

Real Estate Investment Analysis
Fall 2004

Midterm Exam 1 – Version A – Solutions

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MW 9:30-10:45

1) (14 points) Amy is considering investing in a 75,000 square foot retail property. The current lease is a triple-net lease at \$7 per square foot; this payment is scheduled to increase to \$8.50 per square foot after three years (beginning in year four) and remain at that rate for ten more years. Amy's expected holding period is five years, and her required return on any investment is 12 percent.

a) (7 points) Assuming that Amy can sell the property at an 8.00 percent cap rate at the end of the fifth year, what is the most she would be willing to pay for this property?

In years one through three, the property will generate income of $75,000 \times \$7.00 = \$525,000$. Starting in year four the income will be $75,000 \times \$7.50 = \$637,500$. The reversion value at the end of the fifth year will therefore be $\$637,500 \div 0.08 = \$7,968,750$.

Enter the following into your irregular cash flow worksheet:

<u>Cash Flow</u>	<u>Frequency</u>
\$525,000	3
\$637,500	1
\$8,606,250	1

Solving for the NPV with $CF_0 = 0$ and $I = 12$ gives $PV = \$6,549,522$, or just over \$6.5 million.

b) (5 points) Calculate the current market value of this property assuming that its reversion value will be based on a 4 percent increase in market value per year.

The present value of annual income from this property is solved by entering the following into your irregular cash flow worksheet:

<u>Cash Flow</u>	<u>Frequency</u>
\$525,000	3
\$637,500	2

With this, $PV_{NOI} = \$2,027,839$.

The current market value of the property is therefore

$$\begin{aligned}V_0 &= PV_{NOI} \times \frac{1}{\left(1 - \frac{(1+G)^T}{(1+r)^T}\right)} \\&= 2,027,839 \times \frac{1}{\left(1 - \frac{1.04^5}{1.12^5}\right)} \\&= \$6,549,053.\end{aligned}$$

c) (2 points) If she pays this price, what is Amy's going-in cap rate?

$$R = 525,000 \div 6,549,053 = 8.02\%.$$

- 2) (20 points) Frank is considering investing in an apartment complex located on Long Island. The complex has 120 units, broken down as follows:

<u>Bedrooms</u>	<u>Number</u>	<u>Monthly Rent</u>
1	20	\$850
2	75	\$1,050
3	25	\$1,200

Currently, the market vacancy rate for similar apartment complexes is 7.5 percent. The prior owner's records show the following expenses:

Salaries for on-site staff	\$85,000
Utilities	\$142,000
Maintenance & lawn care	\$128,000
Property management	10% of EGI
Mortgage interest	\$400,000
Property taxes	\$230,000
Depreciation	\$180,000

The asking price for this property is \$6.7 million.

- a) (8 points) Write out the pro forma operating statement for this property. What is its expected net operating income?

Potential gross income		
20 units @ \$850 × 12	\$204,000	
75 units @ \$1,050 × 12	945,000	
25 units @ \$1,200 × 12	360,000	1,509,000
Less: Vacancy & collection @ 7.5%		(113,175)
Effective gross income		1,395,825
Operating expenses		
Salaries	\$ 85,000	
Utilities	142,000	
Maintenance	128,000	
Management	139,583	
Property taxes	230,000	(724,583)
Net operating income		671,242

- b) (2 points) At what cap rate is the seller offering this property?

$$R = NOI / V = 671,242 / 6,700,000 = 10\%$$

- c) (4 points) Similar apartment buildings have recently been selling at a 9.0 percent cap rate. Based solely on a comparison of cap rates, does this appear to be a good investment at the current asking price? Explain.

Based solely on its cap rate, this appears to be a good investment. For the price you must pay, the income it is generating annually is higher than other apartment properties in the market. Thus, if Frank were to pay \$6.7 million for the typical complex in this market, he would only receive \$603,000 in annual income from the investment.

- d) (4 points) Provide two specific reasons why the cap rate may be a misleading indicator of a property's true value as an investment. That is, what factors might cause you to change your answer in part (c) above?

