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Investigating the use of Automated Valuation Models (AVMs) in the South African commercial property market

Peer reviewed and revised

Abstract

The adoption of Automated Valuation Models (AVMs) in the field of property valuation is a trend, considered controversial and not readily accepted by the valuation profession. The aim of the article is to report on a study conducted in an attempt to determine whether the commercial property sector in South Africa is ready to accept and adopt or reject AVMs and to investigate the possibility of AVMs replacing professional valuation services for commercial property valuations.

Limited research was available both nationally and internationally on commercial property AVMs. It was found that AVMs utilised for the valuation of commercial property are still in the development phase and cannot be considered feasible as yet. The major concerning factor is that commercial property markets are heterogeneous. AVMs offer various advantages over traditional methods, but there are also some disadvantages, which were identified in the study.

Structured interviews were conducted to determine the opinions and sentiments of commercial property professionals towards commercial property AVMs. As no AVM system exists for commercial property in South Africa, no factual opinion or experience was obtained. The general attitudes towards AVMS were negative and a small percentage of respondents indicated that there may be future potential. AVMs were also regarded as a threat to the valuation profession.

It was established that there is scope for commercial property AVMS, however, on a limited basis, and the results could be improved by combining these with traditional valuation techniques. Commercial property AVMs will never replace traditional valuations and can be implemented as a useful tool for verification and auditing of values.

Keywords: Property valuation, Automated Valuation Models, commercial property

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Abstrak

Die aanvaarding van Automatiseerde Waardasie Modelle (AVMs) in die veld van eiendomswaardasies is 'n tendens wat beskou word as kontroversieël en word nie geredelik deur die waardasieberoep aanvaar nie.

Die doel van die artikel is om verslag te doen oor 'n studie wat gedoen is in 'n poging om te bepaal of die kommersiële eiendomsektor in Suid-Afrika gereed is om AVMs te aanvaar en aan te neem of te verwerp asook om ondersoek in te stel of daar 'n moontlikheid is dat AVMs professionele waardasiedienste sal kan vervang rakende kommersiële eiendomswaardasies.

Beperkte navorsing kon plaaslik en internasionaal in hierdie verband gevind word. Bevindings dui daarop dat die gebruik van AVMs vir die waardasie van kommersiële eiendom steeds in die ontwikkelingsfase is en kan nog nie as lewensvatbaar beskou word nie. Die grootste beperkende faktor is dat kommersiële markte baie heterogeen is. AVMs bied verskeie voordele bo tradisionele waardasie metode, maar het ook verskeie nadele, wat in die studie geïdentifiseer is.

Gestruktureerde onderhoude is gevoer om die opinie en sentimente van kommersiële eiendomsvalueerders teenoor kommersiële AVMs te bepaal. Aangesien geen so model tans in Suid-Afrika bestaan nie, kon geen feitelike opinie of ervaring verkry word nie. Die algemene houding teenoor AVMs was negatief en 'n klein aantal terugvoere is ontvang wat aandui dat daar wel toekomstige potensiaal kan bestaan. AVMs is ook beskou as 'n bedreiging tot die waardasieprofessie.

Die studie het bevind dat daar wel 'n plek vir kommersiële AVMs bestaan, alhoewel op 'n beperkte basis en dit kan verbeter word deur die kombinasie saam met tradisionele waardasie tegnieke. AVMs sal nooit tradisionele valueerders kan vervang nie, maar kan wel as 'n handige ondersteunende of ouditinstrument gebruik word.

Sleutelwoorde: Eiendomswaardasie, Automatiseerde Waardasie Modelle, kommersiële eiendomme

1. Introduction

Limited research has been done globally and in South Africa regarding the use of AVMs for commercial property valuations. It is assumed that there is currently no commercial property AVM in use in South Africa. Neither could the research conducted establish whether such a model is currently in use worldwide.

AVMs are a relatively new concept in South Africa; however, they have been operational in various countries for a number of years. In South Africa, these models are used for municipal valuation purposes for all types of properties and, in the mortgage sector, primarily for residential property valuations. Residential mortgage valuations are currently moving from traditional valuation approaches and are adopting AVMs. In both these fields, the correct property value needs to be determined. Incorrect values will lead to over- or

undervalued properties, with a negative influence on the general property market and municipal property taxation bases.

