

Site valuation — a reassessment of the adjustment process

BRIAN S. GETTEL

Brian S. Gettel, B.Comm., AACI, is currently president of Gettel and Dezman Appraisal Consultants Ltd., a private fee appraisal firm in Edmonton.

Editor's Note: Factoring of adjustments is not recognized by the APPRAISAL INSTITUTE OF CANADA at this time.

Site valuation utilizing the direct comparison approach represents one of the most fundamental aspects of real estate appraisal.

The basis of the approach, stated simply, is to select a number of comparable sales, derive a common unit of comparison and, through an adjustment process, extract an estimate of value. This is basic appraisal methodology.

However, in a recent case heard before the Alberta Land Compensation Board (*Hat Development Ltd. v. the City of Medicine Hat, 43LCR1*), the proper methods of adjustment as well as the proper sequencing of adjustments in developing the approach came into question. This ultimately became a key variable in the valuation aspect of the case and was influential in terms of compensation which the owner received. The controversy which arose in the case as a result of the divergent methods of adjustment utilized by the appraisers and the Boards' end position encourage a reassessment of the methodology currently utilized in developing the direct comparison approach as it applies to vacant land.

Valuation methodology

Site valuation, utilizing the direct comparison approach, essentially involves the following five step process:

1. Select a number of comparable sales.
2. Establish a unit of comparison.
3. Examine the elements of comparison.
4. Adjust the sales.
5. Reconcile and produce a final estimate of value.

The basic purpose in undertaking this analysis is to critically re-examine the methods of adjustment as well as sequencing of adjustments utilized in

developing the direct comparison approach in Canada. To this end, the analysis focuses on steps three and four of the valuation process with an emphasis on the methods of adjustment. To assist in re-examining the proper sequencing of adjustments, it is pertinent to examine the various elements of comparison.

Elements of comparison

The elements of comparison represent the characteristics of properties and sales that cause prices to vary. These represent component parts of a transaction which may require adjustment due to differences between the sale and subject property. Relative to site valuation, there are six basic elements of comparison. Certain of these basic elements, however, exhibit a number of subcategories. A brief examination of each of these six basic elements of comparison will be of assistance in addressing the proper sequencing of adjustments.

Financing terms

The sale price of one property may differ from that of an identical property due to the financing arrangements provided. This becomes a crucial variable where a comparable has a preferable financing package as contrasted to that which is available in the prevailing market. This is generally a function of the interest rate and/or term and is most often observed where vendor take-back financing is provided or where existing financing is assumed. In situations of this type, the purchaser may have paid a premium for the property and the financing terms must be considered.

Motivating forces/conditions of sale

When conditions motivating the vendor or purchaser are atypical, the price yielded in a sale situation may vary from that of a normal market transaction. For example, a vendor who is under

considerable pressure to sell quickly may accept a price below market. At the other end of the spectrum is a land owner who has paid a premium to purchase an adjoining property to facilitate an expansion program. The appraiser must be aware of motivating forces and utilize such sales with caution. However, in the imperfect world of real estate, sales of this type must often be given consideration.

Time/market conditions

The date of sale identifies market conditions prevailing when the transaction occurred. Market conditions may change between the date of sale of a comparable and the date at which the appraisal of the subject property is being completed. Changing market conditions often result from various causes such as inflation, economic recession, changing demand, changing supply, availability of money, etc. The cause of the adjustment is not time itself but shifting market conditions. If conditions have not altered, no adjustment is necessary.

Location

Market value is highly sensitive to location. An adjustment may be required if the locational characteristics of a comparable property are significantly different from those of the subject. The relationship is relative because the location of a property can be judged only in relation to that of others. No location is absolutely desirable or undesirable. As such, one can generally only say that a comparable property is inferior, equal to or superior to the subject.

Zoning/land use designations

Properties may exhibit highly similar locations and physical attributes and be designated for a similar use but carry different zonings or land use classes. Adjustments will therefore be required to account for factors such as varying uses and, more importantly, allowable densities. The latter is often a critical variable for commercial and multi-family sites. Generally speaking, the higher the allowable density or increased flexibility in use, the greater the value. This is a factor which must be recognized and adjusted for the subject and comparable properties.

Physical characteristics

This is an all-embracing term which includes physical differences between the comparables and the subject. This

includes a number of variables, the most common of which includes size, shape, frontage, depth, topography, drainage, servicing, site improvements, easements and restrictive covenants. Typically, there are a number of individual factors which must be addressed separately and may require a number of comparisons and adjustments.

