EVALUATING PROJECT CASH FLOWS

METHODS FOR EVALUATING PROJECT CASH FLOWS

Year Project S Project L Firm’s Cost of Capital = .10
0 ($1,000) ($1,000)
1 500 100
2 400 300
3 300 400
4 100 600

PAYBACK PERIOD

<table>
<thead>
<tr>
<th>Project S</th>
<th>Project L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1,000)</td>
<td>(1,000)</td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>900</td>
<td>400</td>
</tr>
<tr>
<td>1,200</td>
<td>800</td>
</tr>
<tr>
<td>1,300</td>
<td>1,400</td>
</tr>
</tbody>
</table>

Payback for Project S = 2.33 years
Payback for Project L = 3.33
NET PRESENT VALUE (NPV)

\[
NPV_S = 500(1.1)^{-1} + 400(1.1)^{-2} + 300(1.1)^{-3} + 100(1.1)^{-4} - 1000 \\
= 454.54 + 330.57 + 225.39 + 68.30 - 1000 \\
= 78.80
\]

\[
NPV_L = 100(1.1)^{-1} + 300(1.1)^{-2} + 400(1.1)^{-3} + 600(1.1)^{-4} - 1000 \\
= 90.90 + 247.93 + 300.52 + 409.80 - 1000 \\
= 49.15
\]

DECISION RULE

1) IF \( NPV \geq 0 \), THEN ACCEPT PROJECT

2) IF \( NPV < 0 \), THEN REJECT PROJECT
INTERNAL RATE OF RETURN (IRR)

\[
\begin{array}{cc}
K & NPV_s \\
0 & 300 \\
.10 & 79 \\
X & 0 \\
.15 & -8 \\
\end{array}
\]

\[
.05 \times 79/87 = .045
\]

\[
IRR_s = .10 + .045 = .145
\]

\[
\begin{array}{cc}
K & NPV_L \\
0 & 400 \\
.10 & 49 \\
X & 0 \\
.15 & -80 \\
\end{array}
\]

\[
05 \times 49/129 = .018
\]

\[
IRR_L = .10 + .018 = .118
\]

DECISION RULE

1) IF IRR $ K_a$, THEN ACCEPT PROJECT
2) IF IRR < $ K_a$, THEN REJECT PROJECT
EXAMPLE OF WHAT IRR REPRESENTS - Using Project S

Deposit 1000 into a Bank Account Paying 14.5% per year:

1,000.00 @14.5%
145.00 Interest first year
1,145.00 Amount in account at end of first year
500.00 Withdraw 500 from account
645.00 Amount remaining
93.53 Interest second year
738.53 Amount in account at end of second year
400.00 Withdraw 400 from account
338.53 Amount remaining
49.08 Interest third year
387.61 Amount in account at end of third year
300.00 Withdraw 300 from account
87.61 Amount remaining
12.39 Interest fourth year
100.00 Amount in account at end of fourth year
100.00 Withdraw 100 from account
0.00 Amount remaining
PROFITABILITY INDEX

PI = PV Future Cash Flows/NICO

PIₜₜ = 1079/1000 = 1.079

PIₜₜ = 1049/1000 = 1.049

DECISION RULE

1) IF PI $ 1, THEN ACCEPT PROJECT
2) IF PI < 1, THEN REJECT PROJECT