The primary objective of this article is to determine whether the commercial property sector in South Africa is ready to accept and adopt or reject AVMs for commercial property valuations. The secondary aim is to establish whether AVMs pose a threat to the valuation profession and can replace professional valuation services for commercial property valuations.

This article focuses on the use of commercial property AVMs for all purposes of valuation. Municipal commercial property valuations, also known as Computer-Assisted Mass Appraisal (CAMA), are excluded.

2. Literature review

A survey of the literature reveals a paucity of studies on the use of AVMs for commercial property valuation, as limited information is available on commercial property AVMs. This overview will provide background information, indicate current uses and summarise opinions regarding the future development of commercial property AVMs.

AVMs are categorised under both valuation services and valuation methods.

2.1 Valuation services

There is a range of different valuation services available from the most comprehensive and costly report to the least comprehensive result indicated only as a value at a reduced cost. Robson & Downie (2007: 20-22) defined the range of valuation services typically offered in property markets as follows:

- Gold standard – After a physical internal and external inspection of the property, a qualified and registered valuer prepares the professional standard of valuation in writing, and supported by market information.
- Drive by and broker price opinions – The next service level down from the gold standard is a drive by or external valuation, which involves an external physical inspection in order to confirm the property's existence and some of its physical characteristics.
- Desktop – A desktop valuation excludes any inspection of the property, and the valuer may use satellite photos, owner

contact and market knowledge to establish information, as well as select and analyse appropriate comparables.

- AVM – An AVM, at its most basic, provides only a valuation output; however, some AVM systems supplement the figure with various features, the most important being a list of comparable transactions and a measure of the expected accuracy, expressed as a confidence score.

In each case, there must be a balance between savings in time and cost versus the property risk factors. More automated models replace traditional valuation approaches. It is important to review the cost benefit relationship of replacing gold standard valuations with automated valuations or values. Gold standard valuations are referred to as high quality, comprehensive reports, which include a physical inspection and a detailed market analysis.

2.2 Valuation methods

Valuation methods include traditional and advanced methods. Traditional methods include the sales comparison method, the investment method or discounted cash flow analysis, the cost method, the profits method and the residual method. Advanced valuation or data-analysis methods developed from advanced technology and include hedonic pricing methods, artificial neural networks, spatial analysis methods, fuzzy logic, autoregressive integrated moving average, real options method and rough set method. Advanced valuation methods are mainly used for the construction of AVMs, and a better terminology includes data-analysis methods or decision support tools for values (Lorenz & Lützkendorf, 2008: 501).

2.3 Automated Valuation Models

The first signs of AVMs originated in 1960 and the models are currently used globally for security valuations (Rossini & Kershaw, 2008: 1). The use of technology to automate the residential lending process elicited the development of AVMs in the private sector. Cassens Zillioux (2005) stated that a prolonged period of low interest rates and related increase in lending activity, along with the Internet, are the key stimulants for the development of AVMs.

The Collateral Risk Management Consortium (2003: 4) indicated that an AVM can be defined as the generic term for any electronic analytic algorithm, process or model that is intended to estimate the value of an individual property, without human assistance (other

than the initial entry of the data). Specific to this report, the term applies to models designed to value residential properties.

The IAAO (2011: 14-15) describes an AVM as a mathematically based computer software programme that produces an estimate of market value based on analysis of location, market conditions, and real estate characteristics from information collected. The distinguishing feature of an AVM is that it produces a market valuation through mathematical modelling. The credibility of an AVM is dependent on the data used and the skills of the modeller or operator producing the AVM.

AVMs offers various advantages such as lower cost, time-saving, consistency, transparency, easier data management, and the ability to combat fraud and valuer bias. Disadvantages include data limitations, public opinion, the lack of property inspections, financial regulation, risk acceptance, and transparency, as indicated by Tretton (2007: 505-506) and Robson & Downie (2007: 33). One limitation is that, as a rule, the property is not inspected when an AVM is used. AVMs cannot capture information about a specific property's internal or external condition, improvements or disrepair (Fitch ratings, 2006: 1). However, adding photographs and mapping information can help overcome some situational omissions. Fitch ratings (2006) pointed out that the greatest weakness of a stand-alone AVM is that it assumes that the property is in a marketable condition with vacant possession and improved internally to normal standards, where a physical inspection can verify these factors (Robson & Downie, 2007:4).

