

Real Estate Investment Analysis
Fall 2005

Final Exam – Solutions

Dr. Stanley D. Longhofer
MW 8:00-9:15

- _____ 1. Which of the following statements is most correct?
- A. Rents are determined in real estate space markets while values are determined in real estate asset markets.
 - B. In real estate asset markets, businesses and individuals buy and lease land and buildings in which they will live and work.
 - C. The economic environment affects the real estate space market more than it does the real estate asset market.
 - D. All of the above statements are correct.
 - E. **NONE OF THE ABOVE STATEMENTS IS CORRECT.**
- _____ 2. Real estate space markets are typically defined by _____.
- A. **GEOGRAPHIC LOCATION, PROPERTY TYPE, AND QUALITY**
 - B. geographic location, size, and owner
 - C. property type, quality, and owner
 - D. geographic location, quality, and owner
 - E. size, property type, and owner
- _____ 3. 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. Treasury securities, corporate bonds
 - C. **CORPORATE BONDS, STOCK MARKET INVESTMENTS**
 - D. stock market investments, corporate bonds
 - E. corporate bonds, Treasury securities
- _____ 4. Suppose that there were a sudden increase in the demand for warehouse space in West Wichita. What would likely happen as a result in the short run?
- A. New space will be developed, causing vacancy rates to rise.
 - B. Rents and vacancy rates will rise.
 - C. **RENTS WILL RISE AND VACANCY RATES WILL FALL.**
 - D. Rents and vacancy rates will fall
 - E. New space will be developed, causing rents to rise.

- _____ 5. What would be the likely long-run impact of the event described in the last question?
- A. **NEW SPACE WILL BE DEVELOPED, CAUSING VACANCY RATES TO RISE.**
 - B. Rents and vacancy rates will rise.
 - C. Rents will rise and vacancy rates will fall.
 - D. Rents and vacancy rates will fall
 - E. New space will be developed, causing rents to rise.
- _____ 6. Which of the following is most relevant for estimating future net operating income on a property that is fully leased with long-term leases?
- A. Market rent
 - B. **CONTRACT RENT**
 - C. Asking rent
 - D. Base rent
 - E. Gross rent
- _____ 7. Which of the following is most relevant for estimating future net operating income on a proposed development project?
- A. **MARKET RENT**
 - B. Contract rent
 - C. Asking rent
 - D. Base rent
 - E. Gross rent
- _____ 8. In a(n) _____, the tenant is responsible for all operating expenses.
- A. gross lease
 - B. **NET LEASE**
 - C. percentage lease
 - D. step lease
 - E. indexed lease
- _____ 9. In a(n) _____, the lease payment changes by a predetermined amount at particular points in time.
- A. gross lease
 - B. net lease
 - C. percentage lease
 - D. **STEP LEASE**
 - E. indexed lease
- _____ 10. True or ***FALSE***: An expense stop limits the tenant's responsibility for increases in operating expenses.

Use the following information to answer the next three questions.

Darci needs to lease 6,000 square feet of office space and is considering space on the fourth floor of a 10-story building. The fourth floor has two other tenants, one with 10,000 square feet of usable area and the other with 8,000 square feet of usable area. The floor common area is 2,000 square feet. The entire building has 260,000 square feet of leaseable space, of which 10,000 is an oversized main lobby on the first floor. The asking rent for this space is \$28 per square foot of rentable area.

- _____ 11. What is the floor load factor for the fourth floor in this building?
- A. 1.10
 - B. 0.92
 - C. 0.08
 - D. 1.08**
 - E. None of the above; the correct answer is _____.
- _____ 12. What is the total load factor for a tenant on the fourth floor?
- A. 1.04
 - B. 1.08
 - C. 1.13**
 - D. 1.10
 - E. None of the above; the correct answer is _____.
- _____ 13. How much total rent per year will Darci be required to pay for this space?
- A. \$168,000
 - B. \$181,440
 - C. \$2,177,280
 - D. \$2,016,000
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS \$189,280.**
- _____ 14. A one-story building has a gross building area of 85,000 square feet, gross leasable area of 80,000 square feet and usable area of 75,000 square feet. What is the building's efficiency percentage?
- A. 93.75%**
 - B. 88.24%
 - C. 94.11%
 - D. 66.67%
 - E. None of the above; the correct answer is _____.

