AVMs or ‘automated valuation models’ are currently being promoted in the Australian market as a meaning of assessing the worth of a property, which unfortunately may be misconstrued as a viable substitution for a valuation. This is when there has been substantial attention placed on the operation and efficiency of global financial markets and in particular exposure to risk, commonly referred to as the ‘economic downturn’. At the same time the property industry has not escaped unscathed with an example being the below average performance of listed property trusts or AREITs on the Australian Stock Exchange (ASX). Other sectors of the property market have also been affected with lower values due to perceived higher risk (e.g. residential, commercial), therefore this paper has been written for property professionals and valuers as a timely reminder about the correct use of valuation methodology in order to produce a valuation. More specifically, the focus has been placed on the increased profile of a certain type of computer modelling which is commonly referred to as AVMs (automated valuation models).

An alarming recent trend has been the promotion of AVMS for use in the risk analysis of property portfolios. According to the Rismark Monthly (July 2008 p.11 – see www.efm.info) "valuing a large portfolio of residential properties on a frequent basis is clearly impossible using human valuers". Arguably this is the type of statement which will be closely scrutinised with regards to the economic downturn and which factors contributed to the errors of judgement and lack of confidence in the marketplace. This has been further complicated by the misuse of the word ‘valuing’ as in this example what stakeholders thought they were receiving (i.e. a valuation) as opposed to what they were actually paying for (i.e. an appraisal).

In the property industry, and especially from a valuation perspective, all members of the Australian Property Institute and the Property Institute of New Zealand must abide by the policies and procedures in the Australia and New Zealand Valuation Practice Standards. However there is growing concern about the pressure within the industry to undertake shortcuts in order to save both time and money as well as achieve targets. For example Dart (21/10/08) in the Sydney Morning Herald recently commented in an article about lending policy that salaries in the industry are commonly linked to benchmarks such as finding loan customers, where 59% out of 2,000 surveyed workers also felt pressured to approve inappropriate services to meet targets. In addition Harley (09/10/07) in the Australian Financial Review stated that the lender will use the AVM as an initial rapid check...in an increasing number or cases — in specific areas, for lower risk borrowers or for low loan-to-valuation lending — a physical inspection is becoming an unnecessary burden.

Dr Richard Reed
School of Architecture and Building
Faculty of Science and Technology
Deakin University

Richard Reed is Professor of Property and Real Estate at Deakin University in Melbourne and responsible for their undergraduate and postgraduate property courses. He is a member of the Australian Property Institute’s Victorian Divisional Council, Chair of the Victorian Training and Education Board, and member of the National Education Board and the National Sustainability Taskforce. His industry background is as a real estate valuer, being previously employed in both private and government firms with the focus placed on residential properties. He has presented at many Australian and international conferences and is widely published in the property and valuation areas.

Contact: rreed@deakin.edu.au
delay and expense. But is this true? Is a physical inspection required or is an AVM as reliable as a full valuation?

This paper discusses the use and possible misuse of AVMs. Although the valuation profession is constantly debating if the process is an 'art' or a 'science', AVMs are undoubtedly 100% science with no human judgement even though a decision to purchase is a decision made by a human. An AVM is a tool with limitations like any other tool. It is only designed to suit a certain purpose and if used outside these purposes then the risk of misuse substantially increases. The recent economic downturn has highlighted the level of risk in our economic society as well as the importance of identifying and minimising risk. It has been demonstrated in a buoyant market that the exposure to risk is not as critical as in a market experiencing a downturn, simply because the level of downside risk quickly turns to an analysis of who is responsible for the error of judgement. It is in this type of market that an AVM is least suited due to the inherent variance in the prediction of value, which is largely based on the absence of an internal inspection.

**The Background to AVMs**

Although the valuation profession is constantly debating if the process is an 'art' or a 'science', AVMs are undoubtedly 100% science. In one form or another AVMs have already been in use for many years to value specific types of property in Australia. For example it is for an AVM to be in use by the government or statutory bodies who use computerised models (e.g. computer-assisted valuations or CAV) to undertake mass appraisals, although previously this was undertaken on a case-by-case basis. An analogy can be drawn here with the increased use of AVMs in mainstream valuation today which gradually is becoming more widespread. Simply explained, an AVM is an analytical modelling process that is conducted automatically — one fundamental difference with traditional valuation approaches is the concept of an 'automatic' model which in turn requires less resources (i.e. time, labour). Since a full valuation is a hypothetical sale, the valuer identifies the value of the property and usually models the market to produce a range of hypothetical sale values (API, 2007). However, at a very basic and broad level an AVM is designed to undertake part of this task automatically and hence this is where the point of difference begins. Note however that an AVM is purely desk-based with no internal inspection. All of the data gathered for the model is sourced from different data suppliers (e.g. real estate agents, statutory government authorities, etc.) and then input into the model.

