Econ Assignment 4

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July 3 2020

1. a) i. Since $i^*_A < MARR$, discarded $\therefore$ B initial champion

ii) $i^*_C > MARR$, $\therefore$ i^*_C new top project

iii) $i^*_D < MARR$, $i^*_C > MARR$, i^*_C new champion

iv) $i^*_F < MARR$, $\therefore$ i^*_C still best

$\therefore$ Project E chosen

b) Only projects C and F would meet this requirement

2.

(2) Jessica has 6 options = A, B, C, AB, AC, BC

From table, $(P/A, 0.12, 4) = 3.0373$

A $-40000 + 20800(P/A, i^*, 4) = 0$

$2 = (P/A, i^*, 4)$

From table, $(P/A, 0.3, 4) = 2.1662$

$(P/A, 0.4, 4) = 1.8492$

$\frac{i^* - 0.3}{2 - 2.1662} = \frac{0.4 - 0.3}{1.8492 - 2.1662}$, $i^* = 0.3524\%$

B $-110000 + 30000(P/A, i^*, 4) = 0$

$3.\overline{6} = (P/A, i^*, 4)$

From table, $(P/A, 0.03, 4) = 3.7171$

$(P/A, 0.04, 4) = 3.6299$

$\therefore 0.03 < i^* < 0.04 <$ MARR, unacceptable

C $-130000 + 45000(P/A, i^*, 4) = 0$

$(P/A, i^*, 4) = 2.\overline{8}$

From table, $(P/A, 0.15, 4) = 2.8550$

$(P/A, 0.14, 4) = 2.9137$

$\frac{0.15 - 0.14}{2.855 - 2.9137} = \frac{i^* - 0.14}{2.\overline{8} - 2.9137}$, $i^* = 0.1486\%$

$\therefore$ since i^*_A & $i^*_C >$ MARR. Project A and C chosen

(3)

N=20

Payback Period = $\frac{\text{First Cost}}{\text{Annual Savings}}$

$7 = \frac{P}{A}$

$\therefore A = \frac{P}{7}$

$P = \frac{P}{7}(P/A, i^*, 20)$

$7 = (P/A, i^*, 20)$

From table, $(P/A, 0.13, 20) = 7.0248$

$(P/A, 0.14, 20) = 6.6231$

$\frac{0.13 - i^*}{7.0248 - 7} = \frac{0.13 - 0.14}{7.0248 - 6.6231}$

$i^* \approx 13\%$, this is the MARR