

## INSE 6230: Assignment 2 – Solution - Winter 2018

*(0% of final grade)*

1. A project in progress has the following characteristics at the present time: SPI=1.35, CPI=0.7, BAC=\$6,400,000, and EAC (t=now) = \$7,000,000. Calculate AC, PV, EV, ETC and VAC under the 2 following situations:
  - a. The project continues under the conditions as originally planned.
  - b. We expect further problems.

a) EAC= 7,000,000 BAC= 6,400,000 CPI=0.7 →EV=0.7 AC

$$\begin{aligned} EAC &= AC + (BAC - EV) \\ 7,000,000 &= AC + (6,400,000 - 0.7AC) \end{aligned}$$

$$AC = 2,000,000 \rightarrow EV = 1,400,000$$

$$SPI = 1.35 \rightarrow PV = EV / 1.35 \rightarrow PV = 1,037,037.04$$

$$ETC = EAC - AC = 5,000,000$$

$$VAC = BAC - EAC = -600,000$$

b) EAC= 7,000,000 BAC= 6,400,000 CPI=0.7 →EV=0.7 AC

$$\begin{aligned} EAC &= AC + (BAC - EV) / (CPI * SPI) \\ 7,000,000 &= AC + (6,400,000 - 0.7AC) / (0.7 * 1.35) \end{aligned}$$

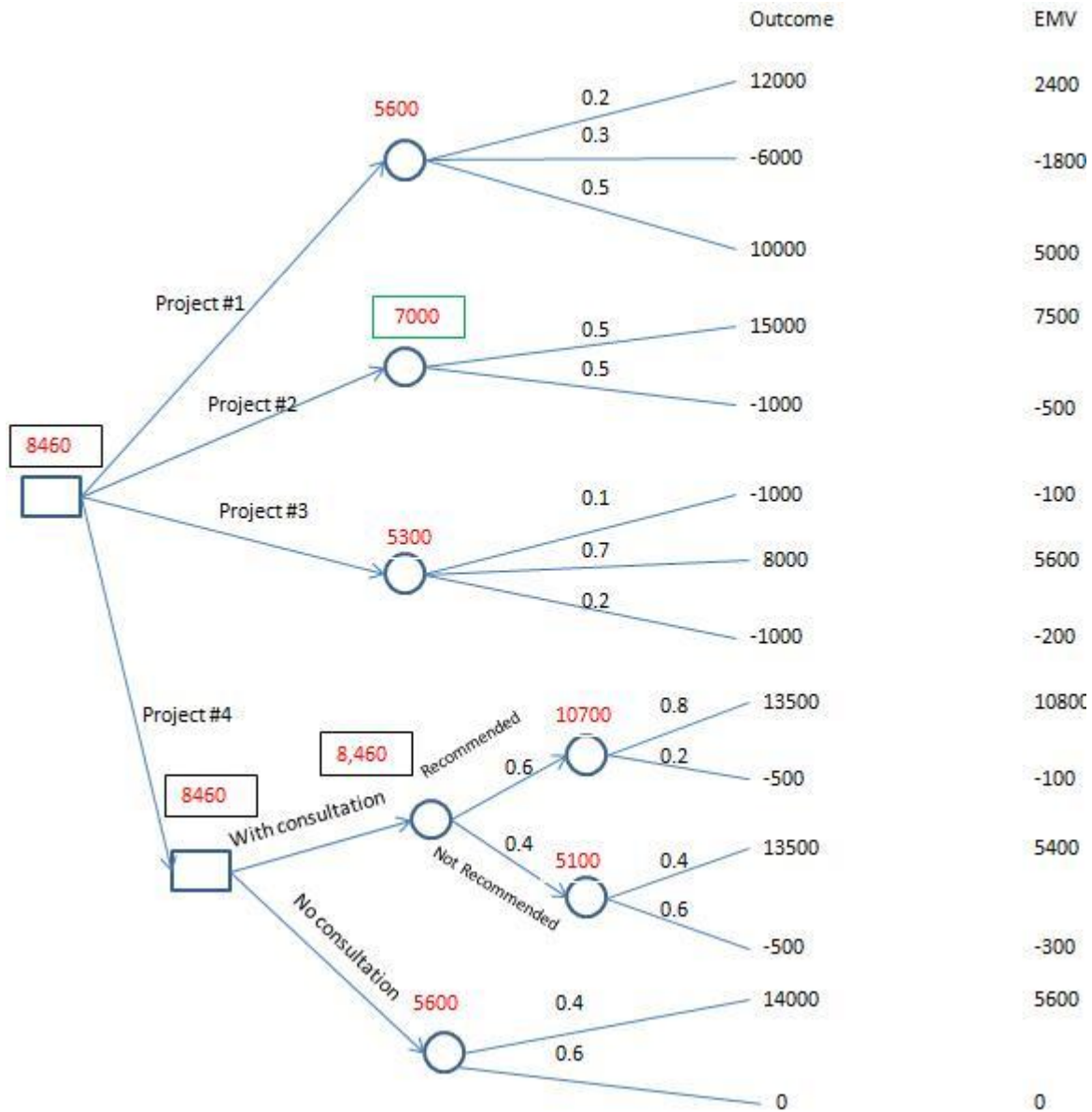
$$AC = 877,551 \rightarrow EV = 614,285$$

