



## **Automated Valuation Models**

### **Introduction**

The use of Automated Valuation Models (AVMs) and Risk Assessment Tools for mortgage lending purposes is not new, yet their increasing presence in the real estate market is causing concern within some segments of the appraisal community for a number of reasons. This paper summarizes the challenges and opportunities from the perspective of the Appraisal Institute of Canada and its members, and provides a set of recommendations aimed at stakeholders with the objective of ensuring the integrity of the Canadian housing sector.

### **About AIC**

The Appraisal Institute of Canada is the national professional organization that designates, and represents professional real estate appraisers, and valuation consultants nationwide. Professional Appraisers provide a broad range of services related to the principles of value in real estate, including advisory and consultative services.

Its designated members, whether Accredited Appraisers Canadian Institute (AACI) or Canadian Residential Appraisers (CRA), have fulfilled the Institute's rigorous educational and professional experience requirements, and are highly qualified professionals in their fields of competence.

The Institute's designated members adhere to the Canadian Uniform Standards of Professional Appraisal Practice and its Code of Ethics. The Canadian Standards account for the appropriate use of AVMs. In Section 6797, “when an **automated valuation model** is applicable, an appraiser must:

- have a basic understanding of how the AVM operates;
- determine if use of the AVM is appropriate for the assignment;
- ensure that the AVM does not exclude relevant data necessary for a credible result; and
- when developing opinions or conclusions in an appraisal, respond to these Standards.”

Further, all Professional Appraisers who are members of the Institute are subject to a mandatory re-certification process and professional development guidelines that embrace the concept of lifelong learning.

The Mission of the Appraisal Institute of Canada is: to protect the public interest and support our members by ensuring high standards of professional real estate and related property advisory services.

Among its objectives, the Institute is looking to develop state of the art programs to help ensure that its members will be in the vanguard of the profession and will reflect the highest standards of professionalism, knowledge, and skills within the industry. In this respect, AIC and its members view information technology such as AVMs as powerful resources which, used appropriately, can increase the level of quality and value-added services offered by Professional Appraisers to the Canadian public. AIC has been meeting with stakeholder organizations to explore their needs and to determine how the Institute's members can assist them in performing their due diligence.

### **About AVMs**

Automated valuation models (AVMs) are computer programs that provide real estate market analysis and estimates of value.

AVMs are no different than any other tool used by Professional Appraisers and other professionals to do their analyses and generate supportable opinions of value. AVMs vary in quality depending upon the data that they use and their design. Perhaps most importantly, AVMs do not replace Professional Appraisers, although they may compete for some of the appraisers' business much as appraisers compete with each other.

AVMs made their appearance in the marketplace several years ago, and since then, the number of AVM software and supporting databases has been increasing rapidly everywhere around the world. Across North America, dozens of AVMs are being used by a wide range of stakeholders as a decision making tool, including Professional Appraisers who use them in support of their work.

Most AVMs only use public records data of residential properties. The primary uses of AVMs are mortgage lending and mortgage insurance. Other uses are for reviews, quality control, loss mitigation, and portfolio analysis. Moreover, AVMs for commercial real estate are currently being developed. Some appraisers are developing their own AVMs and using them in local markets or selling them.

### **Risk Assessment Tools**

Risk Assessment Tools differ from AVMs in that they do not provide estimates of property value. Instead, Risk Assessment Tools assist in the evaluation of mortgage applications by providing lenders with an assessment of the level of risk involved in mortgage lending decisions. Some, but not all, include valuation-based components.

The Canada Mortgage and Housing Corporation's (CMHC) 'emili' is a sophisticated program used for risk assessment primarily for high ratio mortgage applications, but lately also for conventional mortgage lending. Other Risk Assessment Tools include GE Capital's Excel automated underwriting system. CMHC is understood to have stated that

their product is not an AVM, and it generates neither a value estimate nor direction of value.

While Risk Assessment Tools differ from and are not AVMs, some include value and market conditions as components of their risk modeling engines. The Institute wants to ensure that its members, when working with Risk Assessment Tools, are provided with appropriate standards and guidelines.

