**CHAPTER 18**

**Investment Decisions: Ratios**

**Test Questions**

1. Income multipliers:

a. are useful as a preliminary analysis tool to weed out obviously unacceptable investment opportunities.

2. The overall capitalization rate calculated on a potential acquisition:

a. is the reciprocal of the net income multiplier.

3. The operating expense ratio:

c. expresses operating expenses as a percent of effective gross income.

4. The equity dividend rate:

b. expresses before-tax cash flow as a percent of the required equity capital investment.

5. Ratio analysis:

d. serves as an initial evaluation of the adequacy of an investment’s expected cash flows.

6. Assume a retail shopping center can be purchased for $5.5 million. The center’s first year NOI is expected to be $489,500. A $4,000,000 loan has been requested. The loan carries a 9.25 percent fixed contract rate, amortized monthly over 25 years with a 7-year term. What will be the property’s (annual) debt coverage ratio in the first year of operations?

b. 1.19

7. Which of the following is not an operating expense associated with income-producing (commercial) property?

a. Debt service

Use the following information to answer questions 8-9.

You are considering purchasing an office building for $2,500,000. You expect the potential gross income (PGI) in the first year to be $450,000; vacancy and collection losses to be 9 percent of PGI; and operating expenses and capital expenditures to be 38 percent and 4 percent, respectively, of effective gross income (EGI).

8. What is the implied first-year overall capitalization rate?

a. 9.5 percent

9. What is the effective gross income multiplier?

b. 6.11

10. Given the following information, what is the required equity down payment?

• Acquisition price: $800,000

• Loan-to-value ratio: 75%

• Total up-front financing costs: 3%

c. $218,000

**Study Questions**

Use the following information to answer questions 1 – 3:

You are considering the purchase of an office building for $1.5 million today. Your expectations include the following: first-year potential gross income of $340,000; vacancy and collection losses equal to 15 percent of potential gross income; operating expenses equal to 40 percent of effective gross income and capital expenditures equal 5 percent of EGI. You expect to sell the property five years after it is purchased. You estimate that the market value of the property will increase four percent a year after it is purchased and you expect to incur selling expenses equal to 6 percent of the estimated future selling price.

1. What is estimated effective gross income (EGI) for the *first* year of operations?

*Solution*:

|  |  |
| --- | --- |
| Item | Amount |
| Potential gross income (PGI) | $340,000 |
| less: V&C allowance (at 15% of PGI) | 51,000 |
| Effective gross income (EGI) | $289,000 |

2. What is estimated net operating income (NOI) for the *first* year of operations?

*Solution*:

|  |  |
| --- | --- |
| Item | Amount |
| Effective gross income (EGI) | $289,000 |
| less: Operating expenses (OE) | (115,600) |
| less: Capital expenditures (CAPX) | (14,450) |
| Net operating income (NOI) | $158,950 |

3. What is the estimated going-in cap rate (Ro) using NOI for the *first* year of operations?

*Solution*: The overall cap rate is 10.6 percent ($158,950 / $1,500,000)

4. An investment opportunity having a market price of $1,000,000 is available. You could obtain a $750,000, 25-year mortgage loan requiring equal monthly payments with interest at 7.0 percent. The following operating results are expected during the first year.

Effective gross income $200,000

Less operating expenses and CAPX $100,000

Net operating income $100,000

For the first year only, determine the:

a. Gross income multiplier

*Solution*: Market price / Effective gross income = $1,000,000 / $200,000 = 5.0

b. Operating expense ratio (including CAPX)

*Solution*: Operating expenses / Effective gross income = $100,000 / $200,000 = 0.50 or 50 percent.

c. Monthly and annual payment

*Solution*: Monthly payment is $5,300.84. Annual payment is $63,610.13

d. Debt coverage ratio

*Solution:* NOI / Annual debt service = $100,000 / $63,610 = 1.57

e. Overall capitalization rate

*Solution*: NOI / Market price = $100,000 / $1,000,000 = 10 percent

f. Equity dividend rate

*Solution*: Before-tax cash flow / Equity = $36,390 / $250,000 = 14.6 percent

Note: Equity investment = Acquisition price – loan amount

= $1,000,000 - $750,000

5. You are considering the purchase of a quadruplex apartment. Effective gross income (EGI) during the first year of operations is expected to be $33,600 ($700 per month per unit). First-year operating expenses are expected to be $13,440 (at 40 percent of EGI). Ignore capital expenditures. The purchase price of the quadruplex is $200,000. The acquisition will be financed with $60,000 in equity and a $140,000 standard fixed-rate mortgage. The interest rate on the debt financing is eight percent and the loan term is 30 years. Assume, for simplicity, that payments will be made annually and that there are no up-front financing costs.

a. What is the overall capitalization rate?

*Solution*: NOI = EGI – operating expenses

= $33,600 – $13,440

= $20,160

NOI / Market price = $20,160 / $200,000 = 10.08 percent

b. What is the effective gross income multiplier?

*Solution*: Market price / Effective gross income = $200,000 / $33,600 = 5.95

c. What is the equity dividend rate (the before-tax return on equity)?

*Solution*:

Debt service = $12,436, as calculated below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 30 | I/YR = 8 | PV = $140,000 | PMT = ? | FV = 0 |

Before-tax cash flow = NOI - Debt service

= $20,160 - $12,436

= $7,724

Equity dividend rate = Before-tax cash flow / equity invested

= $7,724 / $60,000

= 12.87 percent

d. What is the debt coverage ratio?

*Solution*: DCR= NOI / debt service

= $20,160 / $12,436

= 1.62

e. Assume the lender requires a minimum debt coverage ratio of 1.2. What is the largest loan that you could obtain if you decide to borrow more than $140,000?

*Solution*: Debt service must be such that the following relationship holds:



But, debt service is equal to the loan amount times the mortgage constant (contract interest rate plus principal amortization). Thus, we can rewrite the above expression as



Rearranging,



or,



For our problem,



The mortgage constant is the stated interest rate plus the first-year principal payment divided by the loan amount (1,236/140 000 = .0088), or .0888.



$189,130 *= loan amount*

6. Why do Class B properties generally sell at higher going-in cap rates than Class A properties?

*Solution*: Relative to class A properties, class B properties are more risky and/or are expected to produce smaller rental increases over time. Both effects reduce the amount a rational investor is willing to pay today per dollar of current income. When values/prices fall relative to current net rental income, cap rates increase.

7. Why might a commercial real estate investor borrow to help finance an investment even if she could afford to pay 100 percent cash?

*Solution*: Borrowing--i.e., the use of “other people’s money”—is also refereed to as the use of financial leverage. If the overall return on the property exceeds the cost of debt, the use of leverage can significantly increase the rate of return investors earn on their invested equity. This expected *magnification of return often* induces investors to partially debt finance even if they have the accumulated wealth to pay all cash for the property.

1. You are considering purchasing an office building for $2,500,000. You expect the potential gross income (PGI) in the first year to be $450,000; vacancy and collection losses to be 9 percent of PGI; and operating expenses and capital expenditures to be 42 percent of effective gross income (EGI). What is the estimated Net Operating Income? What is the implied first year overall capitalization rate? What is the effective gross income multiplier?

|  |  |
| --- | --- |
| Item | Amount |
| Potential gross income (PGI) | $450,000 |
| - Vacancy & collection loss (VC) | 40,500 |
| = Effective gross income (EGI) | 409,500 |
| - Operating expenses (OE) | 171,990 |
| = Net operating income (NOI) | 237,510 |

What is the overall capitalization rate?



What is the effective gross income multiplier?



9. What distinguishes an operating expense from a capital expenditure?

*Solution*: An operating expense does not fundamentally alter the market value or remaining economic life of the asset; rather operating expenses simply keep the property operating and competitive in its local market. In contrast, a capital expenditure is defined as an expense that *does* increase the market value and/or remaining economic life of the asset.

10. Explain why income property cash flow is not the same as taxable income.

*Solution*: For several reasons, the actual net cash flow generated by a rental property investment is different than the amount of income the owner must report for federal income tax purposes. First and foremost, a deduction for depreciation is allowed in the calculation of taxable income from annual operations; however, the owner does not “write a check” for depreciation on an annual basis. This reduces taxable income relative to the actual cash flow. The same is true for amortized financing expenses. Conversely, the owner often does make mortgage payments that include both interest and principal amortization. However, only the interest portion of the mortgage payment is tax deductible. The principal portion is, therefore, a cash outflow that is not tax deductible.

11. What is the basic shortcoming of most ratios and rules of thumb used in commercial real estate investment decision making?

*Solution*: The major weakness of most ratios and rules of thumb is that they ignore cash inflows and outflows that are likely to occur beyond the first year of operations. Also, there are no clear decisions rules associated with rules of thumb. For example, how much higher does the going-in cap rate on a potential acquisition have to be relative to the cap rate on similar properties before the investor can conclude that acquiring the property will increase wealth?

**CHAPTER 19**

**Investment Decisions: NPV and IRR**

**Test Questions**

1. A real estate investment is available at an initial cash outlay of $10,000, and is expected to yield cash flows of $3,343.81 per year for five years. The internal rate of return (IRR) is approximately:

b. 20 percent.

1. The net present value of an acquisition is equal to:

b. the present value of expected future cash flows, less the initial cash outlay.

1. Present value:

b. is the value now of all net benefits that are expected to be received in the future.

d. is also correct.

1. The internal rate of return equation incorporates:

d. initial cash outflow and inflow, and future cash outflow and inflow.

1. The purchase price that will yield an investor the lowest acceptable rate of return is:

a. The property’s investment value to that investor.

6. What term best describes the maximum price a buyer is willing to pay for a property?

a. Investment value

7. An income-producing property is priced at $600,000 and is expected to generate the following after-tax cash flows: Year 1: $42,000; Year 2: $44,000; Year 3: $45,000; Year 4: $50,000; and Year 5: $650,000. Would an investor with a required after-tax rate of return of 15 percent be wise to invest at the current price?

b. No, the NPV is -$148,867.

8. As a general rule, using financial leverage:

b. increases risk to the equity investor.

9. What is the IRR, assuming an industrial building can be purchased for $250,000 and is expected to yield cash flows of $18,000 for each of the next five years and be sold at the end of the fifth year for $280,000?

c. 9.20 percent

10. Which of the following is the least true?

d. After-tax discount rates are greater than discount rates used to value before-tax cash flows.

**Study Questions**

1. List three important ways in which DCF valuation models differ from direct capitalization models.

*Solution*: Direct capitalization models require an estimate of stabilized income for one year. DCF models require estimates of net cash flows over the entire expected holding period. In addition, the cash flow forecast must include the net cash flow expected to be produced by the sale of the property at the end of the expected holding period. Finally, the appraiser must select the appropriate yield (required IRR) at which to discount all future cash flows or to use as the hurdle rate in an IRR analysis.

2. Why might a commercial real estate investor borrow to help finance an investment even if she could afford to pay 100 percent cash?

