Topic 6: Real Estate Appraisal

I. What is appraisal?

An *appraisal* is simply an opinion or estimate of value. A *real estate appraisal* is an estimate of the value of specified rights or interests in real estate. While these general definitions are simple, defining the type of value to be estimated (*e.g.*, market, investment, or insurable value) is likely to be more complex.

A real estate appraiser might be asked to estimate the value of any type of interest: fee simple, life estate, remainder, easement, leased fee, leasehold. Usually, however, the right that is to be valued is fee simple absolute ownership.

II. Who utilizes the services of real estate appraisers?

A. Lenders – want an estimate of the value prior to accepting the property as collateral for a mortgage loan
B. Investors – want an estimate of the value prior to buying, selling, or exchanging (yes, you can trade a building)
C. Owner/occupants – want an estimate of the value prior to remodeling or selling
D. Buyers – want an estimate of the value prior to making an offer to purchase real estate
E. Subdividers – want an estimate of the value in determining the feasibility of a proposed new subdivision
F. Developers – may want an estimate of value based on various possible improvements in order to determine the property's *highest and best use*
G. Insurance companies – want an estimate of value prior to insuring a property
H. Lawyers – want an estimate of value for estate planning (taxes, distributions), divorce settlements, various types of lawsuits
I. Local (and other) governments – want to know real estate values for eminent domain or *ad valorem* taxation purposes (with the latter often based on "mass appraisal" techniques that involve complex statistical analysis of large amounts of data, rather than having human appraisers visit all sites in the jurisdiction)

Appraisers can work as independent practitioners or as employees of lending institutions (less common than was true decades ago), local governments, large accounting/consulting firms, or other organizations.

III. Appraiser licensing, and professional appraisal organizations

Prior to 1989, *real estate appraisers were unregulated* in most states. Anyone could advertise his/her services as a Real Estate Appraiser – there were no education or experience requirements – on the theory that all an appraiser did was to give an opinion, and anyone can offer an opinion to someone willing to pay for it. (With their knowledge of recent sales prices and local market conditions, real estate brokers frequently did appraisals as a sideline.)

How could people select "good" appraisers? Well-qualified appraisers could distinguish themselves from their less-qualified competitors by joining professional organizations that awarded *designations* to members who met specified education and experience requirements. Those who could place letters after their names (MAI, SRA, ARA) could expect (hope) to be perceived by the public as both competent and honest, because those who violated their organizations' rules could lose their membership. But still, anyone could work as a real estate appraiser.

Then with passage of the Financial Institutions Reform, Recovery, and Enforcement Act in 1989, Congress dictated that each state must implement a licensing program for real estate appraisers. Congress felt that many savings and loans (banks that specialized in making residential mortgage loans) lost money and ultimately failed in the 1980s because some appraisers were dishonest or incompetent, or both. The Appraisal Foundation was formed by major real estate appraisal industry organizations, and now is authorized by Congress, to promote professional standards and advise the government on best practices. The Appraisal Qualifications Board (AQB) division of the Foundation sets guidelines for licensing, and the Appraisal Standards Board (ASB) division publishes the *Uniform Standards of Professional Appraisal Practice* (USPAP, pronounced Use-Papp) that describe systematic, evidence-based steps to follow in conducting appraisals so the public can be confident in the process. Judges take special care to assure that appraisers testifying in court cases have followed USPAP in conducting their value estimation activities; courts that accept testimony that does not follow USPAP tend to give that testimony less weight. (As recently as the 1960s appraisals done in connection with mortgage loans sometimes consisted of very sketchy evidence on paper, and the appraiser might have done just a "drive-by" without even going inside to see the improvements being appraised.)

Then with the 2009 Home Valuation Code of Conduct (HVCC) and the 2010 Dodd Frank federal financial overhaul regulation, federal law further required that appraisers be selected and supervised by parties whose duties and pay were independent of a lender's loan approval process, so that a loan officer can not favor agreeable appraisers who might willingly overstate values to assure that loans can be processed. To be sure they are in compliance, many lenders now outsource the arrangements for appraisals to independent appraisal management companies (AMCs).

By stating that any appraiser involved in a "federally related transaction" (such as a loan from a federally insured bank or credit union, or involving a government agency or government-sponsored enterprise) had to be "licensed" or "certified" by the government of the state where the subject property is located, Congress hoped to:

- assure that each appraiser met basic education and experience standards, and
- provide a means for preventing dishonest appraisers from continued practice (by revoking their licenses).

So now an appraiser can provide evidence of competence by being a "certified general real estate appraiser" (highest category of license, 300 hours of education and considerable experience required), "certified residential real estate appraiser" (200 hours of education/reasonable experience), and "associate trainee real estate appraiser" (75 hours of education, and can work only under the direct supervision of an experienced license holder), in addition to showing abilities through professional designations. (The licensing categories noted above are the names used in Illinois; other states may use slightly different terms for these license categories, which reflect different levels of education/ experience. Licensing is administered in Illinois, under the Illinois Real Estate Appraisal Licensing Act of 2002/ amended 2009, by the Real Estate Division within the Illinois Department of Financial and Professional Regulation.)

But the professional organizations have not become superfluous in the era of state regulation, for several reasons. High quality professional associations:

- may have stricter standards than state licensing boards (a high-quality designation still can be a credential valued by some appraisal clients),
- exert much influence on the regulatory process, and
- provide much of the education required by the various state licensing boards.

So do you need a license to be a real estate appraiser? Yes and no. No to the extent that many transactions are not federally related (*e.g.*, divorce, insurance, setting an asking price). But yes to the extent that government-sponsored secondary mortgage market giants FNMA ("Fannie Mae") and FHLMC ("Freddie Mac") generally will not buy loans that are not accompanied by state certified or licensed appraisers' value estimates. And the biggest source of business for appraisers of residential real estate has always been mortgage loans on single-family residences.

[Interesting sub-point: the secondary mortgage market has questioned whether appraisals should be required at all. The appraisal process leads to much cost and paper work, which some would argue is just to prevent a few bad transactions. In fact, the lending marketplace seems to be moving toward a standard of saving time and money by accepting "evaluations" or "broker price opinions" or "comparative market analyses" from real estate brokers, that are less thorough than full-blown appraisals in some cases. Indeed, Fannie Mae and Freddie Mac have their own "automated valuation model," or AVM, that allows for waiving the traditional appraisal if the loan application shows a high enough "confidence score" (strong borrower credit history, loan for moderate portion of sale price, perhaps fairly recent appraisal exists). And of course newer computer applications like Zillow, based on geographic information systems (GIS), provide value estimates. Because appraisers' livelihood traditionally has been so closely linked to mortgage lending, we have to use caution in projecting future appraisal-related job opportunities.]

What are the professional organizations? The best known are:
A. Appraisal Institute – formed in 1990 through a merger of the American Institute of Real Estate Appraisers (Realtor®-affiliated) and the Society of Real Estate Appraisers (originally savings and loan industry-affiliated). The Institute offers education on appraising a broad range of property types: residential, commercial, industrial, agricultural, land. The organization is highly reputable; it awards prestigious designations (as was true of the two forerunner organizations). [The Appraisal Institute is headquartered in Chicago.] Designations offered or supported: Member Appraisal Institute (*MAI*) and the less comprehensive Senior Real Property Appraiser (*SRPA*) [both for income property], and Senior Residential Appraiser (*SRA*) [for 1-4 family residential property].

B. American Society of Farm Managers & Rural Appraisers – focus is on appraising farm property (and managing farm business operations). Highly reputable; awards the prestigious Accredited Rural Appraiser (ARA) designation.

C. International Association of Assessing Officers – the focus is on assessing (estimating the value of) property for local government taxation purposes. Highly reputable; designations awarded include Certified Assessment Evaluator (CAE) and Mass Appraisal Specialist (MAS).

D. American Society of Appraisers – deals with appraisal issues involving a wide range of assets, from real estate to collectibles. Headquartered in Washington, DC. Awards the Accredited Senior Appraiser (ASA) designation to qualifying members, whether the individual's area of expertise is office buildings or antique jewelry. (So the appraiser must communicate his/her expertise to the public by means other than publicizing the ASA designation.)

E. Other organizations – over the years some other appraisal organizations have been criticized for having low standards for membership and designations. In a late 1980s case an appraiser who held the MAI designation was sued for defamation after publicly criticizing a less prominent appraisal organization as a "diploma mill." The case was dismissed once the MAI showed that he had secured for his pet house cat, Tobias, one of the criticized group's professional designations by merely submitting an application form with the required $75 fee.[1] A problem is that the general public typically assumes that any designation signifies high professional attainment, when it may not. This point has often been cited by those who favor having state governments award certifications/licenses to assure a desired level of qualification and oversight.

F. A fairly new branch of real estate appraisal practice is "appraisal review," the process of evaluating completed appraisals to assure compliance with USPAP and perhaps other financial compliance issues. Major professional organizations now offer professional designations focused on knowledge and experience in appraisal review, such as the Appraisal Institute's General Review Specialist (GRS) and Residential Review Specialist (RRS).

