RICS PRACTICE INFORMATION

Discounted cash flow valuations

Global

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Discounted cash flow valuations

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Document definitions

Document type	Definition
RICS professional standards	**Set requirements or expectations for RICS members and regulated firms about how they provide services or the outcomes of their actions.** RICS professional standards are principles-based and focused on outcomes and good practice. Any requirements included set a baseline expectation for competent delivery or ethical behaviour. They include practices and behaviours intended to protect clients and other stakeholders, as well as ensuring their reasonable expectations of ethics, integrity, technical competence and diligence are met. Members must comply with an RICS professional standard. They may include: • mandatory requirements, which use the word 'must' and must be complied with, and/or • recommended best practice, which uses the word 'should'. It is recognised that there may be acceptable alternatives to best practice that achieve the same or a better outcome. In regulatory or disciplinary proceedings, RICS will take into account relevant professional standards when deciding whether an RICS member or regulated firm acted appropriately and with reasonable competence. It is also likely that during any legal proceedings a judge, adjudicator or equivalent will take RICS professional standards into account.
RICS practice information	**Information to support the practice, knowledge and performance of RICS members and regulated firms, and the demand for professional services.** Practice information includes definitions, processes, toolkits, checklists, insights, research and technical information or advice. It also includes documents that aim to provide common benchmarks or approaches across a sector to help build efficient and consistent practice. This information is not mandatory and does not set requirements for RICS members or make explicit recommendations.

Glossary

Term	Definition
All-risks yield	See *Capitalisation rate*.
Assumption	A supposition taken to be true. It involves facts, conditions or situations affecting the subject of, or approach to, a valuation that, by agreement, do not need to be verified by the valuer as part of the valuation process. Typically, an assumption is made where a specific investigation by the valuer is not required to prove something is true.
Basis of valuation	A statement of the fundamental measurement assumptions of a valuation.
Discounted cash flow (DCF)	A valuation model that seeks to determine the value of real estate investment property by examining its future net income or projected cash flow from the investment and then discounting that cash flow to arrive at an estimated current value of the investment.
Capitalisation rate/ cap rate	The yield used to capitalise a rental income or value to determine the capital value.
Discount rate	A discount rate is used to derive the present value or net present value of the expected future cash flows. For the evaluation of real estate investments, the discount rate is commonly the real estate's target or expected rate of return (see *present value* and *net present value*).
Exit yield	The capitalisation rate used to capitalise the rental income or value at the terminal date of the DCF valuation.
Explicit DCF	For the purposes of this particular practice information, explicit DCF refers to the discounted cash flow model that sets out, with varying degrees of sophistication, the actual expected cash flow of the investment.

Term	Definition
Implicit method or implicit income capitalisation method	For the purposes of this practice information, implicit method or implicit income capitalisation method refers to the valuation model that sets out, with varying degrees of sophistication, the expected cash flow in terms of current values only and implies any changes to the cash flow over and above current values within the rate used to discount the cash flow, termed the capitalisation rate in this document (see *capitalisation rate*).
Income approach	An approach that provides an indication of value by capitalising future cash flows to a single current capital value.
Initial yield	The current income level obtained from the asset at the date of valuation expressed as an annual percentage return of the capital value.
Internal rate of return (IRR)	The rate of interest (expressed as a percentage) at which all future cash flows (positive and negative) will be discounted in order that the net present value (NPV) of those cash flows, including the initial investment, is equal to zero. IRR can be assessed on both gross and net of finance costs.
Investment property	Property that is land or a building, or part of a building, or both, held by the owner to earn rentals or for capital appreciation, or both, rather than for: **a.** use in the production or supply of goods or services, or for administrative purposes, or **b.** sale in the ordinary course of business. For the purposes of this practice information, it includes all properties, whether commercial or residential, occupied or vacant, which would normally be valued by a method of valuation that addresses the property's income earning potential and a capitalisation of that income.
Investment value, or worth	The value of an asset to the owner or a prospective owner for individual investment or operational objectives (see IVS 104 paragraph 60.1). (May also be known as worth.)
Market approach	An approach that provides an indication of value by comparing the subject asset with identical or similar assets for which price information is available.