*Solution*: Borrowing--i.e., the use of “other people’s money”—is also refereed to as the use of financial leverage. If the overall return on the property exceeds the cost of debt, the use of leverage can significantly increase the rate of return investors earn on their invested equity. This expected magnification of return often induces investors to partially debt finance even if they have the accumulated wealth to pay all cash for the property. Other potential benefits of leverage include: the ability to break through equity capital constraint in order to acquire more + NPV projects; the ability to apply the owner/operator’s comparative advantage in acquisition and management to more projects; and increased portfolio diversification.

3. Using the “CFj” key of your financial calculator determine the IRR of the following series of annual cash flows: CF0= -$31,400; CF1 = $3,292; CF2 = $3,567; CF3 = $3,850; CF4 = $4,141; and CF5 = $50,659.

*Solution*: IRR = 18.51%

4. A retail shopping center is purchased for $2.1 million. During the next four years, the property appreciates at 4 percent per year. At the time of purchase, the property is financed with a 75 percent loan-to-value ratio for 30 years at 8 percent (annual) with monthly amortization. At the end of year 4, the property is sold with 8 percent selling expenses. What is the before-tax equity reversion?

*Solution*:

|  |  |
| --- | --- |
| **Item** | **Amount** |
| Loan amount = 0.75 x (2,100,000) | $1,575,000 |
| Monthly payments | 11,556.79 |
| Remaining mtg. balance | 1,515,450 |
|  |  |
| Selling price [2,100,000 x (1.04)4] | 2,456,703 |
| less: Selling expenses (at 8% of SP) | 196,536 |
| Net selling price | 2,260,167 |
| less: Unpaid mtg. balance | 1,515,450 |
| Before-tax equity reversion | $ 744,717 |

5. State, in no more than one sentence, the condition for favorable financial leverage in the calculation of NPV.

*Solution*: Increasing the use of leverage will increase the calculated NPV if the discount rate exceeds the effective cost of mortgage debt.

6. State, in no more than one sentence, the condition for favorable financial leverage in the calculation of the IRR.

*Solution*: Increasing the use of leverage will increase the calculated IRR if the unlevered IRR exceeds the effective cost of mortgage debt.

7. An office building is purchased with the following projected cash flows:

• NOI is expected to be $130,000 in year 1 with 5 percent annual increases.

• The purchase price of the property is $720,000.

• 100% equity financing is used to purchase the property

• The property is sold at the end of year 4 for $860,000 with selling costs of 4 percent.

• The required unlevered rate of return is 14 percent.

a. Calculate the unlevered internal rate of return (IRR).

b. Calculate the unlevered net present value (NPV).

*Solution*:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | Purchase Price | Net Operating Income | Net Sale Proceeds | Total Cash Flow | Present Value at 14% |
| 0 | ($720,000) |  |  | ($720,000) | ($720,000) |
| 1 |  | 130,000 |  | 130,000 | 114,035 |
| 2 |  | 136,500 |  | 136,500 | 105,032 |
| 3 |  | 143,325 |  | 143,325 | 96,740 |
| 4 |  | 150,491 | 825,600 | $976,091 | $577,924 |

a. IRR = 21.88 percent

b. NPV = 173,732

8. With a purchase price of $350,000, a small warehouse provides for an initial before-tax cash flow of $30,000, which grows by 6 percent per year. If the before-tax equity reversion after four years equals $90,000, and an initial equity investment of $175,000 is required, what is the IRR on the project? If the required going-in levered rate of return on the project is 10 percent, should the warehouse be purchased?

*Solution*:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | Purchase Price | Before-Tax Cash Flow | Before-Tax Equity Reversion | Total Cash Flow | Present Value at 10% |
| 0 | ($175,000) |  |  | ($175,000) | ($175,000) |
| 1 |  | 30,000 |  | 30,000 | 27,272 |
| 2 |  | 31,800 |  | 31,800 | 26,281 |
| 3 |  | 33,708 |  | 33,708 | 25,325 |
| 4 |  | 35,730 | 90,000 | $125,730 | $85,875 |

The IRR is 7.84 percent. Based on a going-in levered rate of return on the project of 10 percent, the NPV equals ($10,246) and the project should not be undertaken.

9. You are considering the acquisition of a small office building. The purchase price is $775,000. Seventy-five percent of the purchase price can be borrowed with a 30-year, 7.5 percent mortgage. Payments will be made *annually*. Up-front financing costs will total three percent of the loan amount. The expected before-tax cash flows from operations--assuming a 5-year holding period—are as follows:

|  |  |
| --- | --- |
| **Year** | **BTCF** |
| 1 | $48,492 |
| 2 | 53,768 |
| 3 | 59,282 |
| 4 | 65,043 |
| 5 | $71,058 |

The before-tax cash flow from the sale of the property is expected to be $295,050. What is the net present value of this investment, assuming a 12 percent required rate of return on levered cash flows? What is the levered internal rate of return?

*Solution*: As solved below, the NPV is ($11,166) and the IRR is 10.75 percent

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Equity Investment | NOI | Debt Service | BTER | Total Cash Flow | Present Value  at 12% |
| 0 | ($211,188) |  |  |  | ($211,188) | ($211,188) |
| 1 |  | $48,492 | $49,215 |  | (723) | (646) |
| 2 |  | 53,768 | 49,215 |  | 4,553 | 3,630 |
| 3 |  | 59,282 | 49,215 |  | 10,067 | 7,165 |
| 4 |  | 65,043 | 49,215 |  | 15,828 | 10,059 |
| 5 |  | $71,058 | $49,215 | $295,050 | $316,893 | $179,814 |

10. You are considering the purchase of an apartment complex. The following assumptions are made:

• The purchase price is $1,000,000.

• Potential gross income (PGI) for the first year of operations is projected to be $171,000.

• PGI is expected to increase at 4 percent per year.

• No vacancies are expected.

• Operating expenses are estimated at 35 percent of effective gross income. Ignore capital expenditures.

• The market value of the investment is expected to increase 4 percent per year.

• Selling expenses will be 4 percent.

• The holding period is 4 years.

• The appropriate unlevered rate of return to discount projected NOIs and the projected NSP is 12 percent.

• The required levered rate of return is 14 percent.

• 70 percent of the acquisition price can be borrowed with a 30-year, monthly payment mortgage.

• The annual interest rate on the mortgage will be 8.0 percent.

• Financing costs will equal 2 percent of the loan amount.

• There are no prepayment penalties.

a. Calculate net operating income (NOI) for each of the four years.

*Solution*:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | 1 | 2 | 3 | 4 |
| PGI | $171,000 | $177,840 | $184,954 | $192,352 |
| Less: V&C | 0 | 0 | 0 | 0 |
| EGI | 171,000 | 177,840 | 184,954 | 192,352 |
| Less: OE | 59,850 | 62,244 | 64,734 | 67,323 |
| NOI | $111,150 | $115,596 | $120,220 | $125,029 |

b. Calculate the net sale proceeds from the sale of the property.

*Solution*:

|  |  |
| --- | --- |
| Item | Amount |
| Selling price [1,000,000 x (1.04)4] | $1,169,859 |
| less: Selling expenses (at 4% of SP) | 46,794 |
| Net Selling price | $1,123,065 |

c. Calculate the net present value of this investment, assuming no mortgage debt. Should you purchase? Why?

*Solution*:

|  |  |  |
| --- | --- | --- |
| Item | Cash Flow | Present Value at 12% |
| Initial Outflow Yr. 0 | -$1,000,000 | -$1,000,000 |
| NOI Yr.1 | 111,150 | 99,241 |
| NOI Yr.2 | 115,596 | 92,152 |
| NOI Yr.3 | 120,220 | 85,570 |
| NOI Yr.4 | 125,029 | 79,458 |
| Reversion Yr. 4 | 1,123,065 | 713,727 |
| Net Present Value |  | **$70,150** |

Yes, purchase the property because it is a positive NPV project.

d. Calculate the internal rate of return of this investment, assuming no debt. Should you purchase? Why?

*Solution*: IRR = 14.22 percent. Purchase because unlevered required rate of return is 12 percent

e. Calculate the monthly mortgage payment. What is the total per year?

*Solution*: Monthly payment = $5,136.35 as calculated below:

Annual payment = monthly payment x 12 = $61,636

f. Calculate the loan balance at the end of years 1, 2, 3, and 4. (Note: the unpaid mortgage balance at any time is equal to the present value of the remaining payments, discounted at the contract rate of interest.)

*Solution*:

Unpaid mortgage balance in year 1 = $694,152

Unpaid mortgage balance in year 2 = $687,820

Unpaid mortgage balance in year 3 = $680,961

Unpaid mortgage balance in year 4 = $673,533

g. Calculate the amount of principal reduction achieved during each of the four years.

*Solution*:

Principal reduction in year 1 = $700,000 - $694,152 = $5,848

Principal reduction in year 2 = $694,152 - $687,820 = $6,332

Principal reduction in year 3 = $687,820 - $680,961 = $6,859

Principal reduction in year 4 = $680,961 - $673,533 = $7,428

h. Calculate the total interest paid during each of the four years. (Note: Remember that debt service equals principal plus interest.)

*Solution*:

Interest paid in year 1 = $61,636 - $5,848 = $55,788

Interest paid in year 2 = $61,636 - $6,332 = $55,304

Interest paid in year 3 = $61,636 - $6,859 = $54,777

Interest paid in year 4 = $61,636 - $7,428 = $54,208

i. Calculate the levered required initial equity investment.

*Solution*:

Loan amount (0.70 x $1,000,000) = $700,000

Up-front financing costs (0.02 x $700,000) = $14,000

Equity investment = $1,000,000 - $700,000 + $14,000 = $314,000

j. Calculate the before-tax cash flow (BTCF) for each of the four years.

*Solution*:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | 1 | 2 | 3 | 4 |
| NOI | $111,150 | $115,596 | $120,220 | $125,029 |
| less: Debt Service | 61,636 | 61,636 | 61,636 | 61,636 |
| BTCF | $49,514 | $53,960 | $58,584 | $63,393 |

k. Calculate the before-tax equity reversion (BTER) from the sale of the property.

*Solution*:

|  |  |
| --- | --- |
| Item | Amount |
| Net selling price | $1,123,065 |
| less: Remaining mortgage balance in year 4 | 673,533 |
| Before-tax equity reversion | $449,532 |

l. Calculate the levered net present value of this investment. Should you purchase? Why?

*Solution*:

|  |  |  |
| --- | --- | --- |
| Item | Cash Flow | Present Value at 14% |
| BTCF Yr.1 | $49,514 | $43,433 |
| BTCF Yr.2 | 53,960 | 41,520 |
| BTCF Yr.3 | 58,584 | 39,543 |
| BTCF Yr.4 | 63,392 | 37,534 |
| Reversion Yr. 4 | 449,532 | 266,159 |
| Total |  | $428,189 |

NPV = Present value of the cash flows less the equity investment:

$428,189 - $314,000 = $114,189.

