IST 614 – Management Principles for Information Professionals (Fall 2017)

Problem # 5

Managing Money

Cost Study 1

Which of these two alternatives looks economically more attractive and why? (use 2.5% cost of money)
   a. Invest $5 million and get a steady $2,500,000 at the end of each of years 1, 2, and 3, or,
   b. Invest $10 million and get $4 million at the end of year 1, $5 million at the end of year 2, and $6 million at the end of year 3?

Solution

The two cases can be viewed as follows:

Case A
Given,
PV_0 = $5 million
FV_1 = $2,500,000
FV_2 = $2,500,000
FV_3 = $2,500,000
$r = 2.5\% = 0.025$

Case B
Given,
PV_0 = $10 million
FV_1 = $4,000,000
FV_2 = $5,000,000
FV_3 = $6,000,000
$r = 2.5\% = 0.025$

Calculating Present Value (PV) for each year using the formula,
$PV = FV / (1 + r)^n$

$PV_1 = 2,500,000 / (1 + 0.025)^1$
$PV_1 = 2,439,024.39$

$PV_1 = 4,000,000 / (1 + 0.025)^1$
$PV_1 = 3,902,439.024$

$PV_2 = 2,500,000 / (1 + 0.025)^2$
$PV_2 = 2,379,535.99$

$PV_2 = 5,000,000 / (1 + 0.025)^2$
$PV_2 = 4,759,071.981$

$PV_3 = 2,500,000 / (1 + 0.025)^3$
$PV_3 = 2,321,498.527$

$PV_3 = 6,000,000 / (1 + 0.025)^3$
$PV_3 = 5,571,596.466$

$PV_A = PV_1 + PV_2 + PV_3$
$PV_A = 7,140,058.907$

$PV_B = PV_1 + PV_2 + PV_3$
$PV_B = 14,233,107.471$

Calculating Net Present Value (NPV) using the formula,
NPV = Sum of all calculated PVs – Initial Investment

$NPV_A = PV_A – PV_0$
$NPV_A = 2,140,058.907$

$NPV_B = PV_B – PV_0$
$NPV_B = 4,233,107.471$

Calculating Return on Investment (RoI) using the formula,
RoI = NPV / Initial Investment %

$RoI_A = NPV_A / PV_0 \%$
$RoI_A = 42.80117814\%$

$RoI_B = NPV_B / PV_0 \%$
$RoI_B = 42.33107471\%$

As seen above, though there is a very minor difference between the two RoIs; RoI_A is greater than RoI_B. Hence, Alternative A is better.

Cost Study 2

The initial start-up expenses for your new office are estimated to be $6,500 for hardware, $3,000 for software, $1,500 for customized modifications to the software, and $727 for relevant IT-related training.

Benefits over the three years are estimated to be: $0 in year 1; $5,160 in year 2 and $15,000 in year 3. Should you proceed with this start-up? Why or why not?

Assume IT-related cost of money at a rate of 22% annually.

Solution

Given,
$PV_0 = \$6{,}500 + \$3{,}000 + \$1500 + \$727$
$PV_0 = \$11{,}727$
$FV_1 = \$0$
$FV_2 = \$5{,}160$
$FV_3 = \$15{,}000$
$r = 22\% = 0.22$

Calculating Present Value (PV) for each year using the formula,
$PV = FV / (1 + r)^n$

$PV_1 = 0 / (1 + 0.22)^1$
$PV_1 = 0$

$PV_2 = 5{,}160 / (1 + 0.22)^2$
$PV_2 = 3{,}466.809997$

$PV_3 = 15{,}000 / (1 + 0.22)^3$
$PV_3 = 8{,}260.60331$

$PV = PV_1 + PV_2 + PV_3$
$PV = 11{,}727.41331$

Calculating Net Present Value (NPV) using the formula,
NPV = Sum of all calculated PVs – Initial Investment

$NPV = PV - PV_0$
$NPV = 0.41331$

Calculating Return on Investment (RoI) using the formula,
RoI = NPV / Initial Investment %

$RoI = NPV / PV_0 \%$
$RoI = 0.00352441\%$

Since the RoI is approximately zero, in my opinion, this start up should not be proceeded with. Theoretically, since the RoI is above zero, the investment will not incur any losses. Realistically, the conditions may get worse eventually and the RoI may turn to negative since it is already extremely low.