Technological advancements have led to the use of AVMs for establishing property values. Technology in property valuations, as in many other industries, has transformed business operations. Gilbertson & Preston (2005: 127-128) indicated that competition between lending institutions and valuers in terms of speed and cost of valuation services and the availability of data is stimulating greater use of technology. Technology assists with the collection, organisation and formatting of data utilised for valuations. The development of AVMs in the private sector was driven by the use of technology to automate the residential lending process.

The following categories of AVMs, according to Robson & Downie (2007: 12), are currently available:

- Hedonic models – This method mirrors the process used by valuers and uses regression techniques to estimate the contribution of each feature of the property to the overall value.

- Intelligent systems – The hedonic model method can be used to develop neural network or artificial intelligence models, which identify the variables relevant to value and learn about changes in the relationships between these variables and value, continually updating the model based on new transaction data.
- Hybrid AVMs Appraiser Assisted AVMs – Robson & Downie (2007: 58) indicated an intermediate service level between a stand-alone AVM and a desktop or drive by valuation named the Appraiser Assisted AVM (AAAVM). An AAAVM starts by providing an AVM and comparable transactions. The valuer verifies the valuation and accepts or refers it for further investigation.

2.4 The use of AVMs in the valuation of commercial properties

The use of AVMs is far more complex for commercial valuations than for residential valuations, as limited comparable data is generally available, as stated by Gilbertson & Preston (2005: 127). Tretton (2007: 486-489) shares this opinion, stating that the scarcity of evidence makes the consideration of AVMs for commercial property much more complex. The complexity and the lack of recorded transactions require professional judgement to analyse the data. Tretton (2007: 486-489) further states that there are limited AVM models in use for commercial property valuation and it is suggested that these models be a supportive tool rather than a fully automated valuation, as the degree of human involvement varies.

Gilbertson & Preston (2005: 127) question whether AVMs for commercial property could be viewed as valuations. The argument is based on the sole use of a computer without valuer input, the evidence and assumptions used and the interpretation of the data. Commercial property AVMs are a subjective-objective balancing act and require a safety mechanism to verify the valuation.

Tretton (2007: 508) commented that full valuation automation is not the answer. A fully automated process with the AVMs producing annual tax base values would be an ideal. However, this is not feasible, given the variety of commercial property.

2.5 Automated Valuation Models in South Africa

AVMs are a relatively new concept in South Africa and traditional valuations have previously been the preferred choice.

According to a case study compiled by Robson & Downie (2007: 37), South Africa is categorised as an early-stage AVM

market. The Financial Services Board and the South African Reserve Bank effectively regulate the well-developed South African banking system. Data availability is satisfactory and electronic registration of title and transactions started in 1993. The Municipal Property Rates Act 6 of 2004 requires regular valuations, necessitating mass valuations and the collection of property and value data (South Africa, 2004).

Electronic tools and web-based data on property transfers have been available for ten years, and the providers are moving towards residential property AVMs. An AVM model became available in 2006, providing output with a confidence score. The data utilised is sourced primarily from the Deeds Office, banks and valuers. In addition to the AVM, the provider offers from 2007 a repeated sales residential index, using data from the AVM, which gives specific price change detail (Robson & Downie, 2007: 37).

Another AVM product, launched on the consumer market, gives free valuations online and sells the product to brokers and property agents.

Robson & Downie (2007: 38) found that all the main South African banks are piloting, or investigating AVMs for loan origination and second mortgages. Banks are using their own models alongside commercial products, with collateral risk policies being developed to determine when they are acceptable.

There is concern regarding AVM accuracy, and the expectation is that 30% of valuations will in future be done by AVM for easy-to-value standard properties in the mid-range market. According to Seota (2011: personal communication), the South African Council for the Property Valuers Profession (SACPVP) does not favour the use of AVMs and no guideline has been formulated to date. The accelerated adoption of residential AVMs by the commercial banks, combined with the limited consultation held with the valuation profession regarding these models, are cause for concern. One should address this approach for future commercial property AVM use or implementation.

