

Real Estate Investment Analysis
Fall 2002

Final Exam – Version A – Solutions

Dr. Stanley D. Longhofer

Tu-Th 11:00-12:15

Multiple Choice/True-False Questions (2 points each)

- _____ 1. Net operating income measures the
- A. before-tax cash flow available to equity investors.
 - B. after-tax cash flow available to equity investors.
 - C. **CASH AVAILABLE TO DISTRIBUTE TO ALL OF THE INVESTORS.**
 - D. gross income generated by the investment.
 - E. anticipated sale price of the property.
- _____ 2. A lease in which the tenant pays some or all of the operating expenses associated with the property is known as a
- A. **NET LEASE.**
 - B. gross lease.
 - C. percentage lease.
 - D. indexed lease.
 - E. expense lease.
- _____ 3. **TRUE** or False: The discount rate used to evaluate an investor's after-tax cash flows should reflect the return he or she could typically expect to earn on other investments with similar risk.
- _____ 4. Suppose an office building recently sold at a 9 percent cap rate, while other office buildings in the market have been selling at a 10 percent cap rate. Which of the following statements is most true.
- A. Investors appear to believe this building is riskier than other office buildings in the market.
 - B. Investors appear to believe that net operating income for this property will increase at a slower rate than it will for other office buildings in the market.
 - C. Investors appear to believe that operating expenses for this property will be higher than they will for other office buildings in the market.
 - D. **THE SALE PRICE OF THIS BUILDING WAS HIGHER THAN THAT OF OTHER OFFICE BUILDINGS WITH SIMILAR NET OPERATING INCOME.**
 - E. Cap rates give us no information on which to evaluate the quality of the investment opportunity.

Use the following information to answer the next four questions.

Peter is purchasing an office building for \$27 million. Iscariot Financial will provide 70 percent LTV financing for this purchase. This will be a 10-year balloon mortgage amortized over 20 years with monthly payments at an interest rate of 7.25 percent. The first payment on this mortgage will be due on March 1st.

- _____ 5. What will be the annual debt service on this mortgage?
- A. \$149,381
 - B. \$1,792,572**
 - C. \$213,402
 - D. \$2,560,818
 - E. \$1,818,838
- _____ 6. How much interest will Peter pay during the first tax year? (Assume that the tax year corresponds with the calendar year.)
- A. \$1,132,151**
 - B. \$1,355,930
 - C. \$1,617,359
 - D. \$1,937,043
 - E. \$1,141,875
- _____ 7. How large will the balloon payment be at the end of the loan's term?
- A. \$23,377,171
 - B. \$16,364,020
 - C. \$12,723,998**
 - D. \$18,177,140
 - E. \$0
- _____ 8. If the Iscariot charges three points to originate this loan and Peter intends to hold the loan for five years, what is the effective borrowing cost of this mortgage?
- A. 8.03%**
 - B. 7.65%
 - C. 7.74%
 - D. 7.38%
 - E. 7.25%

Use the following information to answer the next three questions:

Thaddaeus has purchased an office property with a \$4 million cash down payment and a \$6 million mortgage at 7.5 percent interest with a 10-year term and monthly payments amortized over 20 years. Total closing costs for the purchase included \$250,000 for due diligence and purchase expenses, and 2 points for the mortgage. It will be put into service on January 1 of next year.

