price-Variable Cost)+$600,000/($42-$12)

=120,000+20,000=140,000 units. = (EAC + Fixed Costs(1-t)-t\*Depr.)/(Sales Price-Variable Cost)(1-t)

Original Financial Break-Even = (EAC + Fixed Costs(1-t)-t\*Depr.)/(Sales Price-Variable Cost)(1-t) =140,000

New Financial Break-Even (EAC+(Fixed Costs+$600,000)(1-t)-t\*Depr.)/(Sales Price-Variable Cost)(1-t) =140,000+20,000=160,000 units

3. Get Inc. spent $150,000 on market research via focus groups to determine that it’s new smart watch will be well received and hence can ship 200,000 units each year for the next 5 years. However, there is a 30% chance that the Apple and Samsung smart watches will capture a majority of the market; analysts project only 30,000 units per year will be sold for the next 5 years.

There is also a 10% chance that Apple will focus on their Pen and Samsung will drop from the competition giving us a larger market share; projected sales is 400,000 units.

Equipment and machinery = $50,000,000

Fixed costs per year = $5,250,000

Price per unit = $250

Cost per unit = $90

A 20,000,000 net working capital is needed to fund the project, and it returned in full at the end of the project. Equipment is depreciated straight line to 0 over 5 years. Tax is 34%. Discount rate is 12%. What is the NPV of each scenario?

Solutions to Exercise 3:

Scenario 1: 60%

Expected Revenue = 200,000 x 250

Variable Cost = 200,000 x 90

Fixed Costs = 5,250,000

Depreciation = 50,000,000/5 = 10,000,000

EBIT = 50,000,000 - 18,000,000 - 5,250,000 - 10,000,000 = 16,750,000 //This includes Dep

Taxes = 16,750,000 x 0.34 = 5,695,000

Net Income = 16,750,000 - 5,695,000 = 11,055,000

Operating Cash Flow = 11,055,000 + 10,000,000 = 21,055,000

NPV = - (50,000,000 + 20,000,000) + 21,055,000(P/A, 12%, 5) + 20,000,000/(1.12)^5 NPV

= -70,000,000 + 75,898,562.94 + 11,348,537.10 = 17,247,100.04

Similarly, NPV for scenario 2 (sale of 30,000 units/year) and scenario 3 (sale of 400,000 units per year) can be solved.

4. Payback period of a project is equal to the life of the initial investment at the accounting break-even quantity. Discounted payback period of a project is equal to the life of the initial investment at the financial break-even point.

5**.** The Zengels Brewing Company recently installed a new bottling machine. The machine’s initial cost is $2,000 that will be depreciated on a straight-line basis to a zero-salvage in 5 years. The machine’s fixed cost per year is $1,800 and its variable cost is $0.50 per unit. The selling price per unit is $P. Zengels’ tax rate is 34% and it uses a 16% discount rate. If Zengels needs to produce 320 more units to be able to financially break even compared to the accounting break-even sales level, what is P?

*Accounting break-even is: ($1,800 + $400)/[($P- $0.5)] = X units*

*Financial break-even is: EAC = $2,000\*0.16/(1-1/(1.165)) = $2,000/3.2743 = $610.81*

*[(EAC + Fixed Costs)\*(1-t) – t\*Depr.)] /[(Sales Price-Var. Cost)\*(1-t)]= [($610.81 + $1,800)(1 - .34) - $400(.34)]/[($P - $0.50)(1 - .34)] = X+320 units*

*Solving these two equations give P approximately $0.5148.*