2.6 Future of AVMs and the valuer's profession

There is currently a shortage of supply of valuation service providers, according to Robson & Downie (2007: 33). This is evident in South Africa where there is a shortage of valuers, as the majority of them are approaching retirement age. AVMs can alleviate this problem to some extent; however, they are also viewed as a threat to jobs. In addition, professional bodies initially regarded AVMs as a threat

to valuers' employment. In mature markets, guidance to members on using them is now incorporated in professional standards. Valuers are open to the notion of using AVMs as a supplement rather than a replacement for their traditional services.

In a South African study, Mooya (2011: 2267) stated that the rise in the use of AVMs poses questions about the long-term survival of the property valuation profession. AVMs provide quick and cheaper valuations, which, in this very competitive market place, put them at a distinct advantage over traditional approaches.

According to Gilbertson & Preston (2005: 128), there is an opportunity for valuers, as developments in technology provide a process-driven "valuation". If properly understood and used, AVMs will become a valuable part of the valuation process rather than the process or the result itself. The greatest risk to the valuation profession is commoditisation and automation, which reluctant professional valuers ignore. There is no substitute for the skill of a competent and experienced valuer. As part of what is essentially a risk-management exercise, data and output analysis by appropriately trained valuers can avoid pitfalls.

Gilbertson & Preston (2005: 135) concluded that professionals offering financial or business skills are essential in one section of the valuation services market, and those with technical skills are essential in another part. The profession will have to consider how to train more technicians equipped to handle more of the routine work.

It is difficult to predict the future of the valuation profession, as the profession is constantly under scrutiny and pressure. Costs and speed of delivery are major drivers for AVM development; however, one should consider the quality of valuations. In order to survive the development and implementation of AVMs, valuers in practice will have to change and adapt. The availability and quality of data are key factors, which will distinguish between valuers and valuation companies. The valuation profession is moving from a service to a product-oriented industry.

3. Methodology

The researchers conducted structured interviews with a number of property valuers currently active in the profession. The sample chosen was based on valuers from a residential, commercial and property taxation or municipal background. Valuers in private practice as well as valuers employed by banks were interviewed. Furthermore, valuers specialising in commercial as well as residential

property valuations were consulted. A combination of Professional, Associate Professional and Candidate valuers were included in the sample. A total number of 60 valuers based in Gauteng were approached, of whom 40 responded and were interviewed. This constitutes a response rate of 67%. The interviewees represented a well-balanced profile of the South African valuer profession. Similar questions were posed and the interviews evolved with additional data and information. The structured interviews were conducted during October and November 2011.

Interviews were conducted personally as well as telephonically, and the general response was good. The interviews conducted were strictly guided by the nine questions in the question sheet in order to avoid bias and any influence on the respondents. The responses were categorised and summarised, with various repetitions of responses that were received indicating consensus within the valuation profession in South Africa. The researchers compiled the open-ended questions in such a way as to stimulate additional answers and opinions.

4. Results and discussion

In South Africa, no AVM model currently exists for commercial property valuations; only one service provider is in the process of developing such a model. The structured interviews therefore revealed opinion and speculation regarding the future of such models.

4.1 Prior knowledge of or experience with AVMs

The first question, "Do you have any knowledge of or experience with AVMs?", tested the respondent's prior knowledge of or experience with AVMs.

Approximately 95% of the interviewees had prior knowledge of AVMs, as residential AVM systems have been in use in South Africa since 2008. These systems were utilised for mortgage valuation purposes by banks in South Africa as well as, to a limited degree, for property tax valuations.

The municipal valuers interviewed indicated that AVMs were previously introduced to the property tax field. The development costs of these proposed AVMs were too high to justify the product. Municipalities in South Africa are under severe budgetary restrictions and do not have the funds to support AVM development. It may change in future, if the property taxes collected or municipal funds

can be allocated to AVM development. However, at this stage, the municipalities are uninformed about AVMs, and it is estimated that it will take some years before this is addressed or incorporated. CAMA has been introduced to South Africa and has been utilised by the City of Cape Town Municipality since 2001. This system is based on an international software system, and residential properties are valued on a mass basis. However, commercial property valuations are based on the Income Capitalisation Approach and CAMA is therefore not applicable in this instance.

