Surplus Productivity

Surplus productivity refers to the income earned by land. This is the net income after the costs for other productive factors (labor, management and capital) are taken into account. Land value is dependent on the costs of these other productive elements.

Land Valuation Methods

Land valuation theory identifies six methods for ascertaining land value. These approaches are:

1. sales comparison;
2. ground rent capitalization;
3. cost of development;
4. allocation;
5. extraction; and
6. land residual.

While any of these methods may be a valid valuation process, the nature of the site (i.e., vacant or improved) dictates which method is most suitable. As a general rule, the sales comparison, ground rent capitalization, and cost of development methods are most appropriate when the land is vacant. The allocation, extraction, and land residual methods are typically utilized when there are improvements to the land.

Vacant Land

Sales Comparison Approach

The sales comparison approach to land valuation uses a direct comparison of recent market transactions for vacant land. This can include truly vacant land as well as land that is being considered as though it is vacant. Since this approach uses actual market transactions for land, it is the preferred method of appraising land. In the process of obtaining values, sales of similar parcels are analyzed, compared and appropriately adjusted (through generally accepted appraisal techniques) to indicate the value of the parcel being appraised. The approach is based on the principle of substitution, which means that land of similar utility will yield similar prices in a competitive, open marketplace.

Comparison between land parcels will include the property rights being transferred, legal encumbrances, zoning, financing issues, conditions surrounding the sales of similar properties, general market conditions at the time of sale, property location, available utilities, size, shape, frontage, topography, location, view, and, ultimately, highest and best use. With so many factors to weigh, one can see how different appraisers obtain different land values. The same can be said about the value of any asset.

As with any valuation process that requires the principle of substitution, determining if particular sales are truly comparable is inversely related to the age of the sales—older sales of properties are less comparable, all else equal. Ideally, recent sales are preferred. However, it can be difficult in many markets to find recent sales that have sufficient factors in common, such as usefulness (utility), rights, location, size, etc. This leads us to find and use other techniques to value a site.

Most property tax systems, including the land tax, require a reliable method of determining value. Traditionally, this has been the sales comparison approach as the land valuation assignment requires a sufficient quantity of recent vacant land transactions in the local marketplace (neighborhood, market area, etc.). On the urban fringe, it may be likely that vacant parcels sell on a frequent basis. This relatively high level of transaction activity within reasonable time periods will allow us to value subject properties based on recent indicators of market demand and supply convergence, i.e. the market price.

For such transactions to be considered valid, they must meet several criteria; motivated and informed buyers and sellers who have no other personal or business relationship, the transfer does not involve a religious, non-profit or government entity, and a full transfer of property rights. The appraiser must only consider what are arms-length transactions to better understand the true marketplace.

To use the sales comparison approach, one must conduct some type of market research and verify the data used in the analysis. Sources of information will include recorded deeds, sales disclosure forms, published sales listings—including, but not limited to multiple listing service (MLS) data, interviews with brokers and other real estate professionals, and any private sources of data. Some amount of data verification must be performed to ensure its validity and consistency.

In addition to general data, there are many ways to differentiate useful land measures. Many different methods are used such as front-foot, the square foot, acreage, site or lot, and units-buildable. Depending on the land type (residential, single family vs. multi-family, agricultural, commercial or industrial), each marketplace will logically use one distinct measurement method that most accurately depicts market participant needs. For example, the front-foot method works well with downtown retail-commercial land since exposure is directly linked to its visibility on the property's "front." Residential sites are typically valued on a lot basis or by the square foot for irregular or unique lots. Agricultural and industrial land is typically sold by the acre. Additional important features such as roadway, rail or water access typically incur a dollar or percentage increase for such lots when valuing commercial or industrial sites.

Finally, adjustments must be made to adapt each comparison parcel to the particular subject parcel. Differences in financing, sale date, locational and physical site characteristics must be accounted for to modify the comparable properties to "look and feel" like the subject property that is being valued. Adjustments can either be in dollar or percentage terms. If adjustments are in dollar terms, the order of adjustment is not important. However, when percentages are used, it is very important to first adjust for the date of sale and for special financing. Subsequently, physical differences are adjusted in

percentage terms and applied to an intermediate, date of sale / special financing adjusted price.