- _____ 9. What the initial tax basis for this property?
- A. **\$10.25 MILLION**
 - B. \$10.00 million
 - C. \$10.37 million
 - D. \$4.25 million
 - E. \$4.37 million
- _____ 10. If the total depreciable basis is \$8 million, what is the depreciation allowance for the first tax year?
- A. \$205,128
 - B. **\$196,581**
 - C. \$290,909
 - D. \$278,788
 - E. \$179,487
- _____ 11. How much will Thaddaeus be allowed to claim as amortized expenses in the first tax year?
- A. \$120,000
 - B. **\$12,000**
 - C. \$6,000
 - D. \$10,000
 - E. \$20,000
- _____ 12. Simon is purchasing a retail center for \$14 million. Expected first-year net operating income for this center is \$1.25 million. Iscariot Financial will provide 25-year, 8.75 percent fixed rate financing with monthly payments, a maximum loan-to value ratio of 80 percent, and a minimum debt-coverage ratio of 1.30. Based on these terms, what is the maximum loan amount Simon can expect?
- A. \$11,200,000
 - B. **\$9,746,254**
 - C. \$116,955,045
 - D. \$10,136,104
 - E. \$16,471,169

- _____ 13. Andrew is analyzing a 300,000 square foot industrial property that he can purchase for \$7.65 million. Similar space in the area rents for \$4.50 per square foot, and the current market vacancy rate for industrial properties is 15 percent. Andrew anticipates a 20 percent operating expense ratio for this property. Financing is available with required annual debt service of \$750,000. Based on this information, what is the cap rate for this property?
- A. 2.2%
 - B. 14.1%
 - C. 15.0%
 - D. 8.3%
 - E. 12.0%**

Use the following information to answer the next three questions:

Nathanael owns an office building with a gross building area of 240,000 square feet. This building has 216,000 square feet of gross leasable area. Space in this building rents for \$14 per square foot. All common areas are attributed to tenants on a pro rata basis.

- _____ 14. What is the add-on factor for this building?
- A. 90.00
 - B. 1.11**
 - C. 9.00
 - D. 0.11
 - E. 10.00
- _____ 15. If Philip rents an office in this building with 3,500 square feet of usable area, how much space will he have for his exclusive use?
- A. 3,850 square feet
 - B. 3,185 square feet
 - C. 3,150 square feet
 - D. 3,885 square feet
 - E. 3,500 SQUARE FEET**
- _____ 16. How much will Philip pay annually in rent for this space?
- A. \$39,900
 - B. \$44,590
 - C. \$44,100
 - D. \$54,390**
 - E. \$49,000

Use the following information to answer the next three questions.

James is selling a property for \$14.25 million. His adjusted basis in the property is \$9 million and his transaction costs for the sale will be \$700,000. His depreciation allowances on this property have totaled \$1.5 million

- _____ 17. What is James' total gain on this sale?
- A. **\$4.55 MILLION**
 - B. \$5.25 million
 - C. \$3.05 million
 - D. \$12.05 million
 - E. \$6.05 million
- _____ 18. How much of James' gain is due to cost recovery (taxed at the 25 percent rate)?
- A. **\$1.5 MILLION**
 - B. \$700,000
 - C. \$7.5 million
 - D. \$800,000
 - E. \$3.05 million
- _____ 19. How much of James' gain is due to appreciation (taxed at the 20 percent rate)?
- A. \$1.5 million
 - B. \$700,000
 - C. \$7.5 million
 - D. \$800,000
 - E. **\$3.05 MILLION**
- _____ 20. John has active (salary) income of \$175,000. In addition, he has one rental property that generated positive income of \$30,000 and a second rental property that generated a loss of \$10,000. He also has \$15,000 of unused passive losses that he has carried forward from prior years. Which of the following statements is most correct?
- A. **JOHN'S TAXABLE INCOME IS \$180,000 AND HE HAS NO PASSIVE LOSSES TO CARRY-FORWARD.**
 - B. John's taxable income is \$175,000 and he has a passive loss carry-forward of \$15,000.
 - C. John's taxable income is \$205,000 and he has a passive loss carry-forward of \$25,000.
 - D. John's taxable income is \$195,000 and he has a passive loss carry-forward of \$15,000.
 - E. None of the above statements are correct.

