

RE 618 / Fin 618 – Real Estate Investment Analysis
Taxation – Practice Problems – Solutions

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- 1) You are considering investing in a commercial office building with 120,000 square feet of gross leasable area. Current market office rents in the area of this building are \$11 per square foot gross, and the current market vacancy rate is 6 percent. The appropriate operating expense ratio is 45 percent. The asking price for the building is \$8 million, but you believe you can negotiate the price down to \$7.5 million. You expect to incur closing costs of about 2 percent of the purchase price in order to acquire this property.

The property tax assessor currently estimates that 15 percent of the property's value is attributable to the land. You also have a recent private appraisal that valued the property at \$6 million, \$800,000 of which was attributable to the land.

You expect that rents and operating expenses will increase at roughly the same rate as overall inflation (expected to be 2.5 percent per year for the foreseeable future).

Financing is available with a 10-year balloon loan amortized over 20 years at 7.00 percent interest with monthly payments. The lender's maximum LTV ratio is 70 percent and its minimum DCR is 1.25. The lender will charge 2 points in conjunction with this loan.

If you purchase this property, you will put it into service on January 1 of next year and will hold it for 5 years (until December 31 of the fifth year). At the end of your holding period, you expect that you will be able to sell it at a cap rate of 9.50 percent; you will incur selling costs of 5 percent of the selling price.

Your current marginal tax rate is 28 percent. Capital gains will be taxed at 15 percent, while depreciation recapture will be taxed at 25 percent.

Assuming a 12 percent discount rate, calculate the after-tax NPV and IRR associated with this purchase? Is it a good investment? Explain.

- 2) You are considering purchasing an investment property. The proposed terms of sale require you to pay \$2 million up front, obtain a \$10 million first-mortgage from a life-insurance company, and the seller will carry an addition \$3 million note on the property.

Your expected closing costs for this transaction will be \$100,000 for due diligence and other purchase expenses, and \$200,000 in points to the first mortgage lender.

You expect to close this transaction and put the property into service on February 1st of 2004. You expect to hold the property through the end of 2009 (December 31st).

- a) What is the total purchase price of this property?

The total purchase price is \$2,000,000 + \$10,000,000 + \$3,000,000 = \$15,000,000.

- b) What is your initial tax basis in this property?

The initial tax basis is the total purchase price plus all closing costs related to the sale of the property. Note that the mortgage-related charges are not a part of the initial tax basis. Thus, the initial basis is $\$15,000,000 + \$100,000 = \$15,100,000$.

- c) According to the tax assessor's office, the improvements on this property are worth \$8 million, while the land is worth \$2 million. The appraisal done for your lender indicated a total value of \$15 million, with \$1.5 million of this attributable to the land. Given this information and your answer to part (b) above, what is your depreciable basis in this property?

The tax assessor puts 80% of the value in the improvements, while the professional appraisal indicates that the building accounts for 90% of the value. Since you want as much value allocated to the (depreciable) improvements as possible, use the appraiser's ratio.

Thus, your depreciable basis is $0.90 \times \$15,100,000 = \$13,590,000$.

- d) If this property is an office building, what will be your depreciation allowance in each of the calendar years you own the property? (Hint: You will own the property in six different calendar years.)

Commercial property is depreciated over 39 years, using the mid-month convention in the years of acquisition and sale.

$$2004: \$13,590,000 \div 39 \times 10.5 \div 12 = \$304,904$$

$$2005: \$13,590,000 \div 39 = \$348,462$$

$$2006: \$13,590,000 \div 39 = \$348,462$$

$$2007: \$13,590,000 \div 39 = \$348,462$$

$$2008: \$13,590,000 \div 39 = \$348,462$$

$$2009: \$13,590,000 \div 39 \times 11.5 \div 12 = \$333,942$$

- e) If this property is an apartment property, what will be your depreciation allowance in each of the calendar years you own the property?

