Module 2

The Income (Investment) Approach to Property Valuation

The income (sometimes referred to as the investment) approach to valuation is most appropriate in the valuation of income-producing properties where it most closely reflects the behaviour of actual buyers and sellers in the market place.

The approach involves estimating the present worth of the rights to future benefits to be derived from the ownership of a specific property under given market conditions, where:

'the rights to future benefits' = cash flows (i.e. rent + reversionary capital value on sale)

and converting these rights/cash flows to a present worth sum, i.e. capitalisation, to represent market value.

Objectives

At the completion of this module you should be able:

- to calculate the market value of freehold and leasehold interests of income producing properties using the 'Income Approach to Valuation', given the necessary information
- to understand the conventional and contemporary valuation techniques of the income approach.

3.1 Conventional Valuation Techniques (The Capitalisation Process)

3.1.1 An Overview of the Valuation Process

The basic steps in the process of the income approach to valuation are as follows.

1) **Estimate gross income or gross income potential**

This involves an analysis of existing rents of comparable properties in order to determine market rental levels. A detailed assessment of present and expected income from the building is then required, with potential income to be taken into account if the property is part or entirely vacant and it is anticipated that further leasing of space will take place.

2) **Ascertain permanent vacancy factor/voids**

In multi-tenanted buildings there will be vacancies at the best of times and these will be caused by tenants vacating and a period of time elapsing before new tenants are found. In times of over-supply of space and weak demand for space there will be a greater expectancy of vacancies. The valuer must therefore use experience and market analysis skills to predict a reasonable permanent vacancy factor that can be expected for the building in question and deduct an appropriate amount from gross income to ascertain effective gross income.

3) **Estimate the building expenses / outgoings**

These must be budgeted for on an annual basis. Such expenses might include rates, land tax, insurances, repairs, management, as well as operating expenses such as air conditioning, lighting, hot water, lifts, cleaning and security which are generally met by service charges.

4) **Deduce net income**

This represents what the owner will receive by deducting the sum estimated in Step 3 from the effective gross income determined in Step 2

5) **Apply the capitalisation formula**

Apply the year's purchase or capitalisation formula to this net income figure to indicate market value.

A typical format for a valuation using the income approach would be as follows:
The example assumes the building is100% leased at market rents

Gross income

• Base rental income from building	$1,116,656	
• Income from parking / outgoings recovered from tenants	$ 138,952	
		1,255,608

Permanent **vacancy factor/voids**

Deduct vacancy factor (3% of x)	$ 33,500	
Effective gross income =		$ 1,222,108

Deduct **building outgoings/operating expenses, e.g.**

	Total
Property Taxes	
Operating expenses e.g. air conditioning electricity etc. normally covered in service charge	Say $284,930

Net cash flow = $ 937,178

Market capitalisation rate = say 6.5%

□ Market Value = $\frac{\textit{Net}\text{ operating Inc}}{\text{Market cap. rate}} = \frac{\$937,178}{0.065} = \$14,418,123$

Special attention should be given to checking that over market incomes or under market incomes are allowed for in the valuation methods. The above example assumes rents received are at a market level. This aspect is discussed in more detail below. The most important variable in this valuation model is the capitalisation rate and the role of this variable is reviewed in more detail below. The examples outlined below all assume that the necessary steps to derive a net cash flow have been undertaken and only the process of capitalisation remains to be completed. For more detail of this example see extract from Whipple RTM (2006), Part 1 p314-323 on REDE3100/7100 Blackboard Site.

2.1.2 Valuation of Freehold Property Let at Open Market Rentals

Example

The following freehold warehouse properties are located in the same industrial estate and are similar in terms of nature of tenants/lease, age, design and size, etc. They have sold for the following prices in recent months:

	Net Income	Sale Price

Property A	$16,600	$166,000
Property B	$12,500	$132,500
Property C	$21,000	$199,500

Assume that these incomes are net rents at a current open market value. The relationships of net cash flow to sale prices in this instance are:

A. $\frac{\$16,600}{\$166,000} \times 100 = 10\%$

B. $\frac{\$12,500}{\$132,500} \times 100 = 9.4\%$

C. $\frac{\$21,000}{\$199,500} = 10.5\%$

These percentage returns are often referred to as initial yields. (Assume necessary allowances for outgoings/permanent vacancy factor have been made in the process of analysis.)

From this hypothetical example it would seem clear that investors purchasing this type of property in this location can anticipate a return of approximately 9.5 – 10.5%.

This information is then utilised and applied to the circumstances that exist to a property that is subject to the valuation exercise, say Warehouse D. For example, if Warehouse D is very similar to Warehouses A, B and C outlined above from an investor's point of view, it would not be unreasonable to assume that an investor would expect a similar return to those obtained in the above sales. Therefore to obtain Warehouse D's market value merely requires the reversal of the process outlined above where sale prices and net cash flow were analysed to express a percentage return. The only information required is Warehouse D's anticipated net income.

Example

If net cash flow from Property D is $20,000 and say an approx. 10% return is applicable, as suggested by the above analysis, then:

10% return = $20,000 p.a. return

□ Capital value = $\frac{100}{10}$ x 20,000

i.e. = $200,000

□ Market value = $200,000

This general process is known as capitalisation in perpetuity (see Module 1) and in effect discounts a perpetual future net cash flow from a property. In this respect the process can only be applied to the valuation of freehold interests.

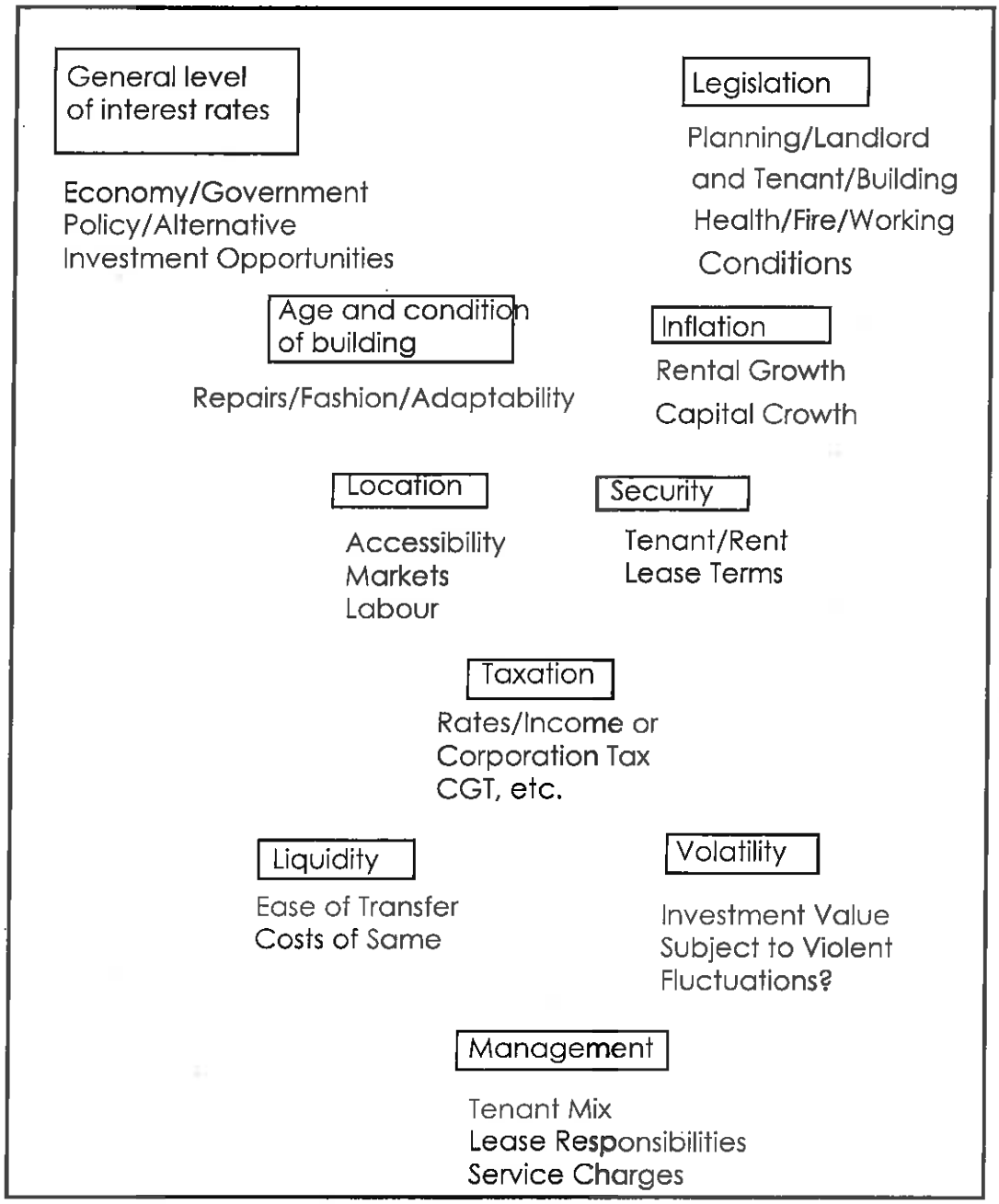
The above calculation then can be alternatively expressed with the same results, by using the capitalisation in perpetuity or year's purchase discussed in Module 2, e.g.

$$\text{Present Worth} = \frac{20,000}{.1}$$

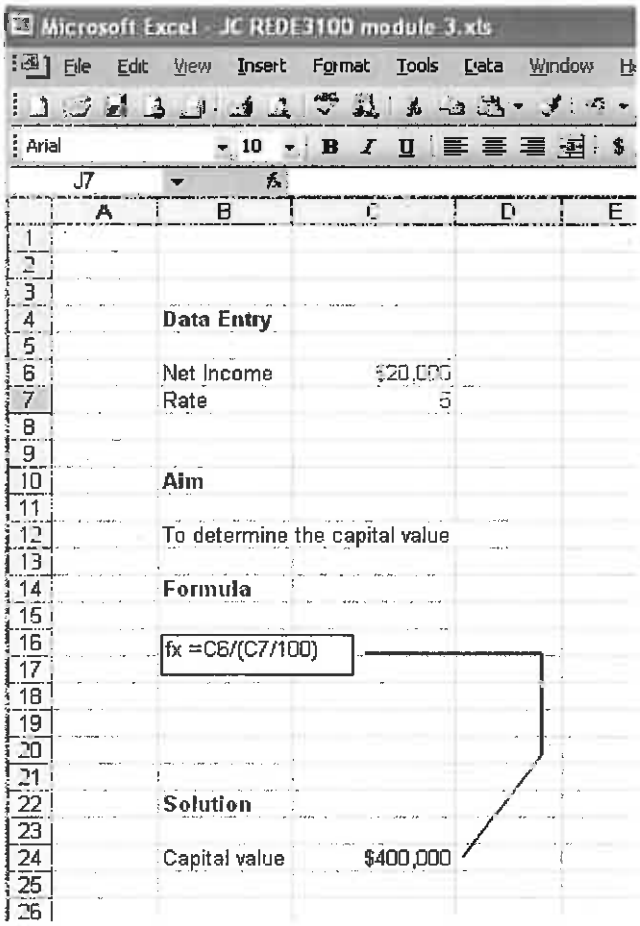
$$= \$200,000$$

The 10% capitalisation rate (sometimes referred to as the 'all risks rate') is then 'market derived' and reflects the buyers and sellers judgement (ie the property market's) assessment of risk involved on the investment. It is the valuer's judgment based on experience and knowledge of the market for that type of property that will determine the exact capitalisation rate to be applied. Basically the valuer will have to analyse existing sales and decide whether these investments are inferior or superior to the subject property in the eyes of potential investors before deducing what capitalisation rate is applicable to the property to be valued. The basic criterion for assessing market value is to observe transactions on property with similar investment risks to the property in question and compare their capitalisation rates. (see diagram below for a summary of functions determining the valuers capitalisation rate). Hence the capitalisation rate is used mainly as a unit of comparison rather than as an actual rate of return which would completely reflect the opportunity cost of capital/inflation etc. One can conclude then that although this approach is conventionally classified as the income approach to valuation, it is to some extent an extension of the market comparison approach.

Factor's determining investors' yield determinants and valuers capitalisation rates



In the spreadsheet below (Tab 1, 'A Level Annuity') in the file JC REDE3100 Module 3.xls you are able to input net income and an interest rate, using the figures above, to corroborate the above example.



The above could be said to be a basic explanation of the conventional valuation model used for freehold property let at open market value.

Variations of this 'valuation model' are made when circumstances require different assumptions, i.e. properties are let at less than open market rents.

2.1.3 *Valuation of freehold property let at under market rates*

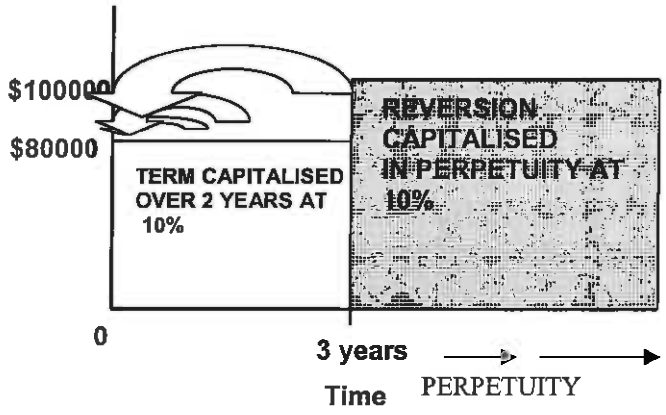
In the previous case of the freehold property let at market rent the estimated net income is treated as a level annuity. If the existing cash flow from the property does not reflect a current open market rental value, e.g. the income is fixed by a lease contract for a period of time at a rent below or above current open market value, then there are variations to the basic capitalisation in perpetuity of a constant annuity model to allow for such circumstances.

These variations in technique are illustrated below. It should be noted that net cash flows are assumed to be yearly in arrears and that the net cash flow has already been determined as a result of the steps outlined above having been completed.