- _____ 21. Levi is purchasing a property for \$560,000, including transaction costs. The tax assessor estimates the value to be \$500,000, with \$425,000 of the value attributable to improvements. A recent appraisal puts the value at \$550,000 with \$495,000 of the value attributable to improvements. What is the depreciable basis for this property?
- A. \$495,000
 - B. \$476,000
 - C. \$560,000
 - D. \$425,000
 - E. **\$504,000**
- _____ 22. Bartholomew owns an investment property that has generated a tax loss in each of the seven years he has owned it. As he had no other passive income against which to offset these losses, he has accumulated a sizable passive loss carry-forward. What will happen to these unclaimed losses when he sells the property?
- A. Bartholomew must forfeit the unused passive losses.
 - B. Bartholomew may immediately claim the losses to offset active income in the year of sale.
 - C. The passive losses reduce Bartholomew's gain from the sale of the property, but cannot be used to generate a capital loss.
 - D. **THE PASSIVE LOSSES REDUCE BARTHOLOMEW'S GAIN FROM THE SALE OF THE PROPERTY, AND CAN BE USED TO GENERATED A CAPITAL LOSS ON THE PROPERTY.**
 - E. The passive losses must be carried forward to use against passive income from other real estate investments.
- _____ 23. This year Thomas will have salary income of \$140,000, and he has a rental property that will generate a loss of \$35,000. Thomas is an "active participant" in this investment, so he is eligible for the rental real estate loss allowance. Which of the following statements is most correct?
- A. Thomas' total taxable income for this year will be \$105,000 and he will have no passive loss carry-forward.
 - B. Thomas' real estate loss allowance will be \$20,000. He must carry-forward the remaining \$15,000 in losses.
 - C. **THOMAS' REAL ESTATE LOSS ALLOWANCE WILL BE \$5,000. HE MUST CARRY-FORWARD THE REMAINING \$30,000 IN LOSSES.**
 - D. Thomas' total taxable income for the year will be \$140,000, and he must carry forward the entire \$35,000 in losses.
 - E. None of the above statements are correct.
- _____ 24. True or **FALSE**: The same discount rate should be used to value both NOI and after-tax cash flows from a property.

Use the following information to answer the next two questions.

James has sold an office building under the following terms. The buyer will pay \$600,000 cash today and assuming James' existing first mortgage note of \$1.2 million. In addition, James will carry a \$600,000 second mortgage note for one year at 10 percent simple interest. James' costs from the sale will be \$200,000 and his adjusted basis in the property is \$1.3 million.

- _____ 25. What is James' profit ratio on this sale?
- A. 75.00%
 - B. 1.33%
 - C. 91.67%
 - D. 1.64%
 - E. 100%
- _____ 26. How much gain on this sale must James recognize this year?
- A. \$450,000
 - B. \$600,000
 - C. \$150,000
 - D. \$550,000
 - E. \$900,000
- _____ 27. All other factors being equal, a company would prefer to own rather than lease under which of the following conditions?
- A. The expected life of the building far exceeds the company's projected period of use.
 - B. The real estate investment represents a large proportion of the company's total capital.
 - C. The company's ability to effectively use the facility is not highly sensitive to the level of maintenance.
 - D. THE COMPANY'S IDENTITY WILL BE STRONGLY ATTACHED TO THE PARTICULAR LOCATION OF THE BUILDING.
 - E. The company is able to use generic space without requiring special modifications to meet its needs.
- _____ 28. TRUE or False: All else equal, leasing is generally preferred to owning if a company's space requirements are far less than the optimal development on a given site.
- _____ 29. True or FALSE: Due diligence is a risk-management strategy used by mortgage lenders that involves checking the credit history of a prospective borrower to see if has has been past due on any loans in the past.

- _____ 30. **TRUE** or False: Managers may have the incentive to do a sale-leaseback to recognize a capital gain when they want to show an increase in earnings per share.

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

Potential gross income	\$3,500,000
– Vacancy & collections	<u>262,500</u>
Effective gross income	3,237,500
– Operating expenses	<u>1,456,875</u>
Net operating income	1,780,625
– Annual debt service	<u>1,369,712</u>
Before-tax cash flow	\$ 380,913

This property has a market value of \$11.87 million.

