

Ejercicio

Valor Presente Neto (VPN)

1.- Utilizando la técnica del Valor Presente Neto (*VPN*), considerando una inversión de \$1, 500,000 y un costo de capital o de TMAR del 10% ¿cuál de los siguientes proyectos es más conveniente?

Año	Flujos Netos de Efectivo (FNE)			
	Proyecto "A"	Proyecto "B"	Proyecto "C"	Proyecto "D"
1	\$0 150,000	\$0,000,000	\$0,150,000	\$300,000
2	\$1,350,000	\$0,000,000	\$0,300,000	\$450,000
3	\$0 150,000	\$0,450,000	\$0,450,000	\$750,000
4	\$0 150,000	\$1,050,000	\$0,600,000	\$750,000
5	\$0 600,000	\$1,950,000	\$1,875,000	\$900,000

Todos los alumnos resuelven en cuaderno los ejercicios y de manera grupal; sin embargo los candidatos para explicar el desarrollo en la clase serán seleccionados.

VAN (A) = \$339,768.15

VAN (B) = \$766,052.38

VAN (C) = \$796,424.76

VAN (D) = \$779,203.42

2.- Ahora determina cuál de estos mismos proyectos es el más conveniente con una TMAR del 15%.

VAN (A) = \$133,925.22

VAN (B) = \$365,717.84

VAN (C) = \$428,418.52

VAN (D) = \$470,545.41

INVERSIÓN 1,500,000

T.M.A.R. 10%

Proyecto "A"

AÑO	F.N.E.	136,363.64	112,697.22	372,532.8
1	\$ 150,000	0	1	3
2	\$ 1,350,000	1	1	4
3	\$ 150,000	2	1	5
4	\$ 150,000	-1,500,000	1,115,702.48	102,402.01
5	\$ 600,000			

$$VP_1 = \frac{150,000}{(1+0.1)^1} = 136,363.64$$

$$VP_2 = \frac{1,350,000}{(1+0.1)^2} = 1,115,702.48$$

$$VP_3 = \frac{150,000}{(1+0.1)^3} = 112,697.22$$

$$VP_4 = \frac{150,000}{(1+0.1)^4} = 102,402.01$$

$$VP_5 = \frac{600,000}{(1+0.1)^5} = 372,532.80$$

$$\begin{aligned} & - 1,500,000.00 \\ & + 136,363.64 \\ & + 1,115,702.48 \\ & + 112,697.22 \\ & + 102,402.01 \\ & + 372,532.80 \end{aligned}$$

$$VAN = 339,768.15$$

T.M.A.R. 15%

$$VP_1 = \frac{150,000}{(1+0.15)^1} = 130,434.79$$

$$VP_2 = \frac{1,350,000}{(1+0.15)^2} = 1,020,793.98$$

$$VP_3 = \frac{150,000}{(1+0.15)^3} = 98,627.44$$

$$VP_4 = \frac{150,000}{(1+0.15)^4} = 85,762.99$$

$$VP_5 = \frac{600,000}{(1+0.15)^5} = 298,306.05$$

$$\begin{aligned} & - 1,500,000.00 \\ & + 130,434.79 \\ & + 1,020,793.98 \\ & + 98,627.44 \\ & + 85,762.99 \\ & + 298,306.05 \end{aligned}$$

$$VAN = 133,925.27$$

INVERSIÓN 1,500,000

T.M.A.R. 10%.

PROYECTO "B"

