

***Financial Analysis
of Development Projects***

Real Estate 619
Urban Land Development
Dr. Longhofer

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Investments 1

Real Estate Investment

- Real estate provides a unique opportunity to earn superior investment returns
 - Fixed location implies each investment is unique
 - Long gestation period for new projects means markets are slow to adjust to new conditions
 - Private information can create profit opportunities
 - With development, you *create value*

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Cash is King!

- Three sources of cash flows must be evaluated when analyzing real estate investments:
 - Up-front costs of developing or acquiring the property
 - Annual operating cash flows from holding the completed real estate investment
 - Terminal (residual) cash flows from disposing of the investment
- Although cash flows are spread out throughout the year, we typically assume they all occur annually

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Up-front Development Costs

- Analysis and pre-development costs
- Site acquisition costs
 - Including sales commission and options costs
- Site improvement costs
 - Off-site improvements
 - On-site improvements
 - Grading & excavation
 - Sewer, water & utilities
 - Paving & landscaping

Up-front Development Costs

- Hard construction costs
 - Including tenant finish
- Soft construction costs
 - Architectural & engineering fees
 - Legal fees
 - Permitting fees
 - Loan fees and construction period interest
 - Profit & overhead

Timing of Cash Flows

- If the construction period is short, treat all up-front costs as if they occur at “date zero”
- If acquisition and construction costs are spread over a long time period, calculate annual cash flows

Multi-year Example

	Year 1	Year 2	Year 3
Cash outflows			
Site acquisition	1,000,000	0	0
Analysis & pre-development costs	125,000	25,000	20,000
Construction costs (hard & soft)	750,000	3,000,000	5,000,000
Construction interest	42,250	195,000	480,000
Mortgage loan repayment	0	0	1,200,000
Total outflows	1,917,250	3,220,000	6,700,000
Cash inflows			
Construction loan draw	792,250	3,195,000	5,480,000
Parcel sales	0	0	1,600,000
Total cash inflows	792,250	3,195,000	7,080,000
Net cash flows to investor	-1,125,000	-25,000	380,000

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- ### *Sources and Uses of Funds*
- Uses are the development and construction costs listed above
 - Make sure you include *opportunity costs* of land you already own
 - Sources include
 - Equity investments
 - Construction loan
 - Joint venture contributions
 - Sale of tax credits
 - Special assessment financing
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- ### *Pro Forma Operating Statement*
- The pro forma is used to calculate the cash flows from a real estate investment
 - Key objective is to calculate NOI
 - The pro forma can be
 - Retrospective
 - Prospective
 - Typical or “stabilized” NOI
 - Year-by-year estimates of NOI
 - Stabilized NOI vs. year-by-year analysis
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Pro Forma Operating Statement

- Potential gross income (PGI)
- Vacancy & collection allowance (V&C)
- Effective gross income (EGI)
- Operating expenses (OE)
- Net operating income (NOI)
- Debt service (DS)
- Before-tax cash flow (BTCF)
- Taxes (Tax)
- After-tax cash flow (BTCF)

Office Building Example

- Purchase price \$885,000
- 15,840 square feet *gross leasable area*
 - 10,800 square feet rent for \$12 psf
 - 5,040 square feet rent for \$10 psf
- Vacancy allowance 10% of PGI
- Operating expenses
 - Real estate taxes \$ 15,900
 - Insurance 12,000
 - Utilities 13,900
 - Cleaning 5,000
 - Maintenance 18,000
 - Management fees 8,100
- 30-year financing at 9% with 75% LTV ratio
 - MDS = \$5,341
 - ADS = \$64,088

Calculate NOI & BTCF

A Digression on Cap Rates

- If NOI were to be constant forever into the future, we could write

$$V = \frac{NOI}{r}$$

- We can rewrite this formula to get an expression for r.

$$R = \frac{NOI}{V} \quad \text{R is called the "cap rate"}$$

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Using Cap Rates

- Cap rates may be used as a quick and dirty measure of the rate of return on an investment
 - In our example the cap rate is
 - $\$89,100 / \$885,000 = 10.07\%$
 - High cap rates imply that the acquisition cost is low relative to the income the property generates
 - Low cap rates imply a high price
- Market cap rates may be used to estimate the value of a property

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Cap Rate Limitations

- Cap rates are a useful tool, primarily because of their simplicity
- Cap rates have important limitations, however
 - They implicitly assume that cash flows are constant over time, and thus ignore expected income growth
 - They do not account for property-specific risk

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Terminal Cash Flows

- Sometimes this is called “equity reversion” because the owner equity reverts to cash
- Factors to consider
 - What is your intended holding period?
 - How do you estimate the future sale price?
 - Will the sale proceeds be received all at once?
 - Refinancing as a means of equity reversion

Cash Proceeds from Sale

- Sale price
- Selling expenses _____
- Net sale proceeds
- Loan payoff _____
- Before-tax equity reversion
- Capital gains taxes _____
- After-tax equity reversion