Example

A commercial property subject to a 5 year lease producing an income of $80,000 p.a. on a net basis fixed for 3 years, i.e. the next rent review is 3 years. Current open market rental would produce a net income of $100,000 per annum. The appropriate market capitalisation rate to be applied to the net cash flow is 10

Term and reversion (or stepped annuity) technique



Net income = $80,000

PV of $1 p.a. received over 3 yrs @ 10% 2.4869

PV of $80,000 over 3 yrs @ 10% = **$198950**

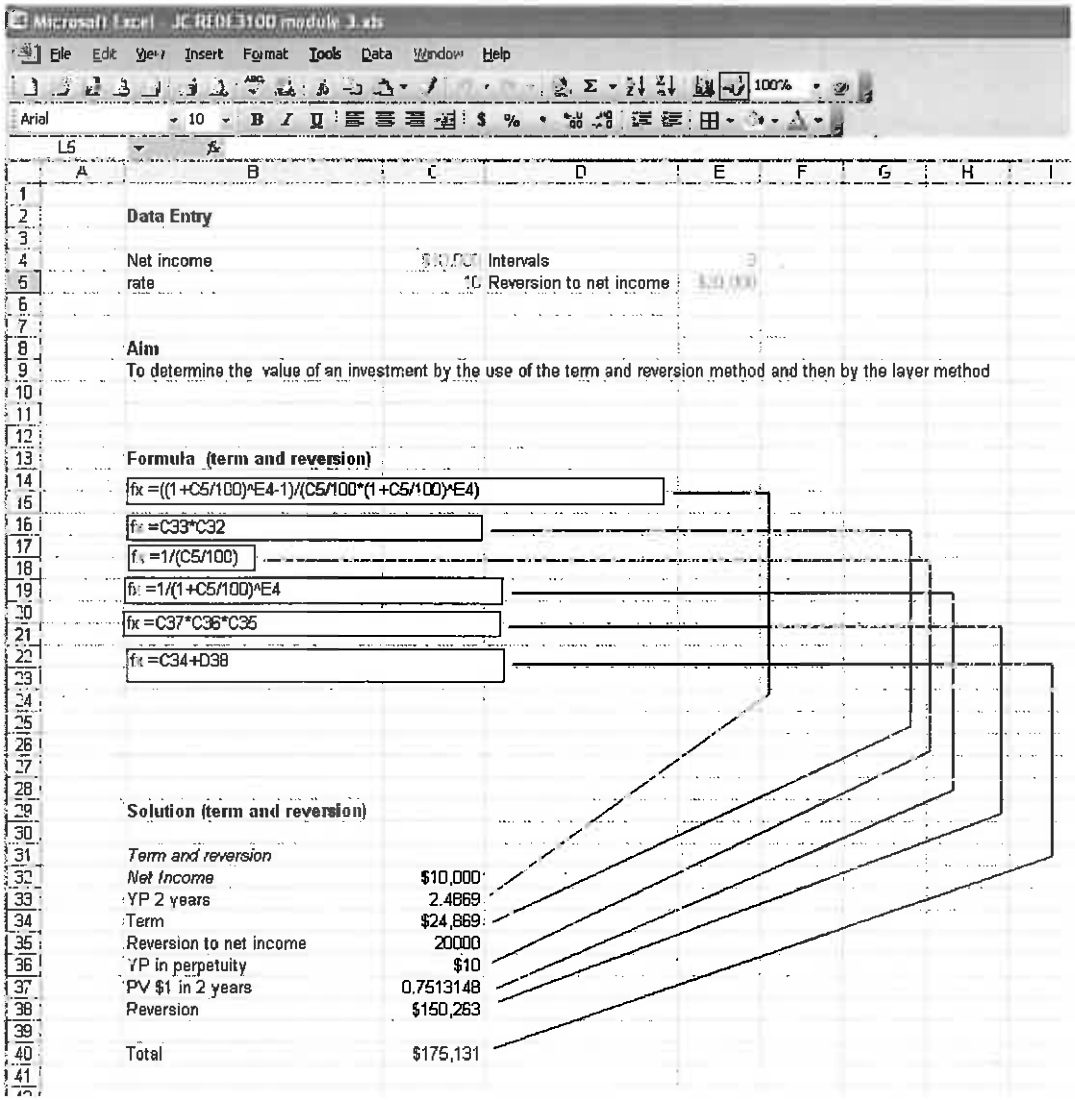
Reversion

PV of $100,000 p.a. in perpetuity $= \frac{\$100,000}{0.1} = \$1,000,000$

PV of $1 received in 3 yrs = 0.7513

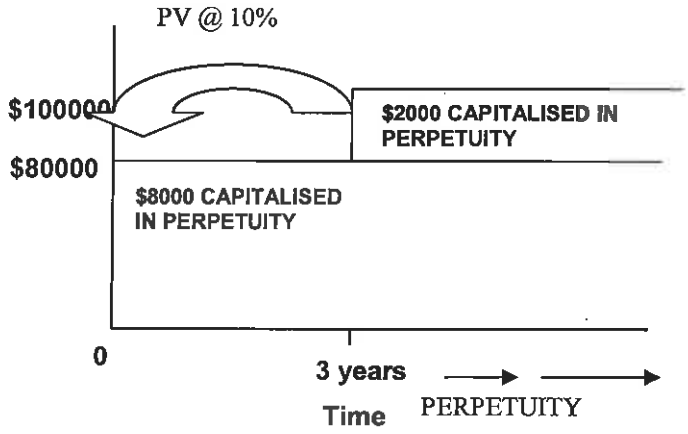
- PV of $100,000 received in 3 yrs = **$751,320**
- Capitalised Value of cash flow derived to represent market value = **$950260**

In the spreadsheet below (Tab 2, 'A Stepped Annuity') in the file JC REDE3100 Module 3.xls you are able to input net income and an interest rate, and reversion to net income, using the figures above, to corroborate the above example.



The same result can be obtained through the layer method if the same capitalisation rate can be used. This variation in technique is explained below

Layer technique



Net income = $80,000

Capitalised in perpetuity $= \frac{\$80,000}{0.1}$ = **$800,000**

(i.e. PV of annuity in perpetuity)

Plus increased net income in 3 years of $20,000 per annum

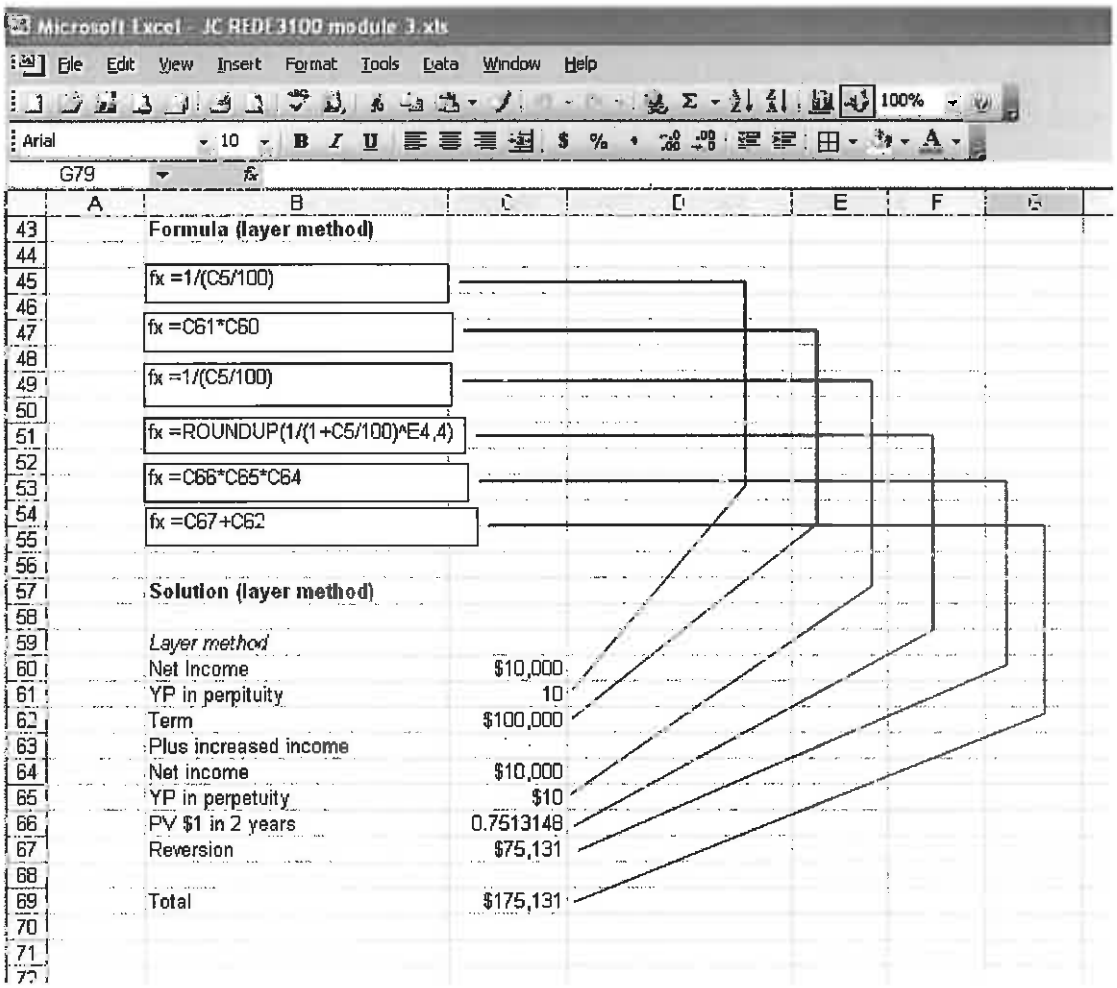
$2,000 Capitalised in perpetuity $= \frac{\$20,000}{0.1}$ = $200,000

PV of increased income of
$2,000 per annum in perpetuity = $200,000

PV of $1 in 3 years @ 10% = 0.751315

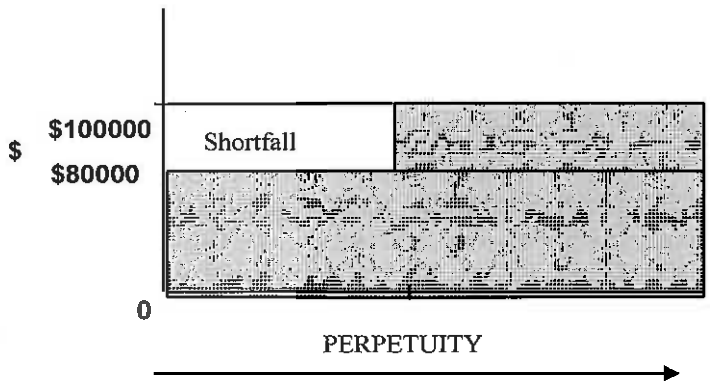
- PV of $20,000 received in 3 years = $150260
- Capitalised value of cash flow derived = **$950260**

to represent market value.



A third approach often referred to as the shortfall technique is sometimes adopted as follows.

Shortfall technique



Example

Capitalise open market rental obtainable on a net basis, i.e.

$$\frac{\$100,000}{0.1} = \$1,000,000$$

Deduct shortfall, i.e. PV of $2,000 p.a. over 3 years

Shortfall = $20,000 p.a.

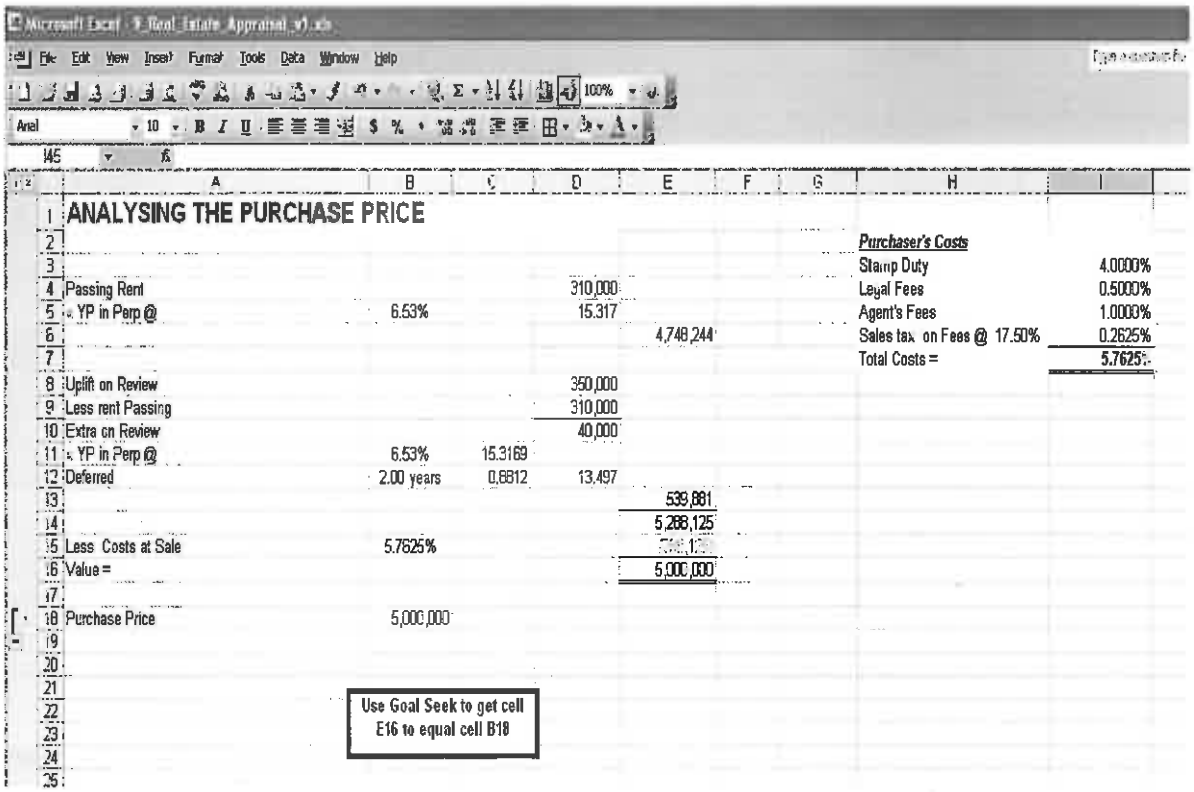
PV of $1 p.a. over 3 years = 2.48685

- PV of $2,000 per annum over 3 years x $2,000 = $49737
- Capitalised value of cash flow = **$950260**

which represents market value. If the capitalisation remains the same throughout the calculations then they will all produce the same value estimates. The capitalisation rate is sometimes varied within these calculations to reflect views on the security of income. However, it has been proposed that the variation of capitalisation rate in these circumstances is not theoretically sound. It is recommended that the capitalisation rate should remain the same throughout any of the calculations illustrated above. Such a capitalisation rate is referred to as an equivalent yield. For a definition of this yield see below.

The techniques outlined above are still based on the capitalisation rate being a unit of comparison to adapt for the differences between comparable properties and the subject property.

If the capitalisation rate is kept constant, then this capitalisation rate is also known as the equivalent yield, i.e. 'the weighted average yield to be expected from an investment in terms of **current** rental value and without allowing for future (inflationary) growths in rental income' (Baum and Mackmin, p. 83). In effect, this is an internal rate of return on the projected cash flow where the cash flow makes no allowance for rental growth with respect to inflation or monetary growth in nominal terms. For this reason it is also often referred to as a 'real value technique' and the capitalisation rate (in these techniques) discounts the cash flow on a real rate rather than a monetarist rate. For an example of this approach to valuation, see spreadsheet 'Analysis of Purchase Price' in the file 9_Real Appraisal_v1.xls in the MathHelp Financial Maths REDE3100 module 3 folder. This spreadsheet is taken from Sayce et al (2006) 'Real Estate Appraisal From Value to Worth'. The key elements are reproduced below where the equivalent yield is 6.53%.



	A	B	C	D	E	F	G	H	I
1	**ANALYSING THE PURCHASE PRICE**								
2									
3								***Purchaser's Costs***	
4	Passing Rent			310,000				Stamp Duty	4.0000%
5	YP in Perp @	6.53%		15.317				Legal Fees	0.5000%
6					4,748,244			Agent's Fees	1.0000%
7								Sales tax on Fees @ 17.50%	0.2625%
8	Uplift on Review			350,000				Total Costs =	5.7625%
9	Less rent Passing			310,000					
10	Extra on Review			40,000					
11	YP in Perp @	6.53%	15.3169						
12	Deferred	2.00 years	0.8812	13.497					
13					539,881				
14					5,288,125				
15	Less Costs at Sale	5.7625%			[illegible]				
16	Value =				5,000,000				
17									
18	Purchase Price	5,000,000							
19									
20									
21									
22									
23									
24									
25									

Use Goal Seek to get cell E16 to equal cell B18

Because these techniques are still basically comparative techniques the valuer still faces the problem of finding comparable properties. The more varied the cash flow, the more difficult it is to assess the capitalisation rate (i.e. the equivalent yield) which is the unit of comparison.

The terminology used with respect to yields and their respective definitions can be varied and for this reason it is recommended those definitions set out by the API (see below) should be used and quoted in valuation reports.

Direct (Capitalisation Rate0

Any devisor (usually expressed as a percentage) that is used to convert net income into value or price. The rate at which the annual net income from an investment is capitalised to ascertain its capital value at a given date.

There are several specific yield types depending on the nature of the net income. Trems commonly used in Australia are:

Effective Yield

The Effective Yield is the percentage return on value or price derived from the current net income after adjusting for rent incentives or impending vacancies.

Equated Yield (refer Whipple (1995, p 335-336))

The Equated Yield is an annualized yield that is derived from the current net Income and future changes to the net income over time with specific consideration of future rental growth. It is the rate of return over a specific time period that has been adjusted for rental growth'

Equivalent Yield

The equivalent yield is an annualised yield that is derived from the current net income and future changes to the net income over time but no allowance is made for future rental growth. This is the rate of return of a net income stream over a specific period of time that reflects current actual rents and costs and current levels of rental values.

Initial (passing) Yield

The initial or passing yield is the percentage return on value or price derived from the current net passing income. No allowance is made for any future rent growth.

Market yield

The market yield is the percentage return on value or price derived from net income that reflects current market rent. If the current income from a property is at market level, then the market yield is the same as the initial (passing) yield.

Reversionary yield

The Reversionary yield is the percentage return on current value or price derived when current market rents are payable. This yield relates a future net income to a current value or price and it is normally quoted together with the date from which it will apply. To calculate a Reversionary Yield one would determine those leases that are subject to a market rent review within the period of consideration and adjust the income from those leases for the effect of the reviews. It should not be confused with the Terminal yield.

