The current issue and full text archive of this journal is available at
www.emeraldinsight.com/1463-578X.htm

Valuing the land component of improved investment property

Terry Boyd
CQUniversity and University of the Sunshine Coast, Sippy Downs, Australia, and
Steven Boyd
Faculty of Business, University of the Sunshine Coast, Sippy Downs, Australia

Abstract

Purpose – Many taxing authorities use unimproved land (site) values as a tax base. In highly developed urban areas this may require the use of indirect valuation methods, such as an extraction technique to arrive at the land value. The purpose of this paper is to propose that the land extraction (residual) valuation calculation of an investment property should incorporate productivity variables, rather than cost based figures, in order to simulate market value principles.

Design/methodology/approach – This paper examines the assessment of the land component of investment property as an *ad valorem* tax base. It justifies a valuation methodology using the market comparison approach before developing a model to meet specified criteria. The model incorporates productivity based benchmarks and differentials appropriate for shopping centre properties. The model is then tested on an Australian shopping centre.

Findings – This paper found that the land value component of a major shopping centre in Australia could be derived from comparable vacant and improved sales using the variables of moving annual turnover (MAT) and gross lettable area (GLA) as key value determinants.

Research limitations/implications – This exploratory research identified a model that is appropriate for major shopping centres in Queensland, Australia. The model could form the framework for other types of investment property but the key productivity determinants would require re-examination.

Practical implications – This study provides a practical solution to an ongoing valuation problem arising from the rating legislation in Australia, which requires the determination of site value for all property types.

Originality/value – This paper uses productivity variables to assess the site value of investment property. This innovative methodology can provide a more accurate appraisal of site values.

Keywords Depreciated replacement cost, Productivity, Mass appraisal, Residual method, Value benchmarks, Australia, Property, Market value

Paper type Research paper

1. Introduction

The judgments of the Queensland Land Court have repeatedly expressed their dissatisfaction with the application of an extraction method when assessing the land value component of improved investment properties for taxing purposes. Unfortunately there are several land valuation statutes in Australia that specifically refer to the cost based assessment of the improvements when attempting to split the value between land and improvements. A recent appeal court hearing supported the findings of earlier cases and was critical of the range and subjectivity of the depreciation factors applied by different valuers within a depreciated replacement cost (DRC) exercise that was applied

Journal of Property Investment & Finance
Vol. 30 No. 4, 2012
pp. 338-353

1463-578X
DOI 10.1108/14635781211241752

to the improvements on a major shopping centre (*Kent Street Pty Ltd and Ors. Department of Natural Resources and Mines (2008), QLAC 0221*.

Where site value is the basis of local authority rates and taxes, as in Australia, it is often necessary to supplement the low number of vacant land sales with sales of improved property. While a residual (extraction) method to arrive at a land value from an improved property sale is, generally, accepted by the Australian courts, when direct sales evidence is not available, the judicial registrar of the Land Court (O'Connor, 2007, p. 3) explains the difficulties facing valuers, and the courts, when complex investment properties are involved and comments "the contentious areas were the value of the physical improvements and, more so, the value of intangibles". In the particular case referred to by the court registrar, the appellant's figure was 15 per cent of the proposed statutory value.

Concurrently, the inadequacies of using a summation method incorporating a DRC to arrive at a market value have recently been debated in the UK (French and Gabrielli, 2007; Mansfield and Pinder, 2008; Wyatt, 2009). While accepting that the DRC is a technique of "last resort" (RICS, 2007), many authors seriously question whether a replacement cost method can be regarded as a legitimate technique when assessing the market value of the property improvements. In addition, the practice of apportioning the market value of an improved property between the land component and the building component is also challenged in the literature. Hendriks (2005) raises the question: "should we separate the inseparable?"

This study attempts to find a better way to analyse improved investment property sales than determining the market value of the improvements using a cost basis. The objective of the study is:

> To propose and test practical, productivity based techniques that assess the land value component of investment property, in particular major shopping centres, when limited vacant land sales are available. The resultant land value should represent the probable market value and the technique should be capable of incorporation in an automated valuation process.

The study will initially describe the context of the study before explaining the methodology used to achieve the objective. A valuation model is proposed and this model is tested on a major shopping centre property in Australia. The paper concludes with sections on the limitations of the study and conclusions.

2. The context of the study

This study relates specifically to land valuations required for taxing purposes in Australia and is restricted to investment properties. The context section will cover:

(1) The Australian land tax base.

(2) Mass appraisal methodology.

(3) Acceptable valuation approaches.

(4) Investment property complications.