A small number equating to 5% of interviewees had no prior knowledge of or experience with AVMs. A number of these valuers mainly practise agricultural property valuations, and no AVM model has been considered for agricultural valuations in South Africa.

Furthermore, property valuation students who were interviewed did not have any or a limited knowledge of AVMs, as these models are a relatively recent development in the valuations field. The current academic curriculum does not cover this topic; however, some universities such as the University of Cape Town provide limited tuition on CAMA approaches.

Finally, property professionals employed by the listed property sector had limited knowledge of AVMs, as their portfolios mostly comprise commercial properties.

The South African property market distinguishes clearly between AVMs and desktop valuations. The distinction is based on the human-intervention element. AVMs are fully automated computer models with human involvement limited to data-base inputs and compilation. By contrast, desktop valuations require human intervention and certain inputs, although this excludes a physical inspection of the property. Desktop valuations are more detailed and properties are individually verified. In conclusion, 95% of the interviewees all had knowledge of or experience with residential AVM models.

4.2 Prior use of AVMs for residential or commercial valuations

The second question, "Do you or your company currently use AVMs for valuations and, if so, was this for residential or commercial valuations?", tested respondents opinions on prior use of AVMs for either residential or commercial valuations.

The majority, 80% of the interviewees, used residential AVMs previously and a large number were involved in the testing phase

of residential AVMs for bank purposes. Currently, there are a small number of residential AVM service providers.

In addition, a representative from one of the service providers was interviewed and indicated that their system is currently used for high-volume mortgage valuations for residential purposes. They are currently in the process of developing a commercial property AVM and this programme is in the research and development stage. A person was recently employed to research, develop and market their proposed system.

AVMs are used on a large scale for residential valuations by the commercial banks in South Africa. These models are generally used for second-mortgage valuations; however, the banks still prefer to physically inspect first-mortgage properties. The purpose of valuation also affects the use of an AVM; for example, arrears valuations will always require physical inspections. Higher priced properties above R3 000 000.00 are generally not valued using AVMs, and this is based mainly on the risk factor. The loan-to-value ratio is also an important consideration and banks generally do not use AVMs where the ratio is above 90%. Furthermore, AVMs are not used for the valuation of vacant land, agricultural holdings and building loans. Most of the banks have risk policies in place to regulate the use of AVMs.

The public also know about the use of AVMs, which excludes a physical property inspection. Fraud and corruption have occurred based on price fixing of false comparable sale transactions, where these properties did not exist. The lack of physical inspections created this opportunity for fraud.

A high percentage (95%) of the interviewees had no prior knowledge of or experience with a commercial property AVM, as this has not been the practice in South Africa to date. In recent years, there has been speculation and discussion about commercial AVMs; however, no product has been developed or presented to the market.

4.3 Successful employment of AVMs applications in the South African commercial property market

The third question, "Do you believe that these applications can be successfully employed in the South African commercial property market?", tested respondents' opinions on the successful employment of AVM applications in the South African commercial property market.

Half (50%) of the interviewees indicated that, in their opinion, AVMs can only be used to a certain degree of accuracy for residential valuations, and this places doubt on more intricate valuation applications.

Furthermore, their confidence levels were low with regard to the current application of residential AVMs. In their opinion, commercial property is a much more involved valuation exercise and the risks associated with this type of property need to be balanced and managed.

The main cause for concern was the lack of physical property inspections, which generally verify property use, building condition, occupancy, tenants in place, compliance with zoning rights, available parking, access and building orientation. These factors all contribute to the value of a commercial property and are known as the value-forming attributes of a commercial property.

In addition, the interviewees mentioned that commercial property is a complex property class to value. The market consists of heterogeneous properties, sometimes situated next to each other, and this complicates the development of reliable homogeneous market information. The variables are too complex to account for in each valuation instance, thus complicating the development of such models.

A commercial valuation involves various activities and analyses of value-forming factors that need to be taken into account. This includes adjustments to the value calculations. The interviewees doubted whether an automated valuation process would be able to perform all these functions and incorporate all these factors.

A small percentage (5%) of the interviewees indicated that there is scope for commercial AVMs. Their responses are summarised in the following section.