Once differences between the comparables and the subject are accounted for, a reconciliation process is conducted to generate a final value estimate for the subject property. As with valuing improved property, those comparables requiring the fewest (in number and magnitude) adjustments are considered more "comparable" and therefore are more indicative of the subject's value. They are weighted more heavily in the final value estimate.

However, several circumstances often make the direct sales comparison method difficult to apply. For example, if the level of market activity decreases, or in areas where sales activity is typically slow such as in rural areas, or in the fully developed parts of an urban area. Other methods of land valuation must be used, and they do exist.

Sales Comparison Examples

Example #1: An urban retail building lot has an 80-foot frontage on Retail Avenue and a lot depth of 80 feet. Comparable vacant land sales indicate that similar 80 foot-deep lots are selling for $1,250 per front foot. Using the front-foot method, this lot would have an estimated value of $100,000 (80 front-feet times $1,250 per front-foot).

Example #2: A residential suburban lot has 30,000 square feet, but irregular in shape and size. Comparably irregular lots are selling for $2.00 per square foot. The estimated value of this residential suburban lot is therefore $60,000 (30,000 square feet times $2.00 per square foot).

Example #3: A 640-acre farm is currently being used to produce wheat. Three other wheat farms in the same general area (similar soil type, slope, productivity and riparian rights) have sold within the last year for $1,800 per acre. This farm has an estimated market value under this method of $1,152,000 (640 acres times $1,800 per acre).

Ground Rent Capitalization Approach

Ground rents can be converted into market values through direct capitalization. This method of valuation is based on the principle of anticipation; one anticipates receiving an amount into the future and places a value on these future payments. Ground rent is the amount paid for the right to use and occupy land according to the terms and conditions of a lease. By capitalizing this ground rent, the market value of the owner's leased fee interest is obtained. This method is useful when there exists an active, open and competitive market for land leases, and when a market-derived capitalization rate can be extracted from other competing properties.

All aspects of the ground lease terms must be analyzed to ensure that no extenuating circumstances exist in the comparable land lease agreements. If any exist, and such circumstances are atypical for the market, this individual land lease must be considered less similar than what is typical for the market. Just as in the sales comparison approach to land valuation, similarity between comparables and the subject must be determined and appropriate adjustments must be made.

In the context of land value taxation, ground rent capitalization is useful when there are both no vacant land sales *and* no improved property sales exist or are inappropriate to use. In this instance, alternate uses—such as a parking lot that has period-to-period renters—may yield a parcel's land value. If a parking lot has an income stream, this anticipated income stream can be discounted (or capitalized in the case of a single period), forming the parcel's value estimate. For agricultural properties, the net income derived from using the land to produce crops or animals can be similarly discounted or capitalized into value. Variations in productivity, such as carrying capacity, production yields and so on must be considered. The primary difference between rural and urban/suburban ground rent capitalization is the unit of comparison: acres for agricultural sites, square footage for urban/suburban land. With either type of parcel, a periodic income value per unit of comparison is obtained, such as dollars of net rent per square foot. For rural land this would be equivalent to cash flow per acre.

Ground Rent Capitalization Examples

Example #1: Suppose there is a vacant parcel in a downtown marketplace and no relevant recent vacant land sales exist. However, there are two nearby lots that are currently being used as parking lots and these lots have waiting lists for spaces. The subject parcel has sufficient space for 100 parking spaces and each space could net (after all operating expenses) $70 per month. That would yield $7,000 per month in net operating income or $84,000 per year. (Based on market information, there is sufficient demand for these 100 additional spaces at prevailing rates.) Further, a market study indicates that a reasonable capitalization rate would be 8.4% on an annual basis. Therefore, the ground rent capitalization value of the land, used as a parking lot, would be $1,000,000 ($84,000 divided by the 8.4% rate).

Example #2: Consider the 640-acre wheat farm example described earlier. The owner can rent his land and receive a net income of $144 per acre per year, or $92,160 for the entire farm. If the capitalization rate for similar types of wheat-production land (based on soil type, slope, productivity and riparian rights) is determined to be 8%, then the capitalized value of the property is $1,152,000 ($144 per acre times 640 acres ($92,160) divided by 8%).

Cost of Development Approach

This method is used whenever the current use of the land is the highest and best use of the land. This method can be used in residential, commercial and industrial subdivisions where some typical form of development is the normal pattern for real estate. Planned subdivisions are one example of this. These can create a more efficient, "highest-priced" land use scenario because the legal, social, economic, and physical restraints for a platted development have been pre-approved by the local government and the local marketplace.

