EXAMPLE 12.1

The projects review committee of Microsoft has $20 million to allocate next year to new software product development. Any or all of five projects in Table 12–1 may be accepted. All amounts are in $1000 units. Each project has an expected life of 9 years. Select the project(s) if a 15% return is expected.

TABLE 12–1	Five Equal-Life Independent Projects ($1000 Units)		
Project	Initial Investment, $	Annual Net Cash Flow, $	Project Life, Years
A	−10,000	2870	9
B	−15,000	2930	9
C	−8,000	2680	9
D	−6,000	2540	9
E	−21,000	9500	9

Solution

Clearly, Project E is not feasible, as $NCF_{E0} = 21 > 20$, so it can be eliminated from consideration. The remaining $2^4 = 16$ possible bundles are

{A}, $NCF_{A0} = 10 < 20$, feasible. $PW_A = -10 + 2.870(P/A, 15\%, 9) = \$3.694$ million.

~~{B}, $NCF_{B0} = 15 < 20$, feasible. $PW_B = -15 + 2.930(P/A, 15\%, 9) = -\$1.019$ K < 0. (Eliminate B from consideration also as any bundle having B will be better off without B in it.)~~

{C}, $NCF_{C0} = 8 < 20$, feasible. $PW_C = -8 + 2.680(P/A, 15\%, 9) = \$4.788$ million.

{D}, $NCF_{D0} = 6 < 20$, feasible. $PW_D = -6 + 2.540(P/A, 15\%, 9) = \$6.120$ million.

{A, C}, $NCFA_{AC0} = 10 + 8 = 18 < 20$, feasible. $PW_{AC} = 3.694 + 4.788 = \$8.482$ million.

{A, D}, $NCFA_{AD0} = 10 + 6 = 16 < 20$, feasible. $PW_{AD} = 3.694 + 6.120 = \$9.814$ million.

{C, D}, $NCFA_{CD0} = 8 + 6 = 14 < 20$, feasible. $PW_{CD} = 4.788 + 6.120 = \$10.908$ million.

~~{A, C, D}, $NCFA_{ACD0} = 10 + 8 + 6 = 24 > 20$, infeasible.~~

Φ, choose nothing, $PW_Φ = 0$.

Optimal solution: {C, D}.