RE 618 / Fin 618 – Real Estate Investment Analysis
Valuation Fundamentals III Lecture Notes

1) Land Values as the Residual
   a) Consider a retail building that is expected to generate NOI of $250,000 forever into the future.
      - If the required rate of return on this investment is 10 percent, what is the current value of the property?

$$V_0 = \frac{NOI}{r} = \frac{250{,}000}{.1} = \$2.5\text{ m.}$$

Question: What is the market cap rate here? Why is the same as the discount rate?

$$R = \frac{NOI}{V} = \frac{250{,}000}{2{,}500{,}000} = 10\%$$

↳ No income growth.

- Suppose that the building on this property costs $2 million to construct. What is the value of the land?

  – The total value of the property is simply the land value plus the depreciated value of the improvements: $V = L + B$. This allows us to write:

$$L = V - B$$

Thus, the land value is simply the *residual*, or the total property value less the value of the improvements:

$$L = 2{,}500{,}000 - 2{,}000{,}000$$
$$= \$500{,}000$$

- Suppose now that the retail building is suddenly expected to generate annual NOI of $260,000. What is the property's total value?

$$V = 2{,}600{,}000$$

What is the building's value?

$$B = 2{,}000{,}000$$

What is the land value?

$$L = \$600{,}000$$

Notice that all of the value difference is actually attributable to the land, not the building, because the NOI change has not affected the building's construction cost.

$V \uparrow 4\%$

$L \uparrow 20\%$

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b) This idea can also be used to determine a property's *highest-and-best use*. Suppose that there are three total options for this property:

Use	NOI	Cap rate	Total V	Bldg. Cost	Land Value
Retail	$250,000	10%	2,500,000	$2,000,000	500,000
Office	$750,000	12%	6,250,000	$6,000,000	250,000
Industrial	$150,000	8%	1,875,000	$1,000,000	875,000

If this land is vacant, which type of user will pay the most for this land?

2) Mortgage-Equity Capitalization

Thus far, we have estimated the value of a property as the present value of the cash flows the property will generate. Alternatively, we can estimate the present value of the cash flows to equity holders and then add in the value of the mortgage:

$V = M + E$

a) Consider a property that is expected to generate $100,000 cash flows in each of the next 6 years. At the end of the 5-year holding period, it is expected to be sold at a terminal cap rate of 11% (V_5 = $909,091). The appropriate market discount rate is 13%.

- Based off of these assumptions the current value of the property is:

N=5, I=13, P/Y=1, PMT=100,000

FV=909,091 ⇒ PV=-845,141

- Suppose that a lender will provide $738,659 in financing at 8.5 percent interest over 20 years:

P/Y=12, N=240, I=8.5, PV=738,659

FV=0 ⇒ PMT=-6,410

– Annual debt service = 76,923

– Balance due at the end of the fifth year =

N=60 ⇒ FV=-650,960

Thus, the equity investor's BTER

= 909,091 - 650,960

= 258,131

- The investor's cash flows are as follows:

BTCF = NOI - ADS
= 100,000 - 76,923
= 23,077

- Suppose that this investor has an equity discount rate of 20%. This is higher than the one used before because of leverage.

The PV of this project is therefore:

N = 5, I = 20, PMT = 23,077,
FV = 258,131, P/Y = 1
⇒ PV = 172,751 = E

- To this investor, the value of this property is:

IV = M + E
= 738,659 + 172,751 = $911,410

This is his *investment value*.

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b) Thus far, we have ignored the effects of mortgage financing on value. In essence, we have used a "free-and-clear" discount rate and calculated value based on the total cash flows of the property.

- Our analysis has been similar to capital budgeting in corporate finance.
  - A major difference, however, is the fact that in capital budgeting, there is typically not a market for the underlying assets, while there is in real estate (e.g., you can sell a building, but you can't sell an aircraft assembly line quite so easily)

- In other ways, this analysis has been like the analysis of stock market investments. However:
  - The market for commercial properties is still not as efficient as the stock market. You can't simply unload a real estate investment right away like you can a stock market investment.

- Thus, real estate investment straddles two worlds: corporate capital budgeting and securities investments.

c) Market Value vs. Investment Value

- So far, we have talked about the market value of the property.

MV= What I can sell the prop. for today

- Alternatively we can think of the property's investment value:

IV = value of the property to me if I hold it a long time.

- Note that you should
  - Buy or hold if IV > MV
  - Sell if IV < MV

$IV_B > IV_S$ if a transaction is to take place.

3) Comparing Going-in and Terminal Cap Rates

b) Question 1: How are cap rates and market values affected by changes in (space) market supply and demand?

↑ demand for downtown office
⇒ Rent growth ↑
⇒ Values ↑
Going-in + terminal cap rates ↓

c) Question 2? How will cap rates and values be affected by changes in capital market conditions (market interest rates)?

Real Rates - Outside rates of return ↑

r ↑, g will be flat.

As required returns go up, market values fall and cap rates rise.

Nominal rates rise - Expected Inflation

- Both the discount rate and the income growth rate will rise by the same amount (Δ expected inflation)

⇒ Values and cap rates unaffected.