IV. Determinants of Value

A. What *attributes* cause an item to have value in a transaction? These attributes typically are specified as:

1. Utility – the ability to satisfy human needs or desires.
2. Scarcity – not abundantly available in nature or through other non-market means.
3. Effective Demand – people who desire the scarce item are willing and able to pay for it by giving up something else of value.
4. Transferability –the ability to transfer the attendant rights to another party.

B. What are the *forces* that influence the magnitude of value?

1. Governmental/Legal/Political – the regulatory environment (*e.g.*, rent controls), level of taxes to which the holder of rights would be subject, quality of public services.
2. Economic – income levels, economic base, costs of land and labor, availability and cost of financing.
3. Social/Psychological – demographics and lifestyles within the market area, demand for particular property types.
4. Physical – features of the site and improvements; access to shopping, utilities, transportation hubs, and other services. (Urban home prices and apartment rents tend to be higher at locations near commuter train hubs,[2] though we might wonder if the impact may diminish as more work from home.) Important factors would include compatible land uses and balance of factors of production on a given site (right mix of land and improvements).

V. Types of value that appraisers might be asked to estimate

A. *Market value* – the highest price that a property would sell for on the specified date if the buyer and seller were well-informed (or well-advised) and acting in their own best interests, and without excessive duress; and if the property were sold for cash in a competitive market after reasonable exposure time and with no special financing or other unusual transaction features. Sometimes market value is stated more simply as "most probable selling price."

Note that "price" and "value" may not be equal. A price paid in a particular transaction may not have reflected the conditions noted above (*e.g.*, parents selling a house to their son may not be acting in their own best interests).

"Assessed Value" sometimes is presented as a concept different from market value. However, if assessments are to reflect market values, then assessed value should differ from market value only through an adjustment (for example, in most of Illinois real estate generally is to be assessed at ⅓ of its market value), or perhaps because of time lags in the reassessment of an area's real estate.

B. *Investment value* – the present value of the future benefits to a particular investor. It takes into account matters that include the investor's other income, access to funds, income tax situation, and overall portfolio holdings. Thus while market value reflects an objective standard, one person's investment value for a particular property could be very different from another's (with real estate, interesting questions arise on whether adding a dissimilar property to a portfolio increases value more from a diversification standpoint, or decreases it more through reduced economies of scale in management).

[For a single-family home we might think of investment value as the lowest price the owner would accept in selling to a party that can not require her to sell, as in our Topic 3 discussion on appropriate compensation in an eminent domain taking.] Since real estate generally could be sold for its market value, we would not expect someone's investment value in a given property to be less than its market value (aside from transaction and holding costs).

C. *Insurable value* – the amount for which an insurance company should insure a property, based on the cost of replacing (with equivalent utility) or reproducing (exact replica of) improvements. An Oregon court ruled that local

ad valorem tax could be assessed, for an odd mixed-use property with no clear market value, based on the amount for which it was insured, since that was the owner's measure of what would make him financially whole if the property were lost ("real market value," per the court).[3]

VI. The Appraisal Process

A. Define the problem
1. Identify the subject real estate (generally done based on a legal description)
2. Identify the rights or interests to be appraised
3. Define the type of value to be estimated
4. Specify the date of the valuation (may be present or past; can not be future because we have no actual information on which to base a value estimate as of some future date)

B. Select data and complete preliminary study
1. Identify the data needed (examples: recent sales of similar properties, construction costs, rents charged locally)
2. Identify the personnel needed (on a complex assignment an appraiser might need legal or engineering advice, or even expert insights on manufacturing processes in a particular industry for which a building might be suited)
3. Determine how much time will be needed
4. Determine the fee to be charged (based on 1 – 3). It is appropriate for an appraiser to quote a standard fee based on the property type (common with single-family homes), a total fee based on the time required and other expected costs, or an hourly fee. *It is not appropriate for the fee to depend on the value estimate*.

The basic idea here is that the appraiser should decide whether she is qualified to do the assignment (or can obtain the right information and input from others) and can do it at a price acceptable to the client. A conflict of interest arises if an appraiser is paid more for reporting a value other than her best objective, professional estimate.

C. Research and analyze the market, including Highest and Best Use analysis
1. The Macro Market: information on the national, regional, and state economy; conditions in the local area and the neighborhood where the property being appraised is located (how might we define neighborhood?)

2. The Micro Market (the property itself): information on the site (lot) and improvements. In this step, the appraiser thoroughly examines the *subject property* (the real estate to be appraised): measures the building size(s), looks at quality features of the land and building(s), counts rooms, looks at mechanical systems, looks at other amenities (porches, patios, fireplaces, loading docks), determines age, looks for problems. The "uniform residential appraisal report" (URAR) appraisal form recommended by U.S. government mortgage lending agencies FNMA and FHLMC provides a nice checklist for the appraiser to use in completing these steps for a single-family residential appraisal.

Highest and best use (HBU) is analyzed in this section. HBU is the use, from among those that are physically and legally possible, and reasonably probable (market participants would tend to desire it), that maximizes the property's value. Because market value is defined as the *highest* price we would expect the property to sell for, we must identify the use for the property that would be the most efficient, and thus would lead to the highest price bid among potential users. The highest and best use sometimes is obvious (a lot that is zoned for single-family residential and that sits in the middle of a single-family residential subdivision can not likely be put, legally, to any use other than single-family residential), but sometimes it is not so obvious.

Consider an older house sitting on land that is (or very likely could become) zoned for light commercial use. People wanting to live in a house with the attendant features would bid $80,000. Potential commercial users would pay only $60,000 to get the use of the land (and thus would bid less than $60,000 because of first having to tear the old house down). So the HBU today of the property, as improved, is the current residential use, since $80,000 exceeds $60,000. (If the land were vacant – let's say the house gets destroyed in a tornado – the HBU today likely would be light commercial.) But then say a few years later the commercial value of the land if vacant had risen to $70,000, while bidders wanting to live there would pay only $58,000 (because the house had gotten older, and had become burdened by even more noise and congestion from the increasing nearby commercial activity). The HBU at that later date would have changed to light commercial (we assume the cost of tearing down the old house would be less than $12,000 – think $8,000) – such that commercial users could outbid home owner/occupants' $58,000 best offer, paying $62,000 for the land as-is (they must hold back $8,000 to demolish, for a $70,000 total investment).

D. Apply the *three approaches to valuation*
1. *Sales Comparison Approach* – examine what buyers have paid for properties reasonably similar to the subject property in recent transactions, adjusting for features on which those recent sales differed from the subject.

2. *Income Approach* – you should pay no more for an income-producing property than the price of buying an asset that would provide a substitute income stream with equal magnitude and risk.
3. *Cost Approach* – the adjusted price of substituting newly-built improvements (without serious delay) for a property that is the subject of an appraisal.

An important economic principle in the appraisal process is the principle of marginal productivity – how much does the presence/absence of an item add to/detract from value? This principle offers insight into why the addition to cost is not always equal to the addition to value. For example, you might add a family room to your house at a cost of $43,000, only to see the home's value rise by just $35,000. Why? Because adding on to a finished property at a later date typically is not an efficient way to construct improvements in a market that is competitive, such that costs incurred inefficiently can not be passed along to buyers (we are assuming that the family room could have been incorporated while the crew was on site, with its equipment, building the house at an extra cost of just $35,000).

E. Finalize the Process
1. Reconcile the three approaches (determine which one is, or ones are, the most reliable in light of the circumstances, including the available information)
2. Come up with one final value estimate (it is not a simple averaging process; the most weight should be given to the approach that provides the most reliable insights on value)
3. Write the Appraisal Report

[Note: an *appraisal* is the value estimate that results from the appraiser's analysis; an *appraisal report* is a limited summary of the steps the appraiser took in completing that analysis.]

VII. The Three Approaches to Value (all based on the economic principle of *substitution*)
A. *The Sales Comparison Approach* – The justification is that a rational buyer would pay no more for a property than the cost of buying a substitute with similar physical and locational features in the current market environment. (You would not pay $200,000 for a house if you could buy one very similar to it just down the street for $160,000.) [It was once widely called the "market data" approach, but critics pointed out that all three approaches should be based on data from the market, like construction cost and income figures in the cost and income approaches.]

The sales comparison approach tends to provide a reliable value estimate if the property is of a type that is regularly sold, and for which abundant information is available on recent sales of similar units in the same or similar areas.

Steps in the Sales Comparison Approach:
1. Assemble information on recent sales of properties that are similar to the subject property. Sources of this information would include local *tax assessors' files*, real estate data bases in printed or electronic form (including *Multiple Listing Service*, or *MLS*, information from the local Board of Realtors®), discussions with *recent buyers and sellers*, and the *appraiser's own files* assembled from earlier appraisals. Select as the "*comparables*," or "comps," sales of properties that
- are reasonably similar physically to the subject property
- are in the same *market area* as the subject (we would define "market area" based on the property type. Possibilities: in the same neighborhood for a typical house, in the same metro area for an unusual house, in the same region for a distribution warehouse, anywhere in the country for a major manufacturing facility).
- did not involve undue pressure, unusual financing, or other unusual terms of sale.
- sold recently (what is "recent" depends on the property type and market conditions; for a typical home we generally would try to stay within a year or at most two, but for unusual properties we might look at sales that occurred several years ago to see what a willing buyer paid).