**Comparing an AVM to a valuation is like comparing a bicycle to a formula one racing car...**

Simply explained, an AVM is a mathematically generated valuation that primarily utilises real estate or property information such as, but not limited to, property characteristics, market demographics, transfer prices and regional trends in order to calculate a value for a specific property (Kirchmeyer, 2004). In other words an AVM uses a large cross section of variables and seeks to identify a mathematical relationship between them. Most models work on a broad two stage process, namely (step 1) build the model based on recent sales data and then (step 2) run the model for the subject property. In step 1 all information relating to sale properties is gathered and assembled in order to create the statistical model. Once this model has been created (note: it will differ for each region and each housing type), then step 2 involves inserting the subject property into the model and then asking the model to produce a price range (with associated error rate).

**The concept of Hedonic Modelling**

A common way to think about an AVM is to consider hedonic modelling which has been widely used for many years with new property developments, such as a house and land package on a new subdivision. In this example every additional bedroom will add value (up to a certain point) to the value of a house — a 4 bedroom house is usually worth more financially than a 3 bedroom house. Or the closer the proximity is to the main road then the lower the value of the property, where a house next to the main road is worth less than a house near the main road. Clearly there is a mathematical relationship in this example (with some room for error), and therefore this is an extremely basic form of an AVM. To create an AVM with this new property development model, the first step would be to enter all of the recent sale property details into the model (e.g. sale price, date of sale, land area,
then would measure (or effect) of different variables on the sale price. The second step would be to enter the attributes of a different property, where the model would produce the anticipated sale price based on past sales.

From a starting point an AVM works to a degree in a perfect homogeneous market where all properties are very generic or practically identical. Once again, a new housing development on the edge of a city is an ideal situation since many variables (e.g. distance to shops/transport, size/topography of land, age of buildings, etc.) are very similar. In this example the market will operate efficiently where buyers and sellers will easily add or deduct value according to the positive and negative attributes of each property. At the other end of the scale, a heterogeneous market such a waterfront property will assign drastically different values to each parcel - consider for a moment the exact monetary difference in value between a property with full ocean views and a property with partial ocean views. Such a difference in value is not easy to identify between two properties.

To define the detailed workings behind an AVM is outside the scope of this paper and the reader is referred to a standard statistical text for further information. Nevertheless, AVMs are based on a modelling process referred to as 'multiple regression analysis' or MRA. Ongoing technological advancements in computers including increased accessibility and improved software has ensured that AVMs and relatively easy to write and use in the format of a MRA. For example Microsoft Excel \(^\text{©}\) includes the capacity to undertake relatively simplistic MRA calculations (refer to the F1 help key for a detailed explanation), although more complex calculations require the use of a specialised computer package such as SPSS \(^\text{©}\) or Statistica \(^\text{©}\).

**Is an AVM the same as a valuation?**

No, definitely not. An AVM is very different from a valuation although the use of the word 'valuation' in AVM has created a lot of confusion. Comparing an AVM to a valuation is like comparing a bicycle to a formula one racing car - both are 'vehicles' that travel from A to B on the road but that is where the similarities end. One of the dangers that have been observed in the marketplace is the perception that an AVM can give a person the actual value of a property, rather than undertaking a valuation by a qualified valuer. As an example think for the moment about the regular series in the local newspaper which states 'What is my house worth?' and lists the median housing values for each suburb in an area/city. Many people refer to these values and directly compare their property - *how incorrect is that approach?* Clearly there needs to be an error rate allocated or an amount of variance for each property from the median.

AVMs do not come close to (or even attempt to) conform precisely to the IVSC (International Valuation Standards Committee – see www.ivsc.org) definition of market value. The largest margin for error would appear to come from the absence of an internal inspection. For example, how many prospective used car buyers would purchase a vehicle unless they tested the engine (via a test drive) or at least checked to see if an engine was in the car? Most prospective used car purchasers would potentially use the local automobile club to test the vehicle prior to paying the purchase price, otherwise it is like buying a car sight unseen (i.e. over the internet or via a photo only). Undertaking a valuation without an internal inspection is using a large number of assumptions. For
example how the interior been extensively renovated? Or alternatively does the house have termites or major structural problems? Both of these scenarios can have an adverse effect on the building value, which in turn can be the largest proportion of the overall property value.

