Daffodil Institute of Information Technology (DIIT)

Third Year, Sixth Semester

BBA (Honors) in Tourism and Hospitality Management (THM)

Fundamentals of Finance

Chapter-5

INTRODUCTION TO CAPITAL BUDGETING

Formula of Introduction to Capital Budgeting

1. For uniform cash inflow

$$\text{Payback period (PBP)} = \frac{\text{Initial Investment}}{\text{Average cash flow}}$$

2. For not uniform cash inflow

$$\text{Payback period (PBP)} = A + \frac{NCO - CNCB_A}{NCB_{Next}}$$

A=Year preceding the payback period.

NCO= Net cash outflow/initial investment/initial outlay/cash outflow/cost of machine/cost of project/opening for beginning capital.

$CNCB_A$=Cumulative net cash flow of year A.

NCB_{Next}=Net cash flow of the immediate year following the year A.

$$\text{Depreciation} = \frac{\text{Cost of the Equipment} - \text{Salvage value/ Scrap value/Residual value}}{\text{Expected life of the Equipment}}$$

3. $$\text{Average rate of return (ARR)} = \frac{\text{Average Net Earnings/Average Net Profit After Tax}}{\text{Average Investment}} \times 100$$

$$\text{Average Investment} = \text{Working Capital} + \frac{\text{Investment+Salvage value/ Scrap Value/Residual value}}{2}$$

4. $$\text{Net Present Value(NPV)} = \left[\frac{NCB_1}{(1+i)^1} + \frac{NCB_2}{(1+i)^2} + \cdots + \frac{NCB_1}{(1+i)^1}\right] - NCO$$

NCB= Net cash Benefit/ Net Expected Cash Flows/ Cash Inflows/ Cash Flows after Tax (CFAT)

NCO= Net Cash Outflow/ Initial Investment

i = Interest Rate/ Discount Rate/ Required Rate of Return/ Opportunity Cost/ Cut off Rate/Hurdle rate

5. $$\text{Certainty Equivalent Net Present Value(CENPV)} = \left[\frac{CEF_1 \times CIF_1}{(1+i)^1} + \frac{CEF_2 \times CIF_2}{(1+i)^2} + \cdots + \frac{CEF_n \times CIF_n}{(1+i)^n}\right] - NCO$$

Where,

CIF= Cash Inflows / Net cash Inflows/ Net cash Benefit/ Net Expected Cash Flows/ Cash Flows after Tax (CFAT)

NCO= Net Cash Outflow/ Initial Investment
I= Interest Rate/Discount Rate/Required Rate of Return/Opportunity Cost/Cutoff Rate/ Hurdle Rate/ Cost of Capital.

6. Internal Rate of Return(IRR)=$Lr + \frac{NPV_{Lr}}{NPV_{Lr} - (-NPV_{Hr})}$ (Hr-Lr)

Lr= Lower Discount Rate
Hr= Higher Discount Rate
NPV_{Lr}= Net Present Value of lower discount Rate.
NPV_{Hr}= Net Present Value of higher discount Rate

7. Profitability Index(PI)/ Benefit Cost Ratio (BC)= $\frac{\text{Present value of all cash inflows}}{\text{Present value of all cash outflows}}$

8. Return on Original Investment (ROI)= $\frac{\text{Average net profit after tax}}{\text{Original Investment}} \times 100$

9. Modified Internal Rate of Return (MIRR)

$$PV = \frac{\text{Future Value}}{(1+MIRR)^n}$$

$FV/TV = NCB_1(1+i)^2 + NCB_2(1+i)^1 + NCB_3(1+i)^0$
PV=Initial Investment

Or.

$$MIRR = \sqrt[n]{\frac{TV}{PV\ cost}} - 1$$

Where,

n= Number of Years
TV/FV= Terminal Value/ Future Value
PV= Initial cost/ Investment

10. Net Profitability Index(NPI)= $\frac{\text{Net Present Value}}{\text{Present value of all cash outflows}}$