The adjustment process

After describing each comparable sale and understanding the key characteristics of the comparables and subject, the appraiser must adjust the selected unit of comparison for the differences between the various properties. The final result is the adjusted sales price, which is the analyst's estimate of what the comparable would have sold for had it possessed all of the salient characteristics of the subject property as of the date of appraisal.

The underlying principle in terms of which adjustments are made is the principle of contribution or marginal productivity. In relating this principle, the appraiser must acknowledge the influence of the presence or absence of a factor being considered on the probable sale price and what difference does a varying amount of the factor make in the probable sale price or value. The actual sale price of a comparable is known. The element being sought in each adjustment is the estimated price at which the comparable would have sold for if it was identical to the subject site. Therefore, all adjustments are made from the comparable sales property to the subject. Stated simply, if a comparable property exhibits a superior factor, a downward adjustment is made. If an inferior factor is evident, an upward adjustment is made.

In estimating the amount of adjustment to be made for the presence or absence of any factor or for varying quantities of the various factors in the comparable as compared to the subject, the only valid measure in almost all instances is the evidence of the market reactions of buyers to such a difference. These reactions are reflected in varying sale prices of otherwise identical properties with or without the factor in question, if such evidence is available. As implied, a majority of the adjustments are relatively subjective and somewhat difficult to accurately quantify. As such, the most typical response is to quantify the adjustment on a percentage basis. Cost is generally not an appropriate measure of potential differences but has validity for certain types of adjustment.

Such adjustments are primarily of a physical nature relating to factors such as servicing deficiencies and fill requirements which are often examined objectively and on a cost to cure basis.

The preceding analysis has laid some of the fundamental groundwork for site valuation utilizing the direct comparison approach. A critical re-examination of the methods of adjustment and sequencing of adjustments utilized in Canada can now be undertaken.

Methods of adjustment

In Canada and the United States, there are three basic methods of adjustment which have traditionally been utilized in site valuation:

1. plus/minus dollar adjustments
2. plus/minus percentage adjustments
3. cumulative percentage adjustments or factoring

The following presents a brief description of each of the three basic methods:

Plus/minus dollar adjustments

If the differences between a comparable property and the subject can be substantiated in dollar amounts, the appraiser may add for deficiencies in the comparable property or subtract for elements of superiority. In utilizing this method, each adjustment is treated individually and independently as a \pm adjustment in dollar amounts. The resulting total is added or subtracted from the actual sale price or unit of comparison and the adjusted sale price derived.

Plus/minus percentage adjustments

In essence, this technique is the same as the dollar adjustments. However, rather than expressing the adjustment in dollar amounts, percentage adjustments are utilized. Once again, each adjustment is dealt with individually and independently and the \pm percentage figures are added to obtain a net percentage adjustment. This is then applied to the sale price or unit of comparison and the adjusted sale price is derived.

Cumulative percentage adjustments or factoring

The third method of adjustment is to express the percentage as a decimal and multiply each factor by the preceding factor to arrive at a cumulative factor representing the total adjustment which is

Example 1

	Unadjusted Unit Value	Terms of Sale	Time	Location	Size	Net Adjustment	Adjusted Unit Value
1.	\$10.00/sq. ft.	+\$1.00	+\$1.00	-\$1.00	-\$0.50	+\$0.50	\$10.50/sq. ft.
2.	\$10.00/sq. ft.	+10%	+10%	-10%	-5%	+5%	\$10.50/sq. ft.
3.	\$10.00/sq. ft.	1.10	1.10	.90	.95	1.035	\$10.35/sq. ft.

then applied to the unit of comparison or sale price. This method is based on the assumption that there is a relationship between the various factors making up the value of sites and that the forces in the market are interrelated.

Example 1 represents a simple example outlining the adjustments which would be applied for each technique.

In Canada, the only adjustment methods currently taught in the appraisal curriculum represent \pm dollar adjustments and \pm percentage adjustments. Factoring is no longer taught. Factoring was embraced as a method of adjustment until the early 1970s, however, it is no longer included in the course manuals or the text *Real Estate Appraising in Canada, Third Edition*.

Factoring is still taught in the United States, however, it is suggested that the method be used with caution as the technique can only be utilized in situations where the factors involved in the adjustment process are casually interdependent and, hence, correlated with one another.

A review of the texts currently utilized by the APPRAISAL INSTITUTE OF CANADA, the American Institute of Real Estate Appraisers and the Society of Real Estate Appraisers all focus on the direct comparison approach on an overall basis, acknowledging the technique as it applied to both vacant land and improved properties. A careful reading of all three texts relative to the direct comparison approach indicates that the sections are basically directed towards improved properties and, in particular, improved residential properties. The emphasis placed on improved properties, in turn, has influenced the recommended methods of adjustment outlined in the various texts. Factoring has definite limitations as it applies to improved properties. It is this phenomenon which has perhaps resulted in the cumulative percentage adjustment or factoring method falling out of favour as a technique for adjusting vacant land sales.