2.1 The Australian land tax base

The Commonwealth of Australia was formed in 1901 and, for a relatively small population of approximately 23 million, has three tiers of government; all of which have rights to the collection of taxes. In relation to land-based taxation, the local

authorities (lowest level of government) use a land value base to levy rates for local authority costs and each state of Australia uses the land value to levy a land tax on certain categories of property. Each state has its own regulation relating to the valuation and taxation of land and there are differences between them (Hefferan and Boyd, 2010; Cowley, 2006).

Despite the differences between the states, each state now relies, primarily, on the unimproved capital value, called site value, as the basis for the rating and land taxes. Certain states such as New South Wales and Victoria have the right to levy rates on the annual rental value or on improved capital value, but these states rely substantially on site value. Consequently, the land component of property forms the basis for nearly all property-linked taxes in Australia. Queensland has recently adopted a new land valuation act (Land Valuation Act 39 of 2010) and this act requires non-rural properties to be assessed on a site value basis in line with the other states of Australia.

A major problem when using an unimproved capital (site) value as the tax base is that it is often difficult to find comparative evidence of vacant land sales in highly developed urban areas. Consequently, the land component is, at times, calculated from the improved capital value as the residual land value. When considering investment properties, this residual land exercise is complex and results in large variations between valuations.

Australian investment property and, in particular, retail property, is a significant portion of the property wealth and makes a substantial contribution to the local authority rates and the state land taxes. Newell and Hsu (2007, p. 147) describe retail property in Australia and state:

> The retail sector makes an important contribution to the Australian economy, being the largest employment sector (14% contribution) and the seventh largest contribution to gross domestic product (5% contribution).

Consequently, it is extremely important that the site values of investment properties established for rating and taxing purposes in Australia, many of which have a market land value in excess of $100 million, are as accurate and defensible as possible. It is unfortunate that Australia does not base its property tax for commercial property on the rental value, rather than the site value, as is done in England and Wales (Tretton, 2007), as this would, in our opinion, be an appropriate measure of the capital value of properties that derive their worth from their productivity capacity.

2.2 Mass appraisal methodology

Mass appraisal may be defined as:

> The systematic appraisal of groups of properties at a given date using standardised procedures and statistical testing (d'Amato, 2004, p. 205).

There is extensive literature on the methods developed for mass appraisal systems. The International Association of Assessing Officers (IAAO, 1990) continues to be active in improving assessment practice. Kauko and d'Amato (2008) have completed a list on the latest tools being used to enhance automated valuation methods (AVM) and empirical modelling of value. Tretton (2007, p. 484) writes:

> Governments now demand analysis, interpretation and application of property information, managed and delivered through technology. The use of automated valuation processes for new or significantly revised systems of property valuation for local taxation is now universal.

Later in his paper, Tretton (2007, p. 508) reviews the practicality of AVMs and concludes:

> A fully automated process with the AVM arriving at values annually would be an ideal but given the variety of commercial property this is not feasible. Much can be automated. However, the following are likely to particularly need valuer intervention:
>
> - Analysis of complex transactions.
> - Updating relativities/updating calibration.
> - Basic price.

We believe that AVMs are necessary tools, but, as mentioned by Tretton, there are limitations where complex properties are involved. AVMs are ideal when there are many transaction records within a relatively homogeneous area. However, when valuing the unimproved capital value of developed and complex investment properties, the standardized hedonic methods are not appropriate.

While some form of mass appraisal system is required for complex investment property to ensure uniformity and transparency, it should incorporate relevant productivity measures and take account of the limited number of comparable sales. This paper considers the challenge to determine the market value of the land component of investment property and is structured on two key beliefs being:

(1) The primary method of valuation is the comparable sales method.

(2) The exclusion of a DRC technique to assess the value of the improvements of highly developed investment properties.

2.3 Acceptable valuation approaches

When vacant land is being valued, it is always preferable to use comparable vacant, or near vacant, land to determine the market value. Consequently, when assessing the land component for tax purposes, the primary method of valuation should be the direct comparison method, if comparative data is available. Whipple (2006, p. 250) states:

> In comparing sold and subject properties, there are at least three requirements that must be met: the heads of comparison must be significant price determinants, the number of properties used in the comparison must be sufficient, and the comparison must be "weighted" – that is considered.

The fact is that the comparison requirements mentioned by Whipple are often not met when valuing the unimproved value of complex properties, such as investment properties. Consequently, it is commonplace, in Australia, to consider sales of improved property as part of the comparative valuation method. Accepting that an indirect valuation method may be necessary and that the analysis of improved sales is often used, it should be acknowledged that this indirect method is usually not as reliable as a direct comparison method.