Term	Definition
Market rent (MR)	The estimated amount for which an interest in real property should be leased on the valuation date between a willing lessor and willing lessee on appropriate lease terms in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion (see IVS 104 paragraph 40.1).
Market value (MV)	The estimated amount for which an asset or liability should exchange on the valuation date between a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion (see IVS 104 paragraph 30.1).
Net present value (NPV)	The present value of all cash flows received from an investment, including all inflows and outflows and including any initial outflow, where each receipt/payment is discounted to its present value at the discount rate. Where the NPV is zero, the discount rate is also the internal rate of return (IRR).
Net initial yield	The current income level obtained from the asset at the date of valuation expressed as an annual percentage return of the capital value plus any purchaser's costs.
Present value	The present value of all cash flows received from an investment, including all inflows and outflows excluding the initial outflow, where each receipt/payment is discounted to its present value at the discount rate.
Price	The amount either asked (asking price) or paid can be established as a matter of fact from market evidence. Price is an objective term. Similar measures such as worth and value are matters of opinion but may need to be established to aid decision-making.
Rental value	See *market rent*.
Reversionary yield	The percentage return on capital value of the rental value of the asset at the date of valuation.
Sensitivity analysis/ testing	The investigation of how a valuation varies with a change in the value of any of the inputs into the valuation. Basic sensitivity analysis assesses each input separately or in pairs.

Term	Definition
Simulation	A sophisticated application of sensitivity analysis that considers the probability of outcomes given certain variances applied to key inputs within any financial assessment. It can quantify the level of variation in the valuation of the investment based on input variation.
Special assumption	An assumption that either assumes facts that differ from the actual facts existing at the valuation date or that would not be made by a typical market participant in a transaction on the valuation date.
Statistical analysis	The collection and interpretation of data to uncover patterns and trends. *RICS Valuation – Global Standards* VPS 5 states that: 'Valuation methods may include a range of analytical tools or techniques as well as different forms of modelling, many of which involve advanced numerical and statistical practices. In general, the more advanced the method, the greater the degree of vigilance needed to ensure there is no internal inconsistency, for example, in relation to the assumptions adopted.'
Target return	The level of expected total return, considering the risk of the particular investment expressed as a periodic rate of return.
Valuation	An opinion of the value of an asset or liability on a stated basis at a specified date. Unless limitations are agreed in the terms of engagement, this will be provided after an inspection and any further investigations and enquiries that are appropriate, having regard to the nature of the asset and the purpose of the valuation.
Valuation date	The date on which the opinion of value applies. The valuation date should also include the time at which it applies if the value of the type of asset can change materially in the course of a single day.
Valuation variation	A range of possible valuation outcomes based on different estimates of inputs and/or different methodologies applied.
Yield/capitalisation rate	Yield that can be applied to the rental income from an investment property to capitalise that income. Depending on the jurisdiction, variations in terminology include capitalisation or cap rate, all-risks yield, equivalent yield, reversionary yield and initial yield/net initial yield.
Worth	See *investment value*.

1 Introduction

1.1 This global practice information addresses the valuation of real estate investment property and the calls from some stakeholders in the valuation process, not least valuers themselves, for greater consideration and, where appropriate, adoption of explicit discounted cash flow (DCF) methods for valuing such property. This practice information can be applied to all properties, whether commercial or residential, occupied or vacant, which would normally be valued by a method of valuation that addresses the property's income earning potential and a capitalisation of that income.

1.2 Debates over the appropriate methods to value investment properties have evolved across different jurisdictions and sectors over a long period. Two major strands of this debate include the basis of the valuation – market value and/or investment value as defined in valuation standards – and the application of method. The outcome of these debates is that varying practices have emerged in different countries, with explicit DCF dominating in some while being used for different bases in others. This emergence is the result of a number of factors, such as the increasingly sophisticated investment market practices, changing physical environments and less homogeneous real estate assets. This practice information is designed to give general guidance across international jurisdictions, and it will need some interpretation locally to cater for the myriad of different global customs and practices.

1.3 The debates around application of methods have increased the pressure on so-called 'traditional' market valuation methods, which rely primarily on transaction evidence from comparable properties to determine both rental levels and the interest rate or yield at which the rental levels are capitalised. In particular, less homogeneous real estate assets make it more difficult to analyse transaction prices on an implicit basis.

