IAAO
INTERNATIONAL ASSOCIATION of ASSESSING OFFICERS
Valuing the World

Course 312 - Commerical/Industrial Modeling Concepts Learning Objectives

Course Description

Course 312 presents a detailed study of the mass appraisal process as applied to income-producing property. Topics include income property data, market analysis, sales comparison approach, cost approach, cost approach, gross and net income analysis, capitalization rate development, model specification and calibration, and value review and maintenance. Recommended: Course 300, MARP

Objectives

Upon completion of Section 1, you will be able to:

- Identify the major steps in the mass appraisal process.
- Identify general, specific and comparative data required in mass appraisal.
- Understand the forces of supply and demand relative to regional (city), and neighborhood market analysis.
- Understand the concept of highest and best use of the site and the improvements.
- Apply the principle of consistent use in highest and best use analysis.
- Understand the difference between model specification and model calibration.
- Understand modern price theory.
- Recognize the three basic model structures used in mass appraisal.

Upon completion of Section 2, you will be able to:

- Recognize city, regional and economic factors, and social, governmental, and environmental forces.
- Understand the effect of location on the value of income-producing properties.
- Distinguish the difference between site and improvement characteristics.
- Describe the five methods of collecting income and expense data.
- Analyze income and expense data.
- Determine allowable expenses for income producing properties.
- Define net operating income (NOI) before-tax cash flow and after-tax cash flow.
- Recognize the different types of leases.
- Identify the different types of data.
- Understand binary and scalar data transformations.
- Understand common mathematical transformations used in mass appraisal modeling.

Upon completion of Section 3, you will be able to:

- Stratify income properties by property type, location or other criteria such as, size, age, condition, etc.
- Determine an appropriate unit of comparison.
- Develop graphs and charts based on one variable analysis.
- Divide data into percentiles and quartiles.
- Develop common measures of central tendency.
- Develop common measures of dispersion.
- Conduct a two-variable analysis using cross-tabulation, scatter diagrams or box plots.
- Understand three and four variable analysis through the use of contingency tables or "breakdowns".
- Develop sales ratio statistics for income properties.
- Analyze uniformity among property groups.

Upon completion of Section 4, you will be able to:

- Define and write examples of additive, multiplicative, and hybrid model structures for income properties.
- Explain the difference between additive and multiplicative multiple regression analysis (MRA).
- Explain the requirements for successful MRA models.
- Define and interpret the following "goodness of fit" statistics: R-square, Standard Error of Estimate, (SEE) and coefficient of variation.
- Interpret a correlation matrix.
- Explain and interpret the following measures of variable importance: t-value, F-value, and beta-value.
- Explain stepwise regression and its advantages.
- Define and explain how to address violations of the following MRA assumptions: linearity, additivity, constant variance of the error term, and uncorrelated independent variables.
- Explain the advantages and disadvantages of multiplicative MRA.
- Interpret the exponents in a multiplicative model.

Upon completion of Section 5, you will be able to:

- Understand the economic principles and theories inherent in the cost approach.
- Properly stratify income properties.
- Specify construction cost models.
- Distinguish four types of building costs in commercial cost manuals.
- Explain the steps in calibrating Replacement Cost New (RCN).
- Explain the steps in developing a formula driven cost model.
- List the steps in developing a market driven depreciation schedule.
- Explain methods for calibrating.

Upon completion of Section 6, you will be able to:

- Explain the two general approaches to the development of market rents and gross income multipliers (GIMs).
- List the steps to determine market rents by stratification.
- List three factors to consider in evaluating the reliability of per unit rents or GIMs developed through stratification.
- List five theoretical factors that affect GIMs.
- Calculate usual measures of central tendency and dispersion for per unit rents and GIMs.
- Write the structure of additive models used to estimate per unit gross income or GIMs.
- List the dependent variable and typical independent variables in a gross income model.
- List the dependent variable and typical independent variables in a GIM model.
- Apply a gross income or GIM model developed through regression analysis to a subject property.
- Explain the advantages and limitations of gross income versus net income models.

Upon completion of Section 7, you will be able to:

- List important points in the screening of expense data.
- Explain two general approaches to the development of expense ratios.
- Calculate a median and trimmed mean expense ratio or OAR.
- List important factors to consider in determining the reliability of expense ratios or OARs developed through stratification.
- Write the structure of a simple additive expense ratio model.
- Define the key regression statistics to use in evaluating the output from an expense ratio or OAR model.
- Apply the regression output from an expense ratio or OAR model to a subject parcel.
- Define the relationship between OAR and net income multiplier.
- List theoretical factors and property characteristics that affect OARs.
- Explain three approaches to developing vacancy and collection loss ratios.

Upon completion of Section 8, you will be able to:

- Explain the role and importance of value review in mass appraisal.
- Distinguish between office and field review and state the purpose of each.
- Describe the statistical information important in the office review of values.
- Describe information helpful in field reviews.
- List the aspects of value acceptability.
- List several methods of improving the stability of values from year to year.
- Describe several strategies for updating values and their relative advantages and disadvantages.

Topic	Time Table	Day Covered
Section 1		
Overview	120 Minutes	Monday AM
Section 2		
Income Propert Data	300 Minutes	Monday AM/PM
Section 3		
Market Analysis	300 Minutes	Tuesday AM/PM
Section 4		
Sales Comparison Approach	300 Minutes	Tuesday PM/Wednesday AM
Section 5		
Cost Approach	120 Minutes	Wednesday PM
Section 6		
Gross Income Analysis	210 Minutes	Wednesday PM/Thursday AM
Section 7		
Net Income Analysis	210 Minutes	Thursday AM/PM
Section 8		
Reviewing and Maintaining Values	120 Minutes	Thursday PM
Review	120 Minutes	Friday AM