

Real Estate Investment Analysis
Fall 2005

Midterm Exam 1 – Version B – Solutions

Dr. Stanley D. Longhofer
MW 9:30-10:45

- 1) (14 points) Irene is estimating value of a 42,000 square foot office building. The property is currently leased to a single tenant with a gross lease at \$5.50 per square foot; this payment is scheduled to increase to \$7.50 per square foot after five years (beginning in year six) and remain at that rate for ten more years. The current market vacancy rate is 10 percent, while operating expenses for the property are expected to be \$2.75 per square foot. Irene uses an expected holding period of five years, and the market discount rate is 14 percent.
- a) (8 points) Estimate the current market value of this property using discounted cash flow analysis assuming that the property will be sold in five year at a 9 percent cap rate.

The property's NOI will be as follows:

	<u>Years 1-5</u>	<u>Years 6-10</u>
PGI	\$231,000	\$315,000
– V&C	<u>23,100</u>	<u>31,500</u>
EGI	207,900	283,500
– OE	<u>115,500</u>	<u>115,500</u>
NOI	\$92,400	\$168,000

Thus, the property's NOI will be \$92,400 during each year of the holding period, but will rise to \$168,000 after that time. Using a 9 percent cap rate, the reversion value will be $\$168,000 \div 0.09 = \$1,866,667$.

The property's market value can therefore be calculated as: $P/Y = 1$, $N = 5$, $I = 14$, $PMT = 92,400$, $FV = 1,866,667 \Rightarrow PV = \$1,286,705$.

- b) (6 points) Estimate the current market value of this property assuming that its reversion value will be based on a 5 percent increase in market value per year.

First, calculate the present value of annual income from the property:

$P/Y = 1$, $N = 5$, $PMT = 92,400$, $FV = 0 \Rightarrow PV = \$317,217$.

The multiplier is

$$\frac{1}{1 - \left(\frac{1+G}{1+r}\right)^T} = \frac{1}{1 - \left(\frac{1.05}{1.14}\right)^5} = 2.97,$$

Meaning that the current market value of the property is $317,217 \times 2.97 = \$940,907$.

- 2) (20 points) Katrina is considering investing in an apartment complex located in New Orleans. The complex has 110 units, broken down as follows:

<u>Bedrooms</u>	<u>Number</u>	<u>Monthly Rent</u>
1	20	\$650
2	70	\$850
3	20	\$950

Currently, the market vacancy rate for similar apartment complexes is 12 percent. The prior owner's records show the following expenses:

Salaries for on-site staff	\$85,000
Utilities	\$97,000
Maintenance & lawn care	\$135,000
Property management	10% of EGI
Mortgage interest	\$450,000
Property taxes	\$280,000
Depreciation	\$225,000

The asking price for this property is \$2.7 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 @ \$650 × 12	\$156,000	
70 units @ \$850 × 12	714,000	
20 units @ \$950 × 12	228,000	1,098,000
Less: Vacancy & collection @ 12%		(131,760)
Effective gross income		966,240
Operating expenses		
Salaries	\$ 85,000	
Utilities	97,000	
Maintenance	135,000	
Management	96,624	
Property taxes	280,000	(693,624)
Net operating income		272,616

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

$$R = NOI / V = 272,616 / 2,700,000 = 10.01\%$$

- c) (4 points) Similar apartment buildings have recently been selling at a 10 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 an average investment. The income the property will generate annually is approximately equal to what would be generated by investing in similar properties in the market.

- 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 faster rate than other properties in the market, it could sell for a lower cap rate.

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

- e) (2 points) If Katrina were to buy this property at a 12.0 percent cap rate, what price would she pay?

To obtain a 12.00 percent cap rate, she would need to purchase the property at $V = NOI / R = 272,616 / 0.12 = \$2,271,800$, or just over \$2.27 million.

- 3) (16 points) Rita would like to rent retail space in Houston, and is evaluating two different lease alternatives. The first is a gross lease with steps. The base rent for this lease is \$32.00 per square foot (psf) in the first year, with steps of \$1.00 psf in years 3 and 5. The second option is a gross percentage lease with base rent of \$20.00 psf and overage rent of 5 percent of sales over \$40 psf. Sales are expected to be \$250 psf in the first three years and rise to \$350 psf after that. Either of these leases will have a six-year term.