Terminal Yield (and Capitalisation Rate)

The Terminal or Exit yield is the percentage applied to the expected net income following a hypothetical sale at the end of the cash flow period. It is a capitalisation rate used to determine the terminal value in a discounted cash flow exercise.

It is recommended that other yield terms are not used in Australia without an associated definition.

At this stage, it is logical to outline the discounted cash flow technique to valuation which is sometimes referred to as a contemporary technique. However, it still falls within the general category of an income approach.

2.2 Contemporary Valuation Techniques – Discounted Cash Flow

2.2.1 Introduction

The basic discounted cash flow model has already been explained and the results of the analysis in terms of Net Present Value and Internal Rate of Return explained. Therefore, the most important factors to be covered are:

- how does it fit into the valuation process
- how does it differ from the conventional valuation techniques.

The discounted cash flow technique is still obviously one of discounting future benefits, i.e. converting these rights/cash flows to a present worth sum as in the traditional approach outlined above.

The cash flows to be discounted to obtain present worth are also still net cash flows derived by the same procedural steps as outlined in Section 2.3. Therefore the discounted cash flow technique fits into the general valuation process quite readily and is in fact merely an extension of the capitalisation process already outlined above.

Discounted cash flow differs from the conventional techniques in that it is explicit in making certain assumptions, i.e.

- future growth in rental and capital values
- a target rate/yield required from the investment.

The conventional techniques use a discount rate which is derived from market SALES analysis and does not explicitly make assumptions about future rental and capital values.

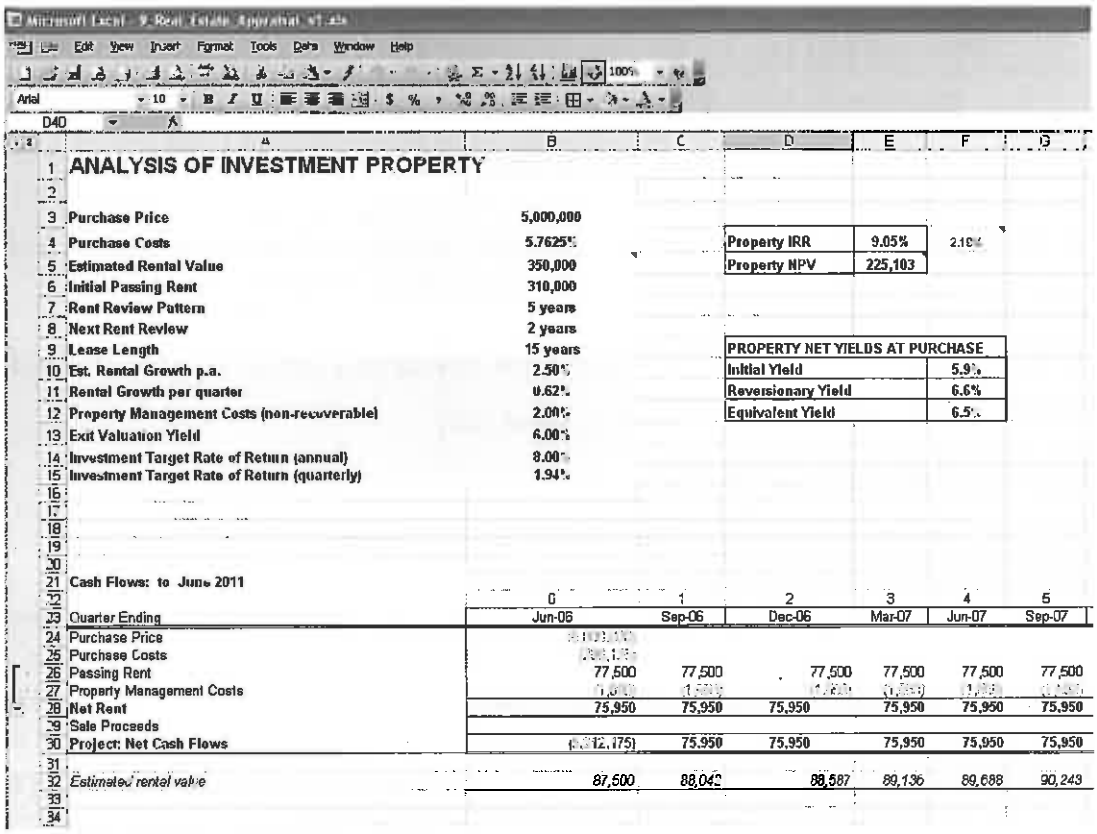
The typical variables of the discounted cash flow model of property valuation would be:

- cash flow projections at explicit growth rates
- market capitalisation rate/sale price
- target rate/required rate of return from the investment.

The increasing use of computer spreadsheets encourages a tabular format in setting out such models, as illustrated in the spreadsheet 'DCF' in the in the file 9_Real Appraisal_v1.xls in the MathHelp Financial Maths REDE3100 module 3 folder. This spreadsheet is taken from from Sayce et al (2006) 'Real Estate Appraisal, from Value to Worth'. The key elements are reproduced below. DCF as a valuation technique basically uses the concept of net present value to indicate the value of the property. Once the possible cash flow has been determined from the property investment and an appropriate discount rate applied, the net present value can be determined. This represents the possible purchase price an investor can pay given target/discount rate for the investment and is used to assist the valuer in formulating his opinion as to market value.

Example

A commercial property is let to a single tenant at $310,000 per year ($77,500 per quarter) in advance on a 15 year lease with 5 year rent reviews. The estimated current market rental value is $350,000 per year and the next rent review is in 2 years time. The required rate of return / target rate is 8% and from analysis of the market a rental growth rate of 2.5% per year is considered applicable to the property's cash flow. A terminal / exit yield of 6% is used. On this basis the cash flow would be as follows.



Edit View Insert Format Tools Data Window Help

Arial 10

D40

ANALYSIS OF INVESTMENT PROPERTY

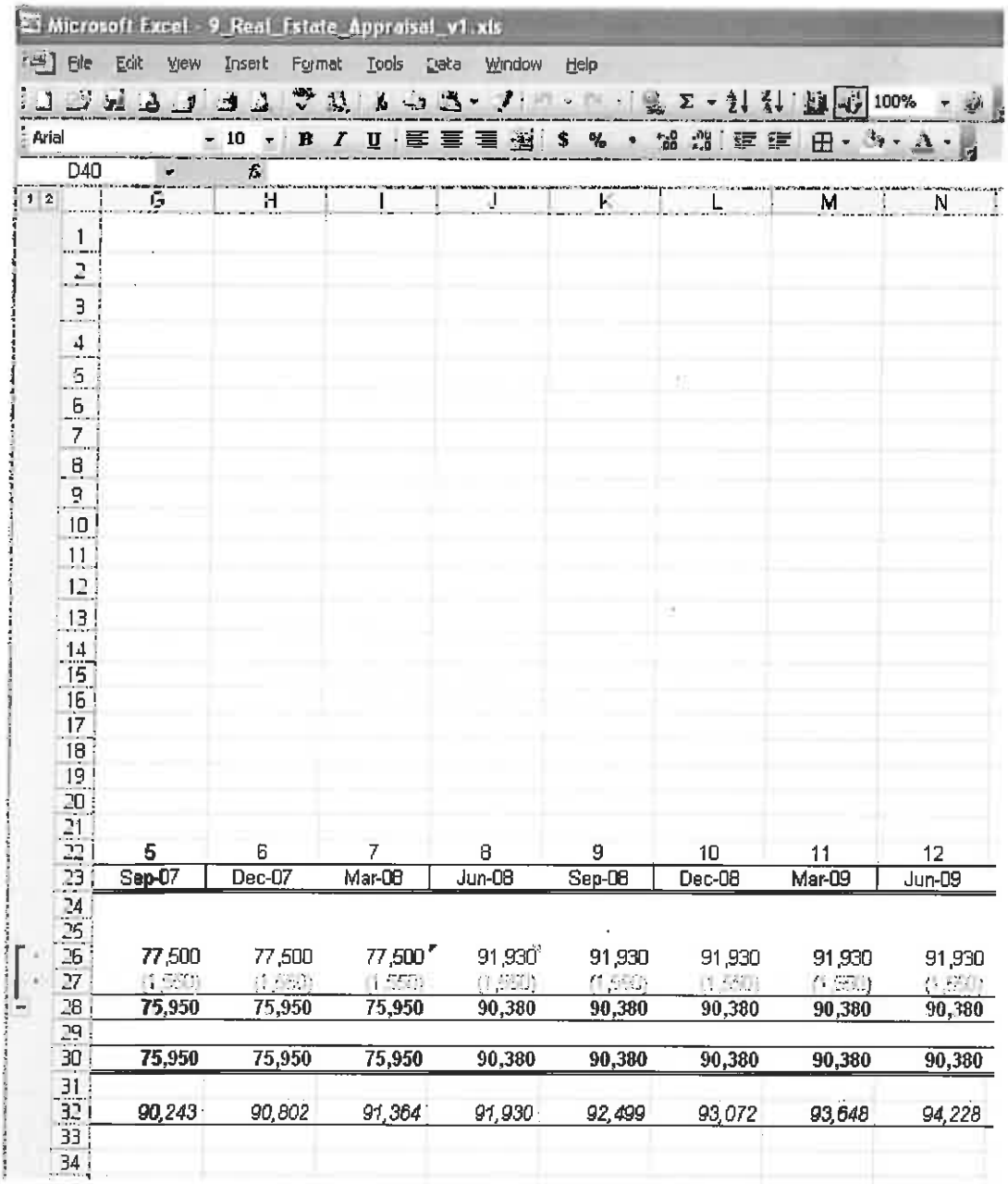
Purchase Price	5,000,000
Purchase Costs	5.7625%
Estimated Rental Value	350,000
Initial Passing Rent	310,000
Rent Review Pattern	5 years
Next Rent Review	2 years
Lease Length	15 years
Est. Rental Growth p.a.	2.50%
Rental Growth per quarter	0.62%
Property Management Costs (non-recoverable)	2.00%
Exit Valuation Yield	6.00%
Investment Target Rate of Return (annual)	8.00%
Investment Target Rate of Return (quarterly)	1.94%

Property IRR	9.05%
Property NPV	225,103

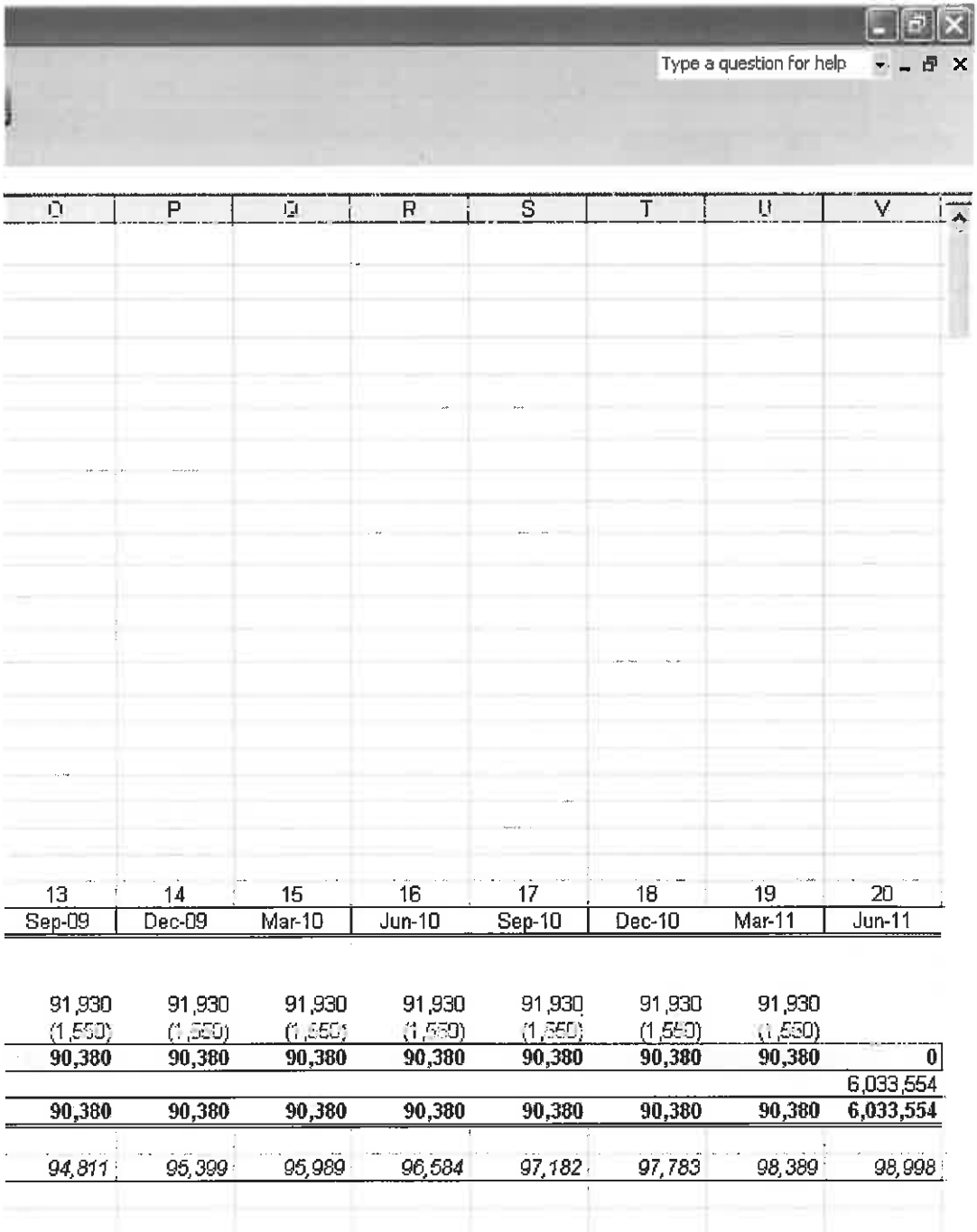
PROPERTY NET YIELDS AT PURCHASE	
Initial Yield	5.9%
Reversionary Yield	6.6%
Equivalent Yield	6.5%

Cash Flows: to June 2011

	0	1	2	3	4	5
Quarter Ending	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07
Purchase Price						
Purchase Costs						
Passing Rent	77,500	77,500	77,500	77,500	77,500	77,500
Property Management Costs						
Net Rent	75,950	75,950	75,950	75,950	75,950	75,950
Sale Proceeds						
Project: Net Cash Flows		75,950	75,950	75,950	75,950	75,950
Estimated rental value	*87,500*	*88,042*	*88,587*	*89,136*	*89,688*	*90,243*



	5	6	7	8	9	10	11	12
	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09	Jun-09
	77,500	77,500	77,500	91,930	91,930	91,930	91,930	91,930
	(1,550)	(1,550)	(1,550)	(1,550)	(1,550)	(1,550)	(1,550)	(1,550)
	75,950	**75,950**	**75,950**	**90,380**	**90,380**	**90,380**	**90,380**	**90,380**
	75,950	**75,950**	**75,950**	**90,380**	**90,380**	**90,380**	**90,380**	**90,380**
	90,243	*90,802*	*91,364*	*91,930*	*92,499*	*93,072*	*93,648*	*94,228*



O	P	Q	R	S	T	U	V
13	14	15	16	17	18	19	20
Sep-09	Dec-09	Mar-10	Jun-10	Sep-10	Dec-10	Mar-11	Jun-11
91,930	91,930	91,930	91,930	91,930	91,930	91,930	
(1,550)	(1,550)	(1,550)	(1,550)	(1,550)	(1,550)	(1,550)	
90,380	**90,380**	**90,380**	**90,380**	**90,380**	**90,380**	**90,380**	**0**
							6,033,554
90,380	**90,380**	**90,380**	**90,380**	**90,380**	**90,380**	**90,380**	**6,033,554**
94,811	*95,399*	*95,989*	*96,584*	*97,182*	*97,783*	*98,389*	*98,998*

2.2.2 Cash Flow Projections

Current rental income is estimated, as outlined in the conventional techniques and then used as a basis for future cash flow. Current rentals then become the basis for the cash flow until such time as there are rent reviews which will change the level of rental income to the appropriate market level. These changes in rental income are then explicitly allowed for, together with any changes in the level of non-recoverable operating expenses and vacancy

factors that may have to be specifically allowed for in future discount periods. These projected cash flows are usually calculated allowing for rental growth at the appropriate rent review.