[Appraisers occasionally use *listings*, meaning properties currently being advertised for sale, as comparables when few recent sales have occurred. While listings provide some information on current market conditions (and might help establish ceiling values), they should not be used as comparables in the *sales* comparison approach because of the uncertainty over the price and other terms that ultimately will prevail. Question: how many comparables should an appraiser select? URAR calls for three, but think about what an *appraisal* is, not what an appraisal report is.]

2. Make dollar adjustments for features on which each comparable differs from the subject. Adjust for: rights conveyed (*e.g.*, the subject is burdened by an easement but the comparable is not), market conditions (*e.g.*, the date of sale), financial terms and other *conditions of sale, physical and locational characteristics*, possible inclusion of non-real estate value (*e.g.*, the comparable sold with all furnishings included – but use caution in such a case, because an appraisal of real estate should not make reference to any type of personal property; values of furniture or other personal property should be documented in bills of sale and/or separate appraisals of personal property).

Practicing appraisers frequently compute an adjustment's magnitude by trying to find a *matched pair*: two transactions that differed on only one dimension. *Example*: in the Oak Tree Acres neighborhood, two houses recently sold that were essentially identical *except* that one had three bathrooms (sold for $259,000) and the other had only two bathrooms (sold for $250,000). When doing appraisals in that area, the appraiser might subsequently be inclined to adjust $9,000 for the value of a third bathroom. But statisticians are troubled by a matched pair's lack of even a single "degree of freedom" – dollar differences in one pair of transactions could be a fluke; if there were a pair of sales in which a house with three bathrooms sold for *less* than an otherwise identical house with only two bathrooms, would the appraiser conclude that additional bathrooms *detract* from value (of course not)?

A statistical attempt at solving this problem is to use multiple regression analysis to extract estimated values of property components from data involving a large number of past transactions. But then another problem arises if the analyst can construct a big enough data set to work with effectively only by including transactions involving properties with fundamental differences, such as houses in different neighborhoods in the same town, or of different general sizes or ages. An in-between solution would be to look for multiple matched-pair sales from the same market area, with the improvements differing only by bathroom count, and – if you can find them – see if they consistently show the house with a third bathroom selling for about $9,000 more.

[The following might be a more helpful and realistic look at matched pairs. You are appraising A, a ranch style house in Fox Dale subdivision, and have chosen recently sold homes B, C, and D as the best comparables to use in the sales comparison approach, because all are ranch style houses in Fox Dale that sold fairly recently. B sold just a few days ago, and is so similar to subject A that you need adjust only for a fireplace that B has (A, C, and D lack fireplaces). But what is a fireplace worth? You find recent sales of houses E and F, both two-story Fox Dale houses, that differed only in that E has a fireplace and F does not, and E sold for $5,000 more than F just a few weeks apart. Thus you have one matched pair indicating that a fireplace in Fox Dale is worth about $5,000. But you know the danger of attributing a component value estimate to a single matched pair, so you look for additional matched pairs. You can not find other Fox Dale matches that differ only on the fireplace trait, but find somewhat recent sales of houses G and H, both split-level residences in Wolf Glen, a subdivision in another part of the city with houses that generally are similar in age, style, and price range to those in Fox Dale. G (sold eight months ago for $277,400) has a 2-car garage and a fireplace, while H (sold a year ago for $283,000) has a 3-car garage but no fireplace. (We might also have to adjust for changes in home price levels over the past year, but will ignore that issue here.) Analysis you have done for earlier appraisals (multiple matched pairs, regression analysis, capitalizing lost rents as seen below) indicates that an extra garage stall in that type of neighborhood is worth approximately $11,000. So first you note that if G had a 3-car garage it would have been expected to sell for about $11,000 more, or $288,400; now the only big difference on paper between G and H is the fireplace. If G reimagined with a 3-car garage and fireplace would have sold for $288,400, while actual H with the 3-car garage and no fireplace did sell for $283,000, then the indicated value of a fireplace for that general type property is $5,400, not too far from the $5,000 indicated by the initial Fox Dale matched pair. So now you have a bit more evidence that a fireplace in a house of this general type in this general area adds something like $5,000 to value. Then you might seek yet additional pairs of sales in which the only differences are fireplaces or other features whose values you can account for.]

Another basis sometimes used for computing or confirming adjustments relates to the cost of building the feature that the comparable has (lacks) and the subject property lacks (has), which shows an interaction between the sales comparison and cost approaches to valuation. For example, if it would cost $12,000 to add a brand new third bathroom to an existing house, a $9,000 value shown by matched pair analysis for a not-as-new (but efficiently built) third bathroom might seem reasonable in confirming that the $9,000 emerging from other information was not just a fluke. In applying the sales comparison approach to income-producing real estate, appraisers sometimes identify the extra or reduced income a comparable would generate, relative to the subject property, and capitalize that stream of income gains or losses into an adjustment value. An income-based analysis could even be applied to adjustments for a single-family residence; if a house of the type described with a third bathroom would command $100 more in monthly rent than one nearby with only two, and houses of that type in the applicable neighborhood tend to sell for about 95 times what they could be rented for monthly, then a third bathroom should be worth about $100 x 95 = $9,500, a figure that helps support the reasonableness of the $9,000 matched pair result. Here we see an example of how the sales comparison approach can interact with the income approach. Finally, note that a third bathroom added to a four-bedroom house that started with two likely would add less value than a second bathroom added to an otherwise similar four-bedroom house that started with only one – a non-linear *diminishing marginal utility* relationship tends to apply to housing amenities, just as it does in so many other economic situations.

[An alternative application of sales comparison analysis could involve *units of comparison*, such as price per square foot of land area for vacant sites, or price per square foot of floor area for an improved property, or value per bed for a nursing home. For example, if four nearby vacant lots sold recently for prices/square foot of $55,000/13,000 =

$4.23; $67,000/16,000 = $4.19; $108,250/25,000 = $4.33; and $171,600/40,000 = $4.29; or an average of $4.26 per square foot, then a nearby 35,000 square foot lot's market value might be estimated as 35,000 x $4.26 = $149,100. But as suggested above, added square footage's impact might well not be linear, so a market value estimate based on a price per unit figure that came from sales of much smaller or larger properties could be illogical/unreliable.]

If the comparable is *superior to the subject* on the measured feature, the appraiser should *subtract* an appropriate amount from the comparable's sale price to find the subject property's indicated value. If the comparable is *inferior to the subject*, then we should *add* an appropriate amount to the comparable's sale price to get the indicated subject property value. Remember that we are trying to *figure out what the subject is worth* by extrapolating from what the comparables sold for; we are not trying to figure out what the comparables are worth (we already "know" that from their sale prices, if we are confident that the sales were arm's length with no unusual conditions).

[*Example*: Comparable A is just like the subject property, except Comp A has a fireplace (worth $4,000 based on matched pairs or regression analysis) and the subject does not. If Comp A sold last week for $172,000, then the indicated value of the subject, which lacks the fireplace and thus is not as good, is $172,000 *minus* $4,000 = $168,000 – we are effectively stripping the fireplace off of Comparable A to find the subject property's value.

Comparable B is just like the subject property, except Comp B has no garage (it had been destroyed in a fire shortly before the sale) while the subject property and most other neighborhood homes have 2-car garages (worth $10,000). If B was sold last month for $153,500, the indicated value of the subject is $153,500 *plus* $10,000 = $163,500. (We want to think of the subject as being, essentially, $153,500 garage-less Comp B plus $10,000 worth of garage.)

Comparable C is very similar to the subject, except Comp C has a covered patio (worth $2,500) while the subject does not, and Comp C was sold one year ago (the typical house in that area now sells for about 3% more than it did last year). If Comp C sold for $169,900, the indicated value of the subject is $169,900 *plus* $5,000 (about 3% of the $169,900 the house would have sold for a year ago) = $174,900, *minus* $2,500 current patio value = $172,400.

This information would typically be organized in an "adjustment grid" form, which shows all important or relevant information on the subject property and the "comps," and allows for adjustments to be made.]