An indirect valuation method, such as the residual, or extraction, technique, involves many assumptions and this may result in a higher margin or error than

a direct comparison method. Jowsey (2011, p. 478) comments on indirect methods and the need to determine a site value:

> At other times indirect methods of valuation have to be used, and these give rise to difficulties in ensuring accuracy and uniformity [...]. Moreover, the difficulties of isolating the site element of any value resulting from improvements or enterprise of the owner could provide scope for challenge, appeals and litigation.

A common indirect sales analysis method when assessing the land component is a residual method. Simply put, the relationship is:

$$L = V_i - I$$

where:

- L market value of the land.
- V_i market value improved.
- I market value of the improvements.

However, when an investment property is involved, the formula may expand to:

$$L = V_i - (B + N)$$

where:

- L land value.
- V_i market value improved.
- B market value of physical improvements.
- N market value of intangibles.

Two major issues complicate the residual method when investment properties are concerned and they are the determination of the market value of the physical improvements and the market value of the intangibles. These will be considered below.

2.4 Investment property complications

The market value of investment property is established on its productivity, more specifically on its future financial earning capacity. Consequently, the investment valuation approaches examine and capitalise the earning capacity to arrive at the market value. In addition there may be intangible elements within the market value of an investment property.

There has been considerable research in the UK and Europe into the depreciation rate of improved investment property over time and most of these studies reference rental growth rates in the calculation of the depreciation rates. Crosby *et al.* (2011) provide a comprehensive review of the recent literature in this field and describe longitudinal studies covering several European regions. These studies logically use productivity factors to quantify the depreciation rates. Baum and Turner (2004) examine estimated (market) rental value (ERV) growth and depreciation rates. Interestingly, Law (2004, cited in Crosby *et al.* (2011, p. 9)) defines depreciation as:

> [...] the rate of decline in rental/capital value of an asset (or group of assets) over time relative to the asset (or group of assets) valued as new with contemporary specification.

Unfortunately similar research based studies have not been undertaken in Australia and there is still a focus on the replacement cost figure of the improvements when valuing the land component of investment property. However, the UK and European studies provide support for the concept that component values of investment properties should be assessed using productivity measures.

If the value of the improvements is assessed using a DRC technique, then it is essential that the depreciation factor (the economic and functional obsolescence components) take into account that the value of the improvements is a productivity based value. This is conceptually a difficult exercise as the base value is based on cost and consequently the depreciation adjustor must change the resultant figure to a productivity value.

Mansfield and Pinder (2008, p. 203) describe the difficulties of pricing obsolescence in a DRC exercise and state:

> It remains clear that the calculation of the DRC lies within the remit of the valuer (Sayce and Connellan, 2001) but the regulatory guidance does not specifically, or even obliquely, address the practical difficulties associated with accurately estimating levels of "economic" or "functional" obsolescence.

It has been noted earlier in the paper that several UK and European authors (French and Gabrielli, 2007; Mansfield and Pinder, 2008; Wyatt, 2009; Hendriks, 2005) express concern about the use of the DRC technique when assessing market value components. The same level of debate has not taken place in Australia and, conversely, the DRC technique is still mentioned in the latest statutes on land valuation.

The new Queensland Land Valuation Act 2010 makes mention of a cost method when describing the site value of improved property and states:

> If land is improved, its site value is its expected realisation under a bona fide sale assuming all non-site improvements for the land had not been made (s 21(1)).

and: in relation to the use of a residual technique for improved properties:

> The value of the actual improvements is the lesser of the following:
>
> (a) the added value of the actual improvements give to the land on the valuation day, regardless of their cost;
> (b) the cost that should have reasonably been involved in effecting on to the land, on the valuation day, improvements of a nature and efficiency equivalent to the existing improvements (s 25 (2)).

It is difficult to comprehend why a replacement cost should be considered in section 25 when subsection (a) adequately describes the logical market value approach. We can only assume that it is a means to restrict the combined value of the improvements (which may include substantial intangibles) to a figure equal to the replacement cost of the improvements.

We conclude that the valuation of the improvements of an investment property should not be assessed using a DRC technique because the depreciation factor is not a sound adjustor to assess the productivity value of the improvements.

The second problematic issue when using the residual method for investment property is the value of intangibles. In particular, where a business is an integral part of an investment property, such as a regional shopping centre, there may be value

in the intangible property. Several authors discuss the value of intangibles within investment property (Dunse *et al.*, 2004; Malloy, 2005; Lagrost *et al.*, 2010; Miller, 2006).

Brands, franchises, licences, management expertise, loyalty by a customer base and other forms of goodwill are difficult property components to value but there is a need to acknowledge their existence within a market value figure. Consequently, when considering a cost-based technique to assess the value of improvements it is necessary to consider the added component of intangible property value. This is another reason for avoiding the use of a cost-based improvement value for investment property.

