Review IV – Capital Budgeting (Investment Analysis)

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March 20, 2018

Present Value Formulas

1. The present value of an ordinary annuity due with an interest rate of r for n periods is
   a. $\frac{1}{1+r}P$.
   b. $\left(1+\frac{1-(1+r)^{-(n-1)}}{r}\right)P$.
   c. $\left(\frac{1-(1+r)^{-n}}{r}\right)P$.
   d. None of the above

2. What is the present value of an Annuity Due (where the first payment is due at the initiation of the project) with an interest rate of r for n periods?
   a. $\frac{1}{1+r}P.$
   b. $\left(1+\frac{1-(1+r)^{-(n-1)}}{r}\right)P.$
   c. $\left(\frac{1-(1+r)^{-n}}{r}\right)P$.
   d. None of the above
3. What is the present value of an investment that pays \$ 500 into the infinite future with a discount rate of 5 %.
   a. \$ 5,000
   b. \$ 9,000
   c. \$ 10,000
   d. None of the above.

Net Present Value Information

Year	Discount Factor	Investment 1		Investment 2	
		NCF	PV	NCF	PV
0	1.0000	-4,250	-4,250.00	-500	-500.00
1	0.9434	-50	-47.17	225	212.26
2	0.8900	200	178.00	225	200.25
3	0.8396	750	629.71	225	188.91
4	?	1,250	?	225	?
5	?	1,750	1,307.70		
6	0.7050	2,500	1,762.40		
NPV			Q4		?

4. The net present value of Investment 1 in Table 1 (assuming an interest rate of 6 %) is
   a. 507.76
   b. 279.64
   c. 629.71
   d. None of the above
5. The annualized net present value of Investment 2 is
   a. 100.35
   b. 80.70
   c. 279.64
   d. None of the above.
6. Which investment would you make (i.e., Investment 1 or 2) and why?

Cost of Capital

Item	Interest Rate	Value
Total Assets		1,500,000
Liabilities		950,000
Operating Loan	12.5	100,000
Equipment Loan	9.5	350,000
Land Loans	8.5	500,000
Equity		550,000

7. Assuming a opportunity cost for the farmer's equity of 4.5 % what is the weighted average cost of capital?
   a. 9.50 %
   b. 7.43 %
   c. 4.50 %
   d. Impossible to determine.
8. Suppose that the we have current estimates of returns on investment (without inflation). Given a discount rate of 7.25 % and an estimated rate of inflation of 2.25 % - what is the effective discount rate?
   a. 5.00 %
   b. 7.25 %
   c. 9.50 %
   d. None of the above.

Tax Shields

Year	CF	Dep
0	-15,000	
1	4,500	6,750
2	4,500	5,250
3	4,500	3,000
4	4,500	0

9. Starting with the cash flows in Tax Shields Table, assuming a discount rate of 5 % and an effective tax rate of 25 %, the effective discount rate is
   a. 5.00 %
   b. 3.75 %
   c. 6.78 %
   d. None of the above.
10. The value of the depreciation shield in year 2 is
   a. 1,312.50
   b. 0.00
   c. 5,250.00
   d. None of the above.

11. The net cash flow for year 2 including tax considerations is
    a. 4,500.00
    b. 1,312.50
    c. 4,687.50
12. The net present value of this investment with tax considerations is
    a. 956.78
    b. 413.08
    c. 840.84
    d. None of the above.
13. If the investment had a non-zero salvage value, you would need to consider the tax consequences of
    a. Additional First Year Depreciation
    b. Investment Tax Credit
    c. Section 1231 Depreciation Recapture
    d. This will make no difference in the investment analysis.

Term Structure of the Interest Rate

Year	Int. Rate
1	2.15
2	2.30
3	2.45

14. The structure of the interest rate in the above table is an example of a
    a. An increasing term structure of interest.
    b. A decreasing term structure of interest.
    c. A constant term structure of interest.
    d. These interest rates have no implications for the term structure.
15. One possible explanation for this relationship is the expectation that the inflation rate is declining over time.

16. The true marginal interest rate for year 2 in the term structure table is
    a. 2.30 %
    b. 2.45 %
    c. 2.75 %
    d. None of the above.

Other Investment Analysis

Year	Discount Factor 7 %	Discount Factor 8 %	Net Cash Flow
0	1.0000	1.0000	-12,500
1	0.9346	0.9259	2,650
2	0.8734	0.8573	2,650
3	0.8163	0.7938	2,650
4	0.7629	0.7350	2,650
5	0.7130	0.6806	2,650
6	0.6663	0.6302	2,650

17. The Payback Period for the investment in the preceding table is
    a. 3.55
    b. 4.72
    c. 5.00
    d. None of the above.
18. Computing the present value at 7 % and 8 %, the internal rate of return can be approximated (by linear interpolation) as
    a. 7.10 %
    b. 7.35 %
    c. 7.65 %
    d. None of the above.
19. The Benefit/Cost ratio for the investment at a discount rate of 7 % is
    a. 0.950
    b. 1.000
    c. 1.011
    d. None of the above
20. True or False – Internal Rate of Return and Net Present Values are always consistent?