Although three methods of adjustment are indicated, in effect, the first two are

one and the same. Relative to the first two methods, the \pm percentage adjustment method is most commonly utilized in site valuation. Factoring is also utilized, however, it is no longer encountered as frequently as it was in the past. This is considered rational as it is no longer taught in Canada. Factoring has a place in site valuation, and the following information describes the relative merits of the factoring method as compared to the \pm percentage adjustment method.

Factoring — pros and cons

The currently accepted \pm percentage net adjustment method as it applies to vacant land is flawed both logically and mathematically while the factoring or cumulative percentage adjustment method is the more sound of the two techniques and should be utilized in site valuation. The best way to illustrate this conclusion is through the presentation of a number of examples.

Earlier in this analysis, a chart was prepared outlining the results of all three methods of adjustment (Example 1). This example confirmed that there is no difference between the \pm dollar method and the \pm percentage method. In contrasting the latter method to factoring, it also confirms that, where minor adjustments are involved, the discrepancies in terms of the adjusted unit value derived will be minor. Relative to Example 1, the variance is less than two per cent.

In situations where adjustments are relatively minor, it is more difficult to categorize either the \pm percentage method or factoring method as being more appropriate or accurate. Unfortunately, in the imperfect world of real estate, it is not always possible to find a number of highly similar sales. As a result, the appraiser, on occasion, is forced to work with much more substantial adjustments. It is in this scenario, where the appraiser is forced to work with very substantial adjustments, that significant differences between the techniques begin to arise and where the logic in making \pm percentage net adjustments begins to break down. (Example 2).

Obviously, the sale is not a good comparable, however, in many circumstances, appraisers are forced to work with situations of this type. Since it is difficult to rationalize any piece of land being worth nothing, Example 2 provides a classic illustration of the mathematical impropriety of the \pm percentage adjustment method. Carried to the extreme, the \pm percentage net adjustment method could actually result in a negative value arising.

Example 3 further reinforces the mathematical flaws of the \pm percentage method in conjunction with highlighting the weaknesses of the method from a logical perspective.

Although only two adjustments are indicated, use of the two techniques results in a 25 per cent value differential. In utilizing the \pm percentage method, each adjustment, as indicated, is dealt with on an individual basis. This, in turn, influences the relative magnitude of each adjustment. On the other hand, the factoring method indicates that there is an interrelationship between the variables. This again influences the relative magnitude of individual adjustments.

Example 2

	Unadjusted Unit Value	Terms of Sale	Time	Location	Size	Net Adjustment	Adjusted Unit Value
1.	\$10.00/sq. ft.	-15%	-25%	-50%	-10%	-100%	\$0.00
2.	\$10.00/sq. ft.	.85	.75	.50	.90	.287	\$2.87/sq. ft.

Example 3

	Unadjusted Unit Value	Motivation	Location	Net Adjustment	Adjusted Unit Value
1.	\$10.00/sq. ft.	+50%	-50%	Nil	\$10.00/sq. ft.
2.	\$10.00/sq. ft.	1.50	.50	.75	\$7.50/sq. ft.

In reference to Example 3, in utilizing the \pm percentage method, the actual magnitude of the adjustments for motivation and location is \$5.00 per square foot. That is, each adjustment is 50 per cent and is based on an unadjusted unit value of \$10.00 per square foot. In the factoring method, the actual magnitude of the two adjustments is \$5.00 per square foot for motivation and \$7.50 per square foot for location. Technically speaking, in utilizing the factoring method, the unit value is adjusted after each difference is accounted for. As a result, once the 50 per cent adjustment for motivation is applied, the unit value is automatically adjusted to \$15.00 per square foot and the locational adjustment of 50 per cent is derived from a unit value of \$15.00 per square foot. The factoring method is considered more logical as the technique recognizes that, but for the unusual circumstances surrounding the sale, the property would have actually sold for \$15.00 per square foot. In undertaking the adjustment process, it is imperative to remember that the object of the analysis is to estimate what the comparable site would have sold for if it had been identical to the subject site.

Example 4 further illustrates how the factoring method can result in the more effective use of the sales and lead the appraiser to a better indication of value.