3. The methodology framework

Having accepted that, at times, it is necessary to use some indirect valuation methods when assessing land (site) value of investment property for taxing purposes, the following key questions arise:

- Is it possible to find a better technique than the traditional residual method that incorporates a cost based assessment of the improvements?
- Are there productivity measures that can be used as units of comparison and variables within a comparative data analysis process?
- Can we utilise both vacant land and improved property sales within the valuation process?
- Can it be demonstrated that any proposed model uses accessible property data and that the model is suitable for inclusion with an automated valuation process?

We wrestled with these questions, as have many other valuers, and believe that there are more accurate ways to determining the land component than by deducting a cost-based improvement value from the market value. Our initial conclusion was that market rent is the best measure of productivity for improved investment property. Miller (2006, p. 30) referring to land residual theory says:

> A key measure of site productivity is the rent received. It becomes extremely difficult to quantify the benefits or advantages of one site versus another using a cost approach to value.

While England and Wales correctly, in our opinion, use rental as the basis for property tax for commercial property, Australia does not differentiate its *ad valorem* property base for residential and commercial property. Consequently, the actual rental data on investment property is not readily available.

The key issue is how to incorporate into the land component a proportion of the productivity value. Unfortunately the whole property constitutes the utility that produces income and/or profit. If there was a rental figure that could be distributed between land and improvements this would be the best solution; but this is not possible.

As the rental value is not an option in Australia, alternative productivity measures require consideration, as well as the allocation of the productivity measure between land and improvements. Two productivity measures that could be used as units of comparison are the lettable floor area of the improvements and the trading figures of the space occupiers. The lettable floor area and the trading figures are both reasonable proxies for productivity of the property. Colwell and Jackson (2004, p. 355) state that "consumer expenditure has been firmly established as a key demand side determinant of rental change".

Fortunately the gross lettable area (GLA) and the retail sales turnover figures, in the form of the moving annual turnover (MAT), are available for major shopping centres in Australia. The MAT is a sound proxy for productivity as it not only has a direct impact on the rental amount (through the turnover clause) but it is a factor that valuers take into account when determining direct capitalisation rate for the property. The MAT for smaller shopping centres is not always available in Australia. We consider these two measures are good value determinants when undertaking retail investment valuations and consider that a total rent income figure could be a substitute for the MAT figure.

It should be noted that there would be a strong correlation between the two variables and consequently in the analysis, the MAT should be expressed as figure per unit of GLA. Clearly the lettable area could also be expressed as the net lettable area, but in Australia, the GLA is the commonly used measure.

We also undertook an investigation into the allocation technique that identifies the ratio between the land value component and the improved property value. It is difficult from sales evidence alone to get a substantiated and consistent ratio for different types of shopping centres. However, market professionals, including shopping centre owners, developers and valuers have their benchmarks, which constitute expert opinion, and together with sales evidences can provide useful information.

4. Model development

The land value model should be based on comparative sales analysis but be capable of analysing both vacant and improved sales. The following steps were taken when structuring the proposed model:

(1) Define the categories of shopping centres (homogeneous areas).

(2) Collect all nationwide arms-length sales within the selected time frame.

(3) Identify the land area, the GLA and the MAT for each improved sale property and the potential GLA for vacant land sales.

(4) Analyse the sales for each category and calculate the mean and standard deviation of the land area, the GLA and the MAT.

(5) Calculate the mean and standard deviation of the land area, GLA and MAT for all improved shopping centre properties within each category.

(6) Assess the mean ratio of land value to improved market value for each category.

Once this data has been collected and the descriptive statistics for each category calculated, it is necessary to assess two further ratios being the existing plot area ratio and the turnover expressed as a rate per m^2 of GLA. These formulae are:

$$\text{Existing plot area ratio}: \quad (\text{ePAR}) = \frac{\text{gross lettable area (GLA)}}{\text{land area}}$$

$$\text{Turnover per GLA}: \quad (\text{MAT/GLA}) = \frac{\text{MAT for the centre}}{\text{GLA}}$$

The sales analysis process is summarized in Table I. The figures in this table will represent the mean figures for each category from the refined sales record.

Thereafter the process will require benchmarks and differentials from the sales analysis to apply to the improved investment properties being valued. The two proposed benchmarks and differentials are:

(1) Benchmark is the land value per m^2 of GLA and adjustment differential is the MAT difference from the mean.

(2) Benchmark is the ratio of land to capital value and the adjustment differential is the GLA difference from the mean.

The benchmarks are shown in Table I above but the differentials represent adjustments that must be made for the difference between the subject property characteristic (either GLA or MAT) and the mean sales figure. This differential adjustment represents the sensitivity of the sales values to a change in that particular variable (either GLA or MAT). If insufficient sales evidence is available to undertake a statistical study of the single variable impact, the valuer's judgement may be necessary to assess this differential.

