Appendix 30

1.0 Introduction

What are valuation parameters?

Valuation parameters are the property characteristics determined through market analysis to influence value for a group of properties as of a given base date. These parameters are used in every valuation process to ensure that results obtained in the valuation of properties are reasonable.

Why are valuation parameters important?

1. Valuation parameters are the critical elements in a valuation process; they are the factors that determine the values of a group of properties.

   For example, the following valuation formula for a hotel has two variables: number of units and value per unit:

   Hotel Value = Number of Units x Value per Unit

   - The "Number of Units" is a variable dictated by physical evidence.
   - The "Value per Unit" is a valuation parameter established by the assessor through analysis of market evidence.

   In this example, once the valuation parameter is determined for a particular class of hotels, it becomes possible to determine values for all hotels in this class by determining the number of rooms in each hotel and applying the formula to each property.

   The terms variable and valuation parameter are used throughout the Handbook and the valuation guides in referring to valuation models. Mass appraisal theory commonly uses the term specification to refer to the process of determining supply and demand variables for a valuation model and the term calibration to refer to the process of estimating valuation parameters for variables in the valuation model.

2. The assessor is required to estimate the fee simple value of real estate in accordance with the legislated requirements of the market valuation standard. To achieve this end, the valuation process should reflect the actions of participants in the marketplace. The valuation process should be applicable to all properties and should have enough flexibility to reflect the variations and market conditions encountered as of a given base date.

   In modelling the actions of the participants in the marketplace, variables and their respective valuation parameters are identified, researched and analysed by local assessors. For each variable, a valuation parameter (or a value) is developed using standard mass appraisal methodology.

   During model development, the assessor collects and analyses property characteristics which, based upon mass appraisal analysis, add or detract from property value. At times, the assessor relies on his professional knowledge of the market. The final model will reflect typical market conditions as of a given base date.

The Appraisal of Real Estate
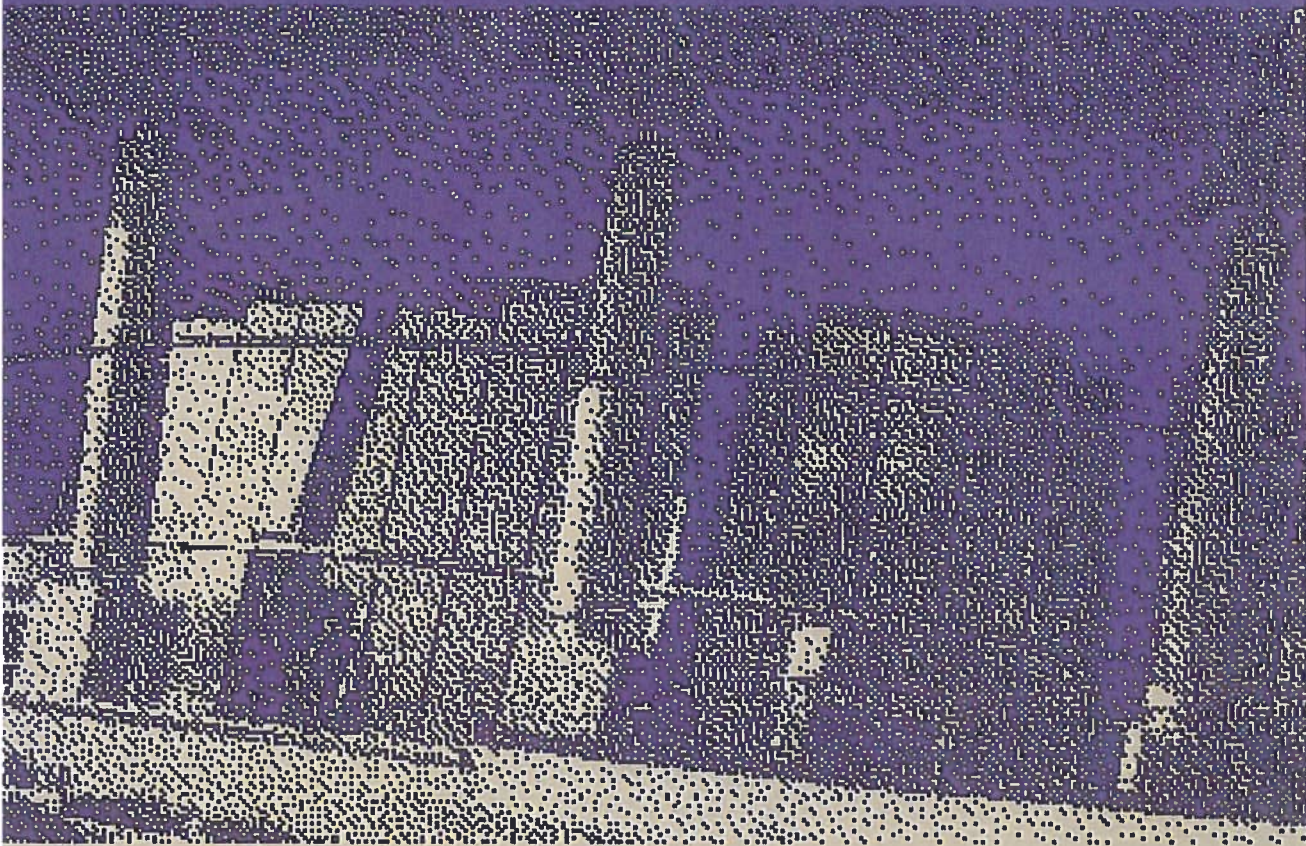## Third Canadian Edition