The purpose of valuation and the associated end-user requirements were factors that had to be considered. The interviewees stated that the purpose of valuation would determine whether AVM use is suitable. They mentioned the example of commercial property building loans, where a physical inspection is paramount to determining actual building progress. Another example included first mortgages, as the end-user needs to determine, for example, the existence, condition and tenancy of the commercial building.

The respondents raised risk management as an important issue. Generally, representatives of commercial banks responded that the

constraints of using AVMs overshadowed the benefits. This statement was based on the higher risk that will result from not inspecting properties. It was stated that the banks were generally opposed to AVMs. The main advantages of cost and time reductions were favoured, but the implementation of commercial property AVMs is considered unlikely. South African banks are conservative and will always favour traditional valuations.

One statement indicated that AVM development was previously attempted in South Africa, but with limited success.

Banks undertake desktop commercial property valuations based on a priority basis where certain properties are flagged or placed on a watch list. The Basel Accord is also incorporated in South Africa and this requires annual revaluations of commercial property portfolios. Older loan agreements as well as the South Africa Credit Act limit the recuperation of costs associated with revaluations. Valuation fees are therefore, in many instances, directly transferred to the banks who subscribe to the Basel Accord. This increase in demand for revaluations has driven the use of desktop commercial property valuations. The majority (95%) of the interviewees were opposed to desktop valuations and were of the opinion that traditional valuations were more suitable for commercial properties. There are certain policies and standards in place where, for example, a substantial difference in value will lead to the request for a full physical valuation. Professional valuers in practice generally do not agree with the use of desktop valuations for commercial properties. Other divisions of banks have driven and implemented these applications.

South African banks require that property valuations include an insurance replacement cost. It is impossible for an AVM to determine an insurance replacement cost, as there is no physical inspection. A physical inspection is, therefore, crucial in the South African bank valuation context.

In conclusion, the majority (95%) of the respondents believed that these models cannot be employed in the South African commercial property market.

4.4 Requirements for successful implementation of these models

The fourth question, "How can these applications work in your opinion?", tested respondents' opinions on the requirements for successful implementation of these models.

A small number (5%) of interviewees indicated that the implementation of AVMs for commercial property could work. The responses indicated that the emphasis should fall on the accuracy and reliability of data which they regarded as the most important driver of the success of such a proposed model.

From a property taxation viewpoint, they replied that following property data should be built into this model:

- Title deed information;
- Zoning details;
- Location analysis;
- Market sales prices;
- Market rental levels;
- Market expense rates;
- Market-related vacancy levels;
- Market-derived capitalisation rates;
- Incorporating GIS mapping, Google Aerial and Streetview, and
- Incorporating current electronic property tax billing systems.

These valuers work on property tax valuations and indicated that South Africa's metropolitan councils have a large volume of data available, which could be integrated to compile a powerful software system. Of crucial importance to the municipal valuer is the ability to revalue properties on an annual basis, with the use of an AVM; this could be feasible.

Interviewees involved in mortgage valuations of commercial properties indicated that AVMs can be utilised as a beneficial tool. The issues raised include the risk acceptance of the banks, with the use of these models, which needs to be drafted in a policy format in order to protect valuers from legal claims. Another issue is the integrity of data in the form of market information and property information. In South Africa, a distinction is made between AVMs and desktop valuations. AVMs are automated processes without human intervention and desktop valuations require operator input and adjustments. Both methods do not utilise physical property inspections. Interviewees were more comfortable using a desktop valuation approach, as the degree of interaction of property data is higher.

Interviewees suggested that a software programme be developed with the following functions:

- Input of property description data.
- GIS mapping, Google Aerial and Streetview incorporation.
- Market research and analysis.
- Based on the above, predictive market value inputs for income, expenses, vacancies and capitalisation rates.
- Adjustments, if needed.
- Calculations.
- Quality control.
- Valuation audit.
- Generation of property indices.

The importance of testing the model and value outputs was firmly stated. In addition, the limitations of commercial property AVMs should be considered and communicated to all stakeholders involved, especially the end-user, in order to avoid confusion. This measure is essential in order to protect the integrity of the valuation profession.

One interviewee indicated that there should be a constant interchange and input of new data to keep the model data up-to-date.

In terms of listed property funds, The Johannesburg Stock Exchange (JSE) regulations do not require annual physical inspections of the portfolio valuations. It was indicated that the application of AVMs for this purpose may be acceptable. Updating rental schedules in the financial calculations and a full portfolio analysis are important.

