11.431J/15.426J Real Estate Finance & Investments, Fall 2006, Midterm Diagnostic Exam

Your name:_____ ID#_____

Answer all of the questions in the space provided below each one. Think about your answer before you start writing, and organize your thoughts. Please write clearly and legibly. (Make notes or outline on the back if that helps you organize, but those won't count in the marking.)

1. (15 pts) Explain in your own words what is "the NPV Investment Decision Rule", and why it makes sense, what it is based on.

2. (20 pts) Define and contrast: "Market Value" (MV), and "Investment Value" (IV). Use a market supply and demand diagram to illustrate the difference between these two values. (Clearly label and define all axes, lines, and points in the chart.) Explain how the DCF computation of MV and IV differ in their use or treatment of investors' income taxes.

3. (10 pts) What is the difference between a property's Net Operating Income (NOI) and its Property Before-Tax Cash Flow (PBTCF)?

4. (20 pts) Suppose a property can be bought for $1,000,000 and it will provide $100,000/year net cash flow forever, and you can borrow a perpetual interest-only mortgage secured by that property at an 8% interest rate, up to an amount of $750,000. (a) Does this present "positive" or "negative leverage", and (b) why? (c) Will the expected return to the levered equity be less than 8%, exactly 8%, between 8% and 10%, exactly 10%, or greater than 10%? (d) Do you think that the use of leverage in this case will increase the NPV of the investment for the equity investor in the property? (e) Why or why not?

5. (10 pts) Do you think in general (or typically on average) the going-in cap rate is larger or smaller than the going-out or terminal cap rate? Why?

6. (25 pts) Below is a 10-year projection of a before-tax cash flow stream. Suppose that the market before-tax OCC for cash flows of this type of risk is 10% per annum, and the marginal investor in the market for the type of asset that produces these cash flows faces a 35% income tax rate, but you face a 25% income tax rate. The reversion amount of $10,000 in Year 10 is not subject to any income tax. What is: (a) the market value (MV) of this cash flow stream? (b) the investment value (IV) to you of this cash flow stream? (Show your computations.)

Year 1	2	3	4	5	6	7	8	9	10
$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$11,000

Formulas that may (or may not) be useful in this exam . . .

$a + da + d^2a + \ldots + d^{n-1}a = a(1-d^n)/(1-d). = a/(1-d)$ if $n = \infty$ and < 1.

$PMT/(1+r) + PMT/(1+r)^2 + \ldots + PMT/(1+r)^n = (PMT/r)[1 - 1/(1+r)^n]$.

$CF + CF/(1+r) + CF/(1+r)^2 + \ldots + CF/(1+r)^{n-1} = (1+r)(CF/r)[1 - 1/(1+r)^n]$.

$CF/(1+r) + (1+g)CF/(1+r)^2 + (1+g)^2CF/(1+r)^3 + \ldots$ (forever) $= CF/(r-g)$.

$EAY = (1+CEY/2)^2-1; MEY=((1+EAY)^{(1/12)}-1)*12$.

$PMT = PV*(i/m)/(1 - 1/(1 + i/m)^N); i=IntRate/Yr, m=Pmts/Yr$.

$PV_0[V_1] = CEQ[V_1] / (1 + r_f); CEQ[V_1] = E[V_1] - (V_1^{up} - V_1^{down})(E[r_V] - r_f) / (V^{up}\% - V^{down}\%) = ((1 + r_f) / (1 + E[r_V]))E[V_1]$

$E = Mc^2$

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