### **Issues with AVMs**

AVMs present both challenges, and opportunities to Professional Appraisers. On the one hand, AVMs can be used in lieu of a Professional Appraisal in some cases. However, AVMs provide Professional Appraisers with a useful tool with which they can enhance the services they provide.

Because AVMs can vary greatly in their design and in the data they use, they must be reviewed to determine if their outputs are reliable, and accurate. AVM generated values should be compared to known prices and the opinion of Professional Appraisers, as a means of ensuring their integrity. The design of an AVM is critically important. AVM model specifications should follow appraisal and economic principles. Well designed AVMs should follow the major appraisal principles. The data underpinning AVMs should be based on neighbourhood, local, or regional market analyses. They should take into account location and not just nearest sales.

AVMs should be clear and transparent with their valuation formulas and their component parts easily understandable. This is important if an AVM output is questioned in court. According to Patrick M. O'Connor, ASA, Managing Member of Real Estate Automated Service Associates, LLC: 'This is the single greatest problem for various artificial intelligence systems that have the so-called hidden layers that perform all the market analyses but cannot specify the model structure or individual variable coefficients. This is the same as the appraisers who before the 1930's said 'I am the expert and I do not have to give any supporting documentation for my opinions.' One of the basic reasons for the creation of appraisal societies in the United States in the 1930's was to develop a body of knowledge that would allow appraisers to provide documentation for their opinions of value.'

As the real estate valuation market increases in complexity, the knowledge base of the appraisal profession has to evolve if Professional Appraisers are to maintain their competitiveness. AVMs are powerful tools that can assist Professional Appraisers to better understand and explain the market to their clients.

While AVMs can provide quick, basic indications of property value, they are not, and do not replace, Professional Appraisals.

## **POLICIES**

### **Public Awareness**

With the increasing use of AVMs and Risk Assessment Tools in generating estimates of value for mortgage lending purposes, there is the potential for confusion by the public and by lenders as to what AVM and Risk Assessment Tools are in relation to an appraisal. It is all too often the case that homebuyers equate obtaining a mortgage with confirmation of the value of their new acquisition. Homebuyers are unaware that increasingly, appraisals are not being done as part of the loan approval process.

There is a danger also that the AVMs, Risk Assessment Tools, and their outputs could be misrepresented as being equivalent to a Professional Appraisal. It is incumbent upon all users of AVMs and Risk Assessment Tools including lenders, mortgage insurers and appraisers to communicate to their clients the differences between an AVM or valuation-based Risk Assessment Tool derived value, and the value conclusion of a Professional Appraisal.

AIC is interested in working with all stakeholders including CMHC and GE Capital to communicate to consumers that loans and insured loans may not always be accompanied by an appraisal. Without an appraisal, consumers should not mistake a loan approval as ratification or support of their purchase decision.

Therefore, the Institute recommends that:

1. Government, lenders, Professional Appraisers and other users of AVMs and Risk Assessment Tools provide information to the public and stakeholders about AVMs and Risk Assessment Tools and point out the differences between them and a Professional Appraisal

Notwithstanding initiatives by stakeholders to inform the public about AVMs, and valuation-based Risk Assessment Tools, and Professional Appraisals, the Institute recommends that:

2. Lenders should clearly advise clients if AVMs or Risk Assessment Tools have been used and should recommend Professional Appraisals where warranted.

The Canadian public is largely unaware of AVMs, Risk Assessment Tools, and the difference between them and a Professional Appraisal. It is entirely appropriate for all consumers to be properly informed about the products and services they are directly or indirectly subscribing to and in many cases pay for when buying or selling a home. Therefore, the Institute recommends that:

3. Lenders, mortgage insurers and governments should clearly distinguish between AVMs, Risk Assessment Tools, and Professional Appraisals in all their publications.

4. Governments should play a leading role in public education about AVMs, and Risk Assessment Tools, and how they differ from Professional Appraisals.