Within Example 4, the \pm percentage method of adjustment results in an adjusted range in values which varies almost 100 per cent. In essence, the appraiser has not improved the position from which he started. As a result, deriving a final estimate of value becomes much more judgemental. The factoring method on the other hand, in

utilizing the exact same adjustments, provides an adjusted range in values varying less than seven per cent. This leads the appraiser to a much more conclusive indication of value.

As highlighted, the key difference between the two techniques is that the factoring process recognizes that the various adjustments are interdependent or interrelated, whereas the \pm method derives adjustments independently. Stated differently, it is analogous to comparing a simple interest situation to a compound interest situation. In examining land, the adjustments are, in fact, interrelated and the valuation process can be completed on a more accurate basis utilizing the factoring method of adjustment. Of particular importance is that the factoring method represents the process that is actually used within the market, whether this is intentional or not. That is, relative to Example 3, a knowledgeable player within the market will be aware that land values within a certain area are \$15.00 per square foot as of the date that an acquisition is being contemplated. This forms the basis upon which the market will then compare one location to another. The same holds true in Example 4. Relative to the third comparable, the market would analyze the locational adjustment necessary on the basis of the property selling at \$9.75 per square foot and not a value of \$15.00 per square foot. In treating the differences independently, as is the case in utilizing the \pm percentage technique, the adjustments tend to be understated or overstated depending on the circumstances surrounding the sale. The effect is particularly magnified where major adjustments are required.

The analysis conducted has led to the

conclusion that the factoring or cumulative percentage method of adjusting land sales is the most accurate technique available to the appraiser. The superiority of this method is clearly exemplified in situations where major adjustments are required. This, in turn, would indicate that the \pm percentage method of adjustment has applicability only in situations where very minor adjustments are required.

Sequencing of adjustments

In terms of the ordering or sequencing of the required adjustments for the various elements, the general practice in Canada has been to first adjust for time, then for other non-physical variables (i.e., location, zoning) and finally for physical differences (i.e., size, shape, etc.) It is, in fact, recommended that the analyst first adjust for time to arrive at a time adjusted value and then adjust for other variables. The rationale for doing so is to bring the comparable to the same economic base as is evident for the subject. This procedure, in effect, represents a partial adoption of the factoring method of adjustment. It also implies that the following adjustments can only be accurately quantified once the sale has been adjusted for time.

In utilizing the \pm percentage method, each adjustment is made individually and independently on the basis of a unit or sale price. As such, the order or sequence of adjustments has no impact mathematically on the end adjusted sale price or unit value. That is, the net result from the additions and subtractions to the sale price or unit value of the comparables remains the same.

In utilizing the factoring method, the order or sequence of adjustments also has no influence on the end adjusted sale price or unit value. It does not matter mathematically whether time is adjusted for first or last. However, with the factoring technique, the order or sequence of adjustments can have an influence if one is attempting to quantify or rationalize the impact of one specific adjustment. As such, a set order of adjustments should be followed throughout the adjustment process. Following such a pattern will, in effect, allow the analyst to more accurately gauge or quantify the extent of each adjustment that is required in a logical and orderly fashion.

In Canada, the recommended procedure has been to adjust first for time, then for other non-physical

Example 4

PLUS/MINUS PERCENTAGE

Unadjusted Unit Value	Motivation	Time	Location	Size	Net Adjustment	Adjusted Unit Value
\$10.00/sq. ft.	+50%	-	-50%	-	Nil	\$10.00/sq. ft.
\$7.50/sq. ft.	-	-	-	-	Nil	\$7.50/sq. ft.
\$15.00/sq. ft.	-	-35%	-10%	-20%	-65%	\$5.25/sq. ft.

FACTORING

Unadjusted Unit Value	Motivation	Time	Location	Size	Net Adjustment	Adjusted Unit Value
\$10.00/sq. ft.	1.50	-	.50	-	.75	\$7.50/sq. ft.
\$7.50/sq. ft.	-	-	-	-	Nil	\$7.50/sq. ft.
\$15.00/sq. ft.	-	.65	.90	.80	.468	\$7.02/sq. ft.

variables, and finally for physical differences. A review of American texts indicates that a different sequencing is recommended relative to the six basic elements of comparison and this is outlined as follows:

1. financing terms
2. motivating forces/conditions of sale
3. time/market conditions
4. location
5. zoning/land use designations
6. physical characteristics

A logical examination of these variables would, in fact, suggest that this represents a more sound approach to the ordering of adjustments. Adjustments for financing or motivation are highly specific to each individual sale. Each represents an element which has acted upon the comparable in a manner which results in an deviation from market. These adjustments should be completed first so as to place the comparable in a position of providing a true indication of actual market value as of the date of sale. The other elements of comparison are more relative in nature and, as such, adjustments for the same should be made later in the process.