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Table 11.1: Building Measurement Standards

Gross living area (GLA)

Definition	Total area of finished, above-grade residential space; ca_ outside perimeter of the structure and includes only finishe living space. Finished basements and attic areas are not gen living area. Local practices, however, may differ.
Use	Used by federal agencies to measure single-unit residential proper_

Gross building area (GBA)

Definition	Total floor area of a building, excluding unenclosed areas, measured from _erio_ of the walls; includes both the superstructure floor area and the substructure or basement area
Use	Used by federal agencies to measure multi-family properties; also the standard of measurement for industrial buildings

Gross leasable area (GLA)

Definition	Total floor area designed for the occupancy and exclusive use of tenants, including basements and mezzanines; measured from the centre of joint partitioning to the outside wall surfaces.
Use	Commonly used to measure shopping centres.

Note that the acronym GLA can stand for two different area measurements. Residential appraisers use GLA for gross living area; non-residential appraisers use it to refer to gross leasable area.

management may measure single-tenant and multi-tenant floors in the same building in different ways. Since these measurements vary with occupancy, the appraiser must apply a consistent method in calculating the floor-by-floor rentable area of a building.

The appraiser should not accept a statement about the size of a subject or comparable property without knowing the basis for the calculation. Unverified size information can cause the resulting opinion of value to be erroneous or misleading.

Format

A complete building description includes information about the details and condition of a building's exterior, interior, and mechanical systems. Although there is no prescribed method for describing all buildings, the outline in Figure 11.1 may be used to establish a format for building descriptions and can be adapted to the special needs of particular assignments.

Other formats can be useful in different circumstances, depending on the type of property concerned and the nature of the appraisal assignment. The level of detail required in the building description varies according to the assignment's scope of work.

> A building description includes a description of the exterior, the interior, and the equipment and mechanical systems.

Sales Analysis and Mass Appraisal Performance Evaluation

20

Introduction

If the property tax is to be fair and provide adequate revenue for local government, mass appraisal must produce accurate appraisals and equitable assessments. The primary tool used to measure mass appraisal performance is the ratio study.