Decision: Purchase the property because the NPV > 0; wealth will increase by $114,189.

m. Calculate the levered internal rate of return of this investment (assuming no debt and no taxes). Should you purchase? Why?

*Solution*: Levered IRR = 25.02 percent; Decision: Purchase the property because IRR > 14 percent, the required return.

n. Calculate, for the first year of operations, the: (1) overall (cap) rate of return, (2) equity dividend rate, (3) gross income multiplier, (4) debt coverage ratio.

*Solution*:

1. Overall cap rate = NOI / Market price = $111,150 / $1,000,000 = 11.12%
2. Equity dividend rate = BTCF / equity = $49,514 / $314,000 = 15.8 percent
3. Gross income multiplier = Market price / EGI = $1,000,000 / $171,000 = 5.85
4. Debt coverage ratio = NOI / Debt service = $111,150 / $61,636 = 1.8

11. The expected before-tax IRR on a potential real estate investment is 14 percent. The expected after-tax IRR is 10.5 percent. What is the effective tax rate on this investment?

*Solution*: The effective tax rate is (1-(10.5/14)) = 0.25 or 25 percent.

12. An office building is purchased with the following projected cash flows:

• NOI is expected to be $130,000 in year 1 with 5 percent annual increases.

• The purchase price of the property is $720,000.

• 100% equity financing is used to purchase the property

• The property is sold at the end of year 4 for $860,000 with selling costs of 4 percent.

• The required unlevered rate of return is 14 percent.

a. Calculate the unlevered internal rate of return (IRR).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
| NOI | $130,000 | $136,500 | $143,325 | $150,491 | $158,016 |
|  |  |  |  |  |  |
| Sale price |  |  |  |  | $860,000 |
| Minus selling costs |  |  |  |  | $ 34,400 |
| Net selling price |  |  |  |  | $825,600 |
|  |  |  |  |  |  |
| Total cash flows | $130,000 | $136,500 | $143,325 | $150,491 | $983,616 |

With a cash outflow of $720,000 at time zero (CF0), and using the cash flow (“CF”) key of your calculator, the unlevered internal rate of return (IRR) = 21.50%

b. Calculate the unlevered net present value (NPV).

Again, with a cash outflow of $720,000 at time zero (CF0), a required unlevered rate of return of 14 percent, and using the cash flow (“CF”) key of your calculator, the unlevered net present value (NPV) = 195,769.78

**Chapter 9**

**Real Estate Finance: The Laws and Contracts**

**Test Problems**

1. The element of an adjustable interest rate that is the “moving part” is the:

b. Index

1. Which of these aspects of a mortgage loan will be addressed in the note rather than in the mortgage?

a. Prepayment penalty

1. A lender may reserve the right to require prepayment of a loan at any time they see fit through a(n):

c. Demand clause

1. When a buyer of a property with an existing mortgage loan acquires the property without signing the note for an existing loan the buyer is acquiring the property:

e. Subject to the mortgage

1. Which if these points in a mortgage loan would be addressed in the mortgage (possibly in the note as well)?

d. Escrows

1. To finance property where either the borrower, the property, or both fail to qualify for the standard mortgage financing, a common *nonmortgage* solution is through the:

d. Contract for deed.

1. Ways that a lender may respond to a defaulted loan without resorting to foreclosure include all of the following except:

d. Accelerate the debt.

1. If the lender in a standard first mortgage wishes to foreclose cost effectively, it is crucial to have which clause in the mortgage:

a. Acceleration clause

1. A common risk that frequently interferes with a lender’s efforts to work out a defaulted loan through either nonforeclosure means or foreclosure is:

d. Bankruptcy.

1. The characteristics of a borrower than can be considered by a lender in a mortgage loan appreciation are limited by the:

c. Equal Credit Opportunity Act.

1. The Real Estate Settlement Procedures Act does which of these:

e. All of the above.

1. Foreclosure tends to be quickest in states that:

d. Have power of sale.

1. From a home mortgage lender’s perspective, which statement is true about the effect of bankruptcy upon foreclosure?

a. Chapter 7 bankruptcy is the most “lender friendly” form.

1. The most internationally oriented index rate for adjustable rate mortgages is:

c. A LIBOR rate.

1. A type of loan that has grown in volume in recent years which has raised concerns about predatory lending practices is the:

d. Subprime mortgage

1. A partially amortizing loan always will have

c. A balloon payment.

1. Which of these statements is true about mortgage loans for income producing real estate?

e. All of the above.

1. With what type of loan security arrangement is the deed held by a neutral party and returned upon payment of the mortgage in full?

c. Deed of trust.

1. The Truth in Lending Act gives a home mortgage borrower how long to rescind a mortgage loan?

c. Three days.

1. Which statement is correct about the right of prepayment of a home mortgage loan?

b. Most home mortgage loans have the right of prepayment without charge, but not all, and the borrower should check the loan carefully.

**Study Questions**

1. Mortgage law is as clear, consistent, and enforceable in the United States as in any place in the world, and far more so than in many countries. Why is this a vital element of an efficient real estate finance system?

*Solution*: Clear, consistent, and enforceable mortgage law is critical to the real estate finance system for many reasons. Since debt financing is used in most real estate transactions, eliminating uncertainty is crucial for both parties in the transaction. Certainty reduces the cost of borrowing. The lender can be more certain of the rights and risks involved, which reduces the necessary risk premium required in the interest rate. The borrower benefits from the same certainty both due to a lower interest rate, and due to the greater predictability of outcome. For example, the borrower can understand, in case of delinquent payments, how much risk actually is involved. For most individuals, a debt-financed home purchase will be the largest financial transaction that they will undertake. The lender is more informed than is the borrower in mortgage transactions. Therefore, it is necessary to establish clear laws to protect consumers and place them on equal footing. Mortgage financing is also a complicated process and requires unambiguous mortgage law to anticipate all possible issues that may arise. Standardized mortgage law is also important to financial markets, as mortgage markets have become national because this enhances trading liquidly and has served to reduce the cost of borrowing to potential homeowners.

1. The Congress has adopted changes in bankruptcy law that would make Chapter 7 bankruptcy more difficult for households, requiring greater use of Chapter 13, thus providing greater protection to unsecured credit card companies. As a mortgage lender, do you care about this? If so, what would be your position?

*Solution*: The mortgage lender is entitled to the value of the mortgage indebtedness under both Chapter 7 and Chapter 13 because their claim has priority. However, Chapter 13 is essentially a debt workout plan that will most likely delay the efforts by a lender to foreclose on the property. Delays may cost the lender opportunity costs through uncollected interest and legal expenses. Addtionally, the value of the property may deteriorate due to neglect during this process.

1. Residential mortgage terms (mortgage notes) have become increasingly uniform as the mortgage market has become more national and efficient. Is there any downside to this for the homeowner?

*Solution*: The increased uniformity of mortgage terms reduces the opportunity for customization of terms based on a homeowner’s unique situation and characteristics. However, the standardization of the mortgage process has allowed the borrower to reap the benefits of reduced costs associated with the lending process as well as reduced delays. Furthermore, the standardization of the mortgage process has been accompanied by the introduction of more laws to protect consumers’ rights.

1. Most lenders making adjustable rate mortgage loans offer a “teaser rate.” Is this a good policy or is it misrepresentation?

*Solution:* The primary concerns with “teaser rates” is that the terms of the mortgage be transparent, and that they clearly address the interaction of periodic caps with the “teaser rate.” The reduction from a teaser rate may be a percentage point or two below the sum of index plus margin, but this usually applies for a short time, perhaps one year. The consumer must be aware of the mechanics of the adjustable feature of the loan.

1. Home mortgage lending is heavily regulated by federal laws. Is this a result of Congressional pandering to consumer groups, or are there good reasons why home mortgage lending should be regulated more than, say, automobile financing?

*Solution*: The purchase of a home is typically the largest financial transaction undertaken by most individuals. Unlike a car, the purchase of a home typically cannot be readily undone by quickly selling the property to another party. Mortgage financing is normally more complex than automobile financing. Mortgage financing requires some basic understanding of law, and, without consumer protection laws, the lender has a disproportionate advantage over the borrower in this transaction. From a public policy perspective, federal regulation prohibits discrimination and financially abusive practices.

1. For your own state, determine whether:
2. It is a judicial or non-judicial foreclosure state.
3. The standard home loan is based on a deed of trust or a mortgage.
4. There is a statutory right of redemption, and, if so, how long.
5. Deficiency judgments are allowed against defaulted homeowners.

Based on this information can you judge your state is relatively debtor friendly or borrower friendly?

*Solution*: For the student to decide as answers to the above questions vary by state.

1. Download one mortgage and one deed of trust from the Freddie Mac website. Compare them to see what differences you can find in their clauses

*Solution*: Differences between a mortgage and a deed of trust include the following:

* A deed of trust is not a mortgage contract; it is a special kind of deed that is recorded in public records.
* The trustee holds your title in trust until the debt is paid but cannot take your property for any reason.
* The deed of trust is cancelled when the debt is paid.

The primary differences between a mortgage and a deed of trust occur if the home is foreclosed. The trustee has power of sale. Therefore, if your loan becomes delinquent, the lender will give the trustee proof of the delinquency and ask the trustee to initiate foreclosure proceedings.

**CHAPTER 10**

**Residential Mortgage Types and Borrower Decisions**

**Test Problems**

1. Private mortgage insurance (PMI) is usually required on \_\_\_\_\_ loans with loan-to-value ratios greater than \_\_\_\_\_ percent.

d. Home, 80 percent.

1. The dominant loan type originated and kept by most depository institutions is the:

b. Adjustable rate mortgage.

1. Which of the following mortgage types has the most default risk, assuming the initial loan-to-value ratio, contract interest rate, and all other loan terms are identical?

a. Interest only loans.

1. A mortgage that is intended to enable older households to “liquify” the equity in their home is the:

d. Reverse annuity mortgage.

1. A jumbo loan is:

b. A conventional loan that is too large to be purchased by Fannie Mae or Freddie Mac.

1. The maximum loan-to-value ratio for an FHA loan over $50,000 is approximately:

b. 97 percent.

1. The maximum loan-to-value ratio on a VA guaranteed loan is:

d. 100 percent.

1. Conforming conventional loans are loans that:

c. Are eligible for purchase by Fannie Mae and Freddie Mac.

1. Home equity loans typically:

d. Have tax-deductible interest charges.

1. The best method of determining whether to refinance is to use:

a. Net benefit analysis.

1. Probably the greatest contribution of FHA to home mortgage lending was to:

a. Establish the use of the level-payment home mortgage.

**Study Questions**

1. On an adjustable mortgage, do borrowers always prefer smaller (i.e. tighter) rate caps that limit the amount the contract interest rate can increase in any given year or over the life if the loan? Explain why or why not.

*Solution*: Borrowers preferences are influenced by their expectations of future interest rates. For example, borrowers may prefer wider caps if they believe interest rates will not increase substantially. In this scenario, the loan interest rate will be lower because the borrower, not the lender, bears the risk of interest rates increasing.