Cap rates only consider first year net operating income. If the income generated by this property is expected to grow at a slower rate than other properties in the market, it could sell for a higher cap rate.

In addition, cap rates do not fully account for a property's risk. If this building is in an inferior location with a less-stable tenant base, then this property might also command a lower than typical price (e.g., a higher cap rate).

- e) (2 points) If Frank were to buy this property at a 9.0 percent cap rate, what price would he pay?

To obtain a 9.00 percent cap rate, he would need to purchase the property at $V = NOI / R = 671,242 / 0.09 = \$7,458,244$, or just under \$7.5 million.

- 3) (14 points) Ray is considering two possible lease structures for a building he owns. This first is a net lease with steps. The base rent for this lease is \$12.00 per square foot (psf) in the first year, with steps of \$0.50 psf each year thereafter. The second is a gross lease with base rent of \$19.00 psf and an expense stop of \$6.50 psf. Operating expenses are expected to be \$5.50 psf in the first year and increase by \$0.50 psf each year thereafter. Either of these leases will have a five-year term.

- a) (5 points) Calculate the effective rent of the net lease with steps. Assume a discount rate of 13 percent.

The first lease will have the following rents:

<u>Year</u>	<u>Rent</u>
1	\$12.00
2	\$12.50
3	\$13.00
4	\$13.50
5	\$14.00

The present value of these cash flows at a 13 percent discount rate is \$45.30. Using the TVM keys of your calculator, you can then enter $P/Y = 1$, $N = 5$, $I = 13$, $PV = 45.30$, $FV = 0 \Rightarrow PMT = -12.88$. Thus, the effective rent under this lease is \$12.88 psf.

- b) (5 points) Calculate the effective rent of the gross lease using the same discount rate.

The second lease will generate the following net rent for the landlord:

<u>Year</u>	<u>Gross Rent</u>	<u>Expenses</u>	<u>Net Rent</u>
1	\$19.00	\$5.50	\$13.50
2	\$19.00	\$6.00	\$13.00
3	\$19.00	\$6.50	\$12.50
4	\$19.00	\$6.50	\$12.50
5	\$19.00	\$6.50	\$12.50

The present value of these net rents is \$45.24. Entering $P/Y = 1$, $N = 5$, $I = 13$, $PV = 45.24$, $FV = 0$, you can solve for the effective rent of \$12.86 psf.

- c) (2 points) Which of the two leases entails the most risk for the landlord. Explain.

Because of the expense stop, both leases entail roughly the same risk for the landlord. .

- d) (2 points) Based on your answers to parts (a) through (c) above, which lease option would you choose? Explain your answer.

The first lease has the higher effective rent. Given that it has the same risk as the second lease, it would be the more attractive alternative for the landlord. Either lease could be an acceptable answer, however, if you provide a reasonable explanation.

Multiple Choice Questions (2 points each)

- _____ 1. Which of the following items are NOT included as operating expenses when calculation net operating income More than one answer may be correct; write down all correct answers.
- A. Advertising expenses
 - B. Cleaning and maintenance
 - C. DEPRECIATION ALLOWANCES**
 - D. INCOME TAXES**
 - E. Legal and accounting fees
 - F. Management fees
 - G. MORTGAGE INTEREST**
 - H. MORTGAGE PRINCIPAL**
 - I. Property insurance
 - J. Property taxes
 - K. Utilities

Use the following information to answer the next four questions.

Ally would like to purchase a shopping center property. She has determined that the current market vacancy rate is 6 percent, and that operating expenses will run at about 10 percent of effective gross income. The prevailing market cap rate is 9 percent.

The first shopping center she has analyzed has 35,000 square feet which rents at \$15.50 per square foot. The second shopping center she is considering 40,000 square feet and rents for \$14.00 per square foot.