AÑO	FNE
1	0
2	0
3	450,000
4	1,050,000
5	1,950,000

0.00 338,091.67 1,121,796.58

1 3 5

1 2 4

0.00 717,164.13

-1,500,000

-1,500,000.00

0.00

$$VP_1 = 0$$

$$VP_3 =$$

$$\frac{450,000}{(1+0.1)^3} = 338,091.67$$

$$-1,500,000.00$$

$$+ 0.00$$

$$+ 0.00$$

$$+ 338,091.67$$

$$VP_2 = 0$$

$$VP_4 =$$

$$\frac{1,050,000}{(1+0.1)^4} = 717,164.13$$

$$+ 717,164.13$$

$$+ 1,210,796.58$$

$$VP_5 =$$

$$\frac{1,950,000}{(1+0.1)^5} = 1,210,796.58$$

$$766,052.38$$

VAN

T.M.A.R. 15%

$$VP_1 = 0$$

$$VP_2 = 0$$

$$VP_3 = \frac{450,000}{(1+0.15)^3} = 295,882.30$$

$$-1,500,000.00$$

$$+ 0.00$$

$$+ 0.00$$

$$+ 295,882.30$$

$$VP_4 = \frac{1,050,000}{(1+0.15)^4} = 600,340.90$$

$$+ 600,340.90$$

$$+ 969,494.64$$

$$VP_5 = \frac{1,950,000}{(1+0.15)^5} = 969,494.64$$

$$VAN = 365,717.84$$

INVERSIÓN 1,500,000

T.M.A.R. 10%

Proyecto "C"

AÑO	FNE	150,000	450,000	1,875,000
1	150,000	1	3	5
2	300,000		2	4
3	450,000		1	
4	600,000			
5	1,875,000			

$$VP_1 = \frac{150\,000}{(1+0.1)^1} = 136\,363.64$$

$$VP_2 = \frac{300\,000}{(1+0.1)^2} = 247\,933.89$$

$$VP_3 = \frac{450\,000}{(1+0.1)^3} = 338\,091.67$$

$$VP_4 = \frac{600\,000}{(1+0.1)^4} = 409\,808.08$$

$$VP_5 = \frac{1\,875\,000}{(1+0.1)^5} = 1,164,227.48$$

$$\begin{array}{r} -1\,500\,000.00 \\ 136\,363.64 \\ 247\,933.89 \\ 338\,091.67 \\ 409\,808.08 \\ 1\,164\,227.48 \\ \hline \end{array}$$

$$VAN = 796\,424.76$$

T.M.A.R. 15%

$$VP_1 = \frac{150\,000}{(1+0.15)^1} = 130\,434.79$$

$$VP_2 = \frac{300\,000}{(1+0.15)^2} = 226\,843.1$$

$$VP_3 = \frac{450\,000}{(1+0.15)^3} = 295\,892.3$$

$$VP_4 = \frac{600\,000}{(1+0.15)^4} = 343\,051.95$$

$$VP_5 = \frac{1\,875\,000}{(1+0.15)^5} = 932\,206.38$$

$$\begin{array}{r} -1\,500\,000.00 \\ 130\,434.79 \\ 226\,843.1 \\ 295\,892.3 \\ 343\,051.95 \\ 932\,206.38 \\ \hline \end{array}$$

$$VAN = 142\,8418.52$$

INVERSIÓN 1,500,000
T.M.A.R. 10%

PROYECTO "Z"

AÑO	FNE				
1	300 000		272,727.28		
2	450 000				
3	750 000			563,486.1	
4	750 000				558,829.2
5	900 000	-1,500,000	371,900.83	512,260.01	

$$VP_1 = \frac{300\,000}{(1+0.1)^1} = 272\,727.28$$

$$VP_2 = \frac{450\,000}{(1+0.1)^2} = 371\,900.83$$

$$VP_3 = \frac{750\,000}{(1+0.1)^3} = 563\,486.1$$

$$VP_4 = \frac{750\,000}{(1+0.1)^4} = 512\,260.01$$

$$VP_5 = \frac{900\,000}{(1+0.1)^5} = 558\,829.20$$

$$\begin{aligned} & - 1\,500\,000.00 \\ & + 272\,727.28 \\ & + 371\,900.83 \\ & + 563\,486.1 \\ & + 512\,260.01 \\ & + 558\,829.2 \end{aligned}$$

$$VAN = 779\,203.42$$

T.M.A.R. 15%

$$VP_1 = \frac{300\,000}{(1+0.15)^1} = 260\,869.57$$

$$VP_2 = \frac{450\,000}{(1+0.15)^2} = 340\,264.65$$

$$VP_3 = \frac{750\,000}{(1+0.15)^3} = 493\,137.18$$

$$VP_4 = \frac{750\,000}{(1+0.15)^4} = 428\,814.94$$

$$VP_5 = \frac{900\,000}{(1+0.15)^5} = 442\,459.03$$

$$\begin{aligned} & - 1\,500\,000.00 \\ & + 260\,869.57 \\ & + 340\,264.65 \\ & + 493\,137.18 \\ & + 428\,814.94 \\ & + 442\,459.03 \end{aligned}$$

$$VAN = 470\,545.41$$