1. Explain the potential tax advantages associated with home equity loans:

*Solution*: Unlike interest on consumer debt, interest paid on the first $100,000 of a home equity loan is fully deductible for federal and, in some cases, state income tax purposes. By including the interest paid on a home equity loan as an itemized deduction, taxpayers can effectively reduce the cost of this loan on an after-tax basis.

1. Distinguish between conforming and nonconforming residential mortgage loans and explain the importance of the difference.

*Solution*: Conforming residential loans meet the standards required for purchase in the secondary market by Fannie Mae or Freddie Mac. Conforming loans have significantly greater liquidity in the secondary market, and consequently require a lower interest rate.

1. Discuss the role and importance of private mortgage insurance in the residential mortgage market.

*Solution*: Private mortgage insurance protects a lender against losses due to default. Private mortgage insurance companies provide such insurance, which usually covers the top 20 percent of loans. In other words, if a borrower defaults and the property is foreclosed and sold for less than the amount of the loan, the PMI will reimburse the lender for a loss up to 20 percent of the loan amount. The net effect of the private mortgage insurance is to reduce default risk for lenders, which allows lenders to make loans to a larger pool of borrowers who are unable to place a 20% downpayment towards the purchase of a home.

1. Explain the maturity imbalance problem faced by savings and loan associations that hold fixed-payment mortgages as assets.

*Solution*: Savings and loan associations historically have used short-term savings deposits to fund long-term, fixed rate home loans. This mismatch in the maturity of assets and liabilities exposes them to severe interest rate risk. Consequently, the cost of funds from interest paid on short-term savings deposits may rise faster than the yield on their investments, or issued loans. A benefit of adjustable rate mortgages is that they closely track an institution’s cost of funds.

1. Suppose a homeowner has an existing mortgage loan with these terms: Remaining balance of $50,000, interest rate of 8%, and remaining term of 10 years (monthly payments). This loan can be replaced by a loan at an interest rate of 6 percent, at a cost of 8% of the outstanding loan amount. Should the homeowner refinance? What difference would it make if the homeowner expects to be in the home for only five more years?

*Solution a, using net benefit analysis:* The payment on the existing loan is $606.64 while the payment on a new loan for the remaining term of ten years would be $555.10. Thus, the new loan results in a monthly savings of $51.54. Over the ten years to maturity the monthly savings sum to $6,184.80 (120 x $51.54). The cost of refinancing is 8 percent of the amount refinanced, or $4,000 (.08 x 50,000). Thus, to maturity, the estimated net benefit for refinancing would be $2,184.24 ($6,184.24 - $4,000). Over the expected holding period of five years the monthly savings sum to $3,092.12 (60 x $51.54). Thus the net benefit of refinancing would be negative $907.87 (3,092.12 – 4,000).

*Solution b, using net present value (see online chapter appendix)*: The present value of the existing loan, with monthly payments of $606.64 discounted at 6%, is $54,641.98. The cost of refinancing is $4,000, which results in a NPV of $641.98 assuming the loan is held to maturity. If the loan is to be paid off anyway in five years, the benefit of refinancing is only $3,559.38 (n=60, I=.50, Pmt = 606.64, FV=29,918.43). Thus, NPV is negative ($3,559.38 - $4,000 = -440.62) if the homeowner expects to be in the home for only five more years.

1. Assume an elderly couple owns a $140,000 home that is free and clear of mortgage debt. A reverse annuity mortgage (RAM) lender has agreed to a $100,000 RAM. The loan term is 12 years, the contract is 9.25%, and payments will be made at the end of each month.
   1. What is the monthly payment on this RAM?
   2. Fill in the following partial loan amortization table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Month | Beginning Balance | Monthly Payment | Interest | Ending Balance |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |

* 1. What will be the loan balance at the end of the 12-year term?
  2. What portion of the loan balance at the end of year 12 represents principal? What portion represents interest?

*Solution*:

* 1. The monthly payment on the RAM is $381.32 (n=144, I=9.25, PV=0, FV=$100,000.)
  2. The amortization is as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Month | Beginning Balance | Monthly Payment | Interest | Ending Balance |
| 1 | 0 | 381.32 | 0 | 381.32 |
| 2 | 381.32 | 381.32 | 2.94 | 765.58 |
| 3 | 765.58 | 381.32 | 5.90 | 1,152.80 |
| 4 | 1,152.80 | 381.32 | 8.89 | 1,543.01 |
| 5 | 1,543.01 | 381.32 | 11.89 | 1,936.22 |

* 1. The balance at the end of 12 years is $100,000.
  2. Principal is 144 x 381.32, or $54,910. Interest is $45,090, or $100,000 -$54,910.

1. Five years ago you borrowed $100,000 to finance the purchase of a $120,000 house. The interest rate on the old mortgage is 10%. Payment terms are being made *monthly* to amortize the loan over 30 years. You have found another lender who will refinance the current outstanding loan balance at 8% with monthly payments for 30 years. The new lender will charge two discount points on the loan. Other refinancing costs will equal $3,000. There are no prepayment penalties associated with either loan. You feel the appropriate opportunity cost to apply to this refinancing decision is 8%.
   1. What is the payment on the old loan?
   2. What is the current loan balance on the old loan (five years after origination)?
   3. What should be the monthly payment on the new loan?
   4. Should you refinance today if the new loan is expected to be outstanding for five years?

*Solution*:

* 1. The payment on the old loan is $877.57.
  2. The current balance is $96,574.32.
  3. The payment on the new loan is $708.63.
  4. If the new loan is to be paid off in five years, the balance of the original loan after year ten is $90,938.02, calculated with the following inputs: (N = 240, I = 0.8333, PMT = 877.57, and FV = 0.

Answer based on net benefit analysis:

A new loan at 8 percent with the same term as remains on the original loan (25 years) would have a payment of $745.38. The savings in monthly payment by going to the new loan is $132.19 (877.57 – 745.38). This results in an accumulated savings of $7,931.40 (60 x 132.19) over the assumed holding period of five years. The cost of refinancing is $3,000 plus two percent of the balance, or $1,931.49 (.02 x 96,574.32), for a sum of $4,931.49. Thus, the net benefit is $2,999.91 (7,931.40 – 4,931.49), and refinancing is financially beneficial.

Answer based on net present value:

The present value of the old loan, paid off 5 years from today is 104,318.93 (N = 60, I=0.6667, PMT=$877.57, FV= 90,938.02).

The PV of payment reductions is $7,744.61 (104,318.93 – 96,574.32).

The cost of refinancing is $3,000 plus 1,931.49 (0.02 x 96,574.32), or 4,931.49.

The NPV of refinancing the loan is $2,813.12 (7,744.61 – 4,931.49). Therefore, you should refinance today if the new loan is expected to be outstanding for five years.

# CHAPTER 11

# Sources of Funds for Residential Mortgages

**Test Problems**

1. Mortgage banking companies:

a*.* Collect monthly payments and forward them to the mortgage investor.

1. In recent years, the mortgage banking industry has experienced:

d. Rapid consolidation.

1. Currently, which type of financial institution in the primary mortgage market provides the most funds for the residential (owner-occupied) housing market?

d. Commercial banks

1. For all except very high loan-to-value conventional home loans the standard payment ratios for underwriting are:

a. 28 percent and 36 percent

1. The numerator of the standard housing expense (front-end) ratio in home loan underwriting includes:

c. Monthly principal, interest, property taxes, and hazard insurance.

1. The most profitable activity of residential mortgage bankers is typically

b. Loan servicing.

1. Potential justifiable subprime borrowers include persons who:

d. All of these.

1. The normal securitization channel for jumbo conventional loans is:

c. Private conduits.

1. The reduced importance of certain institutions in the primary mortgage market has been largely offset by an expanded role for others. Which has diminished and which has expanded?

d. Savings and loan associations; mortgage bankers.

1. *Warehousing* in home mortgage lendingrefers to

b. Short-term loans made by commercial banks to mortgage bankers.

**Study Questions**

1. What is the primary purpose of the risk-based capital requirements that Congress enacted as part of the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA)?

Solution: The goal of the Financial Institutions Reform, Recovery, and Enforcement Act is to charge banks and thrifts for risky lending practices and to reward safer practices. It supplanted the conventional regulatory approach of simply attempting to prohibit risky behavior even though banks and thrifts found the risk-taking profitable.

1. Explain what is meant by forward commitments and standby forward commitments. Which part of the mortgage banker’s pipeline is often hedged with forward commitments? With standby forward commitments? Why?

Solution: A forward commitment is a commitment now to sell/buy something in the future at a price set now. The commitment is mandatory; that is, the parties must complete the transaction. A standby forward commitment is the same arrangement except that one party, usually the seller, has the option of completing the transaction (delivering) or abandoning the contract.

Mortgage bankers use forward commitments to hedge against price changes on loans. This commitment obligates the secondary market investor to purchase, and the mortgage banker to sell, a pre-specified dollar amount of a certain type of loan. It is used for loans that are sure to be originated.

Standby forward commitments hedge price changes for loans that may or may not be originated. Standby forward commitments from secondary market investors give lenders the right, but not the obligation, to sell a certain dollar amount of a certain loan type to the issuer of the standby commitment.

1. Describe the basic activities of Fannie Mae in the secondary mortgage market. How are these activities financed?

Solution: Fannie Mae purchases both conventional and government-underwritten residential mortgages from mortgage companies, commercial banks, savings and loan associations, and other approved lenders. Part of these acquired mortgages are combined into packages or mortgage pools, mortgage-backed securities are written against the pools, and the MBSs are then sold to investors. Another part of the acquired mortgages are “held in portfolio.”

The agency only needs to fund securitized loans until they are sold as securities. For loans held in portfolio its obtains funds for the acquisition of mortgages by obtaining (forward) commitment fees from originating lenders for loan purchases, by earning interest on its mortgage portfolio and other investments, and by selling notes and bonds to fixed-income investors.

1. Explain the importance of Fannie Mae and Freddie Mac to the housing finance system in the United States.

Solution: Fannie Mae and Freddie Mac have had a vast array of effects on the housing finance system of the U.S. Their first impact was to bring much-needed liquidity to housing finance. Probably their second effect was to standardize the documents and procedures in home mortgage lending. A third effect has been to encourage greater efficiency and flexibility in the process of home mortgage lending. Another effect has been to broaden the range of households able to obtain mortgage financing through more sophisticated and effective loan underwriting. Finally, they have had a great effect on the types of loans presently available to homeowners. Through all of this the GSEs have reduced the interest rates and costs of borrowing for homeowners.

1. What went wrong with mortgage brokerage? Is it being fixed?

Solution: There were at least three fundamental problems with residential mortgage brokerage as practiced in the years up to 2009. First, brokers were compensated at the beginning of a transaction and had no continuing responsibility or liability. Thus they could not be held financially accountable for errors or bad practices. Second, there were few, if any, qualification requirements enforced for a person to act as a broker. Third, brokers tended to be given larger fees for higher cost loans, encouraging them to lead borrowers toward high-cost loans. Some states, and the Congress, have passed legislation both to impose national broker qualification requirements and probably to prevent fees that increase with the cost of the loan. The effect of this legislation remains to be seen.