Apartment properties are depreciated over 27.5 years.

$$2004: \$13,590,000 \div 27.5 \times 10.5 \div 12 = \$432,409$$

$$2005: \$13,590,000 \div 27.5 = \$494,182$$

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$$2008: \$13,590,000 \div 27.5 = \$494,182$$

$$2009: \$13,590,000 \div 27.5 \times 11.5 \div 12 = \$473,591$$

- f) At any point in time, your *adjusted basis* in this property is simply your total *initial* basis minus any allowable depreciation. For both of parts (c) and (d) above, what is your adjusted basis in this property at the time of sale (December 31, 2009)?

If it is an office property, your adjusted basis at the time of sale will be $\$15,100,000 - \$304,904 - \$348,462 \times 4 - \$333,942 = \$13,067,306$.

If it is an apartment property, your adjusted basis at the time of sale will be
 $\$15,100,000 - \$432,409 - \$494,182 \times 4 - \$473,591 = \$12,217,272$.

- 3) You are evaluating the purchase of an apartment complex in Houston, TX. This complex has 150 units that will command average monthly rents of \$1,000 apiece in the coming year. The current market vacancy rate for similar upscale apartments in Houston is 5 percent, and you expect this to remain fairly constant in the near future. Operating expenses for the property are approximately 25 percent of effective gross income (gross operating income); both rents and operating expenses are expected to grow at the same rate as general inflation (2.5 percent per year).

The asking price for this property is \$16 million, and you expect your due-diligence and other sale costs will run approximately 2 percent of your purchase price. A recent appraisal indicated that the improvements on this property are worth \$12 million while the land is worth \$3 million; the tax assessor indicates that the improvements are worth \$10.2 million while the land is worth \$1.8 million.

You can finance this purchase with an 80 percent LTV, 10-year balloon loan with 6.75 percent interest that amortizes over 20 years. You will be charged a 2.5 point origination fee by the lender for this loan.

You anticipate holding this property for 5 years, putting it into service on January 1, 2004. You expect to sell it on December 31st, 2008 at a 9 percent cap rate, with selling costs of 6 percent of the gross sale price.

You are in the 35 percent marginal tax bracket for ordinary income; capital gains will be taxed at 20 percent and depreciation recapture will be taxed at the 25 percent rate.

- a) Calculate the after-tax IRR and NPV of this investment if you pay the asking price for the property assuming that you have other passive activities against which you can offset any tax losses.

See the accompanying PDF file.

- b) Calculate the NPV and IRR of this investment assuming that this is your only passive investment so that you must carry forward passive losses.

See the accompanying PDF file.

- 4) Dave is analyzing an apartment investment with the following characteristics:

- NOI for the next six years is expected to be \$140,000, \$140,000, \$125,000, \$125,000, \$140,000, and \$155,000, respectively.
- Financing is available with a 5-year balloon loan amortized over 30 years with 9 percent interest. The maximum loan amount is based on a 75 percent LTV ratio, and the lender will require Dave to pay 2.5 points to originate the loan.
- The property can be purchased for \$1.3 million, and Dave will incur an additional \$50,000 in transaction costs in purchasing the property.
- Ninety percent of the property's value is attributable to improvements.
- The property will be put into service on January 1 of next year (assume that the first mortgage payment will be due on January 1 as well).

- Dave will hold the property for 5 years, after which time he will sell it at a 9% cap rate based on year six expected NOI. Dave expects to incur selling costs of 7.5 percent of the gross sale price.
- Dave's ordinary income is taxed at the 27 percent rate, capital gains are taxed at 20 percent, and gains due to cost recovery are taxed at the 25 percent rate. In addition, Dave has no other passive investments and he does not qualify for the rental real estate loss allowance.
- Dave requires a 12 percent after-tax return on his real estate investments.

Calculate the before-tax and after-tax cash flows from operations for this property for each of the next five years. Also calculate the before-tax and after-tax equity reversion for this property. Using this information, calculate the after-tax NPV and IRR for this investment. Based on this analysis, is this a good investment for Dave?

See the accompanying PDF file.