AVMs are also limited in many ways. For example, most AVMs consider how many bedrooms there are in a house but do not pay attention to the actual size of a bedroom. It is accepted that a house with four double bedrooms is preferred more than a house with four small bedrooms. An AVM is not able to accurately factor all of the criteria that influence a purchaser’s decision, such as the added emphasis on sustainability for residential housing. For example, according to ‘A Greener House’ (Reed & Wilkinson 2008) there are many sustainable factors that affect a residential property’s value, such as the aspect of the house or unit on the land (i.e. a north facing aspect is preferred). Also it would be extremely difficult for an AVM to account for the character of the surrounding neighbourhood or the type of building located next door (e.g. police station). AVM are not able to accurately reflect the myriad of individual characteristics that affect the value of each property, many of these being intangible.

AVMs are based on a bulk sales ‘analysis’, hence the use of the word ‘automated’ – reference should be made back to the median price of a house as stated in the newspaper. In reality an AVM is a modelling technique which identifies (on a mass basis using a large volume of data or attributes) an estimated ‘sale’ or ‘appraised value’ for a property, in a similar manner to a real estate agent’s appraised value (but not the actual value as determined by a valuer). The historical roots of AVMs are from the USA, where the terms ‘valuation’ and ‘appraisal’ have different meanings to the Australian market. For example, a ‘real estate appraiser’ in the USA is approximately equivalent to a ‘real estate valuer’ in Australia, although the term AVM has been transferred directly to the Australian market. This confusion and misconception about the term AVM and the use thereof is important in the overall discussion. It is clear that the term AVM is fully embedded in the property marketplace now, even though the word ‘valuation’ is clearly misplaced and should be ‘appraisal’.

<table>
<thead>
<tr>
<th>Client Type</th>
<th>AVM</th>
<th>Full Valuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks, financiers and lenders</td>
<td>Cheap estimate of value but with associated higher risk</td>
<td>Ideally suited</td>
</tr>
<tr>
<td>Pre-purchase consumers</td>
<td>Some background information about the broader market only</td>
<td>Well suited</td>
</tr>
<tr>
<td>Valuers</td>
<td>Suitable as a decision-support tool only</td>
<td>Ideally suited</td>
</tr>
<tr>
<td>Other property market stakeholders e.g. real estate agents</td>
<td>Limited use as a decision-support tool</td>
<td>Well suited</td>
</tr>
</tbody>
</table>

### AVMs from a property market perspective

It is clear that AVMs are being actively promoted in the Australian market today although there is substantial confusion from a client’s perspective. This section is separated into headings which are most relevant to AVMs, the valuation industry and stakeholders in the property market.

**Cost**

Since they require very little effort and resources an AVM is cheap to perform and sell, based on the standard economic theory ‘you get what you pay for’. AVMs are conducted on a ‘mass appraisal’ basis and therefore has higher economies of scale than a standard full valuation, although it must be remembered that one of the largest single costs in a full valuation is the inspection process, especially with regards to time and associated costs (e.g. vehicle capital outlay, petrol). Without an inspection an AVM does not require these additional services. This is a critical aspect and highlights a fundamental difference between an AVM and a full valuation, which is reflected in (a) the differences between the cost of each product and (b) the level of risk associated with each product. It would appear that the term ‘automated appraisal model’ or ‘estimate of approximate sale price’ would seemingly be a more appropriate name.

**Delivery time**

AVMs are direct and instantaneous as they are only a computer calculation. This is a similar manner to other ‘log on’ external databases, with the only parameters that slow down delivery of AVM results including the speed of the internet carrier and time required.
to 'log on'. On the other hand, a full valuation takes considerably longer due to the time/resources needed to inspect the property and manually analyse the sales. Although a full valuation can sometimes be conducted on the same day, many organisations have a 2 day or even a 1 day turnaround. An example would be the time required to organise and conduct an internal inspection. However the time required to undertake a full valuation should be compared with other activities in the property market, such as a building inspection or legal services. It would therefore appear that a full valuation taking 2 days is acceptable in the broader context e.g. how many seven day settlements actually occur?

**Target markets**

There are four (4) main target markets or client types for AVMs and full valuations as shown in Table 1. Note that the cheap price and instant turnaround of AVMs is well suited to client who are seeking a broad range of valuation for the property, although importantly have low exposure to risk. These clients include (a) the general public as pre-purchase consumers (in a similar manner to a pre-purchase building inspection) and (b) other property market consumers, such as real estate agents, who seek to determine the approximate selling range of a property but have low risk exposure and limited funds.

The clients who have the highest exposure to risk, namely financiers and valuers, should clearly avoid 100% reliance on AVMs due to the inherent risk associated with the product. This includes the lack of an inspection and the overall absence of consideration of all hypothetical buyer-seller considerations which are not always reflected in statistical approach – this may include knowledge about the depth of the market (i.e. number of buyers and sellers), intangible characteristics about the property/area or other attributes that are only fully understood by an experienced property professional such as a valuer.

