Solution Help for Assignment 7

Problem #1 is similar to textbook examples in chapter 4. Sample solution:

William & Chioma		
Year	transaction	Cum. CF
0	-22000	-22000
1	10000	-12000
2	13000	1000
3	-4000	-3000
4	7000	4000
5	4000	8000
6	4000	12000
7	-11000	1000
8	-3000	-2000
9	8000	6000
10	14000	20000

The sign of net cash flow changes five times, indicating five possible i* values. (Decarte's Rule) Norstrom's Rule not applicable. Although, the cummulative cash flow begins with a negative value, there is more than one change of signs in it (four sign changes)

	Int. Rate	PW
1	0.05	$11,641.37
2	0.1	$6,098.25
3	0.15	$2,234.42
4	0.2	($586.90)
5	0.16	$1,601.43
6	0.17	$1,005.81
7	0.18	$444.40
8	0.19	($85.65)
9	0.185	$175.62
10	0.186	$122.77
11	0.187	$70.23
12	0.188	$17.98
13	0.189	($33.98)
14	0.1885	($8.04)
15	0.1884	($2.84)
16	0.1883	$2.36
17	0.18835	($0.24)

Chart Title
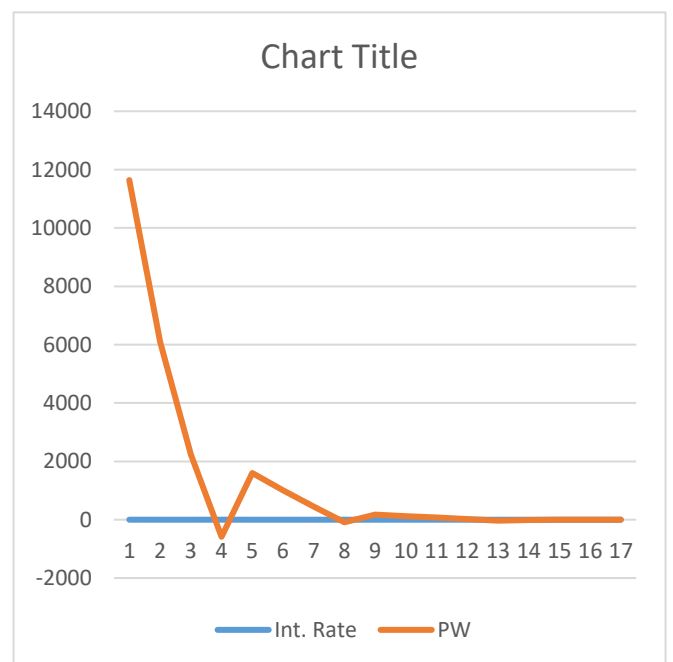
Problem #2 is similar to end-of-chapter problem 7-40 from the textbook.

7.40 (a) There are three changes in sign on the net cash flow, so there are three possible rate of return values.

(b) $PW_0 = -8000(P/A,8\%,6) - 8000(P/A,8\%,2)(P/F,8\%,7)$
$= -8000(4.6229) - 8000(1.7833)(0.5835)$
$= \$-45,307$

$FW_{10} = 52,000(F/P,12\%,3) + 20,000$
$= 52,000(1.4049) + 20,000$
$= \$93,055$

$45,307(F/P,i,10) = 93,055$
$(F/P,i,10) = 2.0539$

Use interpolation in factor tables or spreadsheet to find i'

$i' = 7.5 \%$ per year   (spreadsheet)

(c) Use the same spreadsheet functions as Figure 7-12 to display the ROIC of $i'' = 3.78\%$.

	A	B	C		D
			Future worth		
1	Year	NCF, $	value, F, $		
2	0	0	0		
3	1	-8,000	-8,000		
4	2	-8,000	-16,302	=IF(C3<0, C3*(1+$C$15)+B4, C3*(1+$C$14)+B4)	
5	3	-8,000	-24,918		
6	4	-8,000	-33,858		
7	5	-8,000	-43,137		
8	6	-8,000	-52,766		
9	7	52,000	-2,758		
10	8	-8,000	-10,862		
11	9	-8,000	-19,272		
12	10	20,000	0		
13					
14	Investment rate, i	12.00%			
15	Goal Seek, ROIC	3.78%			

Goal Seek

Set cell: $C$12
To value: 0
By changing cell: $C$15

OK   Cancel

(d) The IRR function displays $i^* = 3.78\%$. It is the same as ROIC $= 3.78\%$ because the FW value (column C above) never becomes positive; therefore, only the ROIC is used in the IF functions. The ROIC value is independent of the re-investment rate.

Problem #3 is similar to end-of-chapter problem 7-56 from the textbook.

7.56 (a) $I = 10,000,000(0.12)/4$

$= \$300,000$ per quarter

By spending $11 million now, the company will save $300,000 every three months for 25 years and will save $10,000,000 at that time. The ROR relation is:

$0 = -11,000,000 + 300,000(P/A,i\%,100) + 10,000,000(P/F,i\%,100)$

$i = 2.71\%$ per quarter   (spreadsheet)

(b) Nominal i per year $= 2.71(4) = 10.84\%$ per year