At this stage we would emphasise that the collection and analysis of the data referred to above are major tasks but are both achievable and worthwhile in a mass appraisal context when a large number of highly valued properties require valuation. In addition the use of industry advisory panels are helpful in refining and confirming the benchmarks. In Queensland, a peer review panel has been established to assist the statutory valuers and this combination of private and public sector knowledge is highly beneficial.

The elements described above are capable of determining two distinct land values that will require reconciliation according to the accuracy of the available data for each benchmark and differential set. The formulae for the two land value calculations are:

$$\text{(i)} \quad LV = G_s \times LG_t \times f\left(\frac{M_s}{M_t}\right)$$

$$\text{(ii)} \quad LV = CV_s \times LC_t \times f\left(\frac{P_s}{P_t}\right)$$

where:

LV land value component.

G_s GLA of the subject property.

LG_t land value as a rate of GLA from sales analysis (benchmark 1).

M_s MAT per m^2 for the subject property.

Shopping centre classification	Super/major regional centres	Regional centres	Subregional/ neighbourhood centres
Size category	Greater than 50,000 m^2	30,000-50,000 m^2	10,000-30,000 m^2
Land value/m^2	$/$m^2$	$/$m^2$	$/$m^2$
Land value/m^2 of GLA	$/$m^2$	$/$m^2$	$/$m^2$
MAT/m^2 of GLA	$/$m^2$	$/$m^2$	$/$m^2$
ePAR	Ratio	Ratio	Ratio
Land value: market value (%)	%	%	%

Table I.
Sales analysis template for major shopping centres

M_t mean MAT per m^2 from sales analysis.

CV_s capital value (market) of subject property.

LC_t land to capital value per cent from sales analysis (benchmark 2).

P_s plot area ratio of the subject property.

P_t mean plot area ratio from sales analysis.

It will be noted that the second benchmark requires the assessment of the capital value of the property in order to derive the land value component. Most major shopping centres in Australia are owned by publicly listed property companies or real estate investment trusts and they are required to value the properties in their portfolios on a regular basis. This assists greatly in keeping the market values up-to-date.

The structure of the valuation model is shown in Figure 1. The model follows the logic of the direct comparison valuation approach.

It should be noted that the model could incorporate alternative variables if other productivity variables were found to be key determinants of the land value of retail property. The model could be restructured to use mean rent levels, but this would suffer the difficulty of widely varying rent rates between majors and specialist shops.

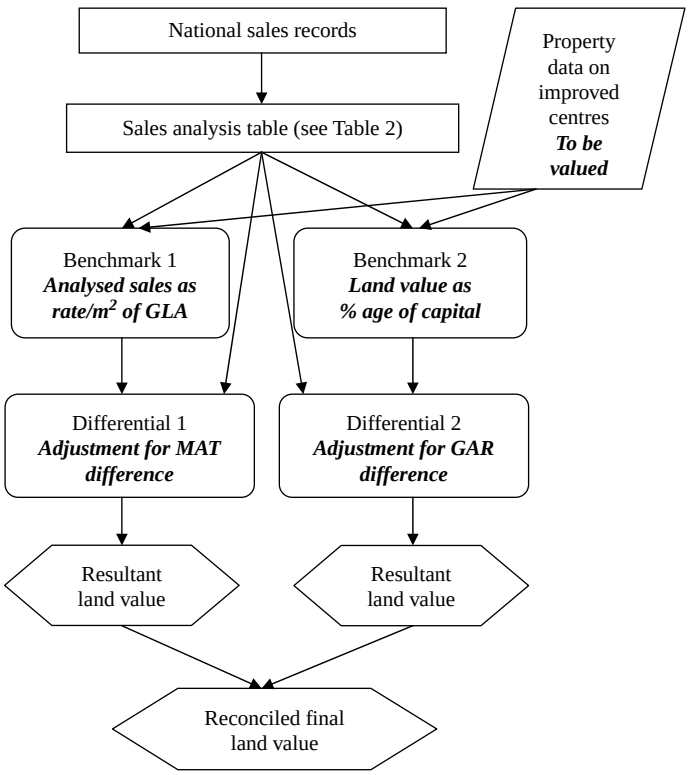

Figure 1.
Land component valuation model

5. Model application

Having developed the conceptual framework of the model, the benchmarks and differentials were researched for shopping centre properties in Queensland Australia. Sales data and property characteristics were collected for 20 shopping centre properties, including only two vacant land sales. Sales data was collected from property transfer records and the property details and productivity figures are published by the Shopping Centre Council of Australia and Urbis Pty Ltd This sample excluded shopping centres that are within the CBD of major cities and was restricted to centres in Queensland. The main shopping centre owners in Queensland are the Westfield Group, Stockland, Mirvac and Centro.