1. Describe the mechanics of warehouse financing in mortgage banking..

Solution: A warehouse loan is a credit line provided by large banks to mortgage bankers to fund loans. The originated mortgage serves as security to the lender and the lender is repaid when the loan is closed and sold in the secondary mortgage market. In this arrangement the mortgage banker places the escrow deposits for the loan (deposits for expected property tax and hazard insurance payments) with the warehouse lender, at no interest charge. In return, the mortgage banker receives a favorable interest rate on the warehouse credit line.

1. Explain how affordable housing loans differ from standard home loans.

Solution: Affordable housing loans include a low down payment requirement and allow for extensive flexibility in one of the "three Cs" of underwriting, while maintaining the other two at more normal standards. Therefore, three factors involved in qualifying for a loan may be relaxed: the loan-to-value ratio, credit qualifications, and payment capacity.

1. List three “clienteles” for subprime home mortgage loans.

Solution: Three clienteles for subprime loans are borrowers with inadequate income documentation, borrowers who want 100 percent or greater financing, and borrowers who have a poor credit record.

1. You have just signed a contract to purchase your dream house. The price is $120,000 and you have applied for a $100,000, 30-year, 5.5 percent loan. Annual property taxes are expected to be $2,000. Hazard insurance will cost $400 per year. Your car payment is $400, with 36 months left. Your monthly gross income is $5,000. Calculate:
   1. The monthly payment of principal and interest (PI).
   2. One-twelfth of annual property tax payments and hazard insurance payments.
   3. Monthly PITI (principal, interest, taxes, and insurance).
   4. The housing expense (front-end) ratio.
   5. The total obligations (back-end) ratio.

Solution:

1. $567.79
2. 200
3. 767.79
4. 15.36% (767.79/5,000)
5. 23.36% ((767.79 + 200 + 400)/5,000)
6. Contrast automated underwriting with the traditional “Three Cs” approach

Solution: In automated underwriting, the three Cs are used as factors with other criteria in a statistical evaluation that is designed to distinguish risky from safe borrower. A critical difference from the traditional approach is that credit evaluation is accomplished through a credit score. Two advantages of automated underwriting are that it is faster than traditional underwriting, and it enables lenders to more safely make “affordable housing” loans.

# CHAPTER 16

# Commercial Mortgage Types and Decisions

**Test Problems**

1. Due-on-sales clauses are included in commercial mortgages primarily to protect lenders from:

b. Default risk.

1. Consider a 30-year, 7 percent, fixed rate, fully amortizing mortgage with a yield maintenance provision. Relative to this mortgage, a 10-year balloon mortgage with the same interest rate and yield maintenance provisions will primarily reduce the lender’s:

a. Interest rate risk.

1. Lockout provisions are primarily intended to reduce the lender’s :

c. Reinvestment risk

1. The tax-benefits associated with installment sales are:

b. Captured exclusively by the seller.

1. Which of the following statements is most accurate?

b. Joint ventures usually decrease the amount of equity capital the developer/borrower must invest in the project.

1. Which of the following financing structures provides for 100 percent financing?

d. Complete (land and building) sale-leaseback

1. Using financial leverage on a real estate investment can be for the purpose of all of the following except:

d. Reduction of financial risk for the leveraged investment.

1. Which of these ratios is an indicator of the financial risk for an income property?

d. Both a and b, but not c

1. If the property’s NOI is expected to be $22,560 operating expenses $12,250, and the debt service $19,987, the debt coverage ratio (DCR) is approximately equal to:

b. 1.13.

10. With a mezzanine loan

c. the borrower’s promise to pay is secured by the equity interest in the borrower’s limited partnership or limited liability company.

**Study Questions**

1. Discuss several differences between long-term commercial mortgages and their residential counterparts.

*Solution*: Commercial mortgages have shorter terms than residential mortgages; five to ten- year terms are common for commercial mortgages and residential mortgages can be payable for up to 30 years. Commercial loans are typically nonrecourse, while residential borrowers are personally responsible for the amount borrowed. Restrictions on prepayment are commonly included with commercial mortgages but not residential mortgages. Residential mortgages are typically standardized; in contrast, most commercial mortgages do not conform to any specific standards or regulations, although this is changing rapidly as an increasing number of commercial real estate loans are being securitized.

1. Answer the following questions on financial leverage, value, and return:
   1. Define financial risk
   2. Should the investor select the origination LTV that maximizes the IRR on equity? Explain why or why not.

*Solution*:

* 1. Financial risk refers to the risk that NOI will be less than debt service. A positive correlation exists between the amount of debt service and financial risk.
  2. Higher expected returns are gained from additional leverage but the average return per unit of risk decreases as leverage increases. Leverage maximizes return when a property is performing well but amplifies the downside when a property is performing poorly. Therefore, the use of leverage may increase the investor’s going-in IRR on equity, but financial leverage also increases the riskiness of the equity because of the increased risk of default and the increased sensitivity of the realized return on equity to changes in rental rates and resale values. Thus, the increase in expected return from the use of debt may not be large enough to offset the corresponding increase in risk.

1. Distinguish between recourse and nonrecourse financing.

*Solution*: When a note is used and the borrower has personal liability, the arrangement is known as recourse financing. The borrower has personal responsibility for recourse debt, and, upon default and foreclosure, the borrower is liable for the difference between the proceeds generated from foreclosure sale and the amount owed to the lender. When a note is not used and the borrower does not have personal liability for the debt, the arrangement is known as nonrecourse financing. In these cases, the provisions of the debt are contained in the mortgage or a separate contract. The borrower is not personally liable for nonrecourse debt and the lender receives the property pledged as collateral in satisfaction of the loan deficiency.

1. Explain lockout provisions and yield-maintenance agreements. Does the inclusion of one or both of these provisions affect the borrower’s cost of debt financing? Explain.

*Solution*: A lockout provision prohibits prepayment of a commercial mortgage over a specified period after the origination of the mortgage. This provision reduces a lender’s reinvestment risk from prepayments in falling interest rate environments.

A yield-maintenance agreement is another mechanism for creating a prepayment penalty. If interest rates decline and borrowers could prepay at par, lenders would have to reinvest the remaining loan balance at current (lower) rates. The prepayment penalty paid by borrowers with a yield maintenance agreement is set equal to the present value of the lender’s loss resulting from reinvesting the remaining loan balance at the lower market rates. The yield-maintenance provision restores the lender’s position as if rates had never changed and no prepayment had occurred.

The borrower’s cost of debt financing is effectively increased because of these provisions. Unlike residential borrowers, who generally have the ability to prepay or refinance existing debt without charge, commercial borrowers are unable to reduce their cost of debt financing if market interest rates fall.

1. Assume the annual interest rate on a $500,000 7-year balloon mortgage is 6 percent. Payments will be made monthly based on a 30-year amortization schedule.
   1. What will be the monthly payment?
   2. What will be the balance of the loan at the end of year 7?
   3. What will be the balance of the loan at the end of year 3?
   4. Assume that interest rates have fallen to 4.5% at the end of year 3. If the remaining mortgage balance at the end of year 3 is refinanced at the 4.5 percent annual rate, what would be the new monthly payment assuming a 27-year amortization schedule?
   5. What is the difference in the old 6 percent monthly payment and the new 4.5 percent payment?
   6. What will be the remaining mortgage balance on the new 4.5 percent loan at the end of year 7 (four years after refinancing)?
   7. What will be the difference in the remaining mortgage balances at the end of year 7 (four years after refinancing)?
   8. At the end of year 3 (beginning of year 4), what will be the present value of the difference in monthly payments in years 4-7, discounting at an annual rate of 4.5 percent?
   9. At the end of year 3 (beginning of year 4), what will be the present value of the difference in loan balances at the end of year 7, discounting at an annual rate of 4.5 percent?
   10. At the end of year 3 (beginning of year 4), what will be the total present value of lost payments in years 4-7 from the lender’s perspective?
   11. If the mortgage contains a yield maintenance agreement that requires the borrower to pay a lump sum prepayment penalty at the end of year 3 equal to the present value of the borrower’s lost payments in years 4-7, what should that lump sum penalty be?

*Solution*:

1. Based on a 30-year amortization schedule, the monthly payment is $2,997.75 (n=360, I =6/12, PV=-500,000, and FV = 0).
2. The balance of the loan at the end of year 7 is $448,197 (solving for the present value of the remaining payments: N=276, I =6/12, PV= ?, PMT = 2,997.75, and FV=0).
3. The balance of the loan at the end of year 3 is $480,420 (solving for the present value of the remaining payments: N=324, I =6/12, PV= ?, PMT = 2,997.75, and FV=0).
4. The new monthly payment assuming a 27-year amortization schedule is $2,564.10 (n=324, I =4.5/12, PV = 480,420.35, and FV = 0).
5. The new loan payment on the new 4.5 percent loan is $433.65 less than the payment on the old 6 percent loan.
6. The remaining mortgage balance on the new 4.5 percent loan at the end of year 7 (four years after refinancing) is $440,400 (solving for the future value: n=48, I = 4.5/12, PV = 480,420 and PMT = 2,564.10.
7. The difference in the remaining mortgage balances at the end of year 7 (four years after refinancing) is as follows: The balance at year seven for the original loan at 7% is $448,197. The balance of the new loan fours years after refinancing is $440,400. The difference between the two is $7,797.
8. At the end of year 3 (beginning of year 4), the present value of the differences in monthly payments in years 4-7, discounting at an annual rate of 4.5 percent, is $19,017 (n = 48, I = 4.5/12, PMT= 433.65, and FV = 0).
9. At the end of year 3 (beginning of year 4), the present value of the differences in loan balances at the end of year 7, discounting at an annual rate of 4.5 percent, is $6,515 (n = 48, I = 4.5/12, PMT = 0, and FV = 7,797).
10. At the end of year 3 (beginning of year 4), the total present value of lost payments in years 4-7 from the lender’s perspective is $19,017 (n = 48, I = 4.5/12, PMT = 433.65, and FV = 0)
11. The lump sum payment should be 25,532 ($19,017 + $6,515).
12. Consider the stand-alone locations favored by Walgreens for locating their drugstores. In most cases, Walgreens does not own these properties. Instead, they lease the properties on a long-term basis from institutional owners. What does Walgreens gain by leasing instead of owning? What do they lose?

*Solution*: Walgreens obtains the use of a structure that is well suited to its needs. They gain the benefit of investing their funds in its core business operations rather than committing their money in real estate. They also benefit from tax benefits associated with sale-leasebacks. Conversely, Walgreens will not benefit from the appreciation of the property and the tax depreciation benefits that come with ownership.

1. Consider the following table of annual mortgage rates and yields on 10-year Treasury securities.
   1. What is the average annual spread on mortgage rates relative to the 10-year Treasury securities?
   2. What is the correlation between annual mortgage rates and Treasury yields over the 1990-2005 period?