$$SPI = 1.35 \rightarrow PV = EV / 1.35 \rightarrow PV = 455,026$$

$$ETC = EAC - AC = 6,122,449$$

$$VAC = BAC - EAC = -600,000$$

2.



The Company should consult an expert on project # 4 and if he recommends the project, then the company should invest on it. While if he doesn't recommend project # 4, then the company shall invest in project # 2 as it leads to the best EMV in this scenario, (where the expert doesn't recommend project # 4).

3. A contractor has agreed to perform a work for a buyer, but the details of the contract are still not finalized. The contractor has been given a choice to select between Fixed Price Incentive (FPI) contract and Cost plus Incentive Fee (CPIF) contract. The following has been determined for both of the types: target cost = \$500,000; target fee=\$50,000; and sharing ratio of 70/30. Moreover, for the FPI contract ceiling price would be \$600,000, and for the CPIF contract minimum fee would be \$30,000 and maximum fee \$60,000. Calculate the contractor's reimbursement and the contractor's profit for the following three possibilities of the actual cost of performing the work:

- a. \$450,000
- b. \$560,000
- c. \$590,000

Which of the contract types should the contractor select?

**For FPI:**

Target Cost= 500.000\$  
 Target Fee= 50.000\$  
 Sharing Ratio= 70/30  
 Ceiling Price= 600.000\$

**For CPIF:**

Target Cost= 500.000\$  
 Target Fee= 50.000\$  
 Sharing Ratio= 70/30  
 Minimum & Maximum Fee= 30.000\$ & 60.000\$

**CPIF:**

- a. AC= 450 K

Incentive fee = fixed fee + seller's share (target cost-actual cost) = 50k + (500k-450k)\*0.3 = 65k  
 Seller's profit = 60k

Seller's reimbursement: actual cost+ adjusted incentive fee = 450k +60k =510k

- b. AC= 560K

Incentive fee: fixed fee +seller's share (target cost – actual cost) = 50k + (500k – 560k)\* 0.3 = 32k

Seller's profit = incentive fee adjusted to 32k

Seller's reimbursement: actual cost + inn fee = 560k+32k= 592k

- c. AC= 590k

Incentive fee: fixed fee + seller's share (target cost – actual cost) = 50k + (500k-590k)\*0.3 = 23k

Seller's profit = incentive fee adjusted to 30k

Seller's reimbursement: actual cost + incentive fee = 590k+30k= 620k

**FPI:**

$$PTA = \frac{\text{ceiling price} - \text{target price}}{\text{buyer's share}} + \text{target cost} = \frac{600k - (500k + 50k)}{0.7} + 500k = 571,428$$

a. AC= 450k < 500k Cost underrun

Seller's reimbursement: target cost (100%)

=500k Fixed fee (100%) = 50k

MINUS: (Target cost- actual cost)\*(70%) = (500k-450k) \* 0.70 = 35k

The buyer pays: Target Cost+ Fixed Fee- Buyer's Share Ratio\*(Target Cost- Actual Cost)= 500k+50k+ 70% (500k-450k)= 500k+50k - 35k = 515k

Seller's profit = 50k + 30% (500k-450k) = 50k + 15k = 65k

b. AC= 560k < PTA Cost overrun

Seller's reimbursement: target cost (100%) =

500k Fixed fee (100%)= 50k

(Actual cost - Target cost)\*(70%) = (560k-500k) \* 0.70 =

42k The buyer pays: 500k + 50k + 42k = 592k

Seller's profit: fixed fee – seller's share of the overrun = 50k – (560k-500k)\*0.3=32k

c. AC=590k > PTA Cost overrun

Seller's reimbursement: target cost (100%)

=500k Fixed fee (100%) = 50k

(PTA- target cost)\*(30%) = (571,428k-500k) \* 0.70 = 50k

The buyer pays: 500k + 50k + 50k = 600k

Seller's profit: fixed fee – seller's share of the overrun = 50k - (571,428k-500k)\*0.3 – (590k-571,428) =10k

If cost under run is expected FPI is better with no profit adjustment.

If cost overrun bellow PTA is expected then both FPI and CPIF have the same profit.

If larger cost overrun, above PTA is expected, CPIF is the choice.

Table of profit:

Actual cost	FPI	CPIF
a	65k	60k
b	32k	32k
c	10k	30k