2.2.3 Terminal (Exit) Capitalisation Rate

The final cash flow will incorporate the estimated sale price or reversionary capital value of the property which is derived by applying a market capitalisation rate to the estimated income in the final year of the investment's holding period. This conveniently tackles the problem of the perpetual nature of a freehold property investment which implies an infinitely long cash flow projection.

2.2.4 Investment Target Rate/ Required Rate of Return

The question of the appropriate discount rate to be applied to the net cash flow is a problem which has not yet really been fully resolved.

The standard approach is to derive a discount rate through comparison with alternative investments other than property with appropriate adjustments; this process is likely to be more subjective. This discount rate is an opportunity cost of capital adjusted for risk.

2.2.5 Valuation

Based on the investment analysis assumptions (target discount rate of 8%, growth rate of 2.50%, etc) the valuation indicates that the property has an investment value of $5,225,103, (that is a net present value of $225,103 + proposed purchase price of $5,000,000. If these variables can be said to apply to the willing vendor/purchaser, then the figure of investment value can be said to indicate market value.

Alternatively, a possible purchase price of the property of 5,225,103 can be incorporated into the cash flow and the IRR computed (in this example of course, the IRR would be 8%). If this IRR calculated falls within market expectations, this would assist the valuer in formulating an opinion on whether the proposed purchase price indicates market value.

The DCF techniques require an estimate of the growth rates of the cash flow and an appropriate discount rate. These estimates have an element of subjectivity. However, it is argued that the manipulation of the capitalisation rate in the conventional technique is also subjective and variations in this variable have a much greater impact on the final solution. It is also argued that implied growth rates can be analysed from actual market sales.

2.2.6 Which technique to use? Conventional or contemporary?

The validity of the various conventional and contemporary valuation techniques has been under debate for a number of years now. One school of thinking argues that DCF techniques are too subjective for open market valuation purposes and should be restricted to investment analysis. Another school of thought points out that in most cases the perfect comparison does not exist and therefore in most cases the conventional valuation techniques are not only subjective but inconsistent and generally inferior to DCF techniques as long as reliable growth rates can be obtained from market analysis and applied to their relevant cash flows. It can be argued that the techniques used will be dependent on the quality of sales evidence available at the time.

One can conclude that whatever technique is used, the quality of the valuation will be dependent on the quality of the information available and the ability of the valuer to be able to interpret this information in the most rational way.

2.3 The Valuation of Leasehold Interests

Leasehold tenure is by definition an interest in land for a period which is determinable at some defined future date.

Examples of leases are:

- **ground leases:** the lease of land for building in return for a payment of ground rent, usually with the obligation to erect buildings on the land
- **occupation leases:** the lease of premises for occupation, e.g. shop leases granted for 5 years
- **sub-leases:** e.g. the lessee of a commercial building sub-leases part of the premises leased by the company to another.

The worth of a lease is dependent on its potential to produce a profit rent, i.e. the net rent obtainable or obtained exceeds the net rent payable.

Profit rents arise for a number of reasons and the calculation of their investment worth involves the following steps:

- establish present profit rent, taking into consideration outgoings/operating expenses
- estimate any variations in this profit rent (cash flow to lessee) in the future

- capitalise the profit rents (cash flow).

Unless there is an established market for leasehold interests where suitable comparables can be selected on which to base appropriate capitalisation rates, the more conventional approach (as outlined for the valuation of freehold interests above) is arguably difficult to justify. The valuation of leasehold interests has also been the subject of much debate in recent years and it is not the intention of these notes to discuss the merits of those arguments in detail. However, the example illustrated below uses a DCF approach to the problem, as this is considered to be as appropriate as any method in most circumstances.

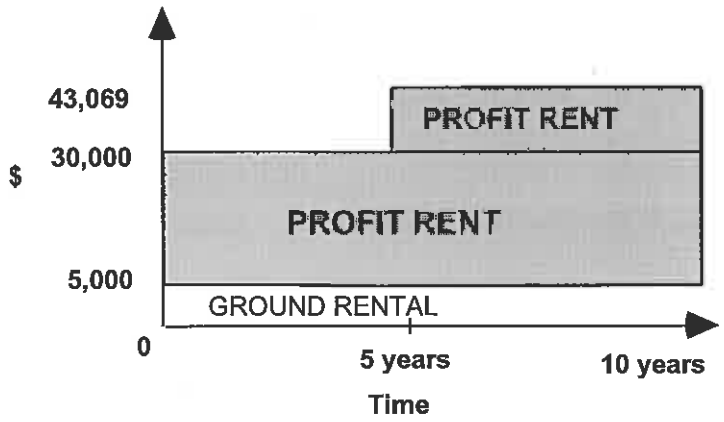
Example

An industrial property is let on a ground lease with 10 years unexpired at a fixed rent of $5 000 p.a. The property has just been sub-let at its estimated rental value of $30 000 p.a. on 5 year reviews to a market rent (i.e. the rent review is in 5 years time). From market analysis it is anticipated that rental growth rates will be approximately 7.5% p.a. over the next 5 years. Therefore nominal net rental value in 5 years will be $(1.075)^5$ x 30 000 = $43 069.

The figures and diagram below show the future profit rents/cash flow enjoyed by the lessees.

	1	2	3	4	5	6	7	8	9	10
Project net rent value	30,000	30,000	30,000	30,000	30,000	43,069	43,069	43,069	43,069	43,069
Less Ground Rent	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Profit Rent	25,000	25,000	25,000	25,000	25,000	38,069	38,069	38,069	38,069	38,069
PV @ 18%	21,186	17,955	15,216	12,895	10,928	14,102	11,951	10,128	8,583	7,274

This profit rental/cash flow pattern is illustrated by the diagram below.



NPV @ opportunity cost or target rate of 18% = $130,216. Therefore, investment value of lessee's interest is $130,216 based on the example's assumptions, say $134,000.

The above DCF approach can of course be applied to more complicated cash flow patterns produced by varying profit rentals and it is in these cases that the approach is particularly suitable.

2.4 Conclusion

Module 3 has provided a general overview of the theory and practice of the income approach to valuation. The theory is merely the discounting of income flow expected from the return of real estate investment to calculate present worth. In practice, the theory is applied in using two different techniques.

The conventional method discounts income using the overall capitalisation rate derived from the analysis of sales evidence where

$$\text{capitalisation rate} = \frac{\text{ni}}{\text{sale price}}$$

The method assumes a level annuity without taking into account inflation, and uses a real discount rate. Whereas the more contemporary DCF methods generally are 'monetarist' in approach, i.e. the expected annuity incorporates inflation estimates and discounts at an opportunity cost of capital.

The following topic considers the application of these valuation methods to particular types of property and discusses the general nature of the markets within which these valuation models operate.

For Required Reading see attached

Robinson, J. (1989) Property Valuation and Investment Analysis: A Cash Flow Approach. Sydney: Law Book Co., pp. 15-20

D.J. Wilson (1991) Elements of the Capitalisation Rate'

W.D. Fraser (1981) YP or DCF – A question of comparables

JLW RESEARCH (1992) 'Capitalisation and discounted cash flow valuation: bridging the gap, Property Research Paper, December 1992. JLW Research &Consultancy Pty Ltd.

Reading 2.1

Robinson, J. (1989) Property Valuation and Investment Analysis: A Cash Flow Approach. Sydney: Law Book Co., pp. 15-20

Chapter 3: The Conventional Wisdom

Introduction

The term "conventional wisdom", coined by an economist (Galbraith, 1962, p. 17), has no better application than in the valuation of real property. As stated in Chapter 1, the value of real estate is best ascertained by discounting the net income receivable for the life of the real estate investment. The mathematics of discounting have been available since the 17th century (Burton, 1982), but it was first applied to real estate by Inwood who published, amongst other things, the first perpetuity table in 1811. This has remained the conventional wisdom ever since. The concept of conventional wisdom helps to explain why the valuer's calculus assumes income is receivable forever, why the calculus fails to recognise future rises in land values, why the calculus rarely specifically allows for the fact that buildings depreciate and why the procedure states that the overall capitalisation rate subsumes all of the exigencies of the market because the rate is itself market determined.

It should always be remembered that real estate investment is no more than one possible way in which investors may place their funds so that real estate is in constant competition with other avenues of investment. There are two main modes of investment, debt and equity. Debt investments involve a capital outlay in return for a fixed periodic income (so-called fixed interest securities including government bonds, notes, debentures and mortgages) for a predetermined period at the end of which the original capital outlay is returned. The measure of return is the rate of interest payable. Equity investments involve a similar outlay which comprises full, or part, ownership of a body corporate or an asset (e.g., ordinary shares in a public company listed on a stock exchange). The shares may be bought and sold at will; the shares entitle the holder to a share of the profits and this is paid periodically but it is not guaranteed. There is a possibility of capital gain or loss. The measure of return is effective yield (cf., interest) plus possible capital gain. There is a vast literature on measurement of equity returns based on forecasting of profit and hence yield and capital gain (see, e.g., Merrett & Sykes, 1973; Sharpe, 1981; Weston & Brigham, 1981). Real estate is a type of equity investment. Rentals are receivable periodically and these may increase with escalations or decrease with vacancies. Capital gains or losses may be made. However, the measure of return is the capitalisation rate which implies a fixed interest (or debt) measure in an equity investment. The measurement techniques described in the above literature should be applied to real estate for the same reasons that they are applied to equity investments and this book is written to that end.

Capitalisation

Standard texts discuss the conventional wisdom of income capitalisation (see, e.g., Britton et al., 1980; American Institute of Real Estate Appraisers (A.I.R.E.A.), 1978; Rost & Collins, 1984; Murray, 1973). These texts use, as a justification, comments such as: "based on the principle of anticipation reflected in the definition of value as the present worth of all the rights to future benefits accruing to ownership" (A.I.R.E.A., 1978, p. 315).

The conventional wisdom is to value the income receivable in perpetuity: "as the (freehold) interest is perpetual then income from the property will be perpetual" (Britton et al., 1980, p. 96); "this concept has traditionally been considered applicable in the valuation of land because land is imperishable" (A.I.R.E.A., 1978, p. 391). However, although land may be imperishable, and a freehold interest in land be perpetual, income is only receivable from urban land once improvements have been effected to, and on, that land apart from the case of ground rents charged in anticipation of development. In the context of this book, the improvements are buildings, and buildings are not imperishable. Obsolescence, fashion, the social climate of opinion, dictate that buildings must be replaced at periodic intervals:

> "The indestructible physical characteristics of land permit consideration of income derived from use of land as extending on and on into perpetuity, without termination. Improvements placed on land have finite economic lives; but new improvements can replace old ones, and the cycle of replacement for all practical purposes can be conceived as extending on into infinity" (Ring, 1970, p. 267).

Thus the conventional wisdom assumes that the replacement process is subsumed by the capitalisation rate.

Although reference to the market demonstrates that vacant land has value, it only has value in anticipation of future improvements being made. The value, by way of rental income, will not be realised until the improvements (buildings) are erected and occupied. If the income producing improvements on the land are less than perpetual, then this fact must be recognised in value. However, perpetuity has been considered to be a close approximation because the effect of discounting incomes receivable for more than 50 or 60 years has such a small effect on present worth, that the period between 50 or 60 years and perpetuity (infinity) becomes negligible. But the conventional wisdom assumption that buildings have an optimum economic life of 50 or 60 years must be accepted. In fact, in recent years, this assumption has itself been demonstrated to be, at best, doubtful. Buildings less than 15 or 20 years old are being replaced or radically refurbished, and these short periods and high future costs are being ignored by the calculus of the conventional wisdom.

There are other factors which are not explicitly recognised. The conventional wisdom treats income receivable for the life of the building as a level annuity. This is because capitalisation is based upon the income expected to be received, if the building is fully let, in the next year of operation commencing now. However, rentals constantly change over time, but there are many possible scenarios four of which are considered. The first is the base assumption of fixed rentals, a limiting scenario assuming full occupation. The second allows for rental increases on an annual basis, also a limiting

scenario (under the assumption of yet another piece of conventional wisdom that rentals are receivable annually in arrears when it is known that rentals are actually receivable in advance several times each year; however, this piece of conventional wisdom is retained throughout for simplification). The third scenario allows for rental increases, but only where such increases are made possible at lease renewal (every five years in the example). Finally, rental increases on the common assumption of biennial rent reviews is also illustrated. It is assumed, for this example, that rentals increase at 10% per annum, and values have been calculated for rentals received over a ten year period with no reversion at the end of this time. Discounting factors for periods less than perpetuity with the resulting capital recovery requirement, and for interests other than freeholds, are discussed in Chapter 8. The conventional wisdom also treats the cash flows on a before tax basis on the ground that taxation is an individual matter and that valuation is market oriented and does not take an individual into account.

Baum (1984) has discussed the implicit factors subsumed by the conventional wisdom. These are listed as follows:

> "(1) gearing . . .;
> (2) management costs . . .;
> (3) acquisition costs . . .;
> (4) risk of shortfall in service charges . . .;
> (5) dilapidations;
> (6) risk of voids or non- or late-payment of rent;
> (7) lack of liquidity and high initial capital outlay;
> (8) prestige and occupation rights;"
> and it is stated that "this list is not finite . . ." (Baum, 1984, p. 233).

An alternative list is put forward by A.I.R.E.A. (1978) as follows:

> "(1) safety . . . of return of capital . . .;
> (2) reliability of yield . . .;
> (3) marketability . . . prerequisite to liquidity . . .;
> (4) denominations . . . amounts (required) . . .;
> (5) acceptability as collateral . . .;
> (6) duration . . . short or long term . . .;
> (7) freedom from care . . . (i.e., management) . . .;
> (8) potential appreciation . . .;
> (9) tax advantage . . ." (A.I.R.E.A., 1978, p. 369).

Murray (1973) groups these factors under the headings of "the risk involved in the investment" (p. 107) and "the price of money" (p. 108). Murray also states that other implicit factors, such as the condition of the building, obsolescence and accrued depreciation, are "automatically (taken) into account" (p. 108) in the actual returns arising out of the property.

The conventional capitalisation methodology (see exhibit 3.1) is that value is equivalent to capitalised net income, i.e.,

$$\text{value} = \text{net income} / \text{capitalisation rate}$$

where the capitalisation rate is itself calculated by reference to market evidence by transposing the value equation, i.e.,

$$\text{capitalisation rate} = \text{net income} / \text{value}$$

where value is synonymous with sale price. Much of the rest of this book is taken up with "exposing the implicit".

Net income	100,000
Years' purchase in perpetuity at 10% (multiplier)	10
Value	1,000,000
or	
Net income	100,000
Capitalisation rate (divisor)	10%
Value	1,000,000

Exhibit 3.1: Conventional Capitalisation

For the reasons discussed above, perpetuity is assumed in the case of freehold real estate. Accordingly, a sinking fund factor is not required to replace the capital since the value of this sinking fund factor approaches zero as the term of years approaches infinity.

Several authors have made explicit some of the implicit factors discussed above. The most developed form of this methodology is the component capitalisation procedure where returns from real estate are partitioned into seven components:

"(1) return of original equity investment;
(2) growth of equity from amortisation;
(3) growth of equity from value appreciation;
(4) value of cash flows at first year level;
(5) growth (decline) of cash flow stream;
(6) tax shelter of (project's) cash flow;
(7) tax shelter of external income" (Dilmore, 1985, p. 21).

Separate appropriate discount rates are assigned to each component, and a weighted average rate is calculated.

Cash Flow Analysis

In order to expose the implicit, the individual periodic cash flows must be investigated in detail. The conventional wisdom sometimes attempts to deal with the implicit by allowing qualitative adjustments to the capitalisation rate, but the implicit cannot be fully exposed in this manner. A monetarist view must be taken in order to assess the projected flow of funds to (and from) the development or investment. Cash flow analysis is a technique whereby cash flows can be so assessed. The component capitalisation technique discussed above (Dilmore, 1985) is really a form of cash flow analysis as the weighted average rate is really the internal rate of return.

Cash flow analysis recognises that the size, sign and timing of cash flows is critical. Building development does not involve a lump sum spent on a single day; it entails a series of unequal negative and positive cash flows distributed unevenly over a number of years. Conceptually, an account is

opened for the project and through the account the following transactions are passed:

(1) inflows of money to the project;
(2) outflows of money from the project;
(3) interest is charged each period when the account is in debit; and
(4) interest is credited each period when the account is in credit.