- _____ 15. A parcel of land will be able to generate \$350,000 per year in net operating income if it is developed as a retail property. Current retail market cap rates are 9.25 percent. If the building will cost \$2,000,000 to construct, what is the value of the land under this use?
- A. \$3.784 million
 - B. \$1.784 MILLION**
 - C. \$3.238 million
 - D. \$1.238 million
 - E. None of the above; the correct answer is _____.
- _____ 16. Suppose that the property in the last question is suddenly able to generate 10 percent more net operating income. What is the resulting percentage appreciation in the land value?
- A. 10.00%
 - B. 9.25%
 - C. 13.27%
 - D. 10.81%
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS 21.21%.**

Use the following information to answer the next three questions.

Elizabeth needs to lease 3,000 square feet of space for five years and is considering two different lease alternatives. Option A is a triple-net lease with base rent of \$8.00 per square foot in the first year and steps of \$0.50 per square foot each year thereafter. Option B is a gross lease with base rent of \$11.50 per square foot over the entire life of the lease. Elizabeth's discount rate is 12 percent, and operating expenses are expected to be \$2.50 per square foot in the first year and increase by \$0.25 per square foot per year.

- _____ 17. What is the total effective cost (effective rent) of Option A for Elizabeth?
- A. \$8.00 psf
 - B. \$12.00 psf
 - C. \$8.89 psf
 - D. \$42.65 psf
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS \$11.83 PSF.**
- _____ 18. What is the total effective cost (effective rent) of Option B for Elizabeth?
- A. \$14.50 psf
 - B. \$52.07 psf
 - C. \$14.44 psf
 - D. \$41.41 psf
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS \$11.50 PSF.**

- _____ 19. Which of these two leases entails the most risk for Elizabeth as a tenant?
- A. **OPTION A**
 - B. Option B
 - C. Neither, they both have the same risk
 - D. There is not enough information to determine which has more risk
- _____ 20. True or **FALSE**: Investment value is calculated by dividing a property's net operating income by a market cap rate.

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

Potential gross income	\$1,105,000
– Vacancy & collections	<u>77,350</u>
Effective gross income	1,027,650
– Operating expenses	<u>308,295</u>
Net operating income	719,355
– Annual debt service	<u>625,171</u>
Before-tax cash flow	94,184

This property has a market value of \$9 million and the loan on the property is \$6.75 million amortized over 20 years.

- _____ 21. What vacancy allowance is used in this statement?
- A. 93.00%
 - B. 7.53%
 - C. 30.00%
 - D. 27.90%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 7.00%.**
- _____ 22. What is the cap rate for this property?
- A. 12.51%
 - B. **7.99%**
 - C. 1.05%
 - D. 4.19%
 - E. None of the above; the correct answer is _____.
- _____ 23. What interest rate is the investor paying on this mortgage?
- A. **6.94%**
 - B. 9.26%
 - C. 3.48%
 - D. 7.99%
 - E. None of the above: the correct answer is _____.

- _____ 24. What is the operating expense ratio for this property?
- A. 93.00%
 - B. 90.84%
 - C. 42.86%
 - D. 27.90%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 30.00%.**
- _____ 25. What is the breakeven ratio for this property?
- A. 93.00%
 - B. **90.84%**
 - C. 42.86%
 - D. 27.90%
 - E. None of the above; the correct answer is _____.
- _____ 26. What is the (effective) gross income multiplier for this property?
- A. 11.42
 - B. **8.76**
 - C. 12.28
 - D. 8.14
 - E. None of the above; the correct answer is _____.
- _____ 27. What is the net income multiplier for this property?
- A. 11.42
 - B. 7.99
 - C. 12.28
 - D. 8.76
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 12.51.**
- _____ 28. What is the cash-on-cash return for this property?
- A. **4.19%**
 - B. 8.52%
 - C. 7.99%
 - D. 23.87%
 - E. None of the above; the correct answer is _____.
- _____ 29. Based on this information, this property exhibits _____.
- A. positive financial leverage
 - B. **NEGATIVE FINANCIAL LEVERAGE**
 - C. neutral financial leverage
 - D. There is not enough information to determine financial leverage.

Use the following information to answer the next four questions.

Jen is evaluating a warehouse property that is expected to generate net operating income of \$285,000 next year. This is expected to remain constant for the next ten years, but to increase by 4 percent per year after that. Comparable properties that are ten years older than this warehouse are currently selling at a 12 percent cap rate. Jen's expected holding period is ten years. Jen can purchase this building today for \$2.5 million, and her required rate of return on this investment is 16 percent.