*Solution*:

1. The average annual spread on mortgage rates relative to the 10-year Treasury securities is 1.71%
2. The correlation between annual mortgage rates and yields over the 1990-2005 period is 96.9%.
3. List and briefly describe the typical items included in a commercial mortgage loan application package.

*Solution*: Loan application packages typically include the following:

* + Loan application – the specific document that serves as a request for funds.
  + Property description – a detailed description, including maps, photos, surveys, etc., of the property securing the loan.
  + Legal aspects – precise description of the property and identification of any easements or encroachments.
  + Cash flow estimates – a copy of the property’s financial statements and rent roll to future income producing ability of the property.
  + Appraisal report – a third-party appraisal of the property’s fair market value.

1. List at least six characteristics of a commercial loan application that the lender should carefully evaluate.

*Solution*: Characteristics of a commercial loan application that the lender should carefully evaluate include the property type, location, tenant quality, lease terms, property management, building quality, environmental concerns, and borrower quality.

1. What is the difference in the present value of these two loan alternatives? Assume the appropriate discount rate is 6 percent.

*Solution*: The difference in NPVs is $50,000: Option “A” is more expensive.

Present value of Option A is $1,050,000: initial equity ($300,000) + upfront financing fees ($50,000) + present value of interest payments ($578,123) + present value of loan principal upon repayment ($121,877).

Present value of Option B is $1,000,000: initial equity ($250,000) + present value of interest payments ($619,417) + present value of loan principal upon repayment ($130,583).

1. You are considering the purchase of an industrial warehouse.
   1. Calculate the overall rate of return (or “cap rate”)
   2. Calculate the debt coverage ratio.
   3. What is the largest loan that you can obtain (holding the others terms constant) if the lender requires a debt service coverage ratio of at least 1.2?

*Solution*:

1. The overall rate of return (or “going-in” cap rate) is 10.8% (NOI of 108,000/purchase price of 1,000,000)
2. The debt coverage ratio is computed below:

DCR = NOI/DS = 108,000/42,000 = 2.57

1. The maximum amount of interest that you can afford to pay based on the lender’s requirements is $90,000 (108,000/1.2). Therefore, the largest loan you can obtain is $90,000/.06, or $1,500,000.
2. Distinguish among land acquisitions loans, land development loans, and construction loans. How would you rank these three with respect to lender risk?

*Solution*: Land acquisition loans finance the purchase of raw land. Land development loans finance the installation of the onsite and offsite improvements to land that are necessary to prepare the land for construction. Construction loans are used to finance the costs associated with erecting the building(s).

1. Discuss the potential advantages of a miniperm loan from the prospective of the developer/investor, relative to the separate financing of each stage of the development.

*Solution*: The existence of a single lender and a single application process simplifies the financing process. Miniperm loans enable developers to proceed with construction without long-term financing. A miniperm loan is an attractive financing option if the developer expects to sell the project or refinance into a permanent loan before the term of the miniperm expires.

1. You are considering purchasing an office building for $2,500,000.
   1. What is the implied first-year overall capitalization rate?
   2. What is the expected debt coverage ratio in year 1 of operations?
   3. If the lender requires DCR to be 1.25 or greater, what is the maximum loan amount?
   4. What is the break-even ratio?

*Solution*:

1. PGI $450,000

Vacancy and collections (40,500)

EGI 409,500

Op Expenses and CAPX (171,990)

NOI 237,510

DS (138,170)

BTCF $ 99,340

the implied first-year overall capitalization rate is $237,510/$2,500,000 or 0.095

1. The expected debt coverage ratio in year 1 of operations is 1.72 ($237,510/$138,170)
2. If the lender requires DCR to be 1.25 or greater, the maximum loan amount is determined by first calculating the maximum debt service amount: $190,008 ($237,510/1.25). The maximum loan amount implied by this debt service amount is $2,578,460 (N = 300, I = 5.5/12, PMT = 190,008/12, and FV = 0)
3. The break-even ratio is 68.9% ($171,990 + $138,170)/ ($450,000).

# CHAPTER 17

# SOURCES OF COMERCIAL DEBT AND EQUITY CAPITAL

**Test Problems**

1. Double taxation is most likely to occur if the commercial properties are held in the form of a(n):

c. C Corporation

1. With regard to double taxation, distributions, and the treatment of the losses, general partnerships are *most* like:

c. Limited partnerships

1. Special allocations of income or loss are available if the form of ownership is a(n):

c. Limited partnership

1. Real estate syndicates traditionally have been legally organized most frequently as:

c. Limited partnerships

1. A real estate investment trust generally:

d. None of the above

1. Which of the following forms of ownership involve both limited *and* unlimited liability?

a. limited partnerships

1. Which statement is *false* concerning the limited partnership of ownership?

c. The limited partners cannot enjoy tax deduction benefits but the general partners can.

1. Which of these lenders is most likely to provide a construction loan?

c. Commercial bank

1. Which of these loans is a life insurance company most likely to invest in?

c. Large office building loan (nonconstruction)

1. Which of these financial firms is the least likely to invest in a large, long-term mortgage loan on a shopping center?

d. Mortgage broker

**Study Questions**

* 1. For what debt in a general partnership is each of the general partners liable?

*Solution*: General partners have unlimited liability and are liable for all debts of the partnership. This includes contractual debts and debts resulting from tort actions against the partnership. General partners are also jointly and severally liable for wrongful acts committed by other partners in the course of the partnership’s business. Therefore, the personal assets of the general partners are subject to the claims of the partnership’s creditors.

2. Why are many pension funds reluctant to invest in commercial real estate?

*Solution*: Pension funds have historically viewed real estate as too risky, difficult to manage, and illiquid. Addtionally, the lack of available information for performing quantitative investment analysis has also contributed to the reluctance of pension funds to invest in real estate.

3. Discuss the role life insurance companies play in financing commercial real estate.

*Solution*: Given the long-term nature of their liabilities, life insurance companies prefer to invest in assets on a long-term basis. They are a major source of commercial real estate capital and are heavily involved in the long-term commercial mortgage market.

4. Approximately 88 percent of investable commercial real estate (on a value- weighted basis) is owned by “noninstitutional” investors. Who are these investors?

*Solution*: These “noninstitutional” investors include both individual investors and groups of private investors who pool their capital via several types of ownership structures, including C corporations, S corporations, general partnerships, limited partnerships, and limited liability companies, to purchase real estate assets. Pooled investments comprise the bulk of the market value of real estate held by “noninstitutional” investors. Individual investors, or investors who own property jointly with other family members, comprise a small fraction of these “noninstitutional” investors.

5. Briefly explain a commingled fund. Who are the investors in these funds and why do these investors use commingled funds for their purchases?

*Solution*: A commingled fund is a means for pension funds that do not possess sufficient in-house real estate expertise to invest in real estate. Pension funds contribute funds to a real estate fund manager who pools, or commingles, these funds with finds from other pension funds to purchase real estate assets.

6. There are two primary considerations that affect the form in which investors choose to hold commercial real estate. List each and explain how they affect the choice of ownership form.

*Solution*: Federal income taxation rules, and the avoidance of personal liability for debts and obligations affect the form in which investors choose to hold commercial real estate.

Federal income taxation is a critical factor in the determination of which ownership form to use in real estate investment. The income produced by properties owned by C corporations is potentially subject to double taxation because tax is assessed at both the corporate and investor level. S corporations, limited liability companies, general partnerships, and limited partnerships are pass-through entities and avoid double taxation. A limited partnership has the added benefit of permitting special allocations of cash distributions and taxable income.

Investors prefer ownership structures that provide limited liability. C corporations, S corporations, limited partnerships, and limited liability companies shield investors from any personal liability; liability is restricted to the amount of capital invested. General partnerships require at least one general partner who has unlimited liability for the debts of the partnership.

7. Explain what is meant by the double taxation of income.

*Solution*: Double taxation refers to the taxation of income at both the entity and investor level. For example, a C corporation pays tax on its income, which reduces the amount available to be distributed to shareholders by the amount of the entity-level tax. Shareholders are then taxed on the income distributed to them in the form of dividends, resulting in the double taxation of the income generated by the corporation.

8. What are the major restrictions that a REIT must meet on an ongoing basis in order to avoid taxation at the entity level?

*Solution*: A REIT must have at least 100 shareholders and 50 percent or more of the REIT’s shares cannot be owned by five or fewer investors. A REIT is required to distribute at least 90 percent of its taxable income to shareholders in the form of dividends. A REIT is required to have at least 75 percent of its assets invested in real estate assets, cash, and government securities. Additionally, 75 percent of a REIT’s gross income must be derived from real estate assets.

9. Compare the tax advantages and disadvantages of holding income-producing property in the form of a REIT to the tax advantaged and disadvantages of holding property in the form of a real estate limited partnership. Does either form dominate from a *tax perspective*?

*Solution*:

A REIT is a C corporation and but, unlike the standard C corporation, does not pay income tax at the entity level if it adheres to a set of conditions outlined in the Internal Revenue Code. A disadvantage of the REIT ownership form is that tax losses do not pass through to shareholders.

Real estate limited partnerships are not subject to double taxation because income tax is not assessed at the entity level. Limited partnerships may allocate tax losses to partners, but the ability of limited partners to use tax losses is potentially limited by passive activity loss restrictions.

In practice and from a tax perspective, pass through entities such as limited partnerships and limited liability companies are the dominant form of ownership structures used to invest in real estate assets. However, REITs are also able to avoid double taxation and are favored as a form of ownership by some investors.

10. Of the more than $3.6 trillion in outstanding commercial real estate debt, what percent is traded in public markets? What percent is traded in private markets? What institutions or entities are the long-term holders of private commercial real estate debt? What is the fastest growing source of long-term mortgage funds?

*Solution*: Approximately 29 percent of commercial real estate debt is traded in public markets and the remaining 71 percent is privately held by institutional and individual investors. Commercial banks, savings institutions, and life insurance companies are the long-term holders of private commercial real estate debt. At least until 2008, Commercial mortgage-backed securities (CMBSs) had been the fastest growing source of long-term mortgage funds.

11. Distinguish among equity REITs, mortgage REITs, and hybrid REITs.

*Solution*: Equity REITs invest in and operate commercial properties. Mortgage REITs purchase mortgage obligations (typically commercial) and thus become, effectively, real estate lenders. Hybrid REITs invest a significant percentage of their assets in both properties and mortgages.

12. Define funds from operations (FFO) and explain why this measure is often used instead of GAAP net income to quantify the income-producing ability of a real estate investment trust.

*Solution*: GAAP accounting includes non-cash deductions, such as deprecation and amortization of certain financial and fixed assets. Therefore, if a REIT has significant depreciable assets, which result in non-cash expense deductions for depreciation, GAAP net income may not reflect the net cash flow available to distribute to investors. Funds from operations (FFO) is an alternative earnings measure that adds back deprecation and amortization expenses to GAP income. Additionally, FFO adjusts GAAP income for gains and losses from infrequent and unusual events. Formally, FFO is defined as:

FFO = Net income (GAAP)

+ Depreciation (real property)

+ Amortization of leasing expenses

+ Amortization of tenant improvements

- Gains/losses from infrequent and unusual events

13. How have equity REITs, measured in terms of total returns, performed in recent years relative to alternative stock investments?