Definition and Purpose

A ratio study compares appraised values to market values. Market value is the most probable price in cash that a property would bring in a competitive and open market, assuming that the buyer and seller are acting knowledgeably, sufficient time is allowed for the sale, and price is not affected by special influences. In a ratio study, market values are usually represented by sales prices; actual prices may be adjusted for time of sale, financing, personal property, or other considerations. Sales that do not represent open-market, arm's-length transfers should not be used in ratio studies.

Independent, expert appraisals may also be used to represent market values in a ratio study, particularly when valid sales data are insufficient or when the accuracy of appraisals of property not subject to the market value standard is evaluated. In many jurisdictions, for example, statutes require agricultural lands to be appraised on the basis of productivity, or use value, rather than

market value. A ratio study designed to measure appraisal performance for such properties should be based on independent appraisals that reflect the use-value requirement.

Computation of Ratios

The ratios used in a ratio study are formed by dividing appraised values made for tax purposes by other estimates of market value, such as sales prices or independent appraisals. For example, a property appraised for tax purposes at $40,000 and sold for $50,000 has a ratio of 0.80, or 80 percent:

$$A/S = \$40,000/\$50,000 = 0.80,$$

where A is the appraised value and S is the sale price.

Gross assessed values (values before subtraction of partial exemptions) may be substituted for appraised values where the statutory level of assessment is 100 percent of market value. Using gross, rather than net, assessed values avoids complications caused by exemptions.

If the property in the above example were required by statute to be assessed at 50 percent of market value, the *assessed* value of the property would be $20,000 (50 percent of $40,000), and the assessment ratio would be 0.40 or 40 percent ($20,000 divided by $50,000). In this chapter, unless otherwise

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praisal uniformity within property groups
are discussed later in this chapter.

Figure 1. Examples of Appraisal Uniformity

	Group 1	Group 2
	0.90	0.40
	0.95	0.80
	1.00	1.00
	1.05	1.20
	1.10	1.60
Average	1.00	1.00

Uniformity between Groups   Uniformi-
ty between groups of properties is deter-
mined by comparing their average ratios
(appraisal levels). Large differences indicate
inequitable appraisals and thus unequal tax-
ation between groups. For example, if the ap-
praisal level is 90 percent for single-family
residential property and 60 percent for mul-
tifamily property, multifamily property is
underappraised relative to single-family
property, and owners would pay one-third
less in taxes per dollar of market value.

Systematic differences in appraisal level can
be analyzed in terms of *horizontal inequities*
and *vertical inequities*. Horizontal inequities are
differences in appraisal levels between groups
of properties defined by property type, lo-
cation, age, size, or some other attribute. The
above comparison between single-family and
multifamily properties illustrates horizontal
inequity.

Vertical inequities are differences in ap-
praisal levels for groups of properties defined
by value. Assume that appraisal levels are
similar among neighborhoods, but that more

expensive houses are generally appraised at
a lower percentage of market value than less
expensive houses. Although there is no
horizontal inequity among neighborhoods,
vertical inequities exist. In practice, horizon-
tal and vertical inequities are often related.
A simple measure of vertical inequity, the
price-related differential, is discussed later in
this chapter. Appendix 18-1 discusses
statistical tests for vertical inequities.

Design of Ratio Studies

The ratio study is a flexible tool that can pro-
vide valuable information for a variety of
purposes. The design of a ratio study should
reflect its purposes, including any legal re-
quirements, and the budget and staff avail-
able. Computer software options should also
be considered (appendix 19-1). A ratio study
usually has six parts: (1) delineation of ob-
jectives, (2) collection and preparation of
data, (3) matching of appraisal and sales data,
(4) stratification, (5) statistical analysis, and
(6) evaluation and use of results.

Delineation of Objectives   The objectives
of the study determine its scope, content,
depth, and flexibility.

Collection and Preparation of Data   The
precision and reliability of any ratio study
depend on the quantity and quality of the
sales and independent appraisals available.
Sales data must be collected, screened, and
edited, and sales prices adjusted as necessary
for financing, personal property, and time of
sale.