- _____ 30. Estimate the reversion value of this property assuming its value increases by 3 percent per year over the purchase price.
- A. \$2.500 million
 - B. \$2.375 million
 - C. **\$3.360 MILLION**
 - D. \$2.192 million
 - E. None of the above; the correct answer is _____.
- _____ 31. Estimate the reversion value of this property assuming its value is based on a terminal cap rate derived from comparable sales.
- A. \$2.500 million
 - B. \$2.375 million
 - C. \$3.360 million
 - D. \$2.192 million
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS \$2.470 MILLION.**
- _____ 32. Estimate the reversion value of this property using a terminal cap rate assuming constant income growth.
- A. \$2.500 million
 - B. \$2.375 million
 - C. \$3.360 million
 - D. \$2.192 million
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS \$2.470 MILLION.**
- _____ 33. Estimate the reversion value of this property assuming that its value increases by 3 percent per year over its current market value.
- A. \$2.500 million
 - B. \$1.981 million
 - C. **\$2.662 MILLION**
 - D. \$2.192 million
 - E. None of the above; the correct answer is _____.

- _____ 34. Which of the following are NOT typically included as operating expenses when calculating net operating income in a pro forma operating statement? More than one answer may be correct; write down the letter of all correct answers.
- A. The value of the property owner's time spent managing the property
 - B. DEPRECIATION EXPENSES**
 - C. Utilities
 - D. Salaries for cleaning staff
 - E. INCOME TAXES**
 - F. Accounting and legal fees
 - G. MORTGAGE INTEREST**
 - H. MORTGAGE PRINCIPAL**
 - I. THE COST OF REPLACING THE ROOF**
 - J. The cost of restriping the parking lot (i.e., marking the lines for parking spaces)
 - K. Property taxes
 - L. Hazard insurance
 - M. LEASING COMMISSIONS**
- _____ 35. Sara is purchasing a property for \$420,000. The tax assessor estimates the value to be \$400,000, with \$300,000 of the value attributable to improvements. A recent appraisal puts the value at \$500,000 with \$350,000 of the value attributable to improvements. What is the depreciable basis for this property?
- A. \$420,000
 - B. \$294,000
 - C. \$105,000
 - D. \$126,000
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS \$315,000.**
- _____ 36. All other factors being equal, a company would prefer to lease rather than own under which of the following conditions?
- A. The company's ability to effectively use the building is highly sensitive to the level of maintenance.
 - B. THE EXPECTED LIFE OF THE BUILDING FAR EXCEEDS THE COMPANY'S PROJECTED PERIOD OF USE.**
 - C. The company's identity will be strongly attached to the particular location of the building.
 - D. The company needs highly specialized space that requires special modifications to meet its needs.
 - E. All of the above are conditions under which a company will generally prefer to lease a building rather than own it.

Use the following information to answer the next three questions.

You are selling a property for \$12.5 million. Your adjusted basis in the property is \$8.25 million and your transaction costs from the sale will be \$250,000. Your cost recovery allowances on this property have totaled \$1.5 million.

- _____ 37. What is your total gain on this sale?
- A. \$3.50 million
 - B. \$4.00 MILLION**
 - C. \$4.25 million
 - D. \$12.25 million
 - E. None of the above; the correct answer is _____.
- _____ 38. How much of this gain is due to cost recovery (taxed at the 25 percent rate)?
- A. \$250,000
 - B. \$3.50 million
 - C. \$3.75 million
 - D. \$1.75 million
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS \$1.50 MILLION.**
- _____ 39. How much of this gain is due to appreciation (taxed at the 20 percent rate)?
- A. \$3.25 million
 - B. \$1.50 million
 - C. \$3.50 million
 - D. \$4.00 million
 - E. NONE OF THE ABOVE; THE CORRECT ANSWER IS \$2.50 MILLION.**
- _____ 40. You have five years remaining on a 40,000 square foot lease that requires to you pay \$3.50 per square foot next year, with step increases of \$0.25 per square foot in each future year (e.g., \$3.75 in year 2, \$4.00 in year 3, etc.). Comparable space would now cost you \$5.00 per square foot, and you would incur \$100,000 in moving costs if you moved to this new space. Your landlord would like to buy out your lease to redevelop the property. If your opportunity cost of capital is 15%, what is the minimum you would accept to give up your current lease?
- A. \$243,378**
 - B. \$201,129
 - C. \$143,378
 - D. \$301,129
 - E. None of the above; the correct answer is _____.