Tax Considerations

- Income from property is often taxed at the personal income tax rate because of the ownership structures used
- Depreciation is a key element in the size of these cash flows
- Appreciation on the property is taxed at the time of sale
- Tax credits for certain types of real estate projects can further enhance value

Evaluating Real Estate Investments

- We've discussed the three types of cash flows that must be considered
 - Up-front investment costs
 - Operating cash flows during holding period
 - Terminal cash flows (equity reversion from sale)

Evaluating Real Estate Investments

- Depending on the nature of the project, real estate investments are analyzed using
 - Ratio and multiplier methods
 - Calculate first-year or stabilized NOI and compare to total up-front costs of development
 - Discounted cash flow analysis
 - Calculate expected cash flows over each year of the holding period and apply time value of money techniques

Capitalization Rate

- Cap rates are the common ratio for evaluating real estate investment
- With development projects you typically calculate a "stabilized" NOI and compare to the total development costs
- Remember that NOI considers only the income return from a property, not the capital gain return

Cash-on-cash Return

- The “cash-on-cash” return (equity dividend rate) measures the investors equity return

$$COCR = \frac{NOI - \text{Annual Debt Service}}{\text{Acquisition Cost} - \text{Loan Amount}}$$

$$COCR = \frac{89,100 - 64,088}{885,000 - 663,750} = 11.3\%$$

Mortgage Constant

- The mortgage constant represents the annual payment required to repay a \$1 loan

$$MC = \frac{\text{Annual Debt Service}}{\text{Loan Amount}}$$

$$MC = \frac{64,088}{885,000 \times 0.75} = 0.0966$$

Effects of Leverage

- Most real estate investments rely heavily on debt financing
- *Positive leverage* occurs when the cap rate is higher than the cost of debt (mortgage constant)
 - Implies that added leverage will *raise* the cash-on-cash return
- Added leverage implies higher risk, meaning investors will require a higher return

Effects of Leverage

- *Negative leverage* results when the cap rate is lower than the cost of debt
 - Implies that added leverage will *lower* the cash-on-cash return
- *Neutral leverage* occurs when the cap rate and the mortgage constant are equal
 - Leverage has no effect on returns

Other Financial Ratios

- Operating Expense Ratio
 - $OER = OE / EGI$
- Break-Even Ratio
 - $BER = (OE + ADS) / EGI$
- Debt Coverage Ratio
 - $DCR = NOI / ADS$

Discounted Cash Flow Analysis

- The better way to analyze a development project is using discounted cash flow analysis
 - Calculate all three types of cash flows for each year of the holding period
 - Assume all cash flow happen on an annual basis
 - Use a spreadsheet to calculate NPV and IRR

Time Value of Money Principles

- Estimate the size (and sign) of the cash flows
 - Cash inflows are positive, outflows are negative
 - *More is better than less*
- Determine the timing of the cash flows
 - *Sooner is better than later*
- Determine a required rate of return
 - *Certain is better than uncertain*

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Present Value

- If you can earn r percent on your savings, how much money would you need to put into an account today to have X dollars one year from now?

$$PV \times (1 + r) = X$$

$$PV = \frac{X}{1 + r}$$

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Present Value

- Suppose you wanted Y dollars two years from now. How much would you need to save today?

$$PV \times (1 + r)^2 = Y$$

$$PV = \frac{Y}{(1 + r)^2}$$

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Present Value

- This idea generalizes to any length of time

$$PV = \frac{CF_n}{(1+r)^n}$$

- Excel makes it easy to do this analysis without worrying about the math

NPV & IRR

- The *net present value* is the present value of all the future cash flows minus the up-front costs
 - NPV = PV(future cash flows) – Up-front costs
 - Accept a project if NPV > 0
- The *internal rate of return* on an investment is the rate of return (discount rate) that would make the NPV = 0
 - Accept project if IRR > required return

TVM in Excel

- Estimate the cash flows in each year
 - Use one column for each year (with any up-front cash flows occurring at date “zero”)
 - Break down all the different types of cash flows in different rows and calculate the totals at the bottom of each column
 - Cash outflows should be negative; inflows should be positive
 - Focus on actual cash in and out of your pocket

TVM in Excel

- $NPV(\text{rate}, CF1:CFn) + CF0$
 - It is easiest to use the formula wizard
 - Rate is your required rate of return (point to a cell in your spreadsheet where you input this figure)
 - $CF1:CFn$ is the range of cells with the *future* cash flows (not any up-front cash flows)
 - $CF0$ is the up-front costs (typically negative) and is added *outside* the NPV function

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36

TVM in Excel

- $IRR(CF0:CFn, \text{guess})$
 - It is easiest to use the formula wizard
 - $CF0:CFn$ is the range of cells with your annual cash flows; note that $CF0$ is included here
 - If you get an error, try adding a “guess” to the formula; 0.10 is a good starting guess

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Investments

37