**AVMs have been accepted ... as a decision-making tool specifically to assist the valuation process, not replace it.**

**AVMs and the valuation profession**

From the outset a distinction must be made between an AVM and the relevance to the valuation profession. The concept of an AVM is relatively straightforward. It is apparent that AVMs are able to provide a level of accuracy about the range of values for a particular property; this range can be provided cheaply and also very quickly, although in many ways this range of values is quite different to a valuation itself.

However when referring to the valuation profession, consideration must be given to the three most common types of valuation reports are shown in Table 2. The varying cost levels should be noted, as well as whether an internal inspection is conducted. A clear distinction should be made here between the distinct two groups, being (a) a drive-by valuation or (b) a full valuation (either short or long report format). At this point the focus will be placed on the two categories of full valuation reports, since the drive-by valuation reports represent a relatively small proportion of work undertaken by the valuation profession.

**An AVM as a decision-making tool**

The use of AVMs can 'assist' valuers as a decision-making tool in the overall valuation process, much in the same way that a GPS can assist a taxi driver. However most people have found a GPS trying to take them up a non-existent road, so using an AVM by itself is like putting the actual GPS in the driver's seat and then sitting in the rear seat of a taxi. Although AVMs have been accepted in most western societies they have been acknowledged by the valuation and appraisal professions as a decision-making tool specifically to assist the valuation process, not replace it.

**Table 2: Primary valuation types**

<table>
<thead>
<tr>
<th>Type of valuation report</th>
<th>Cost</th>
<th>External Inspection</th>
<th>Internal Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive-by or kerbside valuation</td>
<td>Very Low</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Full valuation – short report e.g. for residential mortgage purposes</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full valuation – long report e.g. for lending or compensation purposes</td>
<td>Standard</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
It is unfortunate in today's challenging financial marketplace that confusion and misconceptions still surrounds AVMs and their application in the property market from a stakeholder's perspective. Of most concern is the full recognition of their limitations, where use of the word 'valuation' clearly does not help to lessen this confusion. At times the current AVM providers appear to be seeking to capitalise on a market opportunity and also return a profit to investors. Whilst recent advances in technology have encouraged the use of statistical approaches, it is important the valuation (and lending) profession embraces this new technology whilst recognising the associated limitations at all times. A valid example is the use of discounted cashflow (DCF) technology to value complex multi-tenanted income-producing buildings, which is substantially assisted by powerful (and relatively inexpensive) computer technology. In this example DCF technology and associated information is now commonly accepted as co-complementary to the capitalisation of income valuation approach. In the same manner AVMs should never be used in isolation but in conjunction with a valuation (i.e. with an internal inspection).

Conclusions

It is important that property professionals are kept up-to-date with new technology that affects the marketplace within which they operate, where AVMs are part of this emerging era. AVMs are useful for a specific purpose and associated limitations, although their rapid entry into the property market has perhaps not permitted the marketplace to be fully conversant with what they can and can't do. Therefore the focus should be placed on clients who may not fully understand AVMs although who may be attracted to the two main benefits of AVMs i.e. fast turnaround and low cost. The main target groups would be major banks and mortgage lenders, which are traditional users of full valuation reports and seeking to reduce costs. Unfortunately it appears that AVMs reduce costs but there is a commensurate increase in the level of risk which the market is clearly unable to afford.

It is also essential that educational providers (e.g. API accredited universities) are fully informing their graduates of the advantages, limitations and potential misconceptions of AVMs. This approach will ensure that (a) graduate valuers are fluent with the use of AVMs as a co-complementary decision making tool and (b) they can also educate potential financiers and lenders that come into contact with. Just like DCFs, AVMs are now here to stay and can assist the valuation process if used correctly. But also in similar manner to a DCF, an AVM can be viewed as a 'black box' includes many assumptions which must be fully understood by the user or the implications for higher risk are extremely high.

Melbourne Geelong Warrnambool

Get a Career that's Hot Property

Graduate Diploma in Property Valuation

Deakin's new industry-focused Graduate Diploma in Property delivered at the Melbourne Campus will prepare you for a career in the rapidly evolving global property and real estate market. You'll graduate equipped with a high level understanding of the theoretical, policy, evaluative and research frameworks that underpin the property and real estate profession.

Gain specialist skills through practical experience and benefit from cutting-edge research and close cooperation with the property industry. Graduates of the course will have the opportunity to work with a broad cross-section of property and real estate organisations in a range of occupations including property valuer, investment trust manager, property developer, property consultant, property finance consultant and housing market analyst.

For information call 03 9244 6699 or visit www.deakin.edu.au/scitech

The difference is Deakin

Property Valuation