Use the following information to answer the next seven questions.

Kelly is purchasing an apartment property using a cash downpayment of \$2.5 million and a \$4.5 million mortgage at 6.75 percent interest with a 20-year term and monthly payments. Total closing costs for the purchase include \$250,000 for due diligence and purchase expenses, and 2 points for the mortgage. The property will be put into service on March 1st of next year and the first payment on the mortgage will occur one month later on April 1st.

- _____ 41. What will be Kelly's initial tax basis in this property?
- A. **\$7.25 MILLION**
 - B. \$7.00 million
 - C. \$2.75 million
 - D. \$7.34 million
 - E. None of the above; the correct answer is _____.
- _____ 42. If Kelly's depreciable basis in the property is \$5 million, what is her depreciation allowance in the first tax year?
- A. \$181,818
 - B. \$151,515
 - C. \$174,242
 - D. \$159,091
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS \$143,939.**
- _____ 43. If Kelly's depreciable basis in the property is \$5 million, what is her depreciation allowance in the second tax year?
- A. **\$181,818**
 - B. \$151,515
 - C. \$174,242
 - D. \$159,091
 - E. None of the above; the correct answer is _____.
- _____ 44. How much will Kelly be allowed to claim as amortized expenses in the first tax year?
- A. \$90,000
 - B. \$4,500
 - C. **\$3,375**
 - D. \$7,000
 - E. None of the above; the correct answer is _____.

- _____ 45. How much will Kelly be allowed to claim as amortized expenses in the second tax year?
- A. \$90,000
 - B. \$4,500**
 - C. \$3,375
 - D. \$7,000
 - E. None of the above; the correct answer is _____.
- _____ 46. How much will Kelly be allowed to claim as an interest expense in the first tax year?
- A. \$300,382
 - B. \$250,837
 - C. \$303,750
 - D. \$225,986**
 - E. None of the above; the correct answer is _____.
- _____ 47. How much will Kelly be allowed to claim as an interest expense in the second tax year?
- A. \$292,708
 - B. \$294,675**
 - C. \$303,750
 - D. \$294,023
 - E. None of the above; the correct answer is _____.
- _____ 48. Andee is purchasing an office building for \$1.2 million. Expected first-year NOI is \$96,000. Lamb Mortgage will provide 25-year financing at 7.50% interest; Lamb requires a 70 percent loan-to-value ratio and a 1.30 debt-coverage ratio (DCR). Based on this information, what is the largest loan Lamb will provide?
- A. \$840,000
 - B. \$832,736**
 - C. \$1,407,324
 - D. \$9,992,833
 - E. None of the above; the correct answer is _____.
- _____ 49. Based on the loan amount you calculated in the previous question, what is Andee's DCR?
- A. 1.30**
 - B. 1.29
 - C. 0.78
 - D. 7.50
 - E. None of the above; the correct answer is _____.

Use the following information to answer the next three questions.

The one-year Treasury security is currently price to yield 5.75 percent, while the long-term risk premium for investment grade real estate is approximately 3.50 percent. Investment-grade properties are currently selling at an 8.00 percent cap rate. Income growth is expected to be approximately 4.00 percent per year, while capital expenditures on investment-grade real estate run at about 1.50 percent. Smaller, class B and C properties demand an additional 1.50 percent risk premium.

- _____ 50. Estimate the discount rate for investment-grade real estate using the risk premium method.
- A. 9.25%
 - B. 8.00%
 - C. 12.00%
 - D. 10.50%
 - E. None of the above; the correct answer is _____.
- _____ 51. Estimate the discount rate for investment-grade real estate using the cap rate method.
- A. 9.25%
 - B. 8.00%
 - C. 12.00%
 - D. 10.50%
 - E. None of the above; the correct answer is _____.
- _____ 52. Estimate the discount rate for smaller, class B and C real estate using the risk premium method.
- A. 9.25%
 - B. 8.00%
 - C. 12.00%
 - D. 10.50%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 10.75%.**
- _____ 53. Two years ago, Amber entered into a 10-year lease on 3,500 square feet of space at \$15.00 per square foot. Now, comparable space leases for \$18.00 per square foot. What is the value of Amber's leasehold interest at a 12 percent discount rate?
- A. (\$52,160)
 - B. **\$52,160**
 - C. (\$59,327)
 - D. \$59,327
 - E. None of the above; the correct answer is _____.