	SUBJECT PROPERTY		COMPARABLE SALE 1			COMPARABLE SALE 2			COMPARABLE SALE 3	
Street Address	101 Maple		101 Redwood			215 Maple			1011 Oak	
Proximity to Subject			3 Blocks East			2 Blocks Southeast			5 Blocks South	
Data Source			Multiple Listing Service			Multiple Listing Service			Appraiser's Own Records	
Sale Price				$172,000			$153,500			$169,900
Feature			Description	Adjustment		Description	Adjustment		Description	Adjustment
Date of Sale	Current Date		1 Week Ago	=		1 Month Ago	=		1 Year Ago	$5,000
Financing	Conventional		Conventional	=		Conventional	=		Conventional	=
Location	Arbor View Subdivision		Arbor View	=		Arbor View	=		Arbor View	=
Property Interest	Fee Simple		Fee Simple	=		Fee Simple	=		Fee Simple	=
Site	100 x 130		100 x 130	=		100 x 130	=		100 x 130	=
Design/Style	Ranch		Ranch	=		Ranch	=		Ranch	=
Actual Age	20 Years		21 Years	=		20 Years	=		19 Years	=
Siding	Brick/Vinyl		Brick/Wood	=		Brick/Vinyl	=		Brick/Vinyl	=
Above-Ground Room Count	8 / 4 / 3		8 / 4 / 3	=		8 / 4 / 3	=		8 / 4 / 3	=
Basement	Full, Unfinished		Full, Unfinished	=		Full, Unfinished	=		Full, Unfinished	=
Garage/Carport	2-Car Attached		2-Car Attached	=		None	$10,000		2-Car Attached	=
Fireplace	No		Yes	($4,000)		No	=		No	=
Porch/Patio/Deck	None		None	=		None	=		Patio	($2,500)
Condition	Average		Average	=		Average	=		Average	=
Net Adjustment				($4,000)			$10,000			$2,500
Adjusted Sales Price				$168,000			$163,500			$172,400

3. Assign weights to the comparables (based on how "good" they are), and correlate/"reconcile" the various indicated values into one point estimate of value under the sales comparison approach. Example: assume that the three comparables discussed above are sufficient to allow us to form an opinion of the subject property's value. If Comp C seems extremely "good" as an indicator, then we might assign it more weight than we assign the others, and infer an indicated value of perhaps $171,000 (tempering Comp C's indicated $172,400 value with the fact that Comps A and B indicate values considerably lower than $172,400).

A more systematic and objective method for weighting the comparables might be called the "squared adjustment weighting technique." In this technique, we square each adjustment made to each comparable (both to eliminate negatives and to impose a greater penalty on larger, more uncertain adjustments), and then assign the greatest weight to the "comp" with the smallest squared adjustment total. The idea is that a comparable is "good" to the extent that the adjustments made to it are few in number and/or small in magnitude, thus making it objectively more similar to the subject than other "comps" are (a big adjustment has greater potential to be incorrect; think of adjusting $40,000 because the comp is in a different kind of neighborhood than the subject). So this system provides a *relative*, rather than absolute, weighting scheme; it may be that none of the "comps" are good in any absolute sense, but still some will be better than others and deserve more weighting. [And if none of the comps are good in an absolute sense the appraiser will place little confidence in the market value estimate generated through the sales comparison approach.]

Consider the example above. We know that the indicated value should be somewhere between $163,500 and $172,400. But how much weight should we assign to each of the comparables? Adjustments are – $4,000 for Comp A, +$10,000 for Comp B, and +$5,000 and –$2,500 for Comp C. (We have to consider each adjustment separately. Think of what happens otherwise; if a comparable were adjusted +$25,000 because it is in a location much farther from jobs than the subject but also – $25,000 because it considerably newer than the subject, would it be a perfect comparable because its adjustments net out to $0? *No, it is a weak comparable*, because it required two really large adjustments; it just happened that they were equal in magnitude, with one positive and one negative.) Use a decimal fraction – like 1/1,000 or .001 – of each adjustment to keep the numbers from getting awkwardly large.

So take $(-.4)^2 + 1.0^2 + .5^2 + (-.25)^2 = .16 + 1 + .25 + .0625 = 1.4725$ as the total of all squared adjustments.
for A for B for C

To get each "comp's" weight in this relative weighting scheme, use adjustments to *other* "comps" as the numerator and (n – 1) x (total of all squared adjustments) as the denominator. Because there are three comparables in this example, (n – 1) = (3 – 1) = 2, and the denominator becomes (2)(1.4725) = 2.945. The weights therefore become

$\frac{1+ .25 + .0625}{2.945}$ = .4457 for A, $\frac{.16+ .25 + .0625}{2.945}$ = .1604 for B, and $\frac{.16 + 1}{2.945}$ = .3939 for C

(note that these three weights total to 1.00, as weights always should.) Based on these weights, the subject property's indicated market value is (.4457)($168,000) + (.1604)($163,500) + (.3939)($172,400) = $74,878 + $26,225 + $67,908 = $169,011.36 (perhaps rounded to $169,000),[4] *vs.* $167,967 if we just average the three.

B. *The Income Approach* – based on the economic principles of *anticipation* and *change*, in addition to substitution. The justification is that a rational buyer would pay no more for a property than the present value of the financial benefits that could be realized by owning the property or one similar to it *if* the investment were well managed and *if* the owner's expected cash flows were discounted to a present value at an appropriate, risk-adjusted discount rate.

The income approach tends to provide a reliable value estimate if the property would be expected to produce an explicit income stream. (An income-related analysis is frequently used with single-family houses as well, but it generally is not seen as providing very useful information unless many houses of that type and in that neighborhood are routinely rented in arm's-length transactions.) The income approach can be applied in various forms.

Based on Discounted Cash Flows
The value of any income-producing asset can be measured as

$$\text{Value} = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{CF_4}{(1+r)^4} + \cdots + \frac{Final\ CF}{(1+r)^n}$$

This "discounted cash flow" (DCF) technique should seem quite straightforward to finance majors, although it also should be clear that (as with bonds and, especially, common stock) estimating the amount and duration of the cash flow stream, and setting the required rate of return on investment, are difficult. For income-producing real estate, the periodic *CF*s used in a DCF analysis typically are the before-tax cash flows expected for the equity investor, with the final *CF* also including the expected future selling price net of amounts owed on loans ("equity reversion," the return *of* the owner's investment). A DCF analysis might be undertaken if the future cash flows were expected to differ considerably from year to year (for example, if unusual lease terms had been negotiated) and the appraiser felt some confidence in specifying what they would be. In such a situation, it would not be logical to generalize about the future based on one year's financial return to the property.

However, appraisers traditionally have often applied the income approach through *Direct Capitalization*, a shortcut in which a measure of one year of expected income is translated directly into an estimate of market value:

$$Value = Annual\ Income \times Multiplier$$

or, more commonly,

$$Value = \frac{Annual\ Income}{Annual\ Rate\ of\ Return-Related\ Measure}.$$

We therefore want to find a *consistent general relationship between market value and one year of income for a particular type of property*, so that after estimating a subject property's annual income we can use the consistent income/value relationship to estimate its value. The underlying logic is that we might observe cases in which one year of income can serve consistently as a proxy for whatever financial benefits the property can be expected to provide in the future. This shortcut would be logical to use for real estate with unusual expected future income patterns only if such properties *in general* were expected to display the same unusual future income results.

Steps in Direct Capitalization

1. Estimate the relationship between income and value for the subject's property type and market area. This relationship can be based on periodic *gross income* or, preferably, *net income* measures. We divide the subject property's annual income measure by an applicable percentage "capitalization" rate figure, or multiply the annual income measure by the "cap" rate's reciprocal (a multiplier), to estimate the subject property's market value.

This relationship does not reflect a simple required *return on investment* (as we normally would use in valuing common stock, or in valuing real estate with the DCF equation shown above). In looking only at one year (or sometimes month) of expected income, we do not directly take into account any expected increase or decrease in annual income, the property's expected resale value over time, or the potential need to spend on improvements, so the multiplier or "cap" rate used in direct capitalization ultimately must incorporate both a return *on* investment for the entire property and return *of* investment for the improvements, since buildings wear away, or depreciate, over time. (A stated percentage return *on* investment is misleading if there is not also a full return *of* the investment. If you lend $100 today and get back $6 a year later your annual rate of return is – 94%, not 6%; it is only if you get back $106 a year later that you have earned a 6% annual rate of return. In DCF analysis we discount with the required return *on* investment, and account for return *of* investment through the after-tax equity reversion).

We can estimate the multiplier or "cap" rate either by *observing recent transactions* involving similar properties in the same market area, or by using our *knowledge of the financial markets and the financial decision-making process*. The methods we can use are:

a. *Direct extraction from the market* – locate several similar properties that have sold recently, in arm's length transactions, in the subject property's market area. The return *on* and *of* investment are provided for implicitly, but automatically, if we can assume that recent buyers set their offering prices appropriately. Identify an applicable income for each observed property, and compare that income measure with the selling price to compute a:

- Gross Income Multiplier (GIM) – used particularly for single-family houses of a type for which an active rental market exists (such that some potential buyers would be motivated by investment potential). It also can be used in appraising other income property types, but we typically prefer net income-based measures if expense information is available, since gross income is only the "top line" in an income-based analysis. It is easier to defend gross income as a basis for estimating value if expense percentages would be expected to be similar for all properties of the type in question within its market area – even if we do not know what those percentages are.

[Example: Four houses physically similar (general age, size, style) to the subject property, that were rented to tenants through arm's-length transactions, recently were sold in the subject property's neighborhood.