It must be emphasized that the application is a preliminary study. A full application should include a comprehensive record of all major shopping centre sales in Australia and greater consultation with specialist retail valuers. The application of the model to major, improved shopping centre properties is described below.

The initial step was to collect the sales data and categorise the centres. As mentioned above, this research was restricted to Queensland and a full examination of the mean GLAs and MATs for all major shopping centres in Queensland has not been undertaken for this preliminary study. The results of the sales analysis are shown in Table II. Please note that several figures have been rounded off to demonstrate the uncertainty in these initial figures. The MAT figures for the regional and subregional categories show high dispersion at this stage.

The next step was to calculate the differential adjustment factors. This required an assessment of the impact of a change in a single variable (initially the MAT and then the existing PAR) on the resultant sales price. The adjustment factor has been derived from improved sales and later applied to the land component of the property. We believe that this is acceptable because the productivity potential is inherent in both the land value and the improved capital value. Figure 2 is an illustration of the best-fit linear pattern from the sales evidence for the super/major shopping centre category only. The linear relationship is restricted the probable variations in the variables – the MAT range is -40 to $+40$ per cent and the ePAR from -80 to $+80$ per cent.

The differentials are described as percentage variations of that variable from the mean figures identified in the sales analysis. An additional study should be undertaken to determine the means from the full population of shopping centres within Queensland, this would assist in determining whether the sales used are representative of the whole population. The tables, derived from the best-fit line, are useful to show the range

Shopping centre classification	Super/major regional centres	Regional centres	Subregional/ neighbourhood centres
Size category	Greater than 50,000 m^2	30,000-50,000 m^2	10,000-30,000 m^2
Land value/m^2	\$500/m^2	\$400/m^2	\$300/m^2
ePAR	0.5	0.45	0.6
Land value/m^2 of GLA	\$1,000/m^2	\$890/m^2	\$500/m^2
MAT/m^2 of GLA	\$6,000/m^2 GLA	\$5,500/m^2 GLA[a]	\$4,500/m^2 GLA[a]
Land value: market value (%)	10	12	16[a]

Note: [a]Denotes highly dispersed figures

Table II.
Preliminary Queensland shopping centre sales analysis table

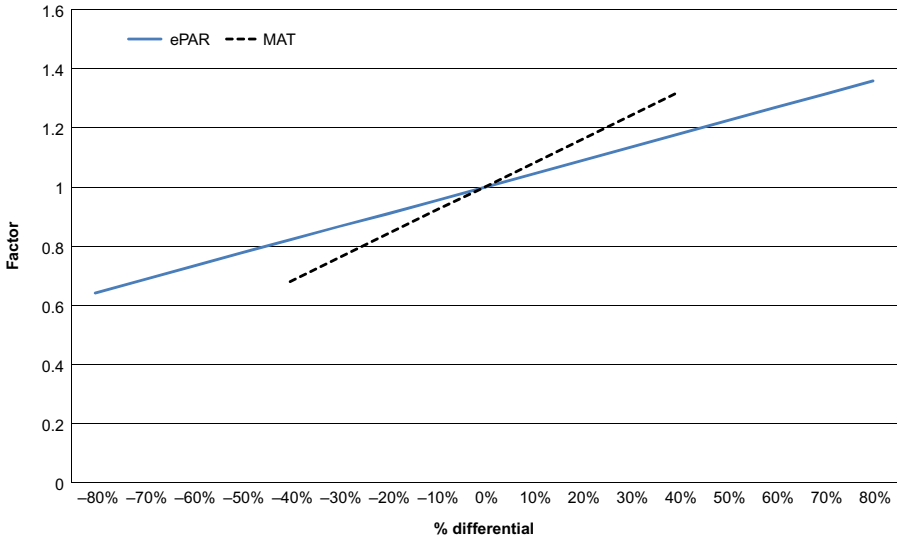

Figure 2.
Preliminary ePAR and MAT differential adjustments from benchmarks

and factors for set differentials. The differential adjustment tables are included as Table III for the MAT adjustment and Table IV for the ePAR adjustment.

The final step in the valuation process is to reconcile the two land values, this should be done by applying weightings to each technique according to the quality of the market information used in the benchmarks and differential tables. It is probable that the first technique will contain greater certainty in most situations because of the "crudeness" of the land to capital ratio.

From a practical point of view, it is highly beneficial to have the benchmarks and differential tables widely exposed to industry comment as the valuation process revolves around these tables. Provided these tables are acceptable to property practitioners, there should be very limited objections to the resultant valuations.

The land component value model described above has been tested on an actual shopping centre in Queensland.