To illustrate this logic, assume that an analyst is examining a two-year-old sale that sold above market due to the availability of a preferable financial package which resulted in a 15 per cent premium being achieved. During the past two years, the market has escalated 15 per cent. In adjusting for the impact of financing first, a more accurate time adjustment can be quantified which provides a more meaningful base for analyzing any other adjustments which may be required.

As indicated, adjustments for the six basic elements of comparison can be broadly categorized as being either subjective or objective. A majority of the adjustments that are required in site valuation fall into the subjective category. That is, such adjustments are typically derived from the market and tend to be somewhat difficult to quantify in a highly specific manner. Hence, these are typically expressed on a percentage basis. Certain adjustments, however, do fall into the objective category. These basically pertain to physical differences which generally reflect a deficiency (i.e., lack of servicing, fill requirements) or possibly an over-adequacy (i.e., site improvements or a small building). Cost

is often a key factor in evaluating such adjustments. For example, a site requiring \$25,000 in fill to allow for development will often be discounted by exactly this amount in a sale situation. This represents an adjustment which tends to be highly specific to the individual sale. In situations where this type of circumstance or adjustment is encountered, the adjustment should be relegated to first priority so that a more meaningful analysis of any other differences can be completed. Furthermore, if the adjustment can be analyzed on a highly specific basis (i.e., \$25,000 for fill), the adjustment should be calculated as such and dealt with first in order to derive an adjusted value which then forms the basis for analyzing subsequent adjustments.

In summary, the ordering or sequencing of adjustments as previously taught in Canada is considered inappropriate. A more logical sequencing of adjustments to be utilized with the factoring process is outlined as follows:

1. physical characteristics which are dealt with on an objective basis (i.e., cost to cure)
2. financing terms
3. motivating forces/conditions of sale
4. time/market conditions
5. location
6. zoning/land use designations
7. physical characteristics

Conclusions

The analysis conducted indicates that the \pm dollar or percentage methods of adjusting vacant land within the context of the direct comparison approach, as accepted and taught in Canada, is seriously flawed. The technique has applicability only in situations where few or minor adjustments are required. The factoring method, overall, represents a superior and more accurate means of completing adjustments for land valuation. Accordingly, the method has a place in appraisal methodology.

Relative to the sequencing of adjustments, the procedure that has historically been adopted in Canada is considered inappropriate. This is especially so in terms of calculating adjustments within the confines of the factoring method. As such, appraisers and analysts should give consideration to the sequencing of adjustments as outlined in this article.

As a final comment, the factoring

method of adjustment only has validity in land valuation. The technique has virtually no applicability for improved properties. The principle which gives the method its strength in land valuation (interrelationship of variables) is, in fact, the method's greatest weakness in analyzing improved properties. For example, it is virtually impossible to prove any interrelationship between variables such as location, size of building, age/depreciation, or the impact of special features on an improved industrial warehouse property. For improved properties, the \pm dollar or percentage methods are the only techniques which can be utilized. On this basis, the various appraisal texts have been correct in criticizing the factoring technique. However, in acknowledging the weaknesses of the method for developed real estate, the strengths of the technique for vacant land have been neglected. ▲

References

- Real Estate Appraising in Canada, Second Edition*, APPRAISAL INSTITUTE OF CANADA.
- Real Estate Appraising in Canada, Third Edition*, APPRAISAL INSTITUTE OF CANADA.
- Introduction to Real Estate Appraising Course 101 Student Manual, Sept. 1988 Edition*, APPRAISAL INSTITUTE OF CANADA.
- Appraising Real Property, 1984 Edition*, Byrl N. Boyce, Wm. N. Kinnard Jr, Society of Real Estate Appraisers.
- The Appraisal of Real Estate, Second Edition*, American Institute of Real Estate Appraisers.
- The Appraisal of Real Estate, Eighth Edition*, American Institute of Real Estate Appraisers.
- Real Estate Valuation in Litigation*, J.D. Eaton, American Institute of Real Estate Appraisers.
- Commentary: Making Adjustments, H. Bob Stellmacher, *The Real Estate Appraiser & Analyst*, Summer 1990.
- Resolving Confusion in Percentage Adjustment Techniques, Jay S. Berger, *The Appraisal Journal*, April 1971.
- Modernizing The Market Data Approach, W.M. Shenkel, *The Appraisal Journal*, April 1967.

The author also gratefully acknowledges the assistance of Dr. H.I. Freedman, Director Applied Mathematics Institute, Department of Mathematics, University of Alberta.