Subdivision development creates lots (from a larger, single parcel) based on physically, economically and legally determined uses that meet the needs of the local market place. Since the lots created in a subdivision are vacant, the resulting structure of the subdivision is a large number of available parcels. Once these parcels begin to sell,

appraisers have valuable information in conducting individual appraisals of parcels using the sales comparison approach.

The appraiser must take into consideration the demand characteristics and forces for specific lots within the subdivision. In a typical subdivision, the most desirable lots will sell first, and usually at a premium. As time progresses, there will be less demand, relative to the supply, for the remaining lots—assuming general market conditions don't shift or radically change. Therefore, appraisers must not unilaterally place the same value on all lots. Rather, adjustments must be made in valuations to account for parcel-by-parcel differences in utility and desirability. Failure to consider such site-specific information is a common pitfall of mass appraisals.

Cost of Development Example

Example #1: Consider the 80-acre development described in the sales comparison example section above with a total asking price of $2,760,000. The 80-acre site can be converted into multi-family residential lots. A market analysis shows that investors are willing to pay up to $5,000 per dwelling unit for parcels in this general market area. Based on specific characteristics and zoning, this 80-acre site will be divided with one-half of the site (40 acres) having a maximum of 6 units per acre whereas the other one-half (40 acres) will have 8 units per acre. Thus, the total number of dwelling units is 560 units (40 acres times 6 units per acre—240 units—plus 40 acres times 8 units per acre—320 units). Market information shows that the higher number of units per acre, the higher the land value.

Further, a market study has shown that of this final price per dwelling unit, 25% is attributed to site development—streets, sewers, water, planning, etc., 25% is attributed to overhead and sales expenses—commissions, accounting, legal expenses, permits, and 25% is attributed to developer profit and interest expenses during construction. The remaining 25% is the value of the raw land plus the incremental value added by improvements to the land. Using this final 25% figure we can see that the improved land has an aggregate value of $34,500 per acre on average (25% of the total price of $2,760,000).

Improved Land

Allocation Approach

In densely populated urban areas, vacant sites are typically quite rare. This creates a problem of estimating prices for land by direct market comparison. At the same time, sales of vacant parcels in rural areas are typically few and far between. Therefore, land may need to be valued by another method.

Allocation is based simultaneously on the principles of balance and contribution (see pages 9-10). Generally, similar properties feature improvements in comparable proportions, and the improvements contribute to the overall property value in relatively similar proportions. Even though balance and contribution, together, aid in valuing the land component of an improved parcel, final land value estimates may not be conclusive

due to functional, physical and economic differences in the actual improvements attached to the land.

Using the concept of contribution, a portion of the property's total value is from the land. Land has value and improvements generally contribute to its value. Based on market contribution estimates from comparables, an indicative land contribution is given to the land component. Information necessary to attribute a land proportion include site values in prior years, land to improvement ratios for similar properties, and land component percentages from newly constructed sites.

Allocation Example

Example #1: In a local market area it is seen that site values represent 16.67% of total property value. In this case, land is in proportion to improvements by the ratio 1 to 5 (one part land, five parts improvements). Therefore, for a property whose total market value is $150,000, the land value from allocation is 16.67% of $150,000, or $25,000. Likewise, we can see that 5 parts of improvements would be 5 times that of land, or $125,000 ($25,000 land value times 5 equals $125,000). This accounts for the total improved site value as a $25,000 land value plus the $125,000 improvement value yields the overall property market value of $150,000.

Extraction Approach

Extraction, also called abstraction, is a variation of the allocation method in that land value is determined by reducing an improved property's total value by an amount equal to the depreciated cost of the improvements attached to the land. This method of land valuation is based on the principle of substitution, in that a similar improvement could be substituted for the subject property. An implied land value can be obtained by first estimating total property market value by the sales comparison approach and then applying the principle of substitution to subtract the depreciated cost of actual improvements on the property. This procedure is very common in conducting highest and best use analysis for parcels.

