

## RE 618 / Fin 618 – Real Estate Investment Analysis

### Homework – Effective Rent – Solutions

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- 1) A tenant would like to lease 4,000 square feet of space over the next ten years, and is evaluating the following alternatives:

*Option 1:* Gross lease with base rent of \$16 psf each year.

*Option 2:* Gross lease with base rent of \$15 psf with rent rising by \$0.50 psf every other year; the first year of adjustment is year 3.

*Option 3:* Absolutely net lease with base rent of \$12 psf, increasing to \$14 psf starting in year 6.

Operating expenses for the space are expected to be \$2.50 psf in the first year; these expenses are expected to increase at the same rate as overall inflation, which is expected to be 3 percent per year.

- a) Calculate the tenant's effective rent (after expenses) for each lease alternative using a 12 percent discount rate.

- *Option 1:* The tenant's effective rent is simply \$16 psf, since this is a gross lease and it is a level annuity.
- *Option 2:* The tenant's expenses over the term of the lease will be as follows:

n	Rent	OE	Total Cost
1	\$15.00	\$0.00	\$15.00
2	15.00	0.00	15.00
3	15.50	0.00	15.50
4	15.50	0.00	15.50
5	16.00	0.00	16.00
6	16.00	0.00	16.00
7	16.50	0.00	16.50
8	16.50	0.00	16.50
9	17.00	0.00	17.00
10	17.00	0.00	17.00

In your irregular cash flow worksheet, input  $CF_0 = 0$ ,  $C_1 = 15$ ,  $F_1 = 2$ ,  $C_2 = 15.5$ ,  $F_2 = 2$ ,  $C_3 = 16$ ,  $F_3 = 2$ ,  $C_4 = 16.5$ ,  $F_4 = 2$ ,  $C_5 = 17$ ,  $F_5 = 2$ . Then set  $I = 12$  and solve for  $NPV = 80.15$ .

In your TVM solver, enter  $PV = (89.15)$ ,  $P/Y = 1$ ,  $N = 10$ ,  $I = 12$ , and  $FV = 0$ , you can solve for  $PMT = \$15.78$ . This is the tenant's effective rent after expenses.

- *Option 3:* Absolutely net lease with base rent of \$12 psf, increasing to \$14 psf starting in year 6. The tenant's expenses over the term of the lease will be as follows:

n	Rent	OE	Total Cost
1	\$12.00	\$2.50	\$14.50
2	12.00	2.58	14.58
3	12.00	2.65	14.65
4	12.00	2.73	14.73
5	12.00	2.81	14.81
6	14.00	2.90	16.90
7	14.00	2.99	16.99
8	14.00	3.07	17.07
9	14.00	3.17	17.17
10	14.00	3.26	17.26

At a 12 percent discount rate, the present value of the tenant's total costs is \$87.65. Entering  $PV = (87.65)$ ,  $P/Y = 1$ ,  $N = 10$ ,  $I = 12$ , and  $FV = 0$ , you can solve for  $PMT = \$15.51$ . This is the tenant's rent after expenses.

- b) How would you rank the alternatives in terms of risk to the tenant?

Options A and B entail no cash flow risk for the tenant, as all of the cash flows are explicitly known up front. Moreover, the inflation risk is borne by the landlord, because they are gross leases.

Option C does have some risk for the tenant because actual inflation is not known at the time the lease is written.

- c) Considering your answers to parts (a) and (b), which option would you choose if you were the tenant? Explain your reasoning briefly.

Option 1 is clearly inferior, as it has the highest effective rent. Depending on your risk tolerance (and perhaps the connection between your firm's expected revenues and inflation) you could make reasonable arguments for choosing either option 2 or option 3.