If the final balance of the account is zero, or positive, then it can be said that the project has provided a rate of return of at least the rate of interest allowed in 3 and 4 above. Either of the two methodologies discussed in Chapter 2 may be applied, namely, net present value or internal rate of return.

Using a simple hypothetical example, a cash flow may be tabulated as follows. The net income of $100,000 is received for the holding period of ten years. The initial cost is capitalised net income receivable in the first year of the holding period, namely, $1 million. The reversion, by way of an assumed resale at the end of the holding period is capitalised net income receivable in the year following the holding period, in this case, also $1 million (see exhibit 3.2). It is demonstrated that the internal rate of return on this cash flow profile is 10%, the same as the capitalisation rate. This will always be the result assuming a level annuity and a perpetual income. Thus the connection between conventional capitalisation and cash flow analysis becomes obvious.

Year	Cost	Net Income	Reversion (Sale)	Net Cash Flow
0	(1,000,000)			(1,000,000)
1		100,000		100,000
2		100,000		100,000
3		100,000		100,000
4		100,000		100,000
5		100,000		100,000
6		100,000		100,000
7		100,000		100,000
8		100,000		100,000
9		100,000		100,000
10		100,000	1,000,000	1,100,000

Exhibit 3.2: Simple Hypothetical Example: Cash Flow

But two related events which usually occur in property investment should be considered. First, rental changes over time. Second, there is a change in capital value of the investment over time.

To take the second event first, the increase in capital value may be assessed in the same way as a term and reversion valuation of a freehold property which is let at less than full rental value. The holding period may be considered as the term, normally the term remaining in the lease which prevents rental escalation until the lease has run its course. The increase in value at the

end of the holding period as a result of the rental escalation to full rental value may be considered as the reversion, often taken to be a hypothetical sale. In the example, although rentals have been projected to rise by 10% per annum during the holding period, the rental increase can only be received at the end of this period, so the same cash flow profile in exhibit 3.2 above occurs except for the reversion amount, and this is demonstrated in exhibit 3.3. The internal rate of return calculation in this situation is known as equivalent yield (Enever, 1977, p. 119).

Net income	$100,000
Initial capitalisation rate	10.00%
Reversionary capitalisation rate	10.00%
Rental escalation	10.00%

Year	Cost	Net Income	Sale Price	Net Cash Flow
0	(1,000,000)			(1,000,000)
1		100,000		100,000
2		100,000		100,000
3		100,000		100,000
4		100,000		100,000
5		100,000		100,000
6		100,000		100,000
7		100,000		100,000
8		100,000		100,000
9		100,000		100,000
10		100,000	2,593,742	2,693,742
		Equivalent yield		17.09%

Exhibit 3.3: Equivalent Yield

Now to return to the first event, namely, rental escalation during the holding period, a different cash flow profile results (see exhibit 3.4) and this provides yet another internal rate of return calculation known as equated yield (Enever, 1977, p. 114).

Each time the cash flow profile is varied as a result of rental projections, a different equated yield results. For example, consider the rental cash flows shown in exhibit 3.4. If five year leases, as are normal in the commercial rental market, are considered as part of the rental projection, then the equated yield becomes 17.09%; and if there are rent review periods of two years, as is also normal, then the equated yield is 19.56% (exhibit 3.5). It is obvious that the level of projected rental increase has a large effect on the final outcome.

Net income	$100,000
Initial capitalisation rate	10.00%
Reversionary capitalisation rate	10.00%
Rental escalation	10.00%

Year	Cost	Net Income	Sale Price	Net Cash Flow
0	(1,000,000)			(1,000,000)
1		100,000		100,000
2		110,000		110,000
3		121,000		121,000
4		133,100		133,100
5		146,410		146,410
6		161,051		161,051
7		177,156		177,156
8		194,872		194,872
9		214,359		214,359
10		235,795	2,593,742	2,829,537
		Equated yield		20.00%

Exhibit 3.4: Equated Yield

Year	Fixed Rental	Term and Reversion	Two-yearly Reviews	Annual Reviews
0	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
1	100,000	100,000	100,000	100,000
2	100,000	100,000	100,000	110,000
3	100,000	100,000	121,000	121,000
4	100,000	100,000	121,000	133,100
5	100,000	100,000	146,410	146,410
6	100,000	100,000	146,410	161,051
7	100,000	100,000	177,156	177,156
8	100,000	100,000	177,156	194,872
9	100,000	100,000	214,359	214,359
10	1,100,000	2,693,742	2,808,101	2,829,537
IRR	10.00%	17.09%	19.56%	20.00%

Exhibit 3.5: Equated Yield: Rental Growth Scenarios

Conclusion

The conventional wisdom in respect of valuation and property investment analysis has been discussed in this chapter. The justification for cash flow analysis is shown to be the specific allowance that can be made for all of the market factors currently assumed to be implied in, or subsumed by, capitalisation analysis. Yet cash flow analysis is also shown to be an extension of capitalisation; the real cost approach of capitalisation is turned into a monetarist approach using cash flow analysis.

Reading 2.2

D.J. Wilson (1991) Elements of the Capitalisation Rate'

Elements of the capitalization rate

DAVID J. WILSON

David J.Wilson, B.Sc., AACI, ARICS Is a real estate appraiser and chartered surveyor with RE Analysts, Inc. in Fort Lauderdale, Florida.

Although a prime factor in the valuation of investment real estate, the capitalization rate selection process is generally given short shrift in even the most detailed appraisal report. This is unfortunate to say the least, for the capitalization rate selection process is subject to a number of very important variables, all of which, to a greater or lesser extent, influence the marketability and the value of investment real estate.

The basic principle in valuing investment property is the recognition that an investor invests capital to obtain an annual return in the form of a net income. To the investor, this represents an acceptable rate of return, which is also termed the capitalization rate. The capitalization rate can also be a measure of comparison between various investments.

The capitalization rate chosen reflects all the different qualities between the investment in question and others that are available. In simple terms, the capitalization rate is a mathematical relationship which exists between the net income derived from the property and the value or price which a probable purchaser would pay for the privilege of receiving that net income stream. The influences that most affect the price a purchaser will pay for an investment property are the quality, quantity and probable duration of the net income expectancy, as well as general economic conditions.

In selecting a capitalization rate, a distinction must be made between property specific influences such as location, rental vacancies and tenant covenants and macro economic influences such as the current inflation rate. Significant errors in the capitalization rate selection process can occur if undue influence is given to macro economic conditions without an adequate understanding of how such factors affect the specific property investment. However, it remains to be argued whether capitalization rates vary as a result of the random walk hypothesis, which holds that capitalization rates vary only in response to new information and circumstances, all other influences being unaffected, or the very analytical efficient market theory, which assumes that the market is aware of all influences that affect value and that it reflects this in price and the resultant cap rates.

This article assumes that efficient market theory (EMT) is paramount in the real estate investment process and that investors, or at least the more dominant ones, are so rational, knowledgeable and well advised that the real estate investment market becomes as perfect as possible in an increasingly analytical world.

In defence of this position, it can be argued that the accepted definition of market value assumes EMT as follows:

> "Market value is the most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus."

Table I illustrates the various factors that can influence the capitalization rate and which are deemed by the definition of market value to be known by a knowledgeable investor.

Table I

Property specific factors	Economy specific factors
Future rental growth and capital appreciation	Current inflation rate
Strength of lessee, covenants and tenant's ability to pay	General level of interest rates
Rent review pattern	General level of investor confidence
Age-life of improvements and income stream	Economic health of area/region/country
Ease of management and size of the investment	
Liquidity of the investment	
Prestige of the investment	
Ratio of land value to total value	
Taxation advantages	
Location of the investment	

Future rental growth and capital appreciation

For prime investment property, expectation of rental growth and implicity, capital appreciation has undoubtedly been the most critical and important factor over the last 25 to 30 years. This is the reason why property investment has attracted the attention of major corporate investors and, most notably, life assurance companies throughout the world.

To the less sophisticated investor, rental growth is often of more immediate interest and, therefore, of more influence than capital growth which, in most cases, is only a paper profit. Yet, it is interesting to note that rental growth has only recently been a factor in capitalization rate analysis. Only since the 1950s, as interest rates moved up from the historically low rates of the pre-war years, has the attraction of rental growth been a prime motivation for real estate investment. In effect, the market has accepted the fact that inflation is here to stay, despite the contrary views of most politicians.

In essence, the greater the anticipated rental growth, the lower the capitalization rate, presuming all other factors remain the same. Conversely, a property with low, or even negative, rental growth would require a higher capitalization rate. This factor is of such importance it would not be an overstatement to say that, in almost every case, low capitalization rates imply strong rental growth.

Strength of tenant covenant

An investor buys an income producing property in anticipation of receiving a net income over the life of the investment. Hence, vacant space or tenant bad debts not only erode confidence in the investment but can also require the investor to subsidize the property until such time as cash flow improves. It is obvious, therefore, that a tenant or tenants with good covenants provide a significant advantage to the investor and, as such, would likely result in a lower capitalization rate for such a property over a similar property with less desirable tenant covenants.

A government covenant is probably the best, hence the view that government is the developer's best friend. Regularly, it seems, the media reports that a government department has agreed to take space in a new project which not only allows the developer to lease up a project that was not going to sell so well, but generates a lower capitalization rate and a resultant higher value. The developer is a two-way winner.

Other covenants such as multinational, national or regional corporations are almost as good although the market has seen a number of failures or mergers between such firms that has dealt a blow to some real estate investors. The airline industry, the accounting profession and, recently, the banking industry seem to be the best examples of this situation which has left many otherwise prime properties vacant. Nevertheless, a good corporate covenant is of definite benefit to the investor and, in selecting a capitalization rate, significant regard has to be given to the percentage of space occupied by good corporate or government covenants. This is especially true in the typical retail investment where anchor tenants not only contribute to the success of the property but also provide, in most cases, a very secure income.

In placing the value of a corporate covenant in perspective, it should be recognized that, short of bankruptcy, a company in difficulty will stop paying dividends to shareholders before it stops paying rent.

Rent review pattern

The rent review pattern is one of the least understood variables in the capitalization rate selection process. Historically, rents tended to be very stable and rent reviews were not typically included in most leases. However, as inflation became more of a presence, rent reviews began to appear in more leases. The trend started in Britain where leases often ran for 20 years or more without rent review. Leases in North America were often for shorter terms with rent

of an influence than is generally accepted, but they can achieve some importance.

Investor confidence

Investor confidence is perhaps the most important factor since it will establish the demand level for investment property. Investor confidence can vary with the property type, as certain property types can still be attractive to an investor despite an otherwise general downturn in the market.

This scenario is perhaps best shown by multi-family investments during times of economic downturns. Such properties with increasing occupancy ratios, regular rental growth and stabilized expense ratios can be far more attractive than industrial or commercial investments with increased vacancies, no rental growth and poor marketability. Although vacancy levels can rise as family units merge in more difficult economic climates, e.g., as young adults temporarily move back in with their parents or families rent out surplus accommodation, this is generally far less a factor than retrenchment or failure of commercial and industrial tenants.

Thus, it is important to differentiate between the general levels of investor confidence and the more specific elements of investor confidence as they relate to differing property types.

Part of investor confidence is due to other macro economic factors such as the overall level of economic activity, the general level of interest rates and the level of inflation.

Interest rates

Interest rate levels and, to a great extent, the inflation rate are national or even global factors, whereas the level of local economic activity, although influenced by such factors, is more controlled by regional factors.

In analysing capitalization rates, the macro economic factors are often over-simplified. Historically, capitalization rates have been linked with interest rates and utilized to derive involved capitalization techniques such as the somewhat discredited mortgage equity concept.

The fallacy of the mortgage equity concept is that, as interest rates rise, so will capitalization rates. While this may be true in some cases, it is not a universal truth. For example, a Canada Mortgage and Housing Corporation (CMHC) analysis of multi-family capitalization rates in Vancouver during the period 1974 to 1983 showed an inverse relationship with capitalization rates reducing as interest rates escalated.

Indeed, a similar situation occurred in the late 1970s in Britain when the incoming Thatcher government raised interest rates to an all-time high to combat inflation and spiralling wage demands. Capitalization rates not only remained relatively stable, they actually fell for some types of property, thus destroying decades of price theory.

Further investigation of this strange relationship showed that, while interest rates were on the rise, inflation and, more particularly, rental levels were growing at an even faster rate. This made such investments very attractive for investors seeking a hedge against inflation and resulted in capitalization rates falling in the face of increased demand. In view of this, there is enough evidence to justify severing a direct link between capitalization rates and interest rates. It is obviously more complicated than previously acknowledged.

However, it must be said that interest rates do indeed affect activity in the market, although this may or may not affect capitalization rates.

Inflation rates

Inflation is simply the phenomenon of rising prices of goods and services, and, as a result, the fall in purchasing power of money. In recent years, but not necessarily historically, real estate has been considered a good hedge against inflation.

Additionally, the level of inflation can have an influence on the construction industry since developers find that new construction becomes uneconomic in periods of high inflation. This reduces the supply of new properties onto the market and may result in lower vacancies and higher prices for existing products. This decreases the capitalization rate until, at a point in this cycle, building becomes economic again and construction activity commences.

One of the main influences of inflation on property values has resulted from the change of character in the investment market. Before inflation became a serious issue, large investment concerns such as the life companies were content to hold their investments in the form of shares or mortgages. The inflationary push that has occurred since the late 1950s forced such institutions to reconsider their investment strategy. Life companies, for instance, found that not only were revenues eroding, but commitments, in inflation dollars, were increasing. By the early 1970s, the availability of better quality investments was severely limited and capitalization rates began to fall to the extent that many institutions were forced to become their own developers.

Overall economic activity

There is no simple link between the overall level of economic activity and capitalization rates. Real estate investments can, and do, buck the trend shown by other investment mediums. This results primarily from the character of real estate in general, especially the fact that there is a finite supply of land. Indeed, not only have values of prime property remained relatively stable when compared to stocks and shares, for instance, and provided a good hedge against inflation, but even in times of recession they have tended to achieve significant rental and capital growth, although both would likely be higher during levels of better economic activity.

In this instance, the most important word is prime, which is subject to some debate. Many North American markets have suffered years of falling real estate prices, but prime property has performed relatively well even in these markets. All things being equal, such properties keep or easily replace their tenants, maintain a good cash flow and, as a result, hold their value.

Conclusion

Since it involves a number of important variables, the valuation of investment real estate is never an easy task. The capitalization rate, however, is the most critical part of any analysis. ▲

Reading 2.3

W.D. Fraser (1981) YP or DCF – A question of comparables

Will Fraser

YP or DCF? — A question of comparables

Which is the better method for the market valuation of property investments, YP or DCF? The answer to this evergreen debate, ultimately rests on the quality of the sales evidence from comparable property. In any particular instance the choice of valuation method should depend on whether market evidence is sufficient to enable the valuer accurately to identify the appropriate capitalisation rate.

If there is sufficient evidence, then the valuer should use the years' purchase (YP) method: if not, there is a good case for adopting the discounted cash flow (DCF) method instead. In practice, this means that the YP method should be used in the case of investments with a standard pattern of income and rent review, whereas the DCF system will probably be more reliable in the case of long reversions and short leaseholds.

The choice lies between two different valuation concepts. According to the YP concept, capital value is a multiple of current rent and rental value, the multiple being determined by investors' required yield. In the case of rack-rented freeholds, this is represented as follows:

$$V = \frac{R}{y} \qquad (1)$$

where V = capital value
R = current net rent
y = required income yield (all risks yield)

According to the DCF concept, a property's value is the discounted value of expected future rental income flows:

$$V = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} \quad \ldots\ldots \qquad (2)$$

where $R_{1, 2, 3}$ etc = expected net rent in years 1, 2, 3 etc.
r = investors' required total return (target IRR)

Both these concepts, and the mathematics which represent them, are flawless and, if correctly used by the valuer, will produce the correct answer. However, assuming that the current rent and rental value are known, the YP method leaves the valuer with only one unknown to solve — the appropriate capitalisation yield, y. But in the case of DCF there are essentially two unknowns — the appropriate discount rate (target IRR) and the rental growth rate, which determines the expected future income flows. Furthermore, whereas the YP capitalisation rate implied by any sale is ascertainable by a simple analysis, both unknowns in the DCF model are much less evident.