*Solution*: As a sector, equity REITs produced an average annual return of 22.9 percent from 2000-2006. The corresponding average return on the S&P 500 and Russell 2000 were 2.5 percent and 9.6 percent, respectively. In 2007 and 2008, however, equity REITs provided returns of -15.7 percent and -37.7 percent, respectively. This two-year total return of -59 percent was even worse than the -34 percent two-year return produced by the S&P 500.

Chapter 15

**Mortgage Calculations and Decisions**

**Test Problems**

1. The most typical adjustment interval on an adjustable rate mortgage (ARM) once the interest begins to change is:

b. One year.

1. A characteristic of a partially amortized loan is:

b. A balloon payment is required at the end of the loan term.

1. If a mortgage is to mature (i.e. become due) at a certain future time without any reduction in principal, this is called:

d. An interest-only mortgage.

1. The dominant loan type originated by most financial institutions is the:

a. Fixed-payment, fully amortized mortgage

1. Which of the following statements is true about 15-year and 30-year fixed-payment mortgages?

d. Assuming they can afford the payments on both mortgages, borrowers usually should choose a 30-year mortgage over an otherwise identical 15-year loan if their discount rate (opportunity cost) exceeds the mortgage rate.

1. Adjustable rate mortgages (ARMs) commonly have all the following *except*:

e. An inflation index.

1. The annual percentage rate (APR) was created by:

a. The Truth-in-Lending Act of 1968

1. On a level-payment loan with 12 years (144 payments) remaining, at an interest rate of 9 percent, and with a payment of $1,000, the balance is:

c. $87,871.

1. On the following loan, what is the best estimate of the effective borrowing cost if the loan is prepaid in six years?

Loan: $100,000

Interest rate: 7 percent

Term: 180 months

Up-front costs: 7 percent of loan amount

d. 8.7 percent.

1. Lender’s yield differs from effective borrowing costs (EBC) because:

c. EBC accounts for additional up-front expenses that lender’s yield does not.

**Study Questions**

1. Calculate the original loan size of a fixed-payment mortgage if the monthly payment is $1,146.78, the annual interest is 8.0%, and the original loan term is 15 years.

*Solution*: Rounding to the nearest whole dollar, the original size of the loan is $120,000. This problem is solved using the following keystrokes on a financial calculator:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = 8/12 | PV = ? | PMT =$1,146.78 | FV = 0 |

1. For a loan of $100,000, at 7 percent interest for 30 years, find the balance at the end of 4 years and 15 years.

*Solution*: The loans balance at the end of 4 years and 15 years is $95,474.55, and $74,018.87, respectively, as solved below

First, the loan payment must be calculated. The loan payment is $665.30, as solved below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 360 | I = .5833 | PV = -$100,000 | PMT =? | FV = 0 |

The balance at the end of four years is $95,474.55, which is calculated by entering the following data into a financial calculator.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 312 | I = .5833 | PV = ? | PMT =$665.30 | FV =0 |

The balance at the end of 15 years is $74,018.87, which is calculated by entering the following data into a financial calculator.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = .5833 | PV = ? | PMT =$665.30 | FV = 0 |

1. On an adjustable rate mortgage, do borrowers always prefer smaller (tighter) rate caps that limit the amount the contract interest rate can increase in any given year or over the life of the loan?

*Solution*: Borrower preference is dependent, at elast in part, on their expectations of future interest rates. Borrowers choosing ARMs with price caps are charged a higher initial interest rate, a higher margin, more upfront costs, or a combination of the three. The borrower must consider these factors. For example, borrowers may prefer larger caps if they believe interest rates will not increase substantially. In this scenario, the loan interest rate will be lower because the borrower, not the lender, bears the risk of interest rates increasing.

1. Consider a $75,000 mortgage loan with an annual interest rate of 8%. The loan term is 7 years, but monthly payments will be based on a 30-year amortization schedule. What is the monthly payment? What will be the balloon payment at the end of the loan term?

*Solution*: The monthly payment is $550.32 and the balloon payment is $69,358.07.

The payment is calculated using the following calculator keystrokes:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 360 | I = .667 | PV = -$75,000 | PMT =? | FV = 0 |

The balloon payment at the end of year seven is $69,358.07, as calculated with the following calculator keystrokes:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 276 | I = .667 | PV = ? | PMT =550.32 | FV = 0 |

1. A mortgage banker is originating a level-payment mortgage with the following terms:

Annual interest rate: 9 percent

Loan term: 15 years

Payment frequency: monthly

Loan amount: $160,000

Total up-front financing costs (including discount points): $4,000

Discount points to lender: $2,000

1. Calculate the annual percentage rate (APR) for Truth-in-Lending purposes.
2. Calculate the lender’s yield with no prepayment.
3. Calculate the lender’s yield with prepayment is five years.
4. Calculate the effective borrowing costs with prepayment in five years.

*Solution*:

The first step is to solve for the payment, which is $1,622.83, with the following calculator keystrokes:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = .75 | PV = -$160,000 | PMT =? | FV = 0 |

1. The APR is approximately 9.43 percent as solved below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = ? | PV = -$156,000 | PMT =$1,622.83 | FV = 0 |

1. The lender’s yield to maturity is 9.22 percent

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = ? | PV = -$158,000 | PMT =$1,622.83 | FV = 0 |

1. In order to calculate the lender’s yield, the loan balance remaining at the end of year five must first be calculated”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 120 | I = .75 | PV = ? | PMT =$1,622.83 | FV = 0 |

The remaining balance is $128,108.67. With this information, the lender’s yield is 9.34 percent as calculated below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 60 | I = ? | PV = -$158,000 | PMT =$1,622.83 | FV =$128,108.67 |

1. The effective borrowing cost with prepayment in five years is 9.69 percent.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 60 | I = ? | PV = -$156,000 | PMT =$1,622.83 | FV =$128,108.67 |

1. Give some examples of up-front financing costs associated with residential mortgages. What rule can one apply to determine if a settlement (closing) cost should be included in the calculation of the effective borrowing costs?

*Solution*: Examples of upfront costs include discount points, loan origination fee, loan application and documentation preparation fees, appraisal fees, credit check fees, title insurance, mortgage insurance, charges to transfer the deed and record the mortgage, pest inspection, survey costs, and attorney’s fees.

The effective borrowing cost calculation should not include expenses that would be incurred if no mortgage financing were obtained. Therefore, only upfront costs associated with obtaining the mortgage funds should be included.

1. A homeowner is attempting to decide between a 15-year mortgage loan at 5.5 percent and a 30-year loan at 5.90 percent. What would you advise? What would you advise if the borrower also has a large amount of credit card debt outstanding at a rate of 15 percent?

*Solution*: If the borrower does not have a significant amount of debt at a rate well above the rates on the loan, then the difference in mortgage rates should be viewed as a maturity premium difference, and the borrower can consider the loans as equivalent on a purely financial basis. If the borrower owes significant amounts of high interest consumer debt, then the longer-term loan is preferable. It will have a lower present value (present cost) discounted at the borrower’s opportunity cost. In other words, if the opportunity costs of the household are substantially greater than the mortgage interest rate, the household will be better off with the longer-term mortgage.

1. Suppose a one-year ARM loan has a margin of 2.75, an initial index of 3.00 percent, a teaser rate for the first year of 4.00 percent, and a cap of 1.00 percent. If the index rate is 3.00 percent at the end of the first year, what will be the interest rate on the loan in year two? If there is more than one possible answer, what does the outcome depend on?

*Solution*: If the periodic cap applies to the teaser rate, the interest rate in year two will be constrained to 5.00 percent. If the cap applies only to index plus margin, the rate in year two would be 5.75 percent.

1. Assume the following for a one-year rate adjustable rate mortgage loan that is tied to the one-year Treasury rate:

Loan amount: $150,000

Annual rate cap: 2%

Life-of-loan cap: 5%

Margin : 2.75%

First-year contract rate: 5.50%

One-year Treasury rate at end of year 1: 5.25%

One-year Treasury rate at end of year 2: 5.50%

Loan term in years: 30

Given these assumptions, calculate the following:

1. Initial monthly payment
2. Loan balance end of year 1
3. Year 2 contract rate
4. Year 2 monthly payment
5. Loan balance end of year 2
6. Year 3 contract rate
7. Year 3 payment

*Solution:*

* 1. The first year payment, based on an interest rate of 5.5 percent, is $851.68, as calculated below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 360 | I = .4583 | PV = -$150,000 | PMT =? | FV =0 |

* 1. The loan balance at the end of year one is $147,979, as shown below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 348 | I = .4583 | PV = ? | PMT =$851.68 | FV =0 |

* 1. Assuming the annual cap applies to the teaser rate, the interest rate in year two is 5.50 plus 2.00, or 7.50 percent.
  2. With a remaining term of 29 years, interest rate of 7.5 percent and a balance of $147,979.41, the new payment in year 2 is $1,044.32, calculated on a financial calculator with the following keystrokes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 348 | I = .6250 | PV = -$147,979 | PMT =? | FV =0 |

* 1. The loan balance at the end of year two is $146,496:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 336 | I = .6250 | PV = ? | PMT =$1,044.32 | FV =0 |

* 1. The year three contract interest rate is index plus margin, or 8.25 percent.
  2. The year three payment, based on a balance of $146,496, remaining term of 28 years and an interest rate of 8.25 percent, is $1,119.

1. Assume the following:

Loan Amount: $100,000

Interest rate: 10 percent annually

Term: 15 years, monthly payments

* 1. What is the monthly payment?
  2. What will be the loan balance at the end of nine years?
  3. What is the effective borrowing cost on the loan if the lender charges 3 points at origination and the loan goes to maturity?
  4. What is the effective borrowing cost on the loan if the lender charges 3 points at origination and the loan is prepaid at the end of year 9?

*Solution*:

1. The monthly payment is $1,074.61.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = .8333 | PV = -$100,000 | PMT =? | FV =0 |

1. The loan balance at the end of 9 years is $58,006.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 252 | I = .8333 | PV = ? | PMT =$1,074.61 | FV =0 |

1. The effective borrowing cost of the loan, with financing costs of 3 discount points, that is held to maturity and is 10.54 percent:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 180 | I = ? | PV = -$97,000 | PMT =$1,074.61 | FV =0 |

1. The effective borrowing cost of the loan, with financing costs of 3 points, that is prepaid at the end of year nine and is 10.61 percent:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N = 108 | I = ? | PV = -$97,000 | PMT =$1,074.61 | FV =58,004.90 |

# CHAPTER 21

# Enhancing Value through Ongoing Management

**Test Problems**

1. The Institute of Real Estate Management (IREM) awards which of the following designations?

b. CPM.

1. A contractual relationship in which an individual must act in the best interests of a principal when dealing with a third party is termed:

a. An agency relationship.