Address	Selling Price	÷	Gross Monthly Rent	=	Indicated GIM
101 1st St.	$104,000		$1,200		86.67
102 2nd St.	$107,000		$1,250		85.60
103 3rd St.	$101,800		$1,180		86.27
104 4th St.	$108,000		$1,270		85.04

The GIM (sometimes more precisely called a gross monthly rent multiplier) for this type of house in the subject neighborhood is *approximately 86*. So if the subject property's monthly rent objectively should be $1,220, the indicated market value is $1,220 x 86 = $104,920, perhaps rounded to $105,000. Some analysts actually view the

gross income multiplier as a unit of comparison to use in sales comparison analysis rather than a relationship to use in the income approach, because gross revenue is not a true income measure. The traditional use of gross income in appraising single-family homes likely reflected the greater reliability of gross income over net income figures when rented homes largely were owned by small investors, who managed them in their spare time and did not keep detailed expense records. The standard may evolve to net income as large investing organizations continue to buy and even build houses to rent out on a wider scale, in an era when houses in some areas might be purchased by investors at favorable prices and when more families have chosen to rent houses, in just about all price ranges, rather than to own, perhaps because they want to be able to move easily if their job situations change.]

- *Overall Capitalization Rate* (OAR) or Net Income Multiplier (NIM) – our preferred method if expense information is available for recently sold income-producing properties. The OAR is simply 1 ÷ NIM, so the two measures tell us essentially the same thing. But in line with traditional valuation methods (also used in valuing stocks/bonds), we typically divide an income measure by a rate instead of multiplying it by a multiplier.

[Example: Four apartment buildings that are generally similar to the subject property were recently sold in the subject property's neighborhood.

Address	Annual Net Income	÷	Selling Price	=	Indicated OAR
105 5th St.	$85,000		$750,000		.1133
106 6th St.	$91,500		$835,000		.1096
107 7th St.	$78,000		$715,000		.1091
108 8th St.	$80,500		$725,000		.1110

The OAR for this type of property in the subject property's neighborhood is *approximately .11*.]

The comparables used in extracting an OAR from the market should not just be reasonably similar to the subject property physically (age, size, style), but also should have leases that are similar in duration and risk (such as potential future vacancies) and generally similar debt/equity financing proportions. Indeed, as seen with sales comparison approach comparables, sales used as comps in extracting an OAR should not have been accompanied by unusual financing or other terms that are atypical for the type property being appraised. And the most recent year's stabilized NOI (see below) should be the same type of proxy for long-term expectations (growth in revenues and value, change in operating costs, risk of vacancy, need to make capital improvements) for the comps as for the subject. We do not know specifics of why an OAR extracted from the market explains the relationship between value and a year's worth of income; we simply infer that if the same relationship is seen consistently then it must represent the end point in analyses done by knowledgeable transactors, who negotiate prices that provide, overall, for returns *of* investment and appropriate returns *on* investment for owners and the lenders they borrow money from.

b. *Compute a capitalization rate based on financial principles*

- *Band of Investment Method* – similar to the *weighted-average cost of capital* in corporate finance.

[Example: Assume that, in the typical purchase of a property like the subject, the owner provides 30% of the price and borrows the remaining 70%. The lender must be compensated first, through an annual payment on a 7.8%, 25-year loan (payment factor of .092084, which is the reciprocal of the PV of Annuity factor for a 7.8% periodic rate and 25 periods – mortgage loan payments almost always occur monthly, so this annual figure is an approximation). Those payments cover periodic interest and also include the repayment of principal, so they account for both a return *on* and return *of* the lender's investment. To keep things simple, we will assume that the building, which contributes 80% of the property's value, has a 25-year expected life, such that its value declines by 100% ÷ 25 = 4% per year, under a straight-line assumption. If the owner expects a 12% average annual return *on* investment, with an added 4% required to cover the return *of* investment in the building portion for a 12% + 4% = 16% total (a return *of* the investment in the non-depreciating land's 20% component of value will be received when the property is sold), then the weighted average return required to give all money providers what they should expect, based on risks they perceive, is (.7) (.092084) + (.3) {(.2) (.12) + (.8) (.16)} = .064181 + .0456 = .1100591, or *approximately .11*.]

- *Built-Up Method* – similar to the *Fisher equation* for analyzing interest rates. The idea is that the required annual rate of return on a real estate investment should be a *pure risk-free rate* (historically approximately 2.5%) *plus premiums* for various types of risk faced, such as inflation, default, and illiquidity. Another cost that must be included explicitly is a *recapture premium* (the return *of* the investment), which in a simple analysis we can treat as (1 ÷ the life of the improvements) [known as *straight-line* recapture]. We can think of the property as being all equity financed, or can think of debt financing as generally being used in the same manner for properties of this type, such that compensation for both the owner and lender are implicitly included in the cap rate.

[*Example*: If the various premiums total to 6.5% and the expected life of the improvements is 50 years (with a required straight-line recapture rate of 2% per year), the total built-up rate is .025 + .065 + .02 = *approximately .11*.]

- *Land/Building Breakdown* – in this method we also treat return *of* investment (recapture of the improvements' cost) explicitly. Again we can think of an all-equity financed property, or can think of debt as used in the same manner for properties of this type, such that both owner and lender compensation are implicitly included.

[Example: Consider a parcel of real estate that has land (20% of the total property value) and a building with a 50-year expected life (80% of the total property value). The expected annual return *on* the total investment is 9.5%, with 2% simple annual recapture/return *of* investment (for 11.5% total) added on the building portion. So the required annual capitalization rate is (.2 x .095) + (.8 x .115) = .019 + .092 = .111, or *approximately .11*.]

Now we have an estimated capitalization rate, computed by one or more of the methods shown (and yes we obviously manipulated the numbers in these examples to have the cap rates all coming out at 11% per year).

2. Estimate the subject property's annual *stabilized net operating income* (NOI) stream. NOI is income that would remain on a yearly basis, starting with the current year, to compensate the owner and lender, and pay income taxes, after costs of operating the property have been met, if the property manager charged market-level rents and did a good job in controlling expenses. (We would estimate an annual gross income if Gross Income Multiplier analysis were to be used, but our preference usually is to use a more precise net income measure if we can identify consistent expense levels for the type of property being appraised. One type of income-producing real estate, rented single-family houses as noted earlier, often has been owned in the past by non-specialists who managed it in their spare time and would not likely have kept detailed expense records; "When the grass gets too long, I cut it").

We can estimate appropriate expense levels through the property manager's experience; through discussions with insurance agents, tax assessors, and maintenance contractors; and through published figures from the Building Owners and Managers Association (BOMA) or the Institute for Real Estate Management (IREM), which are professional organizations of people who manage income-producing real estate owned by themselves or others. [Example: The subject property, an apartment building, has 72 units. If it could be fully occupied at all times, the coming year's total rent revenue would be 72 units x $1,250 per unit per month x 12 months = $1,080,000 per year. The landlord also can earn $24,000 per year through coin laundry, vending machines, and clubhouse rentals. The total *potential gross income* for the coming year therefore is $1,080,000 + $24,000 = $1,104,000.

However, 5% of the potential rent total ($54,000) is expected to be lost through vacant units and collection/eviction costs. So the *effective gross income* is $1,104,000 – $54,000 = $1,050,000. Then we expect annual insurance costs of $50,000; property tax of $200,000; and general salary, utility, and maintenance costs (including *reserves*: a year's worth of the expected cost of ultimately replacing broken furnaces, stoves, *etc*.) of $250,000 (a $500,000 expense total). So the coming year's projected *stabilized net operating income* is $1,050,000 – $500,000 = $550,000.]

3. Apply the "cap" rate or multiplier to the estimate of stabilized NOI.

[Example: an analysis of recent transactions tells us that the applicable cap rate for properties like the subject is .11. If stabilized NOI for the subject property is $550,000, the indicated estimate of market value for the subject, under the income approach, is $550,000 ÷ .11 = $5,000,000. Alternatively, the Net Income Multiplier would be computed as 1 ÷ .11 = 9.0909, for a market value estimate based on the NIM of an identical $550,000 x 9.0909 = $5,000,000.]

NOI is a number that does not reflect a particular owner's income tax situation. It is a number we use in estimating long-term value, but, as stated earlier, it does not include any portion of the cost of capital improvements that will have to be made to maintain the building's value or the possible cost of getting new tenants in place. Note that if the income is stated higher (perhaps through inadequate set-asides for future replacements), or if a lower cap rate is applied to a given income figure, the indicated value is higher. Large differences of opinion in value can result from small differences in estimated incomes or "cap" rates.

[Example: An income property is projected to generate a stabilized NOI of $750,000 per year. Appraiser #1 feels that the proper capitalization rate is 10% (for an indicated value of $7,500,000), while Appraiser #2 thinks it should be 11.5% (for an indicated value of $6,521,739). A fairly small difference of opinion in the cap rate that should be used leads to a $1 million difference in value estimates. (Think of what a dishonest appraiser might do!)]