DCF analysis and valuation

The accuracy of market valuation depends crucially on the ability to analyse market evidence. When using the DCF method, accordingly, both the market's target IRR and expected rental growth rate must be derived from the analysis of sale prices. However, the calculation of the target IRR implied by any sale first requires the valuer to quantify the market's rental growth expectation — but to calculate the growth expectation first requires the valuer to estimate a target IRR. Fortunately this vicious circle is not the insuperable barrier to progress that it may at first seem. The process requires clarification.

The fact that investors are willing to accept relatively low yields from property when much higher yields are available from fixed-interest government stock implies an expectation of growth from property, and the market's implied rental growth expectation can be quantified by using the following formula:

$$g = \left[\frac{(r-y)(1+r)^n + y}{r}\right]^{1/n} - 1 \qquad (3)$$

where g = the market's implied rental growth expectation
y = yield available on rack rented freeholds
n = period between rent reviews (years)
r = estimated target IRR, rack rented freeholds

(The complexity of the above formula stems from the fact that investments are normally let with review periods greater than one year. In the case of annual reviews the growth expectation is simply the target IRR less the yield on a rack rented freehold.)

So, for instance, if the objective is to value a short leasehold investment by DCF, the formula above can be used to quantify the rental growth expected from similar freehold properties. This growth rate can then be used to calculate the expected rental income over the remaining life of other comparable leaseholds for which sale prices are known, thereby enabling the calculation of the target IRR implied by such sales. This process provides the valuer with objective market evidence of the rental growth and discount rate needed to undertake his DCF valuation. The analysis is particularly important in the case of short leaseholds, long reversions and other non-standard interests, because the risks inherent in such investments, and the target returns required, will tend to be substantially different from those of freeholds, and clear evidence of the discount rate is needed by the valuer.

The one practical flaw inherent in the above DCF process is that it is not possible to identify precisely the market's target IRR for a freehold investment (r in equation (3) above). Although in the case of prime commercial property it is conventional to assume this to be 2% above the current yield on long-dated government stock, the validity of this, or any premium, is doubtful: it will probably vary over time and according to the type of freehold property under consideration. Thus if it is impossible to identify the target IRR on prime freeholds, it is also impossible to quantify the market's growth expectation and, consequently, the target IRR implied by sales in the market.

However, an excessively high freehold target IRR will result in both an excessive growth rate and target IRR for the investment being valued, and when used in the DCF calculation these errors will tend to cancel each other out. The valuation error which this flaw introduces may frequently be less significant than the potential errors introduced in the YP system by the inability of the valuer to identify the appropriate capitalisation rate for investments with a non-standard pattern of income flow.

YP valuation of freehold investments

In turning to the YP system, let us first consider a simple example of a standard term-and-reversion valuation.

A freehold investment in a prime office property has recently sold on the open market for £981,400. It is let on a long lease with a prime FRI covenant and rent reviews at five-year intervals. The current rent is £40,000, the rental value £50,000, and the next rent review is in two years' time.

Current rent	£40,000	
YP for 2 years @ 5%	1.86	
		£74,400
Current rental value	50,000	
YP of rev to perp in 2 years @ 5%	18.14	
		£907,000
		£981,400

If the investment has sold for £981,400, then clearly it reflects a yield of 5%. But although a yield of 5% correctly values the investment as a whole, it does not correctly value either the term income or the reversion considered in isolation. No rational investor would pay as much as £74,400 for an income of £40,000 (pa in arrears) for two years when higher returns are available elsewhere. The relatively low capitalisation yield of 5% reflects a *growth* potential which the term income does not possess. That part of the investment is overvalued and, as the value of the whole investment is deemed to be correct, it follows that the reversion is similarly undervalued.

It is important to appreciate, therefore, that in times of rental growth the YP method does not purport to value the two individual parts of an investment accurately. Term and reversion are treated separately merely because their income is different. The capitalisation yield adopted by the valuer must reflect the qualities of the investment as a whole: it therefore seems entirely anomalous to adopt the traditional practice of using a marginally lower yield to value the secure term income. The term and reversion should be valued at the same yield.

It is also invalid to use a high cost of capital rate to value the fixed term income while valuing the reversion traditionally. The only alternative to years' purchase is the use of discounted cash flow techniques.

It is also worth noting that if one capitalisation rate is used to value the whole investment, it is irrelevant whether the YP system as illustrated above or the alternative

W D Fraser MSc ARICS is lecturer in valuation at the City University. He is the author of "Principles of Property Investment and Pricing" to be published in November by Macmillan.

· layer" or "hardcore" method is used. The r:sult must be identical.

Current rent	£40,000	
YP in perp @ 5%	20	
		£800,000
Rent increase at reversion	10,000	
YP of rev to perp in 2 years @ 5%	18.14	
		£181,400
		£981,400

The significance of growth

So the YP capitalisation yield must reflect all the qualities of the investment as a whole — its growth potential, risk, marketability, taxation liability, indeed everything of concern to the investor except the amount of rent and rental value. Clearly the valuer's selection of capitalisation rate is crucial to the valuation's accuracy, but there is no harm in that — provided the valuer has the market evidence to enable him to select the appropriate yield. However, even in these days of lower inflation, by far the most important factor determining prime yields is growth potential, and the potential of certain non-standard property investments is obscure, creating particular difficulties in identifying the appropriate capitalisation rate.

Generally speaking, the more frequent the rent review the greater is the investment's growth potential and, in the case of reversionary properties, the closer is the reversion the greater is the growth potential. So the property in the example illustrated above has a marginally greater growth potential than a similar rack-rented property just after review, and might therefore be expected to exhibit a marginally lower yield. Comparables used for evidence should have a similar income-flow pattern to the property being valued.

However, in the case of longer reversions (say over 10 years) and cases in which the rent currently received is very small compared with rental value, significant difficulties may arise with the YP system for two reasons. First, there may be a dearth of good comparables; second, because the valuer will have difficulties in adjusting his capitalisation yield to reflect accurately the different growth potential (and risk) of the investment being valued *vis-à-vis* his sales evidence. The growth potential of a reversionary investment is affected both by the period to reversion and by the amount of the term income relative to the income at reversion. If the valuer has adequate evidence of similar properties with a similar pattern of rental income then not only is the YP method adequate, it is probably superior to DCF: in the likely event of evidence being weak, however, then it would be wise to resort to a DCF valuation, at least as a check.

An even greater problem of good comparables is likely to arise in the case of short leasehold investments. Leaseholds are inevitably more disparate than freeholds, partly because of their finite duration but also because their investment characteristics are determined by the conditions of a headlease as well as a sublease. In particular, their growth characteristics are frequently both complex and obscure.

Whereas with most freeholds any rental growth will ultimately be converted into capital growth, the short leasehold investor may be benefiting from income growth while at the same time suffering capital loss. The growth and risk characteristics may be further complicated by a variable head rent or by an element of income gearing (where a fixed head rent is a significant proportion of the sub-rental income).

The uniqueness which such characteristics may give to a leasehold reduces the chances that sufficiently close comparables can be found to enable an appropriate capitalisation rate to be selected with confidence.

Apart altogether from the many anomalies and weaknesses inherent in the dual rate YP system, the valuer's task of adjusting a yield to reflect the combined impact of lease duration, rent review period and gearing, as well as the locational and physical aspects of a property, must enhance the risk of serious error using YP techniques. On the other hand, the ability of the DCF approach to strip out and quantify the market's implied rental income expectation, taking account of length of lease, rent review period, varying head rent and gearing, leaves the valuer with the relatively simple problem of selecting an appropriate discount rate.

Conclusion

The multiple by which capital value exceeds rent (and rental value) is determined by the capitalisation yield. There must always be a yield which gives the correct multiplier, and if market evidence is sufficient to identify this yield accurately, YP valuation methods are not only acceptable but preferable to DCF for market valuation purposes.

However, in cases such as long reversions, complex equity-sharing interests, high geared or short leaseholds, or other investments providing a non-standard pattern of income flow, identifying the appropriate capitalisation rate is particularly prone to error. The difficulty results principally from a combination of a dearth of good comparables owing to the uniqueness of such interests and the fact that their growth characteristics are often complex and obscure. In these somewhat exceptional cases the DCF method may frequently be preferable, at least as a check, despite its inherent practical flaw.

Finally, it is worth reiterating that this discussion has been concerned with assessing the market value of property investments, not property investment appraisal or valuation of worth to an individual. In these cases DCF methods have a more important role to play. In market valuation the greater the proportion of the figure which derives from objective market evidence and the smaller the proportion which results from the valuer's own judgment, the greater will be the accuracy of the valuation. ■

Reading 2.4

Jones Lang Wootton (1992), Capitalisation and DCF Valuation: Bridging the Gap Research Paper Dec. 92

JLW Research

1.0 Summary

This paper has been written to provide an objective comparison of the two main methods of valuing investment class, multi-tenanted properties. They are the capitalisation of net income method which uses an implicit yield to capitalise earnings, and the discounted cash flow (DCF) method which explicitly forecasts cash flows and then discounts them to a present value. The appropriateness of these two methods has recently become a topical issue in view of the severity of the deterioration in market conditions and the apparent lag with which this deterioration has been reflected by current valuation practices.

Capitalisation of income is the most widely used method of valuation and is relatively effective when there are reasonable levels of sales activity. However, arbitrary adjustments to the capitalisation (cap) rate to reflect changes in expected cash flows have proved to be unreliable when there is limited sales evidence to enable proper cap rates to be determined.

An alternative methodology is the discounted cash flow approach which explicitly makes adjustments to cash flows to reflect anticipated changes in fundamental prospects. The current risk-adjusted total rate of return for property is determined and the value is obtained by discounting the expected cash flows at the risk-adjusted discount rate.

However, the valuation profession has shown a general reluctance to use the discounted cash flow method, reflecting in part the acceptance of capitalisation by courts of law. This indicates a lack of appreciation of the applicability of the DCF method, which offers solutions to some of the inherent problems with capitalisation.

The capitalisation approach normally relies on either initial or equivalent yield methods, with the equivalent yield being the best measure. The disadvantage is that adjustments to the yield are difficult to quantify and are normally not sufficiently forward looking. To overcome this problem, all variables which affect expected cash flows such as impending vacancies and incentives can be explicitly quantified in the discounted cash flow approach.

We are of the opinion that, if properly applied, DCF can be a more reliable method because it requires explicit recognition of factors affecting expected cash flows, and should be more useful to the end user. However, the approach is complicated and practical guidance in its application has been lacking. Hence, this paper is aimed at illustrating the problems confronted in the use of DCF, and offers solutions to them.

If all assumptions are made explicit, the DCF and capitalisation approaches give similar answers in most circumstances. However, the valuation process in a much more complex market cannot rely entirely on making adjustments to a single cap rate to allow for factors affecting expected cash flows. Instead, DCF, which can accommodate a greater degree of variation and complexity, is our preferred primary method for valuing investment class, multi-tenanted properties in Australia in the current climate, with capitalisation of income used as a necessary check.

2.0 Introduction

Property markets in Australia are undergoing major adjustments following the buoyant years of the 1980s. As market conditions and property values weaken, criticism has been levelled at the valuation profession. In particular, the traditional approach to valuation of capitalising net income has been found wanting when having to accommodate the impact of falling rentals, increasing use of leasing incentives or impending vacancies. The lack of market sales, which valuers rely upon to establish their benchmarks, further diminishes the reliability of traditional valuation methods.

What is important to recognise is that the current debate is healthy and should lead to more accurate methods of measuring value. Explicitly allowing for market variations such as falling rents within the capitalisation process has been part of the answer, with a check provided by Discounted Cash Flow (DCF) methods. However, we believe that discounted cash flow is a more reliable valuation method for investment class, multi-tenanted properties in the current climate.

Legal precedent and practitioner resistance, due in part to legal requirements, has limited the use of the DCF approach, although the results derived in applying DCF or capitalisation are virtually similar if all assumptions are made explicit and identical. The objective of this paper is to illustrate the theory behind the various approaches, compare their merits and demerits and to provide practical examples of the use of the DCF method of valuation.

3.0 Current Issues in Valuation

The valuation of investment property in Australia has traditionally relied upon the capitalisation of income approach due to its simplicity and acceptance by a court of law. This method uses comparable sales evidence to establish cap rates and can reasonably meet the needs of the industry during normal market conditions when there is sufficient sales activity to provide evidence.

However, the approach has been found to be wanting in the current market where sales activity is limited. Reliable market benchmarks are now being distorted by incentives, impending vacancies, falling face rentals and diminishing tenant security. Although these issues are present no matter which valuation method is used, the problem with the capitalisation approach is that all these assumptions are contained within a single cap rate. This presumption has created confusion regarding which cap rate to use and which income stream to capitalise, leading to the market demanding more accurate and accountable methods of analysis.

Discounted cash flow (DCF) analysis can help to overcome some of the difficulties as it requires the valuer to explicitly forecast market conditions rather than to simply rely on historical data. However, DCF has not been widely used, primarily because it has not been admitted by the courts as an acceptable method and, to some degree, owing to a general lack of understanding by users. The approach also requires all assumptions made in the valuation process to be stated, which has in the past been resisted by valuers.

The Property Economic Task Force[1] has also highlighted these areas of concern and advocates greater use of DCF to derive what they term investment value. However, they contend that this investment value is somehow different from the market value derived from capitalisation. In contrast, we believe that DCF analysis should provide an estimation of market value that is similar to the value derived from capitalisation, if all assumptions are consistent and made explicit. However, the practice in the market has been to use the capitalisation model as the primary method and DCF as a check; we are of the view that there are more merits in reversing this practice, particularly in the current climate. This approach must be seen as an improvement as it would provide far greater insight into market conditions which are anticipated by the valuer, and hence be more useful to the end user.

This paper has been written to provide an objective comparison of the capitalisation method to the DCF approach with a view to clarifying any confusion regarding the application of the methods.

Particular issues that are addressed are:

Capitalisation

- Types of cap rates; and
- Explicit allowance for rental incentives, capital expenditure etc.

Discounted Cash Flow

- Estimating the discount rate;
- Deriving the terminal cap rate;
- Deriving justifiable cash flow growth assumptions; and
- Reconciliation with capitalisation approach.

Faced with difficult market conditions and increased accountability in the 1990s, property valuers must be more forward looking and consider broader economic trends and their impact on demand for property. This has been emphasised by various commentators here, in the US and the UK. 'Appraisers need more than historic absorption and rental rates to project what will happen to the six factors that contribute to a property's income and value, namely - absorption rates, occupancy changes, rental concessions, rental rates, lag periods between tenants, and vacancy in the reversionary year (the year in which a DCF analysis assumes the current owner will sell the property)'[2].

[1] A task force of industry participants including ANZ, National Australia Bank, Minter Ellison, Arthur Robinson Hedderwicks, SGIC of SA, CML, National Mutual, Transport Accident Commission (Vic.), Coopers & Lybrand and CS First Boston. The group was headed by economist Professor Neville Norman.

[2] L.R. Nicholson, *'Urban Land'*, USA, July 1992.

JLW Research

4.0 Measurement of Value

Valuation of investment property, like all investments, is based on the premise that the current market value of a property is equal to the present value of all future cash flows. Capitalisation and DCF are both present value formulas and hence the procedures employed in the application of each should be almost identical. The primary difference is that DCF requires that all assumptions be made explicit.

4.1 Capitalisation of Income Method

Income-based valuation of property is an application of the perpetuity formula derived from finance theory. The cap rate is the reciprocal of the price-earnings ratio used in equity valuation and can be estimated from analysis of comparable open market sales.

The basic formula is:

$$\text{Present Value} = \frac{C}{i}$$

Where:
C = Net Stabilised Income pa
i = Cap Rate

Because the income stream from most types of property will normally grow over the long term, the cap rate reflects the discount rate less an implicit constant rate of growth as shown in the formula below:

$$\text{Present Value} = \frac{C}{r-g}$$

Where:
C = Net Stabilised Income pa
r = Discount Rate
g = Constant Growth Rate
$r\text{-}g$ = Cap Rate

It can be seen from the above equation that the discount rate is equal to the expected total return per annum (pa) from property, which incorporates both income return and capital growth. The formula implies that capital growth is the same as income growth because it assumes the cap rate remains constant. This is why in weak markets investors expect current income to provide a greater portion of return to compensate for low expected rental and hence capital growth. As a consequence, downward pressure is placed on prices and cap rates increase. Poor markets can also lead to above average movements in cap rates to reflect increased uncertainty of income and lower expectation of rental growth.