Matching Appraisal and Sales Data   The
appraised value and the sale price (or in-
dependent appraisal) must be for the same
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Property Appraisal and Assessment Administration

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3.2.2 Sampling

A ratio study is a form of applied statistics, because the analyst draws conclusions about the appraisal of the universe (the entire jurisdiction) of properties based only on those that have sold during a given time period or appraisals selected for a random sample. The ratios constitute the sample that will be used to draw conclusions or inferences about the population.

To determine the accuracy of appraisals within a jurisdiction with absolute certainty, it would be necessary for all properties in the population to have been sold in arm's-length, open-market transfers near the appraisal date or all properties would need to be appraised independently by the oversight agency. Since this is not possible, ratio studies must use samples and draw inferences or conclusions about the population from these samples.

The number of parcels in the population (the jurisdiction or stratum) is not an important determinant of a statistically valid and reliable sample.

3.2.3 Determining the Composition of Samples

In the design stage, the oversight agency must decide whether the ratio study sample should comprise sales (or asking prices when appropriate), independent appraisals, or a combination of the two. Each sample type has its advantages and disadvantages, as described below.

3.2.3.1 Sale Samples

The advantages of using sale samples include the following:

- Properly validated sales provide more objective indicators of market value than independent appraisals.

- Using sales is much less expensive than producing independent appraisals.

The disadvantages include the following:

- Difficulty in collecting sales data in jurisdictions without disclosure documents

- The oversight authority may not have control over the sales data collection and validation process

- Influence of sales chasing can be difficult to detect or prevent

- Samples of sales may not adequately represent the population of properties

- An adequate sample size may not be achieved if sales data are scarce

- Time adjustments are more critical when supplemental sales are included

3.2.3.2 Independent Appraisal Samples

Independent appraisals also can be used instead of or in addition to sales for ratio study samples. (See section 8, "Appraisal Ratio Studies," in this part.)

3.2.3.3 Samples Combining Sales and Independent Appraisals

The oversight agency can design and conduct ratio studies using samples comprised of sales and independent appraisals. In this approach, the combined advantages of sale samples and appraisal samples are realized. However, the disadvantage of combining sales and independent appraisals is the possible existence of some of the disadvantages of sale samples and/or appraisal samples (see Section 8.7).

3.3 Collection and Preparation of Market Data

The reliability of a ratio study depends in part on how accurately the sales or independent appraisals used in the study reflect market values. For sales-based studies, oversight agencies should conduct an independent sales verification and screening program if resources permit. Alternatively, oversight agencies should develop audit criteria to review data submitted to qualify sales, corroborate representativeness and confirm adequate sample size. Audit decisions should accommodate needs of the agency and resources available. Independent appraisals used in ratio studies must comply with the appropriate sections of the *Uniform Standards of Professional Appraisal Practice* (USPAP; Appraisal Foundation 2010–2011), and reflect market values as of the date being studied. Most oversight agencies use property data collected by the local jurisdiction to develop their independent appraisals. In order to produce credible appraisals, the oversight agency must be certain that the local jurisdiction accurately recorded the appropriate value-related property characteristics for each property it is independently appraising. Steps must be taken to ensure that errors in the database made by the local jurisdiction do not materially or significantly affect the conclusions or opinions of value developed by the oversight agency.

3.4 Stratification

Stratification divides all the properties within the scope of the study into two or more groups or strata. Stratification facilitates a more complete and detailed picture of appraisal performance and can enhance sample representativeness

Each type of property subject to a distinct level of assessment could constitute a stratum. Other property groups, such as market areas, school districts and tax units, could constitute additional strata.

Strata should be chosen to be consistent with factors in the mass appraisal model. When the purpose of the study is to evaluate appraisal quality, flexibility in stratification

is essential. The general goal is to identify areas in which the assessment levels are too low or lack uniformity and property groups for which additional reappraisal work may be required. In such cases, it also is highly desirable to stratify on the basis of more than one characteristic simultaneously.