1. The requirement of a real estate property manager to act in the best interests of the landlord when dealing with a tenant is termed:

c. A fiduciary responsibility

1. Which of these is *not* typically a responsibility of a property manager?

d. Income tax analysis.

1. Remodeling and rehabilitation:

c. Are expected to add value to the property if undertaken.

1. Both the owner and the manager may be better off if property management compensation were based on a percentage of the property’s:

c. Net operating income.

1. The following are necessary for a lease to be valid, except:

c. Tenant’s contact phone number, or address, in the event of an emergency.

1. The asset manager is generally NOT responsible for:

c. Making maintenance decisions.

1. Demolition of an existing property on an urban site will likely occur:

c. When the site value, assuming a new use, exceeds the value of the site under its existing use, plus the cost of demolition.

1. For non-real estate corporations, which of the following is not a potential advantage of a real estate sale-leaseback?

c. The firm benefits from property appreciation that occurs after the sale-leaseback.

**Study Questions**

1. An investor purchased a property with an equity investment of $100,000 and an $800,000 mortgage. She has held the property for five years, and the mortgage now has a balance of $750,000. The market value of her property is estimated to be $950,000. What is her present equity investment?

*Solution*: Her current equity investment in the property is $200,000, which is equal to the current market value of the property ($950,000) minus the current loan balance ($750,000).

1. What should be included as costs to be matched by value added after rehabilitation?

*Solution*: An improvement, such as rehabilitation, should be undertaken only if the value added to the property exceeds the cost of improvements, which include material, labor, the contractor’s profit, architect’s fees, and an allowance for contingencies. If the rehab work prevented the owner from renting all or part of the structure for some period of time, the present value of the lost net rental income should be included as a cost.

1. In what ways are the maintenance and repair decision and the rehabilitation decision similar? How do they differ?

*Solution:* Maintenance and repair costs include expenditures for custodial, corrective, and preventive costs. Sometimes, costs related to the performance of ordinary maintenance are not undertaken; they are deferred. The deferment of such costs may increase the short-term NOI of the property but may result in the accelerated deterioration of the building and reduced cash flows in the future.

Rehabilitation costs include painting, roof replacement, or the replacement of other deteriorated portions of the building. The need to perform rehabilitation costs may be the result of deferred maintenance. Therefore, unlike maintenance and repair costs, rehabilitation costs are not recurring costs related to maintaining the property for ordinary use; rehabilitation costs add value to a property.

The decisions to undertake either maintenance and repair costs or rehabilitation costs are investment decisions. The decision to perform or forego maintenance costs must be evaluated from an economic perspective, as are rehabilitation costs. Neither category of costs results in modifications to the property structure.

1. What factors can change after rehabilitation of a property to produce a higher “after” value than “before” value?

*Solution*: The rehabilitation of a property can result in a larger net operating income, an extension of the building’s remaining economic life, or a reduction in discount rate used to calculate the present value of future income.

1. What does the property management agreement accomplish?

*Solution*: The management agreement is the basis of the relationship between the property owner and property manager. This management agreement establishes the manager’s duties, authority, and compensation. The management agreement creates an agency relationship and establishes the fiduciary responsibility of the manager to act in the best interest of the property owner.

1. How does routine maintenance and repair affect a property’s performance?

*Solution*: Routine maintenance and repair expenditures maintain the condition and economic performance of a property. These costs do not increase the value or economic performance of a property but merely maintain the property’s level of performance. Ideally, the present value of money spent on maintenance and repairs will be equal to or less than the present value of the loss in net operating income and sale proceeds that is averted by undertaking the expenditures. The deferment of routine maintenance and repair expenditures may increase the short-term NOI of the property, but this may result in the accelerated deterioration of the building, which, in turn, will reduce net rental income and the property’s market value.

1. Define *deferred maintenance* and list some examples.

*Solution*: Deferred maintenance describes costs related to ordinary maintenance that is not performed at the time a problem is detected. Examples of deferred maintenance include needed roof repairs, HVAC & control systems that are not functioning efficiently, floor repairs, old paint, and broken windows.

1. How is the financial compensation for property managers usually determined? What “agency” problem does this seem to create?

*Solution*: The typical property management fee is based on a percentage of gross rental income. An agency problem is created by this arrangement because the property manager may be motivated to overly maintain the property or pursue other strategies to promote and maximize the property’s gross income. This may occur because the contract rewards the maximization of gross income with no explicit incentive to minimize operating costs. Therefore, the property manager may be more concerned about the top line and not the bottom line.

1. Why is the tenant mix critically important to the performance of shopping center investments?

*Solution*: The correct mix of tenants in a shipping center can maximize each individual tenant’s sales and the property’s total rent potential. Synergies are created from the complimentary relationship of the property’s tenants. For example, customers shopping at a large anchor store may shop at a smaller business located next to a larger anchor store.

1. In the real estate asset management/investment advisory business, why has performance-based management replaced, or at least supplemented, the “traditional” scheme for compensating some asset managers?

*Solution*: The practice of compensating asset managers based on the value of net assets managed creates an agency problem because managers have the incentive to acquire and hold assets--rather than maximizing the investor’s rate of return. Establishing management compensation based on maximizing the investor’s rate of return better aligns the interests of the manager and investor/principal.

1. In the context of asset management agreements in the private commercial real estate industry, what is a benchmark index? What is the most typical benchmark index?

*Solution*: A benchmark index is a reference point that can be used as a standard to measure the relative performance of an asset manager. The typical benchmark index for evaluating the performance of a manager/adviser hired to acquire and manage a portfolio of publicly traded REITS is produced by NAREIT and Wilshire Associates. The most frequently used index to evaluate the performance of privately held and traded commercial properties is produced by NCREIF.

1. With respect to complying with applicable landlord-tenant laws, would you rather be managing an apartment complex or an office building? Explain.

*Solution*: In general, managing a commercial property, such as an office building, is less problematic than managing an apartment complex for various reasons. State law governs landlord-tenant relationships in the commercial arena, and state courts strictly interpret the language of commercial lease agreements. It is assumed that the parties entering into a commercial lease are competent businesspersons. Although, residential rental properties are also governed by state law, state legislators have passed detailed legislation to protect the rights and interests of households in order to level the playing field between landlords and tenants. Residential tenants are also given certain rights under state laws and landlord actions are restricted under state law.

# CHAPTER 23

# DEVELOPMENT: THE DYNAMICS OF CREATING VALUE

**Test Problems**

1. The first step in the process of development is to:

a. Establishing site control.

1. To gain control of a site, a developer may use:

e. All of the above

1. Which of these stages of the development process comes first?

a. Feasibility analysis, refinement, and testing

1. All of the following are valuable in facilitating the development permitting process *except*:

d. Establishing the strength of your legal position early in the process.

1. A method of construction where the actual construction begins before the design is finished is known as:

d. Fast-track.

1. In a land-development, the primary design professional is a :

c. Land planner.

1. Soft costs include all except:

e. Land improvement costs.

1. Which statement is *incorrect* concerning the typical construction loan?

d. The loan extends a few years after a certificate of occupancy is issued.

1. The professional responsible for determining adequate specifications for building footings and foundation is a:

d. Soils engineer.

1. When construction costs exceed the amount of the construction loan, a developer frequently will seek to cover the “gap” with:

c. Mezzanine financing.

**Study Questions**

1. Why is the permitting stage of development often the riskiest stage of the process?

Solution: The process of obtaining permitting entails a commitment of significant time and cost. However, the ultimate outcome is uncertain as to whether the project will go forward. Public hearings, for example, are especially treacherous for developers because the local land use authorities may effectively kill a project. Furthermore, community opposition to the developer’s plans may result in costly delays or force the developer to terminate the project.

1. List at least five ways that a developer may attempt to reduce the risks of the permitting process.

Solution: A developer may attempt to reduce the risks associated with the permitting process in many ways. The developer may offer provisions for buffering the surrounding land from the proposed project. The developer may provide an improvement, such as a park, that will benefit the local neighborhood. The developer should be prepared to negotiate with the land use authorities and neighborhood owners groups. The developer should establish a positive relationship with the local regulatory authorities and keep them informed throughout the development process.

1. Explain what a construction manager is, and why the role could be important in development.

Solution: A construction manager serves as the developer’s liaison and representative on the project site. This is an especially important role because the developer is responsible for monitoring and addressing any problems that occur during the construction process. The construction manager also may stand in for the developer in meetings between the general contractor and architect.

1. In selecting an architect, what must a developer consider about the architect besides design credentials and relevant experience?

Solution: The selection of an architect is a critical decision for the developer. It is important that the architect have values and goals that are comparable to those of the developer. Another selection factor is the architect’s communication skills and rapport with the developer. Addtionally, the presentation skills of the architect are important because architects play a vital role in representing the developer in public meetings with land authorities, particularly during the permitting stage.

1. Why, in some cases, must a developer begin leasing efforts even before the design is complete?

Solution: Depending on the property type, leasing efforts should begin before the completion of the design stage. For example, leasing efforts for office buildings and other facilities with long-term tenants should typically begin well before the tenant actually requires space. Presales are also frequently required for obtaining financing for condominium projects. Retail and office projects may not be viable without securing anchor tenants. Take-out commitments for construction loan financing frequently require preleasing to be in process.

1. Compare the advantages of competitive bidding for a general contractor with negotiated cost plus fee. What is the argument for using a maximum cost with sharing of overruns or savings between developer and general contractor?

Solution: The advantage of competitive bidding for a general contractor is that the selection criterion is based purely on the lowest cost contract price. It places a premium on delivering the proposed project at the lowest possible price. A critical assumption in competitive bidding is that the bidders will offer bids based on acceptable quality standards, and will execute construction at those standards. Unfortunately, this is sometimes difficult to assure. Assuming an owner has confidence in the professionalism of all the bidders, a competitive bidding situation can be a good solution to a situation where the primary need is to maximize the value of every dollar committed to the project.

Also, most government projects are based on competitive bidding for a general contractor.

On the other hand, a negotiated cost and fee contract reduces the incentive to “cut costs” while including a maximum cost provision. Therefore, if the cost exceeds the maximum contract amount, the developer and general contractor split the overrun. Conversely, if the cost is less than the maximum amount, the savings are shared by both parties.

1. Explain the possible advantages of miniperm financing as opposed to traditional construction financing followed by “permanent” financing.

Solution: A miniperm loan serves as a construction loan for a few years after the property is completed. The typical term for a minperm loan is five years.

As a rental property becomes fully occupied and establishes a performance record, it tends to reduce the property’s risk and increase its value. Therefore, a year or two after initial occupancy, lower cost financing may be available. A mini-perm loan can enable the owner to reach that point before needing to pay off the construction financing.

1. Why is property development more vulnerable to business cycle risk than investment in existing property of similar type?

Solution: New development projects typically possess the highest cost structure in the real estate market and, consequently, have the highest break-even cost points. Therefore, a downturn in the business cycle will adversely affect a new project more severely.