Advantages of capitalisation are:

- Simple to use;
- Easily understood compared to DCF; and
- Reasonably accurate when comparable sales evidence is available.

Disadvantages are:

- Conveys limited information on assumptions regarding future cash flow; and
- It is a simplification of the real world with certain rigid assumptions built into the formula including;
  - A constant rate of annual income growth in perpetuity which equals annual capital growth.

    The fact that rental growth is not expected for a number of years in most Australian CBD office markets contradicts this implicit growth assumption. This becomes more complicated when the impact of incentives on rental levels and rental growth are considered, combined with potential falls in face rentals. During more normal market conditions, where the implied rate of constant growth has tended to average out to be in line with actual recorded rental movements, the capitalisation method is a reasonable approximation.

    The constant growth assumption also implies that gross rental income and outgoings, and hence net income, change at the same rate. Over the long term the two also average out, but from market peaks and troughs it has not been the case, i.e. when face rents fall, outgoings continue to rise, reducing net income. In such instances, the use of a cap rate with an implied equal rate of gross rental and outgoings growth may overstate values.
  - A constant cap rate and hence annual total return from property.

    It can be seen from ***Table 1*** that historically cap rates and total returns have varied significantly over time. The rigidity of capitalisation makes it difficult to incorporate a perceived change in yields over the medium to long term and may over or under value at a given point in the market cycle.

Table 1: **Variation in Cap Rate with 10 yr Rolling Annualised Total Returns**

	Income Return	Capital Return	Total Return	Capitalisation Rate*
Yr end 1985	6.0%	16.1%	22.8%	7.1%
Yr end 1986	5.6%	17.9%	24.3%	7.0%
Yr end 1987	5.5%	21.4%	27.8%	6.7%
Yr end 1988	5.0%	23.2%	28.9%	6.1%
Yr end 1989	4.7%	21.0%	26.4%	6.0%
Yr end 1990	4.5%	14.2%	19.2%	6.6%
Yr end 1991	4.8%	7.70%	12.8%	7.2%
1992 (June)	4.9%	4.80%	9.90%	7.6%

*Average start and end period cap rates. Source: JLW Capital Value Indicator Series 1 - Properties built between 1966 and 1973.

These rather rigid assumptions do not invalidate the use of capitalisation, but they do create serious distortions for which adjustments must be made. The adjustments listed in ***Table 2*** help resolve some of the issues and aid reconciliation with DCF-based approaches. It is important to note that the constraints of physically incorporating all of these adjustments into the capitalisation approach (particularly when there are multiple tenancies) is what primarily makes DCF the preferred approach.

Table 2: **Issues in the Application of the Capitalisation Approach**

Issue	Adjustment
Lease incentives	Existing and potential vacancies must be identified and a likely incentive level estimated. The estimated loss of income is discounted to a present value and deducted from the estimated property value. Another approach is to assume that multiple incentives will be provided during the building's economic life, these are then amortised over the building's assumed economic life and the equivalent rental adjusted. These approaches are outlined in the JLW Research & Consultancy paper 'The Implications of Leasing Incentives for Estimating Rents and Capital Values', Sydney, 1991.
Security of income	If a tenant is not financially secure that component of rent may be capitalised at a higher rate to reflect this extra risk.
Ratchet clause[3]	Provided the clause is valid at law this must be considered in order to determine when a decline in rents will be reflected in the cash flow. However, the ratchet clause may be ignored and lower rents used in the analysis if the tenant is judged to be unable to pay the higher rent. This would apply equally if it is considered probable that the landlord will offer tenants a reduction in rental to keep them in the building.
Obsolescence	If major capital works are required in the foreseeable future then the cost of such works may be equated back to their present value and deducted from the derived property value. If this is not done the rent and yield must be adjusted to reflect the state of repair of the property.
Varying rent reviews	When applying yields from comparable sales evidence to an income stream it is also important to consider any abnormalities in the lease covenants applicable to that income stream. Examples include where there are fixed rental increases instead of market rent reviews or different frequencies of rent reviews to be compared. These issues are normally addressed subjectively by reference to comparable historic sales and a subsequent subjective adjustment to the cap rate.

[3] A clause preventing the rent falling at review.

JLW Research

Types of Cap Rates

The cap rate may be either an initial, equivalent or reversionary yield. Although equivalent yield capitalisation is almost always used by valuers as it accounts for variation between current income and income at the next rent review.

Initial Yield: The initial yield is the current annual net passing income divided by the sale price or estimated value. Normally the actual net income receivable at that time of analysis is used unless it is stated as when fully let (i.e. assuming vacant areas are let at current market levels).

$$\text{Initial Yield} = \frac{Y_p}{P} \times 100$$

Where:
Y_p = Annual Net Passing Income
P = Price or Capital Value

Reversionary Yield: This yield is calculated by dividing the imputed annual market rent by the price or estimated value (the date from which it will apply should be stated).

$$\text{Reversionary Yield} = \frac{Y_m}{P} \times 100$$

Where:
Y_m = Current Annual Net Market Rent
P = Capital Value or Price

Equivalent Yield: The equivalent yield is the percentage return on sale price or estimated value derived from the current net passing income and increases or decreases to current market rents. The increases to current market rents are deferred until the date of the next market rent review. When market rents are below passing rents, decreases may be deferred until the lease expires if the lease contains a ratchet clause valid at law and the tenant is judged to be financially secure.

The equivalent yield will normally lie somewhere between the initial yield and the reversionary yield.

The equivalent yield is derived by repeatedly substituting values for 'i' into the equation below until it is solved. An alternative method is to capitalise the reversionary income at a rate estimated from comparable sales, allowing the equation to be easily solved for 'i'.

$$P = \frac{Y_p}{i} + \frac{Y_m - Y_p}{i(1+i)^x}$$

Where:
P = Capital Value or Price
Y_p = Net Passing Rent
Y_m = Current Market Rent
i = Equivalent Yield (expressed as a decimal)
x = No. of years to next rent review

The equivalent yield approach can be used to derive capital value in any one of the following methods:

(i) Term and Reversion Method: Capitalising the passing rent until the next market rent review or until it is no longer payable under the terms and conditions of the lease and today's market rent in perpetuity from then, or

(ii) Capitalising the passing rent in perpetuity and the value of reversions added (i.e. reversionary increases/decreases are capitalised in perpetuity from the date from which they apply under the terms and conditions of the lease), or

(iii) Capitalising the market rent in perpetuity less the shortfall until the next rent review (i.e. the difference between the market rent and the passing rent). Where the passing rent is above the market rent the resultant over rent is added back to the value.

All three methods give the same answer provided a constant discount rate is used. However, intuitively methods (i) and (iii) are most appropriate in abnormal market situations such as where market rents are below passing rents. Worked examples of the three methods are provided in Appendix I.

4.2 Discounted Cash Flow (DCF)

The DCF approach requires periodic net cash flows to be forecast over the life of the investment and discounted at a risk-adjusted opportunity cost of capital to arrive at a present value. Although, theoretically cash flows can be forecast to perpetuity, it is more common to assume a holding period and use a terminal cap rate (or yield) to estimate end value. This terminal rate may be varied to reflect any change in market condition or the competitive position of the investment at the end of the assumed holding period.

The inherent characteristic of the present value formula is that cash flows in the initial years of the investment have a larger impact on value, so it is important to ensure the accuracy of forecasts made during the early years, especially the first half of the holding period. Users often express concern over the need to assume a terminal value notwithstanding that because it occurs quite far out in the investment horizon, its impact on value is usually not substantial.

The DCF uses the following formula, which is really the generic present value formula[4]:

$$PV = \sum_{j=1}^{n} \frac{Y_j}{(1+r)^j} + \frac{S_n}{(1+r)^n}$$

Where:

PV = Capital value or price
Y_j = Estimated income in year j
S_n = Estimated resale price in year n
n = Holding period
r = Discount rate (expressed as a decimal)

Advantages of the DCF approach over the capitalisation approach are:

- Flexible - variations in cash flows, cap rates and discount rates are easily accommodated in the holding period;
- Justifiable - it makes explicit any variation in cash flows and conveys more meaningful information to the end user;
- Allows accurate assessments of individual tenant cash flow;
- The discount rate reflects total return from both income and capital growth, allowing property to be more readily compared with other forms of investments; and
- Measuring annual total returns in turn enables risk such as standard deviation to be quantified.

Disadvantages are:

- Inherent risks with estimating future cash flows;
- The approach is more complex;
- Derivation of an appropriate discount rate for a given class of property may be difficult; and
- Requires more variables to be estimated compared to the capitalisation approach.

Estimating Major Variables

Notwithstanding the weaknesses inherent in the DCF approach, by establishing key variables and analysing their influences on value, DCF valuation can produce reasonable results. The key variables to note are:

1. The Discount Rate
2. The Holding Period
3. Periodic Cash Flows
4. The Terminal Cap Rate

1. The Discount Rate

The discount rate can be estimated by comparing expected returns from property with returns provided by competing asset classes such as shares and bonds. Government paper is normally considered to have the lowest risk, so to justify an investment in a risky asset requires a higher expected return. The appropriate discount rate for property should therefore equal a risk-free return plus a premium for property risk such as lumpiness, illiquidity, management requirements and high transaction costs. The discount rate can be expressed by the following equation:

Discount Rate = Risk-free Rate + Risk Premium + α

In the above equation the 'α' provides for unsystematic risk (or variations) not accounted for in the market risk premium, such as changes in local market sentiment and loss in competitive position.

[4] The capitalisation method is a special case which assumes that n equals infinity.

The risk-free rate of return, risk premium and unsystematic risk can be estimated in the following manner:

Risk-free Rate: Direct property investment is generally viewed as a medium-term to long-term investment owing to large capital commitments, relatively high transaction costs and illiquidity. The appropriate risk-free rate is generally accepted to be 10 year government bonds as they are the longest dated government security issued in Australia. The returns on fixed interest securities also include a real return (broadly in line with short-term rates if the yield curve is positive) plus a return to compensate for expected inflation and the risk that inflation will vary over the holding period (unexpected inflation).

Risk Premium: Modern portfolio theory may be used to estimate the risk premium for property based on measured property risk compared to shares and the risk premium attributable to shares. The methodology assumes that there is a linear relationship between risk and return and that shares, property and fixed interest are all investments that are available to the average investor as ***Figure 1*** shows.

In our analysis variance is used as a proxy for property risk. ***Table 3*** summarises our results. It lists the average annual total return and risk generated by the relevant investment mediums during the 11 years to December 1991. (The property portfolio chosen is Sydney prime commercial property.)

The ex-post return premium of 8.4% for Sydney prime commercial property over the 11 years to December 1991 contained an element of excess return over its risk-adjusted return. Amongst other industry factors, it reflects the extreme investor optimism of the 1980s. The return premium for property can be expected to fall back to its risk-adjusted level as a result of the cyclical downturn now being experienced by the property sector.

The risk premium for property (assuming the market is efficient so that it lies on the investment line shown in ***Figure 1***) may be estimated by multiplying the ratio of the variances of total property returns (113%) and share returns (488%) with the risk premium for shares. As shown in ***Table 3***, the historic risk premium from holding shares over holding 10 year Commonwealth bonds to maturity was 10.2% (20.7%-10.5%).

Fig. 1 ASSET RISK & RETURN

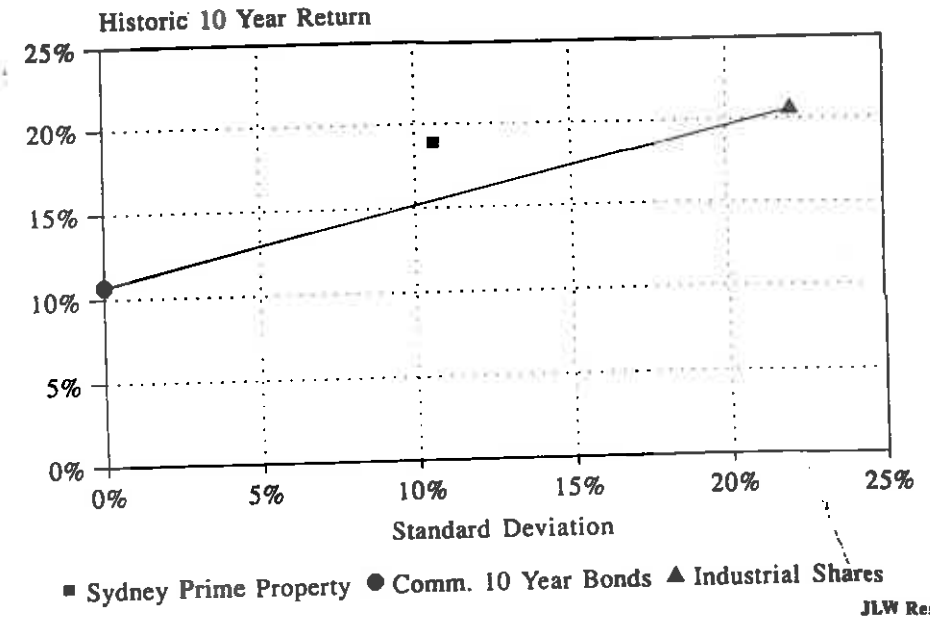


Table 3: **Historic Average Annual Return and Risk 1980 - 91**

	Total Return	Return Premium	Standard Deviation	Variance
Industrial Shares[1*]	20.7%	10.2%	22.1%	488%
Sydney Prime Property[2*]	18.9%	8.4%	10.6%	113%
Listed Property Trusts (LPT)[1*]	15.1%	4.6%	15.7%	246%
Comm. 10 yr Bonds[3*]	14.9%	4.4%	8.7%	75%
Comm. 10 yr Bonds - Issued Jan 80[4*] (Yield to maturity)	10.5%	0.0%	0.0%	0%

1* Australian Stock Exchange Accumulation Indices (ASX)
2* JLW CVI Series 1
3* Commonwealth Bank Bond Index (All Series All Maturities 5-10 Years)
4* Reserve Bank Bulletin

Assuming the expected risk premium for shares remains at 10.2%, the expected risk premium for prime property using this method should be 2.4%. This would be the minimum margin to accept for commercial property over the risk-free rate of return. The expected total return or discount rate for Sydney commercial property, is at the minimum:

Current 10 year bond rate + risk premium, i.e.:
8.9% + 2.4% = 11.3%

Unsystematic Risk: Unsystematic risk is the term used to capture the unique risk of investing in direct property, such as illiquidity, changing investor preferences, variations in occupancies and tenant demand patterns and other industry-specific risks. However, the level of unsystematic risk premium for property estimated from historical information may not adequately provide for future risk given the uncertainty caused by historically high vacancies in the office sector. As well, current valuation practice tends to reduce volatility, inducing another form of unique risk.

The property unique risk may be partially estimated by comparing the risk of listed property trusts (LPT) with the risk for property. The reason is that listed property trusts are more efficiently priced in the market and, hence, their market price would be more reflective of the major unique risks of investing in that sector. However, listed property trusts are not immune to the effect of general share market sentiment on prices and would also tend to pick up a fair amount of non property-specific unique risk.

To isolate the influence of general share market movements, an appropriate adjustment may be to assume that direct property's true risk ranges from halfway between the risk of traded bonds and listed property trusts to 63% of the stock market risk.[5] Making the appropriate adjustments to ***Table 3***, the total risk (standard deviation) for direct property ranges between 12.2%[6] and 13.9%.[7]

Based on this technique, the true return premium for total property risk is estimated to have ranged between 3.1% to 4%, i.e. the ratio of the variance of property returns (148.8%[8] and 193.2%[9]) and share returns (488%) times the risk premium for Australian shares (10.2%). The difference between the true risk premium (3.1% to 4%) and the measured direct property risk premium (2.4%) is the identifiable portion of the unsystematic risk premium. Our analysis indicates that it ranged between 0.7% to 1.6%.

Taking the upper end of the derived unsystematic risk range to compensate for the prevailing pessimism in the property market and uncertainty over the strength of the recovery, the current discount rate can be estimated as follows:

Discount Rate Sydney Commercial Property:
8.9% + 2.4% + 1.6% = 12.9%

[5] See Salomon Brothers, 'Real Estate Investment - Measuring Real Estate Returns: The Hedged REIT Index', p3, US, 7 January, 1992. We chose the mid-point for the latter which actually ranges from 50-75%.