- a) (6 points) Calculate the effective cost of the gross lease with steps. Assume a discount rate of 12 percent.

The first lease will have the following rents:

<u>Year</u>	<u>Rent</u>
1	\$30.50
2	\$30.50
3	\$30.50
4	\$35.50
5	\$35.50
6	\$35.50

The present value of these cash flows at a 12 percent discount rate is \$135.06. Using the TVM keys of your calculator, you can then enter P/Y = 1, N = 6, I = 12, PV = 135.06, FV = 0 \Rightarrow PMT = -32.85. Thus, the effective rent under this lease is \$32.85 psf.

- b) (6 points) Calculate the effective cost of the percentage lease using the same discount rate.

In the first three years, overage rent is expected to be $(250 - 40) \times 0.05 = \10.50 psf. After that, the overage rent will rise to $(350 - 40) \times 0.05 = \15.50 psf. Thus, the second lease will result in the following cash flows for the tenant:

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<u>Year</u>	<u>Base Rent</u>	<u>Overage Rent</u>	<u>Total Cost</u>
1	\$20.00	\$10.50	\$30.50
2	\$20.00	\$10.50	\$30.50
3	\$20.00	\$10.50	\$30.50
4	\$20.00	\$15.50	\$35.50
5	\$20.00	\$15.50	\$35.50
6	\$20.00	\$15.50	\$35.50

The present value of these net rents is \$133.95. Entering P/Y = 1, N = 6, I = 13, PV = 133.95, FV = 0, you can solve for the effective rent of \$32.58 psf.

- c) (4 points) Which of these two leases would you choose if you were Rita? Explain your answer.
- 4) (6 points) Bret owns a vacant piece of land and has determined that there are two feasible development alternatives for the parcel. The first is a retail use that will generate annual NOI of \$535,000. The current market cap rate for similar retail buildings is 9.5 percent, and the building will cost \$5 million to construct.

The second alternative is an office building. This will generate annual NOI of \$750,000. The current market cap rate for similar office buildings is 8.5 percent, and the building will cost \$8.5 million to construct.

Calculate the value of the land for each of these alternatives and determine the property's highest-and-best use.

Retail

$$V = 535,000 \div 0.095 = \$5,631,579$$

$$L = 5,631,579 - 5,000,000 = \$631,579$$

Office

$$V = 750,000 \div 0.085 = \$8,823,529$$

$$L = 8,823,529 - 8,500,000 = \$323,529$$

The highest-and-best use of the land is a retail building.

Multiple Choice Questions (2 points each)

- _____ 1. Real estate space markets are typically segmented by
- A. property type, geographic location, and size.
 - B. size, geographic location, and investor.
 - C. geographic location, investor, and quality.
 - D. PROPERTY TYPE, GEOGRAPHIC LOCATION, AND QUALITY.**
 - E. property type, quality, and investor.
- _____ 2. Unlevered real estate returns are most comparable to _____, while equity investments in real estate (levered returns) are most comparable to _____.
- A. stock market investments, Treasury securities
 - B. CORPORATE BONDS, STOCK MARKET INVESTMENTS**
 - C. Treasury securities, corporate bonds
 - D. stock market investments, corporate bonds
 - E. corporate bonds, Treasury securities
- _____ 3. In _____ markets, properties trade based on the utility they provide, whereas in _____ markets, properties based on the cash flows they can generate.
- A. REAL ESTATE SPACE, REAL ESTATE ASSET**
 - B. commodity, financial
 - C. rural, urban
 - D. residential property, commercial property
 - E. None of the above
- _____ 4. 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