Stratification can help identify differences in level of appraisal between property groups. In large jurisdictions, stratification by market areas is generally more appropriate for residential properties, while stratification of commercial properties by either geographic area or property subtypes (e.g., office, retail, and warehouse/industrial) can be more effective.

3.5 Matching Appraisal Data and Market Data

The physical and legal characteristics of each property used in the ratio study must be the same when appraised for tax purposes and when sold. This implies two essential steps. First, the property description for the sold parcel must match the appraised parcel. If a parcel is split between the appraisal date and the sale date, a sale of any of its parts should not be used in the ratio study.

Second, the property rights transferred, permitted use, and physical characteristics of the property on the date of assessment must be the same as those on the date of sale. Properties with significant differences in these factors should be excluded from the ratio study.

When statutory constraints are imposed on appraisal methods, the resulting assessment may be less than market value. In such cases a sales ratio study may not provide useful performance information. Constraints typically apply to land that qualifies for agricultural-use value, subsidized housing, mineral land, and timberland.

Sales may include property of a type other than the type for which the ratio study analyses is intended. However, sales including more than minimal values of secondary categories are unlikely to be representative, even with adjustment.

For example, a property that is predominantly commercial may include residential components. This sale can be included as representative of the commercial category. In this case, the numerator in the ratio calculation would be the total appraised value including the value of both the commercial and residential components.

In a second example, for a ratio study of vacant land, the numerator in the ratio should reflect only the appraised value of the land. The sale price should be adjusted for the contributory value of the improvements or the sample should be excluded from further analysis.

3.5.1 Stratification for Equalization Studies

Oversight agencies generally should define the strata prior to acquiring and compiling data for the ratio study.

Predefined stratification is more transparent and enhances cooperation between the oversight agency and the jurisdiction appraising the property subject to equalization. In general, oversight agencies should not redefine the strata once they have been defined for equalization purposes, especially in the case of direct equalization. It is appropriate, however, to collapse strata to compensate for otherwise inadequate samples sizes. In addition, a reappraisal or equalization order can be targeted for specific problem areas that cause noncompliance at a broader level of aggregation. If value stratification is necessary, predefined strata may not be practical.

3.5.2 Stratification for Direct Equalization

Strata should be chosen consistent with operational requirements for the required level of equalization. Statistical issues in the determination of strata include the size of the population and resulting strata and the likely variability of the ratios in each stratum. Care must be taken not to over-stratify, that is, to create strata that are too small to achieve statistical reliability (see section 6, Sample Size" in part 1 and Sherrill and Whorton [1991]). No conclusion about stratum level or uniformity should be made from stratum samples that are unreliably small (resulting in unacceptably large margins of error). Ultimately, the degree of stratification is determined largely by available sales data, unless it is cost-effective and practical to add sufficient independent appraisals. If sufficient sales or appraisals are not available for a given stratum, it should be combined with similar strata. When strata are combined, provided there is no reason to suspect dissimilar ratios as evidenced by different level or uniformity measures, such combinations permit broader applicability of ratio study results and prevent ratio study analysis from becoming too focused on substrata with few sales or appraisals. When jurisdiction or category wide equalization actions are required, reliability of component strata is not an issue.

3.5.3 Stratification for Indirect Equalization

Indirect equalization develops an estimate of full market value, but assessed values of individual properties are not altered. Such studies can use a substantially different approach to stratification than ratio studies intended for performance evaluation or direct equalization. The purpose of stratification in this case is to minimize distortions due to different assessment levels, which can vary by property type, value range, geographic area, and other factors. If stratification creates a more representative sample, equalization decisions may be based on results from individual stratum. . If the overall sample is representative of the population then equalization decisions should be based on overall sample results. A reasonable number of strata with small samples and larger margins of error can increase overall representativeness and may reduce the margin of error for the overall jurisdiction-wide sample.