[6] (8.7% + 15.7%) x 0.5 = 12.2%.

[7] 0.63 x 22.1% = 13.9%.

[8] $(12.2\%)^2$

[9] $(13.9\%)^2$

JLW Research

Other Methods for Deriving the Discount Rate

Yield Based: Assuming the market is efficient, the nominal discount rate may be approximated by combining the current cap rate with expected inflation and expected real income growth for the asset over the term of the investment.

In normal market conditions, expected long-term inflation can be estimated by deducting the short-term (overnight call) bill rate from the long-term (10 year) government bond rate. This estimate should then be cross referenced with estimates from recognised forecasters to ensure consistency.

For example, the rate of inflation expected for the next ten years calculated as above is about 3% pa. This figure is roughly in line with Syntec's forecast of inflation from July 1992 to June 2001 of 2.8% pa.

Real rental growth and the cap rate can be estimated from econometric modelling and subjective/trend analysis (see rent and yield forecasts section). The estimated cap rate should be checked against comparable evidence where available.

Since the Discount Rate = Expected Inflation + Real Rental Growth + Required Cap Rate, the discount rate for Sydney Prime Commercial Property is 3% + 2% + 8%, i.e. 13%.

Subjective: A check of the appropriate discount rate may also be derived from surveying major participants in the commercial market as to what returns they expect from different classes of property. The average discount rates adopted by owners and valuers of major Sydney CBD office buildings, as reflected in a Burdett, Buckeridge & Young survey[10], as at December 1991 and March 1992 was 12.6%.

The average long-term expected return indicated from JLW Research's survey of 73 major Australian property investors as at June 1992 was 14.6%.[11] This rate reflects an average across regions and property classes.

2. The Holding Period

There is no predetermined rule on the number of years needed to do a DCF analysis. Theoretically it should match the expected term of the investment. However, a medium-term holding period is recommended for two reasons. Firstly, most assets are bought without a definite investment time frame and it is not practical to forecast to perpetuity. Secondly, the impact on value of future cash flows diminishes with their time of occurrence.

For investment property, a DCF analysis over a 10 to 15 year holding period is normally acceptable. This period matches the duration of the investment returns of property with the adopted rate of discount. Also, a longer time frame may be preferred to reduce the influence of the estimated terminal value on overall value.

3. Periodic Cash Flows

Having derived the discount rate and decided on the discount period it is necessary to estimate anticipated net cash flows.

The cash flow forecast is based on the primary assumption that the state of the property market is a function of the demand for and supply of business accommodation, which is in turn dependent on employment and overall economic growth. Econometric modelling and subjective/trend analysis are the two primary methods used for forecasting expected net income and yields.

Because the estimation of future variables is inherently uncertain, a 'top down' approach incorporating various macro-economic scenarios is recommended. Probabilities can then be assigned to each of the scenarios. To illustrate how future cash flows can be estimated, the following example assuming three scenarios is used:

1. Slow economic growth for the next 10 years: say, 50% probability.

2. Moderate economic recovery to 1996 followed by strong growth: say, 40% probability.

3. Stagnant growth until 1996 followed by robust growth: say, 10% probability.

[10] Burdett, Buckeridge & Young Ltd, 'Jottings on Trusts', Sydney, 1992

[11] JLW Research, 'Survey of Investor Sentiment' No.3, June 1992.

Net Cash Flow: Based on each of the above scenarios, a set of key variables or parameters are forecast including:

- Demand (i.e. employment growth in the relevant sector for offices). Empirical work undertaken by JLW Research indicates that demand for office space is determined principally by employment in the finance, property and business sectors, the price of space and a trend factor to account for changing space standards, locational preferences etc. Although other factors such as growth in GDP, turnover in the stock market, the inflow of foreign capital etc. also affect demand, they are already reflected within employment trends;
- Supply, which will be competing with the subject property;
- Vacancy rates, which reflect the relationship between forecast demand and supply;
- Impending vacancies in the asset, applicable incentive levels with reference to lease expiries and vacancy forecasts;
- Rental growth with reference to the above. Outgoings should be treated separately if it is considered that they will increase at a significantly different rate to the underlying net rent; and
- Capital expenditure with reference to the age of the property and vacancy scenario.

The net cash flow expected under each economic scenario can then be derived.

4. The Terminal Value/Cap Rate

The final requirement is an estimation of the investment value at the end of the assumed holding period which can be approximated by estimating appropriate cap rates (based on the three economic scenarios) to apply to the final year net income.

Empirical work undertaken by JLW Research[12] indicates that property yields are positively associated with current inflation, inflationary expectations, and the one-year lagged risk-free return, represented by the real 10 year government bond rate. Real rental growth prospects are negatively correlated, i.e. higher rental growth prospects should result in falling yields. Conditions in the stock market also show positive association. The slowness of price and yield adjustments in the property market is captured by including the lagged yield as another explanatory variable.

Application: The process described will provide three estimates of cash flows and present values. The overall value may be derived by weighting the estimated value in each case with its probability of occurrence. The process of assigning probabilities to the various outcomes and weighting them based on their likelihood of occurrence helps reduce the uncertainty associated with estimating the many variables involved.

[12] JLW Research, 'Asset Management: Forecasting Office Market Yields', Sydney, 1992.

JLW Research

5.0 Reconciliation of DCF and Capitalisation Approaches

The example below illustrates that if all assumptions are explicitly allowed for in the capitalisation process, then the estimated value will be similar to that derived from DCF analysis, in most cases. The example assumes the following:

- A 2 000 m^2 building let equally to two tenants. Imputed market rent and passing rent is \$720/m^2 gross. Initial outgoings are assumed to equal \$150/m^2;
- Initial and terminal cap rate = 8%;
- One tenant (Tenant B) has been provided with an incentive equivalent to four years rent free;
- Reviews are two yearly to market;
- It is estimated that \$100,000 needs to be spent on the property at the end of year two; and
- Cash flows are assumed to be received at the end of each year to simplify the example.

Working through the DCF, the following should be noted:

- The expected average nominal compound net rental growth is around 5% pa; and
- This rate combined with the 8.0% cap rate implies a discount rate of around 13%.

For the capitalisation of income approach:

- The incentive provided to tenant B has been effectively amortised over the economic life of the building (i.e. inferred to be perpetuity by the present value formula) by calculating its present value at the discount rate and deducting this from the estimated PV. Other approaches have been investigated by JLW Research,[13] although their application is more complicated.

Examples of when the two approaches will not reconcile are:

- When net rents are expected to change at a rate significantly different from the outgoings for a sustained period. This divergence has occurred historically during and after market slumps; and
- When cap rates are expected to change significantly over the holding period.

See section 4.1 for a more detailed discussion.

***Table 4*: Discounted Cash Flow**

Cashflow	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Market rent (Gross) \$	720	720	720	749	786	881	969	1,036	1,088	1,143	1,188
Increase over the year		0%	4%	5%	12%	10%	7%	5%	5%	4%	0%
Out-goings \$	150	150	158	165	174	182	191	201	211	22	233
Increase over the year	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Passing Net Rent \$/m^2	570	570	562	584	612	699	778	836	877	921	955
Tenancy A \$		570,000	570,000	562,500	562,500	612,596	612,596	777,205	777,205	877,211	877,211
Tenancy B \$		(150,000)	(157,500)	(165,375)	(173,644)	612,596	612,596	777,205	777,205	877,211	877,211
Capital Expenditure \$			(100,000)								
End Value \$											23,892,445
Cash Flow \$		420,000	312,500	397,125	388,856	1,225,193	1,225,193	1,554,411	1,554,411	1,754,421	25,646,866

Present Value @ 13% is \$11,768,317.

[13] JLW Research, 'Market Analysis Series: The Implications of Leasing Incentives for Estimating Rents and Capital Values', Sydney, 1992.

Table 5: **Capitalisation of Income (all Assumptions Explicit).**

Imputed Market Rent Assuming Fully Let 2,000m² @ $570	$1,140,000
Imputed Market Rent Capitalised in Perpetuity @ 8.0%	$14,250,000
Less: PV of 4 Years Rent Free on Tenancy B @ 8.0%	$2,384,731
Less: PV of Capital Expenditure in Y2 @ 8.0%	$85,734
Derived Value equals	$11,779,535

It can be seen that the assumptions made in applying the two approaches are virtually identical. The real advantage of DCF is the flexibility it provides, particularly when multiple tenancies are involved, which should provide a more accurate measure of actual cash flows.

Table 6 illustrates the sensitivity of the value derived from capitalisation and DCF to key variables using the previous example. It is evident that capitalisation is almost twice as sensitive to changes in the cap rate as the DCF approach is to changes in a single assumption.

Table 6: **Sensitivity Table DCF and Capitalisation of Income**

	Change in Dependant Variables			
	1.0%	**0.5%**	**-0.5%**	**-1.0%**
Terminal Cap Rate				
DCF				
$ change in value	(782,048)	(414,026)	469,229	1,005,490
% change in value	-6.7%	-3.5%	4.0%	8.5%
Traditional Capitalisation	N/A	N/A	N/A	N/A
Initial Cap Rate				
DCF	N/A	N/A	N/A	N/A
Traditional Capitalisation				
$ change in value	(1,529,634)	(811,145)	922,417	1,980,044
% change in value	-13.0%	-6.9%	7.8%	16.8%
Discount Rate				
DCF				
$ change in value	(842,952)	(430,948)	450,878	922,728
% change in value	-7.2%	-3.7%	3.8%	7.8%
Traditional Capitalisation	N/A	N/A	N/A	N/A

JLW Research

6.0 Conclusion

We believe that given the modern requirements of the property industry, the DCF approach is the more appropriate method for valuing investment class, multi-tenanted properties.

The DCF method has the following advantages over the capitalisation method:

- All assumptions made in the valuation process are stated, which conveys more meaningful information to the end user;
- The mechanics of the DCF process allow a better reflection of expected cash flows and yields over the assumed holding period;
- It is difficult to explicitly account for individual tenancy characteristics regarding tenure and security using traditional capitalisation-based valuation methods when there is a large number of tenancies;
- DCF enables comparison of property values, returns and associated risk to other asset classes;
- Traditional capitalisation analysis assumes that the yield remains constant in perpetuity, whereas in reality yields vary greatly during the economic life cycle of the asset; and
- Capitalisation also implies a constant rate of income growth in perpetuity, which tends to distort values during periods of market disequilibrium.

However, it is not suggested that DCF be used in isolation as it is accepted that capitalisation will remain an integral part of the valuation process. The fact that the latter method simplifies assumptions, is market led and is commonly understood makes it a reliable check method.

It is important to remember that DCF does not require more assumptions than capitalisation analysis; it merely requires them to be made explicit. It is also evident that end users of valuations have signalled their dissatisfaction with the method of allowing for all market discrepancies to be reflected through an adjustment of the cap rate and practitioners are beginning to respond to a more demanding marketplace.

7.0 Appendix I

Deriving an Equivalent Yield

Assumptions:

Assuming period to next review = 2 years
Net Passing Income = $1,200pa
Imputed Market Income = $1,080pa

Method (i) Term and Reversion Method:
Net passing income capitalised until next rent revue. (2 years) at an equivalent yield of 11.02% = $2,054.5

$$\text{i.e. } \frac{1,200}{(1+0.1102)^1} + \frac{1,200}{(1+0.1102)^2} = \$2,054.5$$

Market rent capped in perpetuity deferred for 2 years at the equivalent yield of 11.02% = $7,951.3

$$\text{i.e. } \frac{1,080}{0.1102 \times (1+0.1102)^2} = \$7,951.3$$

Capital Value $2,054.5 + $7,951.3 = $10,005.8
say $10,000

Method (ii)
Net Passing Rent Capped in Perpetuity at an equivalent yield of 11.02% = $10,889

$$\text{i.e. } \frac{1,200}{0.1102} = \$10,889$$

Net Passing Rent = $1,200
Shortfall/Over Rent = $1,080 - 1,200pa = -$120

Plus Shortfall/Over Rent capitalised in perpetuity deferred for 2 years at the equivalent yield of 11.02% = - $883.2

$$\text{i.e. } -\frac{120}{0.1102 \times (1+0.1102)^2} = -\$883.2$$

Capital Value $10,889 + (-$883.2) = $10,005.8
say $10,000

Method (iii)
Net Market Rent Capped in Perpetuity at an equivalent yield of 11.02% = $9,800.3

$$\text{i.e. } \frac{1,080}{0.1102} = \$9,800.3$$

Net Passing Rent = $1,200
Shortfall/Over Rent = $1,080 - 1,200pa = -$120

Less Shortfall/Over Rent capitalised for 2 years at the equivalent yield of 11.02% = -$205.5

$$\text{i.e. } \left(\frac{-120}{(1+0.1102)^1}\right) + \left(\frac{-120}{(1+0.1102)^2}\right) = -\$205.5$$

Capital Value $9,800.3 - (-$205.5) = $10,005.8
say $10,000

8.0 References

A. Baum, 'Real Estate Investment Analysis', The Valuer XXVIII, No. 6, April 1 1985.

R. Brealy and S. Meyers, 'Principles of Corporate Finance', McGraw-Hill, 1984.

S.J. Brown and M.P. Kritzman, 'Quantitative Methods for Financial Analysis', The Institute of CFA, 1987.

Burdett, Buckeridge & Young Ltd, 'Jottings on Trusts', Sydney, 1992.

A.J. Crawford, 'Simplification of the Techniques of DCF', The Valuer XXVIII, No. 6, 1 April 1985.

Nigel Enever, 'The Valuation of Property Investments', 2nd Ed., Estates Gazette Limited, 1981.

J.P. Friedman and N. Ordway, 'Income Property Appraisal and Analysis', Reston Publishing Co., 1981.

A.J. Jaffe and C.F. Sirmans, 'Real Estate Investment Decision Making', Prentice Hall, 1982.

JLW Research & Consultancy, 'The Implications of Leasing Incentives for Estimating Rents and Capital Values', National Research Department, Sydney, 1992.

JLW Research & Consultancy, 'Asset Management: Forecasting Office Market Yields', National Research Department, Sydney, 1992.

JLW Research & Consultancy, 'Property Research Paper: Survey of Investor Sentiment', National Research Department, Sydney, No. 3, June 1992.

JLW Research & Consultancy, 'The Implications of Tax Changes on Property', National Research Department, Sydney, 1988.

JLW Research & Consultancy, 'Technical Paper No. 2 Yields on Income Properties', National Research Department, Sydney, 1985.

D. McArdle, 'Property Investment Analysis', Master's Degree Thesis at South Australian Institute of Technology, 1984.

S.D. Messner and M.C. Findlay III, 'Real Estate Investment Analysis: IRR versus FMRR' in 'Real Estate Portfolio Analysis', Findlay, Messner and Tarantello (Eds.), Lexington Books, 1983.

S. Morley, 'Investment Appraisal' in '*Valuation and Investment Appraisal*', Clive Darlow (Ed.), Estates Gazette Limited, 1983.

L.R. Nicholson, 'Urban Land', USA, July 1992.

N.R. Norman, 'Report of the Property Economic Task Force', Victoria, April 1992.

S.A. Pyhrr and J.R. Cooper, 'Real Estate Investment Strategy, Analysis, Decisions', John Wiley & Sons, 1982.

D. Rose, 'Equated Yields - Jargon or Genuine', The Valuer XXVIII, No. 1, January 1984.

R.O. Rost and H.G. Collins, 'Land Valuation and Compensation in Australia', Aust. Institute of Valuers, 1984.

Salomon Brothers, 'Real Estate Investment - Measuring Real Estate Returns: The Hedged REIT Index', 7 January, 1992.

J.C. Van Horne, 'Financial Management and Policy', 5th Ed., Prentice Hall, 1980.

J.F. Weston and E.F. Brigham, 'Managerial Finance', 7th Ed., Dryden Press, 1981.

R.T.M. Whipple, M. Kummerow, R.R. Fraser, 'Issues in Valuation Reform', Curtin University, June 1992.

I. Woods, 'Measures of Investment Yield', The Law Book Company, 1984.

J. Worthington, 'Family of Equated Yield: Equivalent Yield Valuation Models', The Valuer XXVIII, No. 2, April 1984.