6. Testing the model

The identity of the shopping centre used as the test property is confidential and accordingly some details have been changed, but the relationship is still realistic. The case study exercise is shown below:

Table III.
Preliminary MAT differential adjustments from benchmarks

MAT % differential	−40	−30	−20	−10	0	+10	+20	+30	+40
Factor	0.68	0.76	0.84	0.92	1.0	1.08	1.16	1.24	1.32

Table IV.
Preliminary ePAR differential adjustments from benchmarks

ePAR % differential	−80	−60	−40	−20	0	+20	+40	+60	+80
Factor	0.64	0.73	0.82	0.91	1.0	1.09	1.18	1.27	1.36

The subject property is a super regional centre in Queensland and will be referred to as ABC shopping centre, its relevant data is:

- Land area.
- 185,000 m^2.
- GLA 89,500 m^2.
- ePAR89,500/185,000 = 0.48.
- MAT \$6,821/m^2 GLA.
- Market value.
- \$1,090,000,000 as at January 2011.

The benchmarks that should be applied to this property are:

- Land value component as a rate per m^2 of GLA = \$1,000.
- Land value to market value ratio: 10 per cent.

The first land value calculation is:

- Benchmark land value: 89,500 m^2 × \$1,000/m^2 GLA = \$89,500,000.
- MAT differential from sales: \$6,821/\$6,000 = 114 per cent.
- MAT differential factor from table: 1.12.
- Land value adjustment: \$89,500,000 × 1.12 = \$100,240,000.
- Land value component, say: \$100 million.

The second land value calculation is:

- Benchmark land value: \$1,090,000,000 × 10 per cent = \$109,000,000.
- ePAR differential from sales: 0.48/0.5 = 96 per cent (−4 per cent).
- ePAR differential factor from table: 0.98.
- land value adjustment: \$109,000,000 × 0.98 = \$106,820,000.
- Land value component, say \$107 million.

Reconciliation of values:

- Greater weighting given to first technique (2:1).
- Resultant land value component: \$102 million.

This model has assessed the site value of the improved ABC shopping centre at:

- \$102,000,000 (one hundred and two million dollars).

Note: For illustration purposes a stepped process, including tables rather than formulae, has been used and many figures have been rounded off to emphasise the preliminary nature of this study.

7. Limitations of the study

This study is focused on valuations that are undertaken for rating or taxing purposes and it is constrained by legislation that requires the assessor to assume that the property is unimproved. Within this context, we have concentrated on the site value

of major shopping centres as an example of complex investment property. We believe that the productivity based valuation model for shopping centres can be modified to take account of other types of investment property. However, there is a need to distinguish between properties that have business or goodwill value included as part of their market value.

The proposed model requires a national sales analysis study and the collation of the productivity characteristics of all the shopping centre properties that will require valuation for tax purposes (in this case, the state of Queensland). It was not possible to undertake this comprehensive exercise for this paper that is intended to explain the productivity model framework. Consequently, the example used to test the model has been based on limited sales analysis and is designated as a preliminary exercise. The findings of this preliminary study should not be used for assessment purposes.

There are a number of associated issues that will require further study when assessing the site value of complex investment property. Key issues in major commercial developments are the status of development approval, the building approval rights related to the property and any infrastructure credits. In addition many investment properties are only partially developed and have varying potential for further development. We have not addressed these issues in this paper. Nor have we specifically accounted for goodwill or other intangibles that are outside the norm for a particular property category. Hopefully, at a later stage, when productivity models are implemented, these additional complications will be considered.

8. Conclusions

In Australia site value is the most popular basis for land tax and rating charges. Site value is a market-based unimproved capital value figure and it is best valued using a comparative analysis of vacant land sales. However, there are many types of specialist properties where vacant land sales are severely restricted in number and this means that improved property sales are also used to arrive at the residual land value. In particular, there has been substantial litigation in Australia on the basis for assessing the land value component of major shopping centres and CBD properties. The assessed site values of these properties often exceed several million dollars and consequently these values are regularly challenged in the courts. For this reason the example used in this study is a major shopping centre.

Valuation methodology advocates that the market value of improved investment property is assessed on its anticipated earnings. When undertaking a residual land value exercise for improved investment property, we consider that it is illogical and inaccurate to use a DRC technique to arrive at the value of the property improvements component. In the paper we examine alternative methodology to value the land component of investment property for tax purposes.

Our proposal is a valuation model incorporating two techniques that focus on the productivity value rather than the use of a cost-based technique. The first technique is a comparative analysis of land value that establishes benchmark values based on productivity area as well as a turnover differential to arrive at the land component value. The second technique is a ratio allocation between the improved market value and the land value and the application of a plot area ratio differential to derive the land value. Once the two values have been obtained, the final value should be a reconciliation of the two figures.