1.4 The term DCF has been used to identify most applications of any form of income-based calculation and valuation, from the simplest implicit income capitalisation model (income divided by capitalisation/cap rate) to the most sophisticated cash flow modelling using multiple inputs through time. The traditionally-applied income capitalisation rate method is sometimes termed the all-risks-yield, as it does not explicitly address many of the expected changes to the future cash flow, adopting only current rents and rental values. However, it is still a form of cash flow as the method capitalises the future cash flow to determine the present value. The traditionally-applied capitalisation rate method will be termed the implicit method or the implicit income capitalisation method for the purposes of this practice information, to distinguish it from the explicit DCF method, which tries to be explicit concerning the future benefits generated by the property asset. The distinction between the methods comes in the approach to the cash flow and not the basic mathematical model. These distinctions are discussed further in Appendix A but it is recognised that there are significant variations within the application of both implicit and explicit methods, with some implicit models having a number of very explicit inputs concerning the cash flow.

1.5 Explicit DCF is often used by purchasers to price assets and the more explicit model enables the valuer to be more analytical concerning the different locational, physical, leasing and current and future occupational demand characteristics of the assets. It facilitates reflection on local, national and regional market trends in real estate while also taking account of pricing levels in other financial markets. It also enables a more analytical approach to the assessment of the influences of, for example, environmental, social and governance (ESG) issues on real estate prices.

1.6 Despite the numerous pieces of evidence that more explicit cash flow techniques can have significant advantages over the implicit all-risks yield method, particularly where the comparable transaction evidence is sparse or inconsistent with the valuation subject asset characteristics, the increased number of input variables within explicit DCF have consistently acted against its adoption for market valuation, despite widespread use to assess worth or investment value. But, in some countries, the lack of liquidity and/or the nature of the physical environment has led to adoption of explicit DCF for most purposes and bases, including market valuation. These issues are examined further in sections 2 and 3.

1.7 This practice information applies to all investment valuations regardless of size, scope and purpose. For example, a major shopping mall and a small neighbourhood shop in retail, a high-rise tower and a small office above a shop in a commercial investment, or a major residential apartment block and a single-occupier residential investment property. The choice of appropriate method(s) to be applied in each particular case is the responsibility of the valuer.

1.8 There are many circumstances where the implicit income capitalisation method is appropriate. This practice information identifies such circumstances but it also identifies how to put an implicit income capitalisation method into a simple explicit DCF framework.

1.9 Valuers are reminded that they must act in accordance with VPS 5 of RICS Valuation – Global Standards covering valuation approaches and methods, unless the purpose of the valuation is an exception under PS 1 section 5. In some jurisdictions there may also be additional RICS and other requirements around the valuation of investment property and the consideration of valuation methods such as explicit DCF.

1.10 Regarding the basis of the valuation, previous guidance on explicit DCF has tended to explicitly or implicitly address mainly the investment value basis. This practice information also covers the preparation of valuations on the basis of market value.

1.11 Market value and investment value are defined bases of valuation within IVSC and RICS standards. They are very different bases reflecting different concepts of value. All stakeholders in the valuation process need to understand what question regarding value is being addressed by the valuation. In particular, there is clearly confusion surrounding the difference between a market value and an investment value, as evidenced by some responses to the insight gathering for this practice information.

1.12 A different concept and basis of value often results in a different outcome. Therefore, this practice information clarifies not only the differences between the two bases but

also how the application of methods can be changed to accommodate the two different valuations. Finally, insight gathered for this practice information revealed disagreement as to what an explicit DCF valuation is, what it does, and how it differs from an implicit valuation. This document will address these issues and clarify the method, its application and the width of the market to which it can potentially apply.

1.13 Section 2 addresses the differences between an explicit DCF valuation and a implicit income capitalisation method. Section 3 addresses the concepts and bases issue and clarifies when the use of DCF might be particularly appropriate. Tied to this are the ambiguities set out above surrounding the investment value definition, different valuation methods, and whether an implicit income capitalisation method is a market or an income approach (as defined within IVS).

1.14 Sections 4 and 5 address the application of explicit DCF models to the two different bases of market value and investment value via a discussion of each of the major inputs into an explicit DCF model.