C. *The Cost Approach* – based on the economic principles of *substitution* and *contribution*. The justification is that a rational buyer would pay no more for an improved property than the cost of buying a similar site and building

similar improvements. (You typically would not pay $280,000 for a house if you could buy a similar lot – with the same size and topography, in an equally desirable location within the same jurisdiction with similar public services – and hire a contractor to build similar improvements for a total cost for land and construction of $240,000.) Whereas the sales comparison approach involves comparing an improved subject property with one similar in features that often include age, in the cost approach we compare an improved property with a hypothetical new version of itself.[5]

The cost approach tends to provide reliable value estimates for properties with fairly new improvements. It also sometimes is seen as the best (or default) approach to use for properties that are unusual/special-use (no available comparables to use in sales comparison) and/or do not provide income streams to their owners (churches often are cited, though land that holds a church building could be rented to a congregation to provide the owner with income). Oracle Park, where the Giants play, is assessed under the cost approach for property tax purposes, by agreement of the owner of the stadium (built on land leased from the Port of San Francisco) and the local county assessor.[6]

Steps in the Cost Approach:

1. Estimate what it would cost to build the improvements today, based on either:
   a. *Replacement cost* – the cost to build based on current materials and techniques *or*
   b. *Reproduction cost* – the cost to build an exact replica, including the added cost of hard-to-obtain materials not typically used in today's market (real lath and plaster in an older house instead of drywall, for example)

We usually use replacement cost as our basis, because when we use reproduction cost we must eventually subtract out the impact of some items that add to cost without adding to value in today's environment (like extra-high ceilings in an older house). Information on construction costs is available from published *cost manuals* (Craftsman Books and the merged longtime cost manual publishers Marshall & Swift/Boeckh provide national figures with adjustments for many local market areas), and – often viewed as more accurate – from *discussions with builders* active in the local area. Appraisers now also have access to computerized versions of cost estimation programs.

The process of estimating construction costs can run from the simple comparative cost method (all costs of construction are distilled into an average cost per square foot of above-ground floor area), to the in-between segregated-cost or units-in-place method (sort of like figuring out what each sub-contractor would charge, *e.g.* the electrical system, plumbing system, concrete, framing), to the complex quantity survey method (breaks costs down into very small components, like lumber, plywood, roof shingles, copper and plastic piping, various types of labor).

2. Estimate Depreciation and Obsolescence

An older building is not worth as much as an essentially identical new building would be worth. Older improvements (or sometimes even new improvements) are theorized to lose value through:

a. *Physical deterioration* – wear and tear, action of the elements, poor maintenance, poor construction. Physical deterioration is *curable* if it can be repaired at a price less than or equal to the accompanying increase in market value; otherwise it is *incurable*. Physical deterioration typically is computed as a percentage of value seen as having been "used up," through the "age-life method." *Example*: A house that has an *effective age* of 20 years old (meaning that it is essentially as good as a 20-year old house; it might or might not actually be 20 years old) and a 60-year remaining expected life (80-year life originally expected) has experienced (20/80) = 25% physical deterioration. The effective age of improvements could be greater than the actual age, as when a building was poorly built or has been poorly maintained. But in many cases the effective age is less than the actual age; think of an older house with a new roof, modernized kitchen, and upgraded electrical system. As a prominent appraisal author notes, "most real estate is being rebuilt constantly."[7]

The emotional impact that can accompany the term "incurable" is not always warranted. Incurable can sound very severe, but consider that some incurable medical conditions involve relatively minor matters that the patient simply chooses to live with, like an eye ailment that might impede driving at night – while the severe condition of double kidney failure is curable, with a transplant. In the dollar-and-cents setting of real estate, a good example of incurable physical deterioration is the slight market value loss from the foundation walls having aged a bit. New is better than old, but it would make no economic sense to incur the massive cost of replacing the foundation walls on a house that is a few years old – you just live with the fact that key structural components have worn out a little. But if a tornado blows the roof off while leaving the rest of a building intact, that severe damage is economically curable – putting on a new roof likely adds roughly as much to the property's market value as the cost of doing the work.

Just to further explain curable *vs.* incurable a bit: let's say the furnace and air conditioning compressor on a house we are appraising both function well, but both also are 12 years old, and each has an expected useful life of 20 years. If a contractor who prices competitively would charge $14,000 to install a new furnace and AC unit, and we think

loss in value can reasonably be presented in terms of simple straight-line depreciation, then we estimate the home's market value to be less by $8,400 ($14,000/20 x 12) than that of an otherwise similar property with a brand new heat/AC system, because the equipment in place shows some age. That $8,400 is incurable physical deterioration; it does not make economic sense to replace these components now when they are functioning well and have several years of expected remaining useful life. The depreciation is *incurable* for now because the $14,000 cost to cure exceeds the theoretically expected accompanying $8,400 market value increase; the owner just lives with the fact that this important mechanical system is not brand new.

As the years pass there will be successively higher amounts of incurable physical depreciation until one day, about eight years from now, the units clearly are in need of replacing – and then there will be $14,000 in *curable* physical depreciation; no one could live in a house without a functioning furnace. A quick initial way to think about the situation is: the house in question would have a market value today of $190,000 with a new furnace and A/C system, but with $8,400 in incurable physical depreciation its market value today is $181,600. In eight-ish years when the current system is fully worn out the owner expects to be able to sell it for $176,000, with the market recognizing $14,000 in curable physical depreciation (it will badly need a $14,000 upgrade that will add $14,000 to its market value), and a buyer would immediately spend $14,000 to cure the problem and then own a house worth $190,000. Or the owner could, before selling, pay $14,000 for the upgrade, and then there would be no depreciation with respect to the heating/air system (the depreciation that existed will have been cured), and the house would be expected to sell for an increased post-cure (with brand new furnace and AC) market value of $190,000.

[In this example it would not make sense, if we compare cost to cure to the increase in market value (the value relevant to the typical or *marginal* transactor), to put in new furnace and air conditioning units today. But we would not want to conclude that someone who bought the house today for its $181,600 market value, and then immediately spent $14,000 to put in new furnace and AC units while realizing only an $8,400 market value gain, was being irrational or foolish. Having a top functioning, brand new system might increase the *investment* value for someone with atypically severe respiratory ailments, for example, by $14,000 or more.]

b. *Functional obsolescence* – features that make the improvements undesirable – for directly using, or as a means of generating rental income – relative to current market standards. A poor floor plan (a house with a front door leading right into the living room without a foyer, and having to walk through one bedroom to get to another are examples – though the one-room wide "shotgun" houses well known in the U.S. south have both of those features),[8] too few bathrooms, outdated or insufficient mechanical systems (*e.g.*, too few electrical outlets in an older structure), and super-adequacies (things that add to cost but not correspondingly to value, like really high-end kitchen cabinets in a very basic house) would be examples. Functional obsolescence is *curable* if it can be repaired at a price less than or equal to the increase in value; otherwise it is *incurable* (a poor floor plan likely would be incurable).

c. *Locational obsolescence* – features that reduce improvements' value because of their location. Causes may be *externalities* (loud noises, bad smells from nearby properties) or *allocation* (*e.g.*, brand new houses might sell for less than the cost of having built them if too many new houses already have been built in the area). The loss in value may result from changes that have occurred in nearby uses, or by a poor original choice of location. If, in theory, you could add to a building's value by picking it up and moving it to a new location, then it suffers from locational obsolescence. Locational (once commonly called *external*, now sometimes called *economic*) obsolescence typically is considered to be incurable; we just have to live with the fact that the improvements suffer a value loss because they are sitting in the wrong location. (One appraisal author has broken this source of value loss into three categories: *environmental* caused by negative externalities, *economic* caused by excess supply of the particular type of improvement, and *locational* caused by changing use patterns[9] – not a bad way to group these sources of lost value in some sense, though there seems to be some overlap across the categories.)

[We often measure incurable physical depreciation or functional/locational obsolescence as the present value of the stream of lost rent payments that the deficiency would be expected to cause. Think of a poor floor plan that reduces rent a tenant would willingly pay by $125 per month, relative to what a house without that problem would rent for. If houses of that type, in that market area, generally sell for 98 times their monthly gross rents, then the poor floor plan creates incurable functional obsolescence of 98 x $125 = $12,250 (in estimating value of the improvements with the cost approach we would subtract $12,250 from the estimated cost to build new). "Capitalizing" lost expected revenue or income into an estimate of lost value in that manner shows how the cost approach can intersect with the income approach.]

It is because of the difficulty in estimating the various forms of depreciation/obsolescence that the cost approach is seen as most reliable when improvements 1) are fairly new and 2) do not suffer from severe functional or locational problems.

3. Add together the three depreciation/obsolescence figures, and subtract their total from the estimated cost to build. You now have an estimate of the *depreciated value of the improvements*.