The objective of the paper was to find a productivity based model that could be used within an automated valuation process and to demonstrate that the model could be applied practically and meet the standard requirements of a fair taxation system, being simple, efficient and equitable. We believe that the model outlined in the paper meets these requirements. It was tested on a major shopping centre using preliminary figures and the result value is realistic, in terms of market value, logical and the technique is capable of incorporation within an automated valuation process.

The authors would welcome comment on this exploratory paper.

References

Baum, A. and Turner, N. (2004), "Retention rates, reinvestment and depreciation in European office markets", *Journal of Property Investment & Finance*, Vol. 22 No. 3, pp. 214-35.

Colwell, P.F. and Jackson, C. (2004), "Modelling rental change across key retail investment markets in Britain", *Journal of Property Investment & Finance*, Vol. 22 No. 5, pp. 354-85.

Cowley, M. (2006), *Review of Statutory Valuation Processes in Australia*, Department of Natural Resources, Mines and Water, Brisbane, July.

Crosby, N., Devaney, S. and Law, V. (2011), "Benchmarking and valuation issues in measuring depreciation for European office markets", *Journal of European Real Estate Research*, Vol. 4 No. 1, pp. 7-28.

Dunse, N.A., Hutchinson, N.E. and Goodacre, A. (2004), "Trade-related valuations and the treatment of goodwill", *Journal of Property Investment & Finance*, Vol. 22 No. 3, pp. 236-58.

French, N. and Gabrielli, L. (2007), "Market value and depreciated replacement cost: contradictory or complementary", *Journal of Property Investment & Finance*, Vol. 25 No. 5, pp. 515-24.

Hefferan, M.J. and Boyd, T. (2010), "Property taxation and mass appraisal valuations in Australia – adapting to a new environment", *Property Management*, Vol. 28 No. 3, pp. 149-62.

Hendriks, D. (2005), "Apportionment in property valuation: should we separate the inseparable?", *Journal of Property Investment & Finance*, Vol. 23 No. 5, pp. 455-70.

IAAO (1990) in Eckert, J.K. (Ed.), *Property Appraisal and Assessment Administration*, IAAO, Chicago, IL.

Jowsey, E. (2011), *Real Estate Economics*, Palgrave Macmillan, Basingstoke.

Kauko, T. and d'Amato, M. (2008), *Mass Appraisal Methods*, Wiley-Blackwell, Oxford.

Lagrost, C., Morton, D., Dubois, C. and Quazzotti, S. (2010), "Intellectual property valuation: how to approach the selection of an appropriate method", *Journal of Intellectual Capital*, Vol. 11 No. 4, pp. 481-503.

Malloy, R.P. (2005), "Real estate transactions: policy considerations for law, technology and globalization", *Law and Policy*, Vol. 27 No. 1, pp. 81-99.

Mansfield, J.R. and Pinder, J.A. (2008), "'Economic' and 'functional' obsolescence, their characteristics and impact on valuation practice", *Property Management*, Vol. 26 No. 3, pp. 191-206.

Miller, N. (2006), "The land residual theory and the absence of a business value for real estate as an operating business", *Journal of Property Tax Assessment & Administration*, Vol. 1 No. 4, pp. 29-35.

Newell, G. and Hsu, W.P. (2007), "The significance and performance of retail property in Australia", *Journal of Property Investment & Finance*, Vol. 25 No. 2, pp. 147-65.

O'Connor, B.R. (2007), "Review of valuation cases", paper presented at API Seminar, Brisbane, July, available at: www.landcourt.qld.gov.au/documents/2007%20Valuation%20Review.pdf

Royal Institution of Chartered Surveyors (2007), *Valuation Information Paper 10: The Cost Approach for Financial Reporting*, RICS, London.

Tretton, D. (2007), "Where is the world of property valuation for taxation purposes going?", *Journal of Property Investment & Finance*, Vol. 25 No. 5, pp. 482-514.

Whipple, R.T.M. (2006), *Property Valuation and Analysis*, Lawbook Co., Pyrmont.

Wyatt, P. (2009), "Replacement cost and market value", *Journal of Property Investment & Finance*, Vol. 27 No. 6, pp. 593-602.

Further reading

Ho, K.H. (2007), "Modeling the structure of CV formation and expectations", *Journal of Property Investment & Finance*, Vol. 25 No. 2, pp. 179-206.

McCluskey, W., Grimes, A., Aitken, A., Kerr, S. and Timmins, J. (2006), "Rating systems in New Zealand: an empirical investigation into local choice", *Journal of Real Estate Literature*, Vol. 14 No. 3, pp. 381-98.

Corresponding author

Terry Boyd can be contacted at: t.boyd@cqu.edu.au