Use the following information to answer the next four questions.

Five years ago, Ashleigh purchased an office building with a net cash investment of \$675,000. The table below shows the after-tax cash flows the property generated over the past five years, as well as the forecasted after-tax cash flows over the next five years:

<u>Year</u>	<u>ATCF</u>	<u>Year</u>	<u>ATCF</u>
1	\$40,000	6	\$50,000
2	40,000	7	50,000
3	40,000	8	50,000
4	40,000	9	50,000
5	40,000	10	50,000

Ashleigh now (at the end-of-year five) has the opportunity to sell this property with an expected after-tax equity reversion of \$1.4 million. Alternatively she can wait to sell it in five more years and receive an after-tax equity reversion of \$2 million.

- _____ 54. If Ashleigh sells today, what is her ex-post return from this investment?
- A. 107.41%
 - B. 15.71%
 - C. 21.44%
 - D. 14.99%
 - E. **NONE OF THE ABOVE; THE CORRECT ANSWER IS 20.28%.**
- _____ 55. What will Ashleigh's ex post return be if she waits to sell the property until year 10?
- A. **15.73%**
 - B. 14.99%
 - C. 10.52%
 - D. 107.41%
 - E. None of the above; the correct answer is _____.
- _____ 56. If Ashleigh waits to sell the property, what is her marginal return from holding the property?
- A. 15.73%
 - B. 14.99%
 - C. **10.52%**
 - D. 107.41%
 - E. None of the above; the correct answer is _____.

- _____ 57. Suppose Ashleigh could sell the property at the end of the 6th year for \$1.9 million. What is her incremental return from holding the property one more year?
- A. 39.29%
 - B. 38.57%
 - C. 7.76%
 - D. 22.91%
 - E. None of the above; the correct answer is _____.

In class we discussed the three types of cash flows that must be considered when analyzing sale-leasebacks and the lease-versus-own decision: initial cash flows, operating cash flows, and terminal cash flows.

- _____ 58. Which of the following statements are correct with respect to the sale-leaseback decision? More than one answer may be correct; write down the letters of all correct answers.
- A. If you do the sale-leaseback, your initial cash flow will be zero.
 - B. IF YOU DECIDE TO KEEP YOUR PROPERTY AND NOT DO THE SALE-LEASEBACK, THE TERMINAL CASH FLOW WILL BE THE AFTER-TAX EQUITY REVERSION FROM SELLING THE PROPERTY.
 - C. IF YOU DO THE SALE-LEASEBACK, YOUR OPERATING CASH FLOWS WILL BE THE AFTER-TAX COST OF YOUR LEASE PAYMENTS AND ANY OPERATING EXPENSES YOU MUST PAY.
 - D. IF YOU DECIDE TO KEEP YOUR PROPERTY AND NOT DO THE SALE-LEASEBACK, YOUR INITIAL CASH FLOW WILL BE ZERO.
 - E. If you do the sale-leaseback, the terminal cash flow will be the after-tax equity reversion from selling the property.
 - F. If you decide to keep your property and not do the sale-leaseback, your operating cash flows will be zero.
- _____ 59. Which of the following statements are correct with respect to the lease-versus-own decision? More than one answer may be correct; write down the letters of all correct answers.
- A. IF YOU LEASE THE PROPERTY, YOUR INITIAL CASH FLOW WILL BE ZERO.
 - B. If you own the property, your initial cash flow will be zero.
 - C. If you lease the property, your operating cash flows will include depreciation and interest expenses.
 - D. If you own the property, your operating cash flows will include the lease payment.
 - E. If you own the property, your terminal cash flow will be zero.
 - F. IF YOU LEASE THE PROPERTY, YOUR TERMINAL CASH FLOW WILL BE ZERO.

- _____ 60. (Freebe) What do all of the names used in this exam have in common?
- A. They are all members of the WSU volleyball team.
 - B. They all have good reason to be angry at the NCAA selection committee.
 - C. They all learned this season that sometimes life isn't fair.
 - D. They are outstanding examples of sportsmanship and class.
 - E. **ALL OF THE ABOVE.**