4. *Estimate the Land Value* (typically the appraiser does this by comparing the site to others that have sold recently, and adjusting for any substantial differences). This method of estimating the land value demonstrates another situation in which the cost approach interacts with the sales comparison approach. One appraisal text observes that "any approach will have some overlap with some other parts of the valuation process," since all three approaches reflect market supply/demand conditions and the economic principles of anticipation and substitution.[10]

5. Add the estimated land value to the depreciated improvements value estimate; the result is the market value estimate under the cost approach. Example (here we use the simple comparative cost method):

Cost to build house 2,000 sq. ft. x $90/sq. ft. =		$180,000
Cost to build garage 576 sq. ft. x $30/sq. ft. =		$ 17,280
Total cost of improvements if new		$197,280
Less Depreciation/Obsolescence:		
Physical	$15,000	
Functional	10,000	
Locational	0	– $ 25,000
Depreciated Value of Improvements		$172,280
Add Land Value		$ 45,000
Indicated Value per Cost Approach		$217,280

(Note that the degree to which the physical depreciation and functional obsolescence are curable *vs*. incurable does not matter at this stage; both types reduce the value, but curable items are likely to be repaired/replaced soon.) This figure might be rounded to $217,000; $217,250; $217,300; or $217,500; or some other amount depending on the appraiser's belief about typical selling price increments for the particular property type in the local market area.

D. Final Reconciliation

Then after estimating the subject property's value under each approach used (all three will be used in some cases, but not all, like if the subject is a high-end home for which there is no rental market to base an income analysis on), the appraiser reconciles the individual value figures into a final value estimate, and writes the appraisal report. That reconciled final estimate is not likely to be a simple average of the estimates from the individual approaches; the greatest weight will be applied to the approach the appraiser has the greatest confidence in under the circumstances.

Perhaps a small, 47-year old office property's value estimate was $625,000 with sales comparison; $605,000 under the cost approach; and $640,000 with the income approach. If the sales comparables all were from other nearby cities and the age of the improvements made estimating depreciation difficult, but the appraiser was confident about the net income and cap rate amounts used, she might show a final value estimate of $640,000, or something close to that figure, and would explain in the report why that income approach number was given the predominant weight.

VIII. A few special appraisal topics

A. Range of values *vs*. point estimate – the typical appraisal assignment calls for the appraiser to offer one specific estimate of market value. However, because the available information is imperfect, the appraiser may prefer to offer a range of possibilities (such as $225,000 – $235,000). Appraisers who appraise homes in connection with mortgage loan applications often are criticized for the high proportion of value estimates that turn out to be very close (often exactly equal) to the purchase price (appraiser knows that the buyer has offered $229,900, and the appraiser's value estimate is $229,900 or $230,000). The criticism is that they are just "rubber stamping," rather than exercising independent judgment after having done a thorough analysis.

But another interpretation is that the appraiser knows she is working with limited, imperfect information and, being inclined toward caution, does not want to over-state what the property might reasonably be worth. By showing a value estimate of $229,900, she perhaps is conveying that the $229,900 price falls within the range of values that she could substantiate if permitted to provide an interval estimate rather than a point estimate.

B. Rounding values – the value estimated earlier with the squared adjustment technique in our sales comparison approach discussion was $169,011.36; we noted that the appraiser would likely round appropriately. If we are

estimating market value, and if market value can be defined as the most probable selling price, then rounding should involve more than defaulting to the nearest $1,000 or $500. Just as retailers price items at $1.99 (the "left-digit bias" phenomenon, in which our brains may perceive $1.99 to be meaningfully less costly than $2.00), psychological factors may affect the dollar amounts over which real estate buyers and sellers tend to negotiate (and those amounts might well not be the same for $200,000 houses as for $2,000,000 houses, or for other property types in different price ranges). The $229,900 shown above would be appropriate if the appraiser has observed transactors negotiating to prices following that pattern in sales of similar properties. (One real estate broker told of clients who make offers that contain their lucky numbers; interesting, but not systematic enough to justify an appraised value.)

C. Square footage measures – a structure's square footage generally has a significant impact on its estimated value, from an appraisal or marketing standpoint. But how is square footage quantified? A free-standing house or other building's square footage usually is treated as above-ground area enclosed within the exterior dimensions, such that a one-story "ranch" house whose outside walls are 50 feet wide and 40 feet deep is deemed to have 50 x 40 = 2,000 square feet of living area. (An appraiser estimating value with the cost approach might multiply 2,000 by a dollar figure that distills all costs of constructing the building into an average cost per square foot measure.) But square footage measuring for properties like condo units, especially for sales purposes, poses interesting challenges, and there seems to be no industry standard or required method to use. A low-end possibility would be summing the interior dimensions of all rooms while omitting the space taken up by walls, hallways, and closets that an exterior dimensions measure would include. A high-end estimate might start with exterior dimensions, to which sizes of patios or decks, and a share of common hallway or storage or other common areas, are then added.[11]

D. Diversity issues – A banking industry publication reported in 2022 that the vast majority of real estate appraisers are white and male, with a high proportion above age 50 (and the number of appraisers is declining – perhaps not surprising in an era when technology makes each appraiser more efficient, and questions have arisen on whether appraisals are still needed in connection with all home mortgage loans, long a major source of real estate appraiser income). Some critics assert that bias enters the home lending appraisal process, with houses appraised for less than the proposed purchase price far more often when racial minority home buyers apply for loans. In 2021 the Biden administration created a Property Appraisal and Valuation Equity task force, co-chaired by the Secretary of Housing and Urban Development, to investigate alleged bias in the appraisals requested by home mortgage lenders.[12]

The charge that appraisers' value estimates are affected by the races of home buyers seems odd to me, in that when I did appraisals for home mortgage loans long ago I usually did not know anything about the buyers; was far more likely to know the identities of the sellers, who often were on site to let me into their houses. And a low appraisal does not always create impediments for a buyer; sometimes it can provide leverage for negotiating a lower price. Consider a seller asking $225,000 who accepts a $220,000 offer from a buyer with $44,000 = a 20% down-payment (amount of the purchase price not borrowed), which seems initially to work well toward avoiding the added fees and conditions lenders impose when lending more than 80% of the appraised value. But then the appraisal shows just $200,000 as the market value estimate – perhaps the seller is trying to capture her "Steven Spielberg" investment value, which exceeds the market value. So the lender is willing to lend only 80% of $200,000, which is $160,000, meaning the remaining $220,000 – $160,000 = $60,000 would have to come from the pocket of the borrower (who has only $44,000 in cash). The seller can sell to this buyer for something in the $200,000 to $204,000 range now (80% of $200,000 appraised value, plus buyer's available cash), or can incur the many direct and indirect costs of putting the house back on the market while also having to worry that other future offers would bring forth lender appraisals at the $200,000 figure. (Could frequent low appraisals for transactions involving minority buyers instead be evidence that sellers are trying to induce minority buyers to overpay? The appraiser helps assure that neither the lender nor the home buyer/borrower unknowingly puts hard-earned money into overpriced real estate.)

E. Contesting appraised values – the Consumer Financial Protection Bureau encourages anyone who feels that his or her position is harmed by a low appraisal to ask the lender for a "reconsideration of value." The prospective borrower or that party's broker can identify errors in the appraisal, or submit information such as other possible comparables to consider, toward getting the estimated value increased.[13] A lender earns profit by lending, so it wants to make every loan that the initial or possibly revised supporting evidence shows is prudent to make. Of course a home buyer should want to see the appraised value increased so the transaction can go through only if the amended appraisal figure reflects the fact that the value truly is higher than the initial value estimate showed.

F. Advances in technology – appraisals done for home lenders until the early 1970s were often criticized as "drive-by's," with the appraiser not actually visiting a subject property, perhaps just driving past to look at the exterior (and providing little specific evidence to support the market value estimate). A hallmark of improved professionalism was adoption of the standard appraisal form now known as the Uniform Residential Appraisal Report, and the requirement that appraisers personally examine both the exteriors and interiors of houses valued. But a twist in the

new millennium is the ability of technology to show things that historically would have required on-site visits. An ISU Finance graduate who appraises agricultural real estate notes that satellite imaging lets her see important land features remotely, and those images are sufficient for many appraisal assignments, saving clients time and money.

G. Damage to remainder. When government eminent domain action involves taking only part of someone's land for a public purpose, the dispossessed owner should be compensated for both the land taken and the reduced value of land that remains. Think of a road extension that requires taking a strip of land, with square footage totaling two acres, from the middle of a tract that was worth $90,000 before the road work. If nearby land generally has been selling for $5,000 per acre it might seem initially that just compensation would be $10,000. But if what is left after the taking is two smaller, odd-shaped, unconnected parcels that would sell for only $55,000 total, the owner should be paid $35,000: $10,000 for land ceded + $25,000 damage to the land that is left [($90,000 – $55,000) – $10,000].

H. P/E ratios for houses – some economists analyze home values using the Price/Earnings ratio, a quick rule-of-thumb more typically applied to common stock valuation. The application is slightly different, in that whereas stock P/E relates the current price per share to a year's worth of *net* earnings per share, the home P/E relates the property's current price to a year's worth of *gross* rent. (It is the gross rent multiplier discussed earlier, but based on annual rent instead of monthly.) Just as high P/E's for common stocks were seen by many as a sign of a "bubble" prior to market downturns of recent decades, housing P/E's high above the long-term observed average of about 16 – indicating prices out of line with rents – suggested a housing bubble in many localities to some analysts before the 2000s turmoil. Of course, just as with stock market P/E's, a housing P/E could be high (low) because the market is overpriced (underpriced), or because market participants expect future growth (decline) in home values.