Because improvements "contribute" to overall property value, we can reduce the overall property value by this contribution. The residual is the value of land. It is presumed by most appraisal professionals that land "has" value. This is an important relationship to acknowledge—land has value, and improvements contribute to value. Further, once we are able to remove the value of various improvements to the land, we are left with a land value estimate that can be directly compared to, and included with, vacant land value indicators in a direct sales comparison effort.

Extraction Example

Example #1: Assume an improved property has a market value of $150,000. The cost to construct the improvements that exist on this property (in new form and utility) is expected to be $145,000. At the same time, due to physical wear and tear, functional tastes and preferences (more generally, depreciation) the improvements to the property as they currently exist are worth $20,000 less than the reproduction cost new. In other

words, all forms of depreciation attributable to this property total $20,000. Consequently, the current improvements have a value of $125,000 ($145,000 of new construction cost less $20,000 of depreciation). Deducting this from the total site value of $150,000 leaves a land value of $25,000, based on the extraction approach to value.

Land Residual Approach

Similar to the allocation method, the land residual technique is based on the principle of balance along with the concept of contribution. Also, the agents of production—capital, labor, coordination, and land—are assumed to be in a state of equilibrium. This procedure is quite useful when the are few individual land sales or are difficult to properly adjust via the sales comparison approach. Specifically, this method can be used for income producing properties with well-supported data.

To implement the land residual technique, either actual or hypothetical improvements that represent the highest and best use of the land are determined. Then, an annual net operating income is estimated based on an expected holding period for the property. Of this amount, a proportion is allocated to the improvements (which contribute to overall value) and the remainder, known as the *land residual*, is capitalized at a market-determined rate. By capitalizing this land residual annual net operating income at an appropriate land rate the resulting value is that of land. This method is often used in feasibility studies for evaluating alternate uses of the land.

Land Residual Example

Example #1: Assume we have a property with an annual net income of $250,000. Improvements to the land are valued at $1,000,000. A market study has shown that a land capitalization rate in the local market for competing property is 12.5%, with improvements having a capitalization rate of 15%. This data would indicate that the income attributed to the improvements is $150,000 per year (15% of the $1,000,000 improvement value). Therefore, due to the concept of contribution, land must receive the remaining $100,000 of total net income ($250,000 total NI less the $150,000 of NI from the improvements). We can then capitalize the land net income contribution at the appropriate land capitalization rate to yield a land value estimate of $800,000 ($100,000 divided by 12.5%).

Land Valuation Summary

We all assume that the amount of land is relatively fixed in its current supply. Land use can change over time fairly easily, but what we are doing is shifting proportions of various uses of land. These changes can affect the supply of various land types in a local market as it responds to changes in the legal, social, ethical, financial, and physical constraints associated with individual land parcels and the associated demand for these types of uses. Several principles of value must be considered in valuing land.

In all appraisal assignments, whether valuing individual parcels or applying mass appraisal techniques, value estimates are more reliable when fewer adjustments are necessary. Therefore, the direct sales comparison approach of vacant land is often the

preferred method, since adjustments are not needed. When this preferred method is not feasible, other methods, based on sound economic principles and market information, can be used to estimate the true source of a parcel's value: the land. Ultimately, appraisers attempt to uniformly apply valuation techniques and obtain justified values for each parcel. These values, regardless of the improvement, will represent the true value to the landowner and will be the basis for the owner's share of the jurisdiction's tax liability.

Conclusion

Land value taxation has progressed and evolved since Henry George presented his ideas in the last century. Variations of land value taxation have been implemented in limited cases around the world with varying degrees of success. Despite the complexities of many taxation schemes, such as the income tax, a clear concept like land value taxation has much merit. The issue of speculative land holding on the urban fringe and the societal costs associated with it can be partially mitigated through land value taxation. The benefits of holding land in a less-than-optimum condition will be lowered through land valuation based on potential use and using the methods presented in this paper. This will force landowners to consider developing land more quickly because of the added overhead of paying taxes on its event use. Urban renewal efforts are less certain, but the same process will give beneficial tax relief to owners of distressed urban land so that they will be enticed to redevelop their parcels.

Implementing some form of land value tax requires some level of dissatisfaction with those systems currently in place. Change, especially if it involves taxes, is usually viewed with public distrust. But greater and more available information in today's society has increased the level of public awareness of inequity, particularly tax inequity. As the current property taxation methods have fostered and perpetuate those biases, a sound, fair alternative method is a tax on land.