### **Appropriate Use**

Neither AVMs or valuation-based Risk Assessment Tools can replace Professional Appraisals. However, given their cost-effectiveness and ability to provide information almost immediately, there is pressure on lenders to use them for all manner of transactions. In many cases, these programs fall short in their ability to generate reliable information and can put lenders and buyers in unacceptably high-risk positions.

Users of AVMs and valuation-based Risk Assessment Tools must understand that these products have limitations in their uses.

Therefore, the Institute recommends that:

5. Best Practices be developed collectively by all stakeholders including lenders, mortgage insurers, and Professional Appraisers as to the appropriate use and limitations of AVMs, and valuation-based Risk Assessment Tools.
6. In all but low-risk residential property valuation for mortgage lending purposes, AVMs, and valuation-based Risk Assessment Tools should be qualified by Professional Appraisers.

### **Training**

With the proliferation of AVMs and Risk Assessment Tools, an increasing number of staff working in banks and other lending institutions have become AVM operators and Risk Assessment Tool users. These individuals are generally not appraisers and may have limited knowledge with respect to valuation of real property, especially using AVMs and valuation-based Risk Assessment Tools. Therefore the Institute recommends that:

7. Lenders should ensure valuation training is provided to all staff who use AVMs and valuation-based Risk Assessment Tools.

### **Monitoring**

AVMs and Risk Assessment Tools, and their associated technologies are evolving. New versions of AVMs and valuation-based Risk Assessment Tools use enhanced modeling techniques. Further, the data sets used by AVMs and valuation-based Risk Assessment Tools are constantly updated and enhanced. Professional Appraisers are uniquely qualified to review AVM and valuation-based Risk Assessment Tool performance and to compare it against Professional Appraisals in order to ensure integrity and reliable results. The Institute recommends that:

8. Lenders, mortgage insurers, and appraisers using AVMs and valuation-based Risk Assessment Tools work with AIC to establish a process to periodically review

## AVM and valuation-based Risk Assessment Tool performance against Professional Appraisals.

The use of AVMs and Risk Assessment Tools by lenders and mortgage insurers has as one of its objectives to expedite the process of home financing. Yet, inappropriate use of AVMs and Risk Assessment Tools may, in the long run, hamper home ownership if it leads to mortgage defaults especially where high ratio mortgages are used to facilitate home ownership for first time buyers. CMHC has a stated interest in helping more Canadians become homeowners through its mortgage insurance service. Therefore, the Institute recommends that:

9. CMHC should periodically review 'emili' in the context of its mandate of facilitating affordable housing to all Canadians.

The widely used 'emili' was developed by the Canada Mortgage and Housing Corporation in order to expedite delivery of their mortgage insurance services. Not to be confused with an AVM, 'emili' is a Risk Assessment Tool. As such, the Institute recommends that:

10. CMHC consider making available information about 'emili' so that the appraisal community may better understand what 'emili' does and cannot do.

### **Research and Development**

These issues primarily affect the housing sector, which in turn impacts all Canadians. Therefore, AIC recommends that the:

11. Lenders and mortgage insurers including CMHC and GE Capital should undertake a study in collaboration with AIC to assess the limits of AVMs and valuation-based Risk Assessment Tools and determine best practices in their use.
12. Government should make available funding to Professional Appraisers for research in the areas of advanced property valuation using automated valuation models.

### **Standards**

AVMs are complex programs incorporating a variety of forecasting techniques including linear regression, expert systems, neural networks, artificial intelligence and other methodologies. The different methodologies, algorithms, and variables used by AVMs greatly affect their reliability and accuracy. Yet, there are no established standards for AVM programming and no regulatory supervision of the AVM products that are used in the marketplace. In addition, there are no minimum standards for the data used in AVMs including currency, completeness, or quality. Moreover, there is no standardized testing process to ensure the reliability of AVM outputs. Therefore, the Institute recommends that:

13. Standards should be developed jointly by the lenders, mortgage insurers, and AIC for AVM and valuation-based Risk Assessment Tool structure, data, and use.

