

RE 618 / Fin 618 – Real Estate Investment Analysis

Homework – Estimating Reversion Values – Solutions

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- 1) A small office building in Hutchinson is expected to generate annual NOI of \$120,000 in each of the next five years. It can be purchased at a going-in cap rate of 12 percent. If you purchase the property, you will expect to hold it for five years. Your required rate of return on this investment is 15 percent.

Estimate the property's reversion value (V_5) and current market value (V_0) under each of the following assumptions:

- a) The terminal cap rate based on comparable sales is 14 percent (assume NOI in year 6 will also be \$120,000).

$$V_5 = \frac{NOI_6}{R_T} = \frac{120,000}{0.14} = \$857,143.$$

$$P/Y = 1, N = 5, I = 15, PMT = 120,000, FV = 857,143 \Rightarrow PV = -828,411, \text{ so } V_0 = \$828,411.$$

- b) NOI will grow at a constant rate of 2 percent after the end of your holding period.

$$V_5 = \frac{NOI_6}{R_T} = \frac{NOI_5(1+g)}{r-g} = \frac{120,000(1.02)}{0.15-0.02} = \frac{122,400}{0.13} = \$941,538.$$

$$P/Y = 1, N = 5, I = 15, PMT = 120,000, FV = 941,538 \Rightarrow PV = -870,370, \text{ so } V_0 = \$870,370.$$

- c) The property will appreciate by 3 percent per year over the initial purchase price (P_0).

$$\text{Your initial purchase price will be } P_0 = \frac{NOI_1}{R} = \frac{120,000}{0.12} = 1,000,000.$$

$$V_5 = (1+G)^5 P_0 = (1.03)^5 1,000,000 = \$1,159,274.$$

$$P/Y = 1, N = 5, I = 15, PMT = 120,000, FV = 1,159,274 \Rightarrow PV = -978,623, \text{ so } V_0 = \$978,623.$$

- d) The property's initial market value (V_0) will appreciate by 3 percent per year.

$$P/Y = 1, N = 5, I = 15, PMT = 120,000, FV = 0 \Rightarrow PV = -402,259, \text{ so } PV(NOI) = 402,259.$$

$$M = \frac{1}{1 - \left[\frac{1+G}{1+r} \right]^5} = \frac{1}{1 - \left[\frac{1.03}{1.15} \right]^5} = 2.3605.$$

$$V_0 = PV(NOI) \times M = 402,259 \times 2.3605 = 949,539.$$

$$V_5 = V_0(1+G)^5 = 949,539 \times 1.03^5 = 1,100,775.$$