

EVGN 11

The Valuer's Use of Statistical Tools

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1. Introduction

1.1 As discussed in EVS 4 (The Valuation Process) a professional valuation relies on the valuer appraising the subject property in its context, researching and verifying all matters having a bearing on the value of the property.

1.2 The quality of the valuation will depend on the quality of the information used to prepare it and so the valuer will need to verify any information sources, including their date. The valuation is the culmination of the valuer's investigations – in which visiting and inspecting the property play a key part – and research of all information and file notes, demonstrating his skill in bringing together data from all the various sources, using that information efficiently and providing a considered opinion.

1.3 EVIP 5 (Valuation Methodology) discussed the importance of analysing the market. The examination, investigation and analysis of the available market evidence is one of the most important parts of the valuation process. The valuer will look to see where the bulk of the market evidence is to be found and this process enables the valuer to determine which market transactions are the most relevant to the size, style and condition of the subject property and to give due weight to each piece of relevant evidence.

1.4 Analysis of market evidence is possible using sophisticated IT tools such as:

- regression analysis, both linear and non-linear;
- time series analysis;
- geographically weighted models;
- simulation models, e.g. Monte Carlo simulation;
- neural network models;
- option pricing models;
- fuzzy logic-based models.
- other machine learning/data mining algorithms

1.5 As a general rule, the valuer should be aware that any analytical tool is only as reliable as:

- the data that is fed into it;
- the analytical model it uses.

1.6 As huge volumes of data about real estate become more readily available, vast selection of 'revolutionary' products based on statistical analysis also becomes available on the market.

1.7 AVMs are such statistical models, often a combination of complex models, aiming to produce a price estimate of a property as at a specific date.

1.8 However, the valuer wishing to use an AVM in his work has to understand its role as a statistical tool in producing a valuation report that is in compliance with EVS, as by their nature AVMs are machine-based tools and do not have the advantage of viewing the subject property, understanding its context or appraising and discussing the outcomes.

2. Preconditions for the use of AVMs

2.1 The value of a property cannot be reached solely by using mathematical or statistical techniques. Such techniques can only serve as assistance to the valuer. The valuer's estimate of the value of the subject property has to be based on his best and sound judgement drawing on his professional skill applied to his knowledge of the property market.

2.2 AVMs comprise the following standard components:

- (1) Input data
- (2) The predictive model (algorithm)
- (3) The semi-products and final outputs of the model (valuation estimates).

2.3 The valuer can use components (1) and (3) depending on:

- his knowledge of the sources of the data that the AVM provider is using;
- the subject and purpose of valuation.

2.4 AVM Input data

2.4.1 The valuer usually selects and works from a relatively small portion of the total data available, identifying the market evidence about sale prices and rental prices that is in his judgment most relevant to assist his assessment of value. That judgment will be based on his knowledge of the market with an understanding of matters that may not be apparent to the AVM.

2.4.2 AVMs, on the other hand, use large scale of data from various sources. In order to use data as selected by the AVM, the valuer must know:

- the scope of the data source used by the AVM (regional, national, all transacted properties, only mortgaged properties...);
- the type of data (sale prices, asking prices, valuation results);
- the volume and homogeneity of data under investigation;
- how regularly the source of information is updated;

and then consider its relevance to the subject property.

2.4.3 Armed with that knowledge, the valuer will decide if he can rely on any of the data provided by an AVM statistical tool. It should be noted that when the valuer relies on information supplied by a third party, he must be sure the information is credible enough to be relied on it and that it will not negatively affect the credibility of his valuation opinion. The valuation opinion is the sole responsibility of the valuer.

3. Limitations on the use of AVMs once the preconditions have been met

3.1 AVM semi-products

3.1.1 The AVM's output may vary across the industry: valuation estimates or ranges; accuracy statistics; hit rates; confidence scores; forecast standard deviation (FSD) but there is no agreed industry standard as to how these metrics are defined and calculated.

3.1.2 AVMs also have semi-products or intermediate products which are of interest to valuers.

3.1.3 Valuers must be very cautious in using any of the semi-products or intermediate products as an integral part of their valuation reports, since sole responsibility for any item stated in the valuation report lies with the valuer.

3.1.4 If the valuer is satisfied with his knowledge of the input data and its relevance, he may use AVM semi-products as support in:

- statistical analysis of the prices/rents in a particular segment of the property market, stating which data have been used and which model;
- preparing maps of selected sales/rents.

3.1.5 The valuer must also provide explanation of the input data, so as to reassure the client of the valuer's control over this aspect of the valuation process.

3.1.6 Most often, the valuer will use the AVM's input data – description of the transacted property details – and the following AVM semi-products:

- selection of the data for the statistical analysis;
- descriptive statistics such as: coefficient of co-variation, mean value, standard error, median, mod, standard deviation, range, minimum, maximum, number of samples.

3.1.7 Based on such comprehensive market analysis, the valuer may be able to derive key inputs which will be applied as a component of the valuer's adopted traditional valuation approach.

3.2 The final product of the model

3.2.1 The final product of all AVMs is a price estimate of properties.

3.2.2 When valuing individual properties, the valuer can only use this final AVM product in his reconciliation, as a benchmark. Reconciliation serves as a final look at the indications of value obtained using different valuation approaches, and among others, he can take into consideration an AVM estimation of price, providing that he is satisfied with his knowledge of AVM's input data with an understanding of its strengths, weaknesses and relevance.

3.2.3 The final opinion of value cannot rely solely on the AVM's estimate of price which can only be a contribution to the valuer's work and exercise of judgment in preparing the report.

4. Portfolio valuation

4.1 When valuing large portfolios of properties of a similar type, on individual level or on portfolio level, on a desk-top basis, the valuer may use the AVM's semi-products for market analysis and the AVM's estimate of price to support his opinion of value, providing that he is satisfied with:

- the comprehensiveness and relevance of the data source used by the AVM (national, regional, all transacted properties, only mortgaged properties);
- the type of data (sale prices, asking prices, valuation results);
- the volume and homogeneity of data under investigation;
- how regularly the source of information is updated;

- criteria applied by the AVM provider for the inclusion or exclusion of data;

because the final opinion of value is the responsibility of the valuer.

4.2 Most commonly, the valuer will seek the assistance of the AVM's semi-products and estimate of price for:

- valuation of individual residential properties (apartments) within a large portfolio, on a desk-top basis, for the purpose of monitoring the value of collateral for banks;
- valuation of a portfolio of similar real estate properties, on portfolio level, for the purpose of monitoring values of assets in alternative investment funds.