I. Home improvement money machines? Contracting firms sometimes assert that certain home improvements will increase a home's value by more than 100% of the expenditure ("a $25,000 kitchen upgrade will add $30,000 to the resale price of your home"). This claim seems dubious from an economic viewpoint. Consider a house that could be sold today "as is" for $160,000. If it lacks some kitchen features that generally are desired in the current market, and it would cost $25,000 to upgrade, would doing the work cause a prospective buyer to pay more than $185,000? After all, the buyer could expect to buy the house as is, call a contractor, and have the same work done for $25,000.

We might argue that it could. If the seller upgrades, the buyer gains the convenience value of having the work already done, and the assurance value of knowing the work could be, and was, done well (even simple construction projects do not always turn out as hoped for). But having the work already done forecloses the buyer's option to choose color, style, and layout elements specific to her tastes. We might envision the amount a rational buyer would pay, aside from the $160,000 base value, as $25,000 plus the convenience and assurance values and minus the lost option value. Thus, by this logic, the transaction price would rise by more than the seller's cost only if the convenience and assurance values had a greater absolute value than the lost option value, so the question becomes the magnitudes of these three amounts. The assurance value is especially interesting, in that the current owner, who knows all the property's idiosyncrasies, may have an informational advantage in judging what that assurance might be worth. (This question relates to whether repairing a "curable" deficiency adds value that is greater than, or need be only equal to, the cost incurred – a point on which appraisal textbooks' discussions long have been inconsistent.)

J. Sinking-fund recapture – in the built-up and land/building breakdown methods for computing capitalization rates in our income approach discussion above, we accounted for the return *of* the investment through simple, straight-line recapture. But we also might argue that, to repay himself for the eroding value of the improvements, and have that amount available at the end of the holding period, an investor could reinvest an amount set aside from income each year. For a $100,000 building expected to depreciate fully over 50 years, we might use a straight-line recapture rate of 2% per year. But if we assume that we could reinvest money in hand at a 5% annual rate, we actually could set aside much less than .02 x $100,000 = $2,000 per year. Question: how big an annual deposit is needed to total to $100,000 over 50 years with 5% annual compounding? This is a *future value of an annuity* problem.

$$\text{Payment} \times \text{FV of Annuity Factor} = \text{Total}$$

$$\text{Payment} \times \frac{(1.05)^{50}-1}{.05} = \$100{,}000 \qquad \text{SO} \qquad \text{Payment} \times 209.347996 = \$100{,}000$$

or we can multiply $100,000 by the reciprocal of the FV of Annuity Factor, 1 ÷ 209.347996 = .004777, which is called the *sinking-fund factor*.

$$\text{Payment} = \$100{,}000 \times .004777 = \$477.67.$$

So if we assume that recapture should be done on a sinking-fund basis, we only have to provide for setting aside $477.67 (or .47767%) per year instead of $2,000 (or 2%). The result is a smaller "cap" rate – and a higher indicated value for the property, in keeping with the underlying assumption that the investment gives the property owner a reinvestment opportunity.

K. Regression analysis – for many years theorists have recommended a form of regression analysis in real estate appraisal. This "hedonic regression" technique has not been used extensively by practitioners in the past (other than through mass appraisals by property tax assessors), but it is growing in popularity. It offers benefits relative to the matched pair method of computing adjustments, in that it permits information from many transactions to be used simultaneously. Simple regression relates the magnitude of a dependent variable (*e.g.*, property value) to just one independent or explanatory variable (*e.g.*, square footage). Multiple regression relates a dependent variable's magnitude to measures for a group of explanatory variables working together (*e.g.*, bedroom count, bathroom count, age of improvements, lot and garage and basement features, things like proximity to schools or highway access). In the most straightforward type of multiple regression model for real estate valuation,

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta_n X_n + \varepsilon,$$

the measured property rights' value (Y) is theorized to bear a linear relationship to each feature (explanatory variables X_1 through X_n) believed to be associated meaningfully with that value. (Value does not always increase in a straight-line manner with changes in possible explanatory features, of course, but sometimes simple adjustments allow the linearity assumption to hold; for example, the logarithm of a standard-depth parcel's frontage along a major road might change in a reasonably linear manner with value.)

The computational process generates α (a lump-sum base or "intercept" magnitude) and coefficients β_1 through β_n, the identified explanatory variables' contributions to value, as derived from the provided data. It also measures the error term ε that accounts for value impacts linked to conditions other than the included explanatory variables. A larger error term can indicate that important value determinants were not included as explanatory variables.

This admittedly overly-simple example illustrates the main ideas. An appraiser theorizes that the value of a house in a specific area is explained largely by a linear relationship to the number of bedrooms (X_1), number of bathrooms (X_2), garage size (X_3), lot size (X_4), age (X_5), and whether it has a basement or not (X_6). (Using both room count and the home's size in square feet as explanatory variables would create a "multicollinearity" problem, since higher square footage almost always would accompany more rooms, such that including the two together would interfere with the model's ability to measure size's impact on value.) After data are entered on the sales price and number of bedrooms, bathrooms, *etc*. for a large number of recent nearby transactions into a regression program, the software generates values of α = $17,000 intercept, β_1 = $28,000 value per bedroom, β_2 = $10,000 value per bathroom, β_3 = $28 per square foot of garage size, β_4 = $2.60 per square foot of lot size, β_5 = – $2,000 for each year of age, β_6 = $13,000 if there is a basement (so X_6 is an indicator or "dummy" variable that is assigned a value of 1 if a house being appraised has a basement and 0 if it does not), and ε = $4,200 error term. The indicated value of a house in the included geographic area with three bedrooms, two bathrooms, a 24 x 26 = 624 square foot garage, a 110 x 140 = 15,400 square foot lot, nine years in age, and with a basement should be worth

$$\$17{,}000 + \$28{,}000\,(3) + \$10{,}000\,(2) + \$28\,(624) + \$2.60\,(15{,}400) - \$2{,}000\,(9) + \$13{,}000\,(1)$$

$$= \$17{,}000 + \$84{,}000 + \$20{,}000 + \$17{,}472 + \$40{,}040 - \$18{,}000 + \$13{,}000 = \underline{\$173{,}512}$$

Real estate appraisers can productively apply regression analysis in estimating the total market value of specified property rights (a fee or easement value, for example), or for estimating the magnitudes of adjustment factors for use in a traditional, grid-based sales comparison approach (corresponding to the β values shown above). But as suggested earlier in our sales comparison approach discussion, problems can arise when attempts to create a larger data set for regression analysis bring together transactions involving properties with substantive differences (like mixing data from enclaves of older and newer, or larger and smaller, houses in the same general part of the city), such that the resulting dollar value estimates may not apply meaningfully to the specific property being appraised. The value measured for an extra bedroom in a "neighborhood" for which our data do not differentiate between the older and newer properties will likely not be meaningful. •

[1] Appraisers know this story as the "Tobias the Cat Case." See Moss, H.W. "Appraiser Certificate Really the Cat's Meow." *Los Angeles Times*, October 14, 1990.
[2] Acosta, Deborah. "South Florida Train Juices Home Values." *The Wall Street Journal*, May 24, 2023, B6.
[3] *Helms v. Multnomah County Assessor* (Oregon tax court, 2021).

[4] This method for assigning weights to comparables, based on the logic that better "comps" are those with fewer and smaller adjustments, was introduced in Cannaday, Colwell, and Wu, "Weighting Schemes for Adjustment Grid Methods of Appraisal," *Appraisal Review Journal,* Summer 1984, 25-31.
[5] This observation was offered in an appraisal textbook written by a longtime Penn State University professor. Lusht, Kenneth M., *Real Estate Valuation: Principles and Applications*, Richard D. Irwin & Company, 1997, 199.
[6] See *Torres v. San Francisco Assessment Appeals Board* (California appellate court, 2023).
[7] Bowes, E. Nelson, MAI. *In Defense of the Cost Approach*. Appraisal Institute, 2011, 23.
[8] Bowlby, Katie. "So, What Exactly Is a Shotgun House?" *Country Living*, November 26, 2019.
[9] Williams, Thomas, MAI. "Categorizing External Obsolescence." *Appraisal Journal*, April 1996, 148-154.
[10] Bowes, E. Nelson, MAI. *In Defense of the Cost Approach*. Appraisal Institute, 2011, 37.
[11] Glink, Ilyce and Tamkin, Samuel J. "Is There a Standard to Determine Square Footage?" *Chicago Tribune*, December 24, 2023, Section 7-2.
[12] Campbell, Kyle. "In Debate Over Appraisal Bias, Rival Researchers Clash Over Key Data." *American Banker*, August 17, 2022.
[13] Friedman, Robyn A. "Mind the Appraisal Gap." *The Wall Street Journal*, September 8, 2023, M8.