- _____ 31. What is this property's cap rate?
- A. 6.67%
 - B. 15.00%**
 - C. 3.39%
 - D. 29.49%
 - E. 2.77%
- _____ 32. What is the debt-coverage ratio for this property?
- A. 8.67
 - B. 1.30**
 - C. 76.92
 - D. 87.31
 - E. 1.15
- _____ 33. What is the net income multiplier for this property?
- A. 6.67**
 - B. 15.00
 - C. 3.39
 - D. 29.49
 - E. 2.77
- _____ 34. What is the operating expense ratio for this property?
- A. 45.00%**
 - B. 41.63%
 - C. 87.31%
 - D. 15.00%
 - E. 2.22%

- _____ 35. What is the breakeven ratio for this property?
- A. 8.67%
 - B. 1.30%
 - C. 76.92%
 - D. 87.31%**
 - E. 1.15%

Use the following information to answer the next three questions.

A real estate investment will cost \$1.3 million and is expected to generate operating cash flows of \$250,000 in year 1, \$300,000 in year 2, (\$50,000) in year 3, \$350,000 in year 4, and \$400,000 in year 5. At the end of year 5, the property can be sold for \$1.5 million.

- _____ 36. What is the NPV of this investment assuming a 15 percent discount rate?
- A. (\$423,906)
 - B. \$321,860
 - C. (\$489,657)
 - D. \$256,108**
 - E. \$1,450,000

- _____ 37. What is the internal rate of return on this investment?
- A. 21.87%
 - B. 15.00%
 - C. (1.18%)
 - D. 1.17%
 - E. 20.48%**

- _____ 38. Assuming a reinvestment rate of 15 percent and a safe rate of 6 percent, how much capital will accumulate from this investment by the end of date 5?
- A. \$3,124,277**
 - B. \$3,129,890
 - C. \$515,126
 - D. \$509,513
 - E. None of the above

Use the following information to answer the next three questions:

Matthew owns an apartment building with a fair market value of \$12 million and an adjusted tax basis of \$9 million. His outstanding mortgage balance on this property is \$7 million.

He would like to exchange this property for a shopping center owned by John. The shopping center has a fair market value of \$14 million and John's adjusted basis in it is \$11 million. John's outstanding mortgage balance is \$6 million.

- _____ 39. If cash will be used to balance the equities, who must pay how much cash to whom on this exchange?
- A. John must pay Matthew \$3 million in cash to balance the equities.
 - B. MATTHEW MUST PAY JOHN \$3 MILLION IN CASH TO BALANCE THE EQUITIES.**
 - C. John must pay Matthew \$8 million in cash to balance the equities.
 - D. Matthew must pay John \$5 million in cash to balance the equities.
 - E. Neither need pay any cash; the equities are already balanced.
- _____ 40. What is Matthew's realized gain from this exchange?
- A. \$5 million
 - B. \$1 million
 - C. \$12 million
 - D. \$3 MILLION**
 - E. \$2 million
- _____ 41. What is Matthew's substitute basis in his new property after this exchange?
- A. \$14 million
 - B. \$13 million
 - C. \$12 MILLION**
 - D. \$11 million
 - E. \$10 million
- _____ 42. An office building is expected to generate NOI of \$475,000 per year in each of the next five years and can be sold for \$5 million at the end of five years. If the appropriate discount rate for the property's cash flows is 12 percent, what is the market value of this property?
- A. \$4,549,403**
 - B. \$1,712,269
 - C. \$2,375,000
 - D. \$7,375,000
 - E. \$4,905,230

Use the following information to answer the next three questions.

Zebedee, Inc. is planning to move to a larger office and is trying to decide if the new office should be owned or leased. Cash flows for owning versus leasing are estimated as follows. Assume that the cash flows from operations will remain level over a 10 year holding period. Startup costs for occupying the new space, including furniture and equipment, are estimated to be \$500,000.