4.5 General attitude towards these models

The fifth question, "Are you generally inclined or opposed to these models?", tested respondents' opinions on the general attitude towards these models.

A limited number (9%) of interviewees had a positive response to AVMs in general. AVMs are relatively new in South Africa, and a limited number of service providers are currently available for residential properties. This has led to some concerns regarding open-market competition. This type of valuation has negative connotations, due mainly to various inaccuracies experienced in the testing and development phase.

The respondents against AVMs are senior people in the valuation industry who are nearing retirement and who were trained in

traditional valuation methods and approaches. They regard technology as an impostor, which can reduce employment from the current valuation profession. Some traditionalists believe that the physical inspection of a property is required in order to determine a value and that AVMs are a shortcut method.

After its initial development and phasing, a well-known AVM system, has matured and currently predicts more accurate residential property values. A safety or confidence score measures this and the results indicate a well-established database and model delivering relatively accurate valuations.

For commercial property applications, the general sentiment was negative. The respondents indicated that higher value mortgages presented a higher risk profile to banks and these properties need physical verification. In South Africa, fraud and corruption are widespread and property valuations are a vulnerable target. Fraud generally transpires from false statements of clients, unethical bank officials or during the valuation process. A physical valuation inspection is viewed as one measure to combat dishonesty and misrepresentation. The banks indicated that the commercial property mortgage business is a competitive environment. Challenges in this environment with regard to valuations include accuracy, speed of execution and risk management. The most important factor was the risk associated with commercial properties, as property values are normally much higher compared to general residential properties. Higher property values construct higher mortgage risk and the loan-to-value ratio is constantly under pressure. Therefore, banks are adverse to risk and are unlikely to employ AVMs for high-risk transactions.

A number (60%) of interviewees stated that the risk involved in property tax valuations is significantly less, and that the adoption of AVMs in this field has a better opportunity to be accepted. The high volumes of properties included in municipal valuations also substantiated this comment, which justifies AVM use and development. In addition, the periods are easier to manage with the additional public input or assistance in the appeals process, compared to a high-pressure banking environment. The most favourable response or consideration of AVMs came from the municipal valuations field.

As there is currently no commercial AVM system in South Africa, the respondents were unable to provide an educated opinion based on experience for this question.

In conclusion, the South African valuation profession is generally opposed to AVMs. It is known that the South African Council for the Property Valuers profession (SACPVP) and the South African Institute of Property Valuers (SAIV) are opposed to AVMs. However, to date, no policy or statement document has been published to highlight this view.

4.6 Level of professionalism or skill required for operating these models

Question six, "In your opinion, what type of profession or skilled individual should operate these models?", tested respondents' opinions on the level of professionalism or skill required to operate these models.

All the interviewees indicated that a person with a valuation background should operate AVMs. In addition, they noted that experienced valuers, with a Professional or Associated Professional status, should be the senior personnel involved. Candidate Valuers may also be employed in a data-collection capacity, with training and career enhancement opportunities.

As AVMs are based on statistical analysis, a statistician is required to build the models. Individuals with a combination of valuation and statistical skills are scarce in the marketplace and would be ideal to develop these models. The mathematical analyses of transactions and data are required to verify the inputs of AVMs, to avoid populating poor data in the software system.

Data is the key to any AVM, and the verification and cleaning of data require special skills. Individuals with knowledge of commercial property markets, such as property brokers, researchers, economists, statisticians and valuation auditors, may be employed to manage the data inputs to the AVM.

4.7 Verification of AVM values

Question seven, "How can these AVM values be verified or checked?", tested respondents' opinions on the verification of AVM values.

All the respondents indicated that practising professional valuers should verify AVMs. They suggested that the verification process review the following valuation inputs:

- Rental rate on a R/m² basis;
- Vacancy rate on a % basis;

- Expenses applied on a R/m² as well as % basis;
- Capitalisation rate on a % basis;
- Final value on a Rand amount basis, and
- Final value on a R/m² basis.

Furthermore, once the final value is calculated, a basket or portfolio of properties should be analysed to determine any discrepancies. Values that fall out of the normal distribution require additional verification. The discrepancies need to be analysed in order to determine the reason for the difference.