- 5) Cougar Irons is a professional cricket player who has sought your advice about investing in real estate to diversify his financial situation and earn competitive returns. You promptly arrange a consultation, at which time you obtain a retainer and determine the following facts:
- a) Irons' earnings from his athletic endeavors are sufficient to place him firmly in the 35 percent marginal income tax bracket. He expects this situation to continue into the indefinite future.
 - b) Long-term capital gains are expected to be taxed at a 20 percent marginal tax rate, with gains from cost recovery to be taxed at the 25 percent rate.
 - c) Irons has other investments, but is in no danger of incurring liability for the alternative minimum tax.

You investigate several properties that seem to fit Irons' needs and conclude that one seems particularly well suited to his investment picture. Information on the property, an office building, is as follows:

- The property has 125,000 gross leasable area and currently commands gross rents of \$20 per square foot.
- Market vacancy rates for similar office space are currently at 10 percent and are expected to remain at this level for the indefinite future.
- Operating expenses are expected to run at 50 percent of effective gross income.
- Rents and operating expenses are expected to increase by 3 percent per year for the indefinite future.
- The property can be purchased for \$14 million. The tax assessor has estimated its value as \$10 million, \$1.2 million of which is attributable to the land. A recent professional appraisal put the value at \$15 million, \$2.25 million of which is attributable to the land.

- Mortgage financing is available at 7.25 percent interest with a 10-year balloon loan amortized over 25 years with monthly payments. The lender requires a minimum 1.25 debt-coverage ratio and is willing to make loans for up to 70 percent of the property's value. The lender will charge 3 points to originate this loan, but no penalty for prepayment.
- If Irons acquires the property, she he will most likely sell it after 5 years and pay off the balance of the mortgage note out of the sales proceeds. Assume that the property will be sold at an 8 percent cap rate at that time.
- Transaction costs associated with disposal after 5 years (at the end of his 5th year of ownership) are expected to be about 8 percent of the sales price.

Required:

- a) Calculate the before-tax and after-tax operating cash flows for this property for the entire 5-year holding period. Assume for simplicity that the property would be put into service on January 1, 2003 and that the first mortgage payment would be due on that day as well. Hence, you will receive a full year's worth of rent in the first year, and will make a full year's worth of interest payments during that year as well.
- b) Calculate the before-tax and after-tax equity reversion from the sale of the property. Assume that capital gains are taxed at a 15 percent rate, while gains due to cost recovery are taxed at 25 percent.
- c) Calculate the after-tax NPV and IRR for this investment. Assume a discount rate of 10 percent.

See accompanying PDF file.

- _____ 1. You have purchased a property using a \$200,000 cash down payment and a \$600,000 mortgage. In this transaction, you paid \$40,000 in closing costs and due diligence expenses and \$18,000 in loan fees. What is your initial tax basis in this property?
- A. \$240,000
 - B. \$800,000
 - C. **\$840,000**
 - D. \$858,000
- _____ 2. You have purchased a property with an initial tax basis of \$1.2 million. The County Appraiser currently has the property assessed at \$900,000, with \$150,000 of this value attributable to land. A recent appraisal placed the value of the property at \$1.1 million, with \$100,000 of the value attributable to land. What is your depreciable basis in this property?
- A. \$1.2 million
 - B. \$1 million
 - C. \$109,000
 - D. **\$1.091 MILLION**
- _____ 3. You have purchased a retail center in which your depreciable basis is \$2.5 million. This property was placed into service on October 1 of this year. How much is your depreciation allowance this year?
- A. **\$13,350**
 - B. \$64,100
 - C. \$90,900
 - D. \$18,950
- _____ 4. How much is the depreciation allowance in this property during the second year?
- A. \$13,350
 - B. **\$64,100**
 - C. \$90,900
 - D. \$18,950
- _____ 5. **TRUE** or False: Residential properties receive more favorable tax treatment than commercial properties?