If the office is purchased, the company will invest \$385,000 in equity and finance the remainder with an interest-only loan that has a balloon payment due in year 10. The after-tax cash flow from sale of the property at the end of year 10 is expected to be \$750,000.

	<u>Own</u>	<u>Lease</u>
Sales	\$1,000,000	\$1,000,000
Cost of goods sold	(500,000)	(500,000)
Gross income	500,000	500,000
Operating expenses:		
Business operations	(130,000)	(130,000)
Real estate operations	(60,000)	(60,000)
Lease payments	0	(120,000)
Interest	(90,000)	0
Depreciation	(35,000)	<u>0</u>
Taxable income	185,000	190,000
Tax	(55,500)	(57,000)
Income after tax	129,500	133,000
Plus: Depreciation	<u>35,000</u>	<u>0</u>
After-tax cash flow	164,500	133,000

_____ 43. What is the return Zebedee will earn from operations if it owns this space?

- A. 33.87%
- B. 17.93%**
- C. 13.26%
- D. 41.39%
- E. 43.85%

_____ 44. What is the return Zebedee will earn from operations if it leases this space?

- A. 33.87%
- B. 13.26%
- C. 23.33%**
- D. 9.51%
- E. (3.49%)

- _____ 45. What is the incremental return on equity to Zedebee if the property is owned instead of leased?
- A. 33.87%
 - B. 13.26%**
 - C. 23.33%
 - D. 9.51%
 - E. (3.49%)
- _____ 46. Simon owns a shopping center with a market value of \$2.00 million. He estimates that his investment value from this property is \$2.35 million. Which of the following statements is most correct?
- A. Simon should sell this center because his investment value is higher than the market value.
 - B. SIMON SHOULD HOLD ON TO THIS PROPERTY BECAUSE HIS INVESTMENT VALUE IS HIGHER THAN THE MARKET VALUE.**
 - C. Simon will likely be able to sell this property for \$2.35 million.
 - D. Simon should sell this property because the “typical” investor will likely value it even more than he does.
 - E. None of the above statements are correct.

Use the following information to answer the next three questions.

Andrew is trying to determine the appropriate discount rate for analyzing a Class A apartment property. He has established the following information:

The current T-bill rate is 4.25 percent.

The current market risk premium for similar apartment properties is 5.00 percent.

The market cap rate for similar apartment properties is 8.50 percent.

Mortgage financing is available at 7.25 percent with a 70 percent LTV ratio.

Expected inflation will be approximately 2.50 percent for the indefinite future.

Capital improvement expenses are expected to average 1.00 percent per year.

- _____ 47. What is the estimated discount rate for the property using the risk-premium approach?
- A. 9.25%**
 - B. 5.00%
 - C. 8.50%
 - D. 8.25%
 - E. 10.00%

- _____ 48. What is the estimated discount rate for the property using the cap rate approach?
- A. 8.50%
 - B. 11.00%
 - C. 10.00%**
 - D. 12.75%
 - E. 9.25%
- _____ 49. If the appropriate discount rate for the property as a whole is 9.50 percent, estimate Andrew's required before-tax discount rate as an equity investor in this property.
- A. 14.75%**
 - B. 9.50%
 - C. 7.25%
 - D. 48.58%
 - E. 10.46%
- _____ 50. Matthias is considering purchasing a retail center. He has found a lender willing to provide a \$3.5 million mortgage on the property. If he purchases it, he anticipates after-tax cash flows of \$100,000 in each of the next five years, and that his after-tax equity reversion will be \$900,000 in the fifth year. Assuming that his required after-tax equity discount rate for this property is 16 percent, what is the investment value of this property to Matthias?
- A. \$755,931
 - B. \$4,255,931**
 - C. \$327,429
 - D. \$3,827,429
 - E. \$871,162