All the respondents indicated that valuation auditors should verify AVM values, in a similar process to traditional valuation verification. Generally, commercial banks have a number of valuation auditors who verify the day-to-day valuations received. The audit process generally comprises the following:

1. Verification of traditional valuation report.
2. If required, queries are reverted to the service provider (valuer).
3. If required, amendments after the queries are verified.
4. The same or another service provider (valuer) should request a revaluation, if required.
5. If correct, the valuations are accepted and signed off.

The respondents stated that AVM audits should follow the same basic steps, indicated above.

4.8 Affect of AVMs on the valuation profession

Question eight, "In your opinion, will AVMs affect the valuation profession?", tested respondents' opinions on the affect of AVMs on the valuation profession.

The majority (95%) of the interviewees indicated that AVMs pose a threat to the valuation profession.

First, they stated that employment opportunities would be reduced, as the demand for traditional valuers will decrease due to fewer volumes of work.

Secondly, the interviewees indicated that poor-quality valuations by AVMs would damage the reputation of the valuation profession.

Finally, there was a concern that AVMs are statistical tools and not based on traditional valuation methods. This will create inaccurate valuations based on incorrect methodologies employed.

4.9 Future of AVMs

Question nine, "What is the future, in your opinion, of these models?", tested the respondents' opinions on the future of AVMs.

The majority (95%) of the respondents indicated that they did not see a future for AVMs for commercial property valuations. They stated that a commercial property valuation would always require a physical inspection. The banks operating in the commercial property market also require a physical inspection and a market analysis to manage the risk of the portfolios.

A small percentage (5%) of the interviewees indicated that there may be a future for AVMs; however, the databases and calculations need to be accurate. The interviewees speculated that the development of these models would require substantial financial investment, as well as cooperation between banks, valuers, property funds, and property data of specialists. It will be a mammoth task to obtain collaboration between these parties, as competition and confidentiality of information are major factors that influence the sharing of data.

Automated software programmes in the form of Discounted Cash Flow applications such as Cougar and Argus are regularly employed; however, these programmes are tools for cash-flow analysis and cannot be regarded as automated models. In addition, property management systems and cash-flow analysis programmes are not integrated. These applications differ significantly and still require physical inputs by the operators. Internationally, data integration of various applications is available, and this improves speed, ease and accuracy of cash flow-based valuations.

The future of AVM development in South Africa for commercial property valuations is, therefore, uncertain and highly unlikely. The South African property market is stable; however, the degree of adoption and incorporation of technology applications has always lagged behind international trends.

5. Conclusion

AVMs for residential properties have been incorporated and are being used with acceptable hit rates and confidence scores. In South Africa, the accelerated adoption and implementation of

residential AVMs by banks or other entities are cause for concern. The main concerns are the lack of physical inspection of properties, the undefined scientific base of computerised value estimation, and the threat to the valuation profession.

In South Africa, the demand for commercial property AVMs is limited; traditional valuations are the preferred option. Banks make use, to a certain extent, of desktop valuation models in order to satisfy Basel revaluation requirements. Commercial property poses higher risk investments and high value-to-loan ratios, which require a detailed assessment of the properties based on a traditional property valuation report.

The incorporation of AVMs for commercial property valuations is more complex than that for residential property, and this originates from the heterogeneous nature of commercial properties. Responses from interviews and tests conducted indicated that the development of AVMs is feasible; however, the cost, data-collection, and model calibration are obstacles.

South African valuers are generally traditionalists and the implementation of AVMs will be challenging to be accepted by them, as the valuation profession indicated that AVMs pose a threat to employment opportunities. The valuer profession does not drive the demand for AVMs; pressure from other role players in the property industry will stimulate AVM development. The valuation profession is under pressure following the implementation of AVMs. Valuers will need to adapt to the changes in technology, and the role of the valuer is showing signs of change. In South Africa, a high percentage of the valuer demographic indicates valuers nearing retirement; AVMs can alleviate this problem. AVMs can be utilised as a value-added tool in terms of automating repetitive valuation processes, testing valuations, and for database compilation.

Research indicates that AVMs will never be able to replace valuers, but may reduce the number of valuers required in practice. However, the services of a skilled and professional valuer will always be required.

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