Recognizing Uncertainty and Valuing Flexibility in Appraisals

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Welcome!

- … and thank you for your attendance and courtesy in having us here.
- It is a personal and professional pleasure!

Where this is going

- Presentation suggests an analytic way to deal with “residual value” issue
- Issue is fact that market value of a property often greater than net present value; difference is “residual value”
- Question is: how to measure rigorously?

- Suggestion: systematic analysis of opportunities in context of uncertainties
- A refinement of “highest and best” use

One dimension of issue

- Analysis of cash flows provides sound economic valuation of a property – in theory
- But! Market values often higher
- Why is that?

- Because of possibility of changing use
- … for example, tear down old building, rebuild to higher use
- Technically, this is an “option” (the ‘right, but not the obligation, to do something’)

Another dimension of issue

- What else creates divergence between capitalized cash flow and market value?
- Answer I'd like to focus on is: differences of opinion about future cash flows
- Obviously, different cash flow leads to a different capitalized value
- We need to examine possibilities carefully
- In general, need to consider effect of range of assumptions for analysis

Let's look at Example: Genzyme

- **How do we value stock in this company?**

Genzyme history

- Share price = $50 to $60 until Aug 2010
- Sanofi then offers $69 a share
- Genzyme says real value is $89 a share, based on $3 billion sales of Campath drug
- How do we appraise value?

- Sanofi estimates Campath sales at $ 0.7B
- …independent analysts at about $ 1.5 B

http://www.fiercepharma.com/story/whats-real-fair-price-genzyme/2010-10-25

Comments on Genzyme

- **$55 Market value of recent past (this year until August) not good appraisal**
- **Sanofi sees "option" – to rework property to higher, better use (marketing and research savings) We need to factor in**
- **Company claims higher cash flows will come soon (but who knows) Also need to factor in range of uncertainties**

Lessons from Stock Valuations

- **Market analysts**
  - **Develop spreadsheet models of performance**
  - **Use them to examine many, many different possible scenarios with important options**
  - **Come to a judgment based on these analyses**

- **This is the model we propose**
- **Idea is to adapt current cash flow analysis**
  - **Focusing on analysis of many scenarios**
  - **Identification of important options**

Real Estate appraisals more difficult

- **Why are your appraisals more difficult?**
- **Because share valuation comparatively simple:**
  - **Stock market provides tons of data on trades**
  - **Of similar items (shares in companies)**
  - **Large industry devoted to appraisals of same items – a lot of competition**
- **By contrast, Real Estate valuations are unique, market thin, properties differ**

Elements of Proposal

- **Two main elements**
- **Analysis of Scenarios**
  - **Issue: "Flaw of Averages" -- Simple approach gives wrong answers!!!**
  - **Need to look in detail**
- **Identification of "Options"**
  - **Issue: More than "one shot" -- Intelligent management will adjust over time**
  - **Need to look at detail**

Analysis of Scenarios

- An obvious approach is to
  - Base analysis on average or most likely values of uncertain elements of analysis (growth rates of business, cost of construction, price for products)
  - …and then maybe to vary results by plus or minus some percent
- This is widely practiced. Work for you?
- I hope NOT!!! This gives wrong answers!!!

Why wrong answers?

- Because of “Flaw of Averages”
- A word play, based on “law of averages”, “flaw” indicating that it’s wrong

- Mathematically, the procedure is simply wrong except in very simple cases (which you won’t find in reality)
- Known as “Jensen’s law”

Consider hypothetical case

Consider case of 200 unit condo complex

- Investment is $12,000,000
- Each sells for $ 100,000
- Best estimate: 40 units sold each year
- Discount rate is 18%
- Net Present Value is $ 508,684

Year	0	1	2	3	4	5	6	7
Units sold		40	40	40	40	40	0	0
Cash Flow	12,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	0	0
Net Present Value	**508,684**							

Suppose Sales down or up 25%

Year	0	1	2	3	4	5	6	7
Units sold		40	40	40	40	40	0	0
Cash Flow	12,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	0	0
Net Present Value	**508,684**							
Units Sold		30	30	30	30	30	30	20
Cash Flow	12,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	2,000,000
Net Present Value	**879,342**							
Income		50	50	50	50	0	0	0
Cash Flow	12,000,000	5,000,000	5,000,000	5,000,000	5,000,000	0	0	0
Net Present Value	**1,450,309**							

Variation in		
Annual sales	-25%	25%
Value	-273%	185%

Sales up 25% -- value up 185%, due to earlier money

Sales down 25% -- value down 273%, late sales add little

What is the lesson here?

- **Different scenarios can have very different effects on a property.**
- **Thus effect on value can be 'asymmetric' – upside does not equal downside (may be more, may be less)**
- **Upside and downside do not average out, in example [+ 1.45 - .88]/2 = 0.23 ≠ 0.51**

To get right answer we have to consider scenarios separately

Concept of “Options”

- An ‘option’ – for real estate appraisal, is a Refinement of “highest and best use”
  - Example: Replace parking lot with a building
- This is an “option”: owner of property has the right, but not obligation to convert property to a more valuable use (subject to zoning, of course)
- But this is not the only option…

Identification of “Options”

- What are other options?
- Conversion at different times?
  - Value of converting to higher use next or some other year is not the same
- Converting to some third use
  - Parking lot to apartment house is not same as parking lot to parking garage or mall
- Converting to multiple uses over time
  - Use site for a building, expand it later, then change to residential hotel… many possibilities

Proposed Procedure

Four elements

1. **Baseline analysis – spreadsheet based capitalized cash flow**
2. **Uncertainty Recognition – define types and characterize**
3. **Option identification – what immediate possibilities; management over time**
4. **Valuation of possibilities – same basic spreadsheet**

Result: range of possibilities

1. Baseline Analysis

- Spreadsheet based economic analysis of cash flows over time
- This is the process you know so well
  - Set out investments, revenues, costs, taxes, etc, etc, and calculate value as of reference time
- It provides the basis for all other of proposed analyses
  - Proposed process takes advantage of computer
  - Does more calculations, to give you better understanding of value, explain residual value

2. Uncertainty Recognition

- **Next step is to deal with major uncertainties**
- **Which ones have the most effect?**
  - **for example: growth in sales, price changes, construction delays – depends on the case**
- **What ranges of uncertainty do we face?**
  - **What does experience tell us? How have prices changed in past? What are normal delays? And so on…**

3. Option Identification

- We have to think about possible options, that is, upgrades to higher and better uses
- What buildings are possible for first better use of site? (Even better designs better later on)
- How might we expand or change use of these buildings in future?
- Examples: HCSC Building in Chicago; Blue Water Garage expansion

4. Valuation of Possibilities

- **We put all these elements together**
  - **Run spreadsheet for different values of important parameters**
  - **Calculate value of different 'options' that is, changes to 'higher and better' use, both immediately and later on**
  - **"…and better" because we don't know "best"**
- **Sounds like a lot of work, but really isn't**
- **Computers can do the job automatically!**

Results

- Range of outcomes – just as for Genzyme – this is realistic picture of possibilities
- Importantly – take my word for this – you get many better solutions.
- When we take options into account, we can “cut out downsides, take advantage of upside opportunities” and increase value
- This fact explains residual value

Take-away from this section

- **Proposal**
  - **Addresses Residual value issue**
  - **Is a refinement of "higher and best" use**
  - **Based on standard spreadsheet analysis**
  - **Requires recognition of uncertainties**
  - **Thinking about possible better uses**
  - **Plus a reasonably savvy recent tech graduate -- analysis is easy**

GLAD TO DISCUSS IT WITH YOU!