- _____ 2. Effective gross income for the first center is
- A. \$542,500.
 - B. \$509,950.**
 - C. \$32,550.
 - D. \$458,955.
 - E. None of the above; the correct answer is _____.
- _____ 3. Net operating income for the first center is
- A. \$542,500.
 - B. \$509,950.
 - C. \$32,550.
 - D. \$458,955.**
 - E. None of the above; the correct answer is _____.

- _____ 4. Based on the current market cap rate, the market value of second center is
- A. \$6.222 million.
 - B. \$5.264 MILLION.**
 - C. \$473,760.
 - D. \$4.264 million.
 - E. None of the above; the correct answer is _____.
- _____ 5. A third shopping center is available for purchase at an 8.50 percent cap rate. Under what circumstances might this be a good investment? More than one answer may be correct; write down all correct answers.
- A. THE INCOME OF THIS CENTER IS EXPECTED TO GROW AT A FASTER RATE IN THE FUTURE THAN OTHER CENTERS IN THE MARKET.**
 - B. This income from this center is expected to grow at a slower rate in the future than other centers in the market.
 - C. Allie has a lower required rate of return than other investors in the market.
 - D. Estimates of future income for this center are less certain than they are for other centers in the market.
 - E. Allie has a higher required rate of return than other investors in the market.
- _____ 6. Real estate space markets are typically segmented by
- A. size, geographic location, and investor.
 - B. property type, geographic location, and size.
 - C. PROPERTY TYPE, GEOGRAPHIC LOCATION, AND QUALITY.**
 - D. geographic location, investor, and quality.
 - E. property type, quality, and investor.
- _____ 7. Robert has leased 15,000 square feet of retail space with base rent of \$5.50 per square foot and percentage rent of 2.5% of gross sales above the natural breakpoint. What is the natural breakpoint on this lease?
- A. \$82,500
 - B. \$3.3 MILLION**
 - C. \$600,000
 - D. \$2.062 million
 - E. None of the above; the correct answer is _____.

- _____ 8. In the previous question, how much total rent will Robert pay if he has total sales of \$2 million?
- A. **\$82,500**
 - B. \$50,000
 - C. \$132,500
 - D. \$600,000
 - E. None of the above; the correct answer is _____.
- _____ 9. True or ***FALSE***: In an indexed lease, the amount by which base rent will change in the future is known at the time the contract is written.
- _____ 10. Net operating income measures the
- A. **CASH AVAILABLE TO DISTRIBUTE TO ALL OF THE INVESTORS.**
 - B. before-tax cash flow available to equity investors.
 - C. after-tax cash flow available to equity investors.
 - D. anticipated sale price of the property.
 - E. gross income generated by the investment.
- _____ 11. An expense stop
- A. **LIMITS THE AMOUNT OF OPERATING EXPENSES THE LANDLORD WILL PAY.**
 - B. limits the amount of operating expenses the tenant will pay.
 - C. prohibits the landlord from charging common area maintenance charges.
 - D. limits the amount of tenant improvements the landlord will provide.
 - E. None of the above
- _____ 12. A lease in which the tenant pays all the operating expenses associated with the property is known as a(n)
- A. **NET LEASE.**
 - B. gross lease.
 - C. percentage lease.
 - D. step lease.
 - E. indexed lease.
- _____ 13. A lease in which the base rent is adjusted by prespecified amounts is known as a(n)
- A. net lease.
 - B. gross lease.
 - C. percentage lease.
 - D. **STEP LEASE.**
 - E. indexed lease.