Standards are also lacking for the reporting of AVM results to clients as well as the levels of confidence associated with the figures generated by AVMs. Therefore, the Institute recommends that:

14. Standards should be developed with respect to the information made available to clients regarding the use of AVMs and valuation-based Risk Assessment Tools in determining value for lending purposes.
15. An accreditation process to benchmark AVMs and valuation-based Risk Assessment Tools against established standards should be developed and implemented on a voluntary basis as a way of providing clients with a high level of confidence in the valuation of their purchases or sales.

### **Fraud**

There is a prevalent concern amongst members of the housing industry that fraud impacts the integrity of our industry. There is also a desire to undertake a leadership role to be part of the solution in reducing mortgage fraud. The Institute recommends that:

16. The federal government continue its review of mortgage fraud, in collaboration with AIC and other stakeholders including the Canadian Institute of Mortgage Brokers and Lenders (CIMBL) to identify how AVMs and valuation-based Risk Assessment Tools may be used in committing fraud and to determine appropriate safeguards to curtail it.

### **Conclusion**

The Appraisal Institute of Canada and its members view information technology such as AVMs and valuation-based Risk Assessment Tools as powerful resources which, when used appropriately, can increase the level of quality and value-added services offered by Professional Appraisers to the Canadian public. However, AVMs and valuation-based Risk Assessment Tools cannot replace Professional Appraisals.

Occasionally, AVMs and valuation-based Risk Assessment Tools fall short in their ability to generate reliable information resulting in unacceptably high-risk situations. Therefore, AIC is committed to the development of both Standards, and Best Practices for AVMs and valuation-based Risk Assessment Tools. Such initiatives can serve as the foundation to heighten integrity in the housing sector. By establishing sound collaborative relationships with stakeholders in the housing sector, AIC will assume a leadership role in addressing the issues surrounding mortgage fraud, and defaults .

## Summary of Recommendations

- Users of AVMs and Risk Assessment Tools should provide information to the public and stakeholders about AVMs and Risk Assessment Tools and their appropriate uses
- Clients should be advised if AVMs or valuation-based Risk Assessment Tools have been used in determining value and Professional Appraisals recommended where warranted
- Lenders, mortgage insurers, and governments should distinguish between AVMs, Risk Assessment Tools, and Professional Appraisals in all their publications
- Governments should play a role in educating the public about AVMs and Risk Assessment Tools and how they differ from Professional Appraisals
- Best Practices should be collectively developed by all stakeholders on the appropriate use of AVMs and Risk Assessment Tools
- AVM and valuation-based Risk Assessment Tool outputs should be qualified by Professional Appraisers in all but low-risk residential property valuation for mortgage lending purposes
- Lenders should ensure valuation training programs are provided to all staff who use AVMs and valuation-based Risk Assessment Tools
- Governments should work with AIC in establishing a process to periodically review AVM and valuation-based Risk Assessment Tool performance against Professional Appraisal
- CMHC should consider periodically reviewing 'emili' in the context of its mandate of facilitating affordable housing to all Canadians
- CMHC consider making available information about 'emili' so that the appraisal community may better understand what 'emili' does and cannot do
- Government should undertake a study with AIC and other industry stakeholders to assess AVMs' and valuation-based Risk Assessment Tools' limits and determine best practices
- Government should make available funding to Professional Appraisers for research in the areas of advanced property valuation using automated valuation models and valuation-based Risk Assessment Tools
- Standards should be developed jointly by the lenders, mortgage insurers, and AIC for AVM and valuation-based Risk Assessment Tool structure, data, and use
- Standards should be developed with respect to the information made available to clients regarding the use of AVMs and valuation-based Risk Assessment Tools for lending purposes
- An accreditation process to benchmark AVMs and valuation-based Risk Assessment Tools against established standards should be developed and implemented on a voluntary basis to increase the client's level of confidence in the valuation of their purchases or sales
- The federal government should continue its review of mortgage fraud in collaboration with AIC and other stakeholders including the Canadian Institute of Mortgage Brokers and Lenders (CIMBL) to identify how AVMs and valuation-based Risk Assessment Tools may be used in committing fraud, and to determine appropriate safeguards to curtail it