- _____ 5. True or **FALSE**: Contract rent is usually higher than market rent.
- _____ 6. In a _____, the landlord is responsible for all of the operating expenses of the building.
- A. operating expense lease
 - B. percentage lease
 - C. net lease
 - D. loaded lease
 - E. GROSS LEASE**
- _____ 7. In a _____, the rent is adjusted at period intervals by specific amounts specified in the lease.
- A. gross lease
 - B. indexed lease
 - C. loaded lease
 - D. percentage lease
 - E. STEP LEASE**
- _____ 8. True or **FALSE**: In an indexed lease, the amount by which base rent will change in the future is certain at the time the contract is written.
- _____ 9. An expense stop
- A. limits the amount of operating expenses the tenant will pay.
 - B. LIMITS THE AMOUNT OF OPERATING EXPENSES THE LANDLORD WILL PAY.**
 - C. limits the amount of tenant improvements the landlord will provide.
 - D. prohibits the landlord from charging common area maintenance charges.
 - E. None of the above
- _____ 10. A building has an efficiency percentage of 0.85. The landlord is asking for rent of \$45.00 per square foot of rentable area in the building. What is the total rent per square foot of usable area?
- A. \$38.25
 - B. \$45.00
 - C. \$52.94**
 - D. None of the above; the correct answer is _____.
 - E. None of the above; there is not enough information to calculate the answer.

- _____ 11. The fifth floor of an office building has three office suites each with 5,000 square feet. The elevator lobby, restrooms and other common area total 2,000 square feet. What is the load factor for this floor?
- A. **1.133**
 - B. 0.882
 - C. 1.154
 - D. 0.867
 - E. None of the above; the correct answer is _____.
- _____ 12. A different office building has a main lobby with 10,000 square feet. Other than this lobby, the building contains 80,000 square feet of rentable area. Suppose that the load factor of the second floor of this building is 1.10. What is the total load factor for a tenant on the second floor?
- A. 1.125
 - B. **1.238**
 - C. 0.808
 - D. 0.889
 - E. None of the above; the correct answer is _____.
- _____ 13. Dennis has leased 20,000 square feet of retail space with base rent of \$4.00 per square foot and percentage rent of 4 percent of gross sales above the natural breakpoint. What is the natural breakpoint on this lease?
- A. \$80,000
 - B. **\$2 MILLION**
 - C. \$320,000
 - D. \$500,000
 - E. None of the above; the correct answer is _____.
- _____ 14. Suppose instead that the lease in the previous question specified a breakpoint of \$400,000. How much total rent will Dennis pay if he has total sales of \$1.5 million?
- A. \$44,000
 - B. \$96,000
 - C. \$16,000
 - D. \$80,000
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS \$124,000.**
- _____ 15. True or **FALSE**: The cap rate is generally larger than the discount rate.

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

Potential gross income	\$2,400,000
– Vacancy & collections	<u>192,000</u>
Effective gross income	2,208,000
– Operating expenses	<u>662,400</u>
Net operating income	1,545,600
– Annual debt service	<u>1,236,480</u>
Before-tax cash flow	309,120

This property has a market value of \$12.88 million and the loan on the property is \$10 million.

_____ 16. What vacancy allowance is used in this statement?

- A. 92.00%
- B. 10.00%
- C. **8.00%**
- D. 35.60%
- E. None of the above; the correct answer is _____.

_____ 17. What is this property's cap rate?

- A. 8.33%
- B. 10.00%
- C. 2.40%
- D. 11.73%
- E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 12.00%.**

_____ 18. What is the (effective) gross income multiplier for this property?

- A. 12.00
- B. 8.00
- C. 11.04
- D. **5.83**
- E. None of the above; the correct answer is _____.

_____ 19. What is the net income multiplier for this property?

- A. 12.00
- B. 8.00
- C. 11.04
- D. 5.83
- E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 8.33.**

- _____ 20. What is the operating expense ratio for this property?
- A. 14.00%
 - B. 42.86%
 - C. 27.60%
 - D. 8.00%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 30.00%.**
- _____ 21. What is the breakeven ratio for this property?
- A. **0.86**
 - B. 1.25
 - C. 1.16
 - D. 0.80
 - E. None of the above; the correct answer is _____.
- _____ 22. What is the cash-on-cash return for this property?
- A. 8.33%
 - B. 9.06%
 - C. 11.04%
 - D. 12.00%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 10.73%.**
- _____ 23. (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 ALL NAMES USED FOR TROPICAL STORMS THIS YEAR.**
 - C. They are all names of students in this class.
 - D. They are all names of Dr. Longhofer's relatives.
 - E. None of the above; the correct answer is _____.