- _____ 14. Consider the impact of the recent hurricanes in Florida, which have destroyed large amounts of real estate. In the short run, rents are likely to _____ and vacancies are likely to _____. In the long run, the destroyed buildings will be _____ causing rents to _____.
- A. **RISE, FALL, REPLACED, FALL**
 - B. rise, rise, replaced, fall
 - C. fall, rise, replaced, rise
 - D. fall, rise, be abandoned, stay the same
 - E. rise, fall, be abandoned, rise
- _____ 15. True or **FALSE**: Base rent for commercial office space is typically specified in dollars per square foot per month.
- _____ 16. Debra has an industrial property for sale at \$24.7 million. Forecasted first-year NOI for this property is \$2.1 million. If other similar office properties are currently selling at a 9.5 percent cap rate, which of the following statements is most correct?
- A. This property appears to be a good investment because it is selling at an above-market cap rate.
 - B. This property appears to be a poor investment because it is selling at an above-market cap rate.
 - C. This property appears to be a good investment because it is selling at a below-market cap rate.
 - D. **THIS PROPERTY APPEARS TO BE A POOR INVESTMENT BECAUSE IT IS SELLING AT A BELOW-MARKET CAP RATE.**
 - E. The cap rate provides no useful information about the quality of the investment.
- _____ 17. A building has an efficiency percentage of 0.92. The landlord is asking for rent of \$29.00 per square foot of rentable area in the building. What is the total rent per square foot of usable area?
- A. \$29.00
 - B. \$26.68
 - C. \$29.92
 - D. \$30.09
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS \$31.52.**

- _____ 18. A different building has an efficiency percentage of 0.94. If a tenant leases 14,000 square feet of usable space in this building at \$14.00 per square foot of rentable area, how much total rent will that tenant pay for the year?
- A. \$196,000
 - B. \$184,200
 - C. **\$208,511**
 - D. None of the above; the correct answer is _____.
 - E. None of the above; there is not enough information to calculate the answer.
- _____ 19. The tenth floor of an office building has three office suites each with 8,000 square feet. The elevator lobby, restrooms and other common area total 4,000 square feet. What is the load factor for this floor?
- A. **1.167**
 - B. 0.857
 - C. 1.200
 - D. 0.833
 - E. None of the above; the correct answer is _____.
- _____ 20. A different office building has a main lobby with 10,000 square feet. Other than this lobby, the building contains 120,000 square feet of rentable area. Suppose that the load factor of the fifth floor of this building is 1.10. What is the total load factor for a tenant on the fifth floor?
- A. 1.0833
 - B. 1.1000
 - C. **1.1917**
 - D. 0.9231
 - E. None of the above; the correct answer is _____.
- _____ 21. **TRUE** or False: The fixed location of real estate is its most important physical characteristics, because many of its other characteristics are derived from its fixed location.

Use the following pro forma to answer the next four questions.

Potential gross income	\$1,700,000
– Vacancy & collections	<u>255,000</u>
Effective gross income	1,445,000
– Operating expenses	<u>794,750</u>
Net operating income	650,250

This property has a market value of \$5.65 million.

- _____ 22. What vacancy allowance is used in this statement?
- A. 38.25%
 - B. 85.00%
 - C. 10.00%
 - D. 55.00%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 15.00%.**
- _____ 23. What is this property's cap rate?
- A. 8.69%
 - B. 3.91%
 - C. 10.00%
 - D. **11.51%**
 - E. None of the above; the correct answer is _____.
- _____ 24. What is the gross income multiplier for this property?
- A. 8.69
 - B. **3.91**
 - C. 10.00
 - D. 11.51
 - E. None of the above; the correct answer is _____.
- _____ 25. What is the net income multiplier for this property?
- A. **8.69**
 - B. 3.91
 - C. 10.00
 - D. 11.51
 - E. None of the above; the correct answer is _____.

- _____ 26. In _____ markets, properties trade based on the utility they provide, whereas in _____ markets, properties based on the cash flows they can generate.
- A. residential property, commercial property
 - B. REAL ESTATE SPACE, REAL ESTATE ASSET**
 - C. commodity, financial
 - D. rural, urban
 - E. None of the above
- _____ 27. (Freebe) What do all of the names used in this exam have in common?
- A. They are all names of faculty in the Barton School.
 - B. THEY ARE CHARACTERS ON THE TV SHOW EVERYBODY LOVES RAYMOND.**
 - C. They are all names of students in this class.
 - D. They are all names of Dr. Longhofer's relatives.
 - E. They prove that Dr. Longhofer has too much time on his hands when writing exams.