- _____ 6. To purchase a property you took out a \$600,000, 5-year balloon loan at 8.25 percent interest amortized over 20 years with monthly payments. The lender charged three points in conjunction with this loan. You will hold this property for five years (making 12 payments in each year). How much may you claim as amortized expenses each year in conjunction with this loan?
- A. \$18,000
 - B. \$3,600**
 - C. \$900
 - D. \$30,000
- _____ 7. At the end of your 5-year holding period, how much unclaimed amortized expenses will you have?
- A. \$13,500
 - B. NONE**
 - C. \$18,000
 - D. \$450,000
- _____ 8. You have owned a commercial office building for five years. Its initial tax basis was \$2.2 million and its depreciable basis was \$1.8 million. The building was put into service on January 1 of the first year and will be sold on December 31 of the fifth year. What is your adjusted basis in this property at the time of sale?
- A. \$1,800,000
 - B. \$1,753,092
 - C. \$1,973,092**
 - D. \$2,200,000
- _____ 9. If the property in the previous question is sold for \$3 million net of transaction costs, how much of the gain will be taxed at the capital gains tax rate (currently 15 percent in most cases)?
- A. \$1,026,908
 - B. \$226,908
 - C. \$800,000**
 - D. None
- _____ 10. You are 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. \$315,000**
 - B. \$420,000
 - C. \$294,000
 - D. \$105,000
 - E. \$126,000

- _____ 11. True or **FALSE**: All else equal, an office building receives more favorable tax treatment than an apartment property.
- _____ 12. You are selling a property for \$3.5 million. Your adjusted basis in the property is \$2 million and your transaction costs for the sale will be \$150,000. Your cost recovery allowances on this property have totaled \$500,000. What is your total gain on this sale?
- A. \$850,000
 - B. \$1.35 MILLION**
 - C. \$1.50 million
 - D. \$2.00 million
 - E. \$3.50 million
- _____ 13. How much of your gain in the last question is due to cost recovery (taxed at the 25 percent rate)?
- A. \$150,000
 - B. \$500,000**
 - C. \$850,000
 - D. \$1.85 million
 - E. \$2.35 million
- _____ 14. How much of your gain in question 12 is due to appreciation (taxed at the 15 percent rate)?
- A. \$150,000
 - B. \$500,000
 - C. \$850,000**
 - D. \$1.85 million
 - E. \$2.35 million
- _____ 15. **TRUE** or False: Investors would prefer to expense an item immediately over depreciating it over the life of the property.

Consider the following information to answer the next 7 questions below: You have purchased an apartment property with a \$1.4 million cash down payment and a \$2.1 million mortgage at 8.5 percent interest with a 20-year term and monthly payments. Total closing costs for the purchase included \$150,000 for due diligence and purchase expenses, and 2 points for the mortgage. The property is expected to generate NOI of \$525,000 per year. It will be put into service on March 25 of next year, and the first mortgage payment will be due on April 1.

- _____ 16. What the initial tax basis for this property?
- A. \$1.400 million
 - B. \$3.692 million
 - C. \$3.500 million
 - D. \$3.650 MILLION**
 - E. \$1.550 million
- _____ 17. If the total depreciable basis is \$1.2 million, what is the depreciation allowance for the first tax year? (Hint: Apartment properties are depreciated over 27.5 years.)
- A. \$43,636
 - B. \$34,546**
 - C. \$38,182
 - D. \$32,727
 - E. \$60,000
- _____ 18. If the total depreciable basis is \$1.2 million, what is the depreciation allowance in the second tax year?
- A. \$43,636**
 - B. \$34,546
 - C. \$38,182
 - D. \$32,727
 - E. \$60,000
- _____ 19. How much will you be allowed to claim as amortized expenses in the first tax year?
- A. \$42,000
 - B. \$3,500
 - C. \$2,100
 - D. \$175
 - E. \$1,575**

- _____ 20. How much will you be allowed to claim as amortized expenses in the second tax year?
- A. \$42,000
 - B. \$3,500
 - C. \$2,100**
 - D. \$175
 - E. \$1,575
- _____ 21. How much will you be allowed to claim as an interest expense in the first tax year?
- A. \$176,897
 - B. \$178,500
 - C. \$133,007**
 - D. \$197,210
 - E. \$294,828
- _____ 22. How much will you be allowed to claim as an interest expense in the second tax year?
- A. \$173,202
 - B. \$178,500
 - C. \$290,781
 - D. \$288,671
 - E. \$174,155**