1.15 Section 4 addresses the application of explicit DCF models to the basis of market value. Depending on the physical and institutional structures in different jurisdictions, explicit DCF may or may not be the primary method for the assessment of market value. In some cases, it is not used at all for this purpose. Although the nature of the inputs to the explicit cash flow model may be the same or very similar for either basis of valuation, the sourcing of that information and analytical techniques used to synthesise it may be very different. Section 4 discusses the main inputs into an explicit DCF and identifies how they might be addressed in a market valuation context.

1.16 Section 5 addresses the application of explicit DCF modelling to the assessment of investment value. Investment values are routinely identified as part of the buy, sell, retain decision-making process and for other management purposes. There is no expectation that the worth of the asset to the individual, or to the wider market, and price will be the same at any particular point in time (although they may be the same). Specific inputs are assessed against the investment value basis and within this section there is also a discussion on the discount rate. In addition, there is also a sub-section on risk and risk measurement, expanded upon in Appendix B, which pays particular attention to the difference between assessing real estate asset risk and the variation around a single-point valuation figure (valuation variation risk).

1.17 The appendices are examples of how a valuer might implement explicit DCF in valuation. There may be other solutions that have equal or more merit dependent on the circumstances. These examples are purely illustrative and failure to follow the detail of methods set out within the appendices is not evidence that the valuer failed to follow best practice.

1.18 Appendix A gives additional examples of the differences between implicit income capitalisation and cash flow-based methods and also identifies how the two different applications of DCF modelling can be simply reconciled. Appendix B gives some additional

guidance on applying analytical risk analysis tools and Appendix C provides additional guidance on the treatment of depreciation in an explicit DCF method.

2 Explicit DCF valuation versus the implicit valuation method

2.1 International Valuation Standards (IVS) identifies three principal approaches to valuations: the market approach, the income approach and the cost approach (IVS 105 para 10.1).

2.2 This practice information is primarily concerned with the valuation of investment property, which can be valued by either the market approach or the income approach. Within each approach the valuer must decide which method of valuation to adopt, and within each method, which type of modelling is appropriate. All investment valuation methods would appear to have elements of both the market and the income approaches and this is discussed further in paragraphs 2.7–2.11.

2.3 IVS suggests the goal in selecting valuation methods is to find the most appropriate one under particular circumstances. It states that no one method is suitable in every possible situation.

2.4 IVS 105 paragraph 10.3 states that the selection process should consider, at a minimum:

'a the appropriate bases of value, determined by the terms and purpose of the valuation assignment,

b the respective strengths and weaknesses of the possible valuation approaches and methods,

c the appropriateness of each method in view of the nature of the asset, the approaches or methods used by participants in the relevant market, and

d the availability of reliable information needed to apply the method(s).'

2.5 IVS is flexible on the number of approaches and methods that can be used and the 'inter-mixing' of different methods. The valuer is free to apply either one or multiple approaches and methods appropriate to the circumstances. IVS 105 paragraph 10.4 states that where more than one approach and method is used, or even multiple methods within a single approach, the conclusion of value based on those multiple approaches and/or methods should be reasonable. The process of analysing and reconciling the differing values into a single conclusion, without averaging, should be described by the valuer in the report.

2.6 The use of multiple methods, including both an implicit capitalisation rate and an explicit DCF method, can be adopted where circumstances dictate it is appropriate.

Implicit valuation method

2.7 The main components of an implicit income capitalisation method are listed in IVS as part of a market approach. The market approach provides an indication of value by comparing the asset with identical or similar assets for which price information is available. This method becomes difficult and unreliable in opaque markets where transactional data is not freely available.

2.8 The explicit DCF method is classified in IVS as an income approach. IVS may lead to some confusion as the implicit income capitalisation method can be identified as an income approach, where the income level at the valuation date is assumed to remain fixed through time. Discounting this cash flow at a constant discount rate will result in a series of periodic values that can be mathematically reduced to the basic implicit model of rent divided by the discount rate. The mathematics of this are illustrated in Appendix A and in many valuation texts. To avoid confusion, the discount rate under these circumstances will be termed a capitalisation rate, and not a discount rate.

2.9 In some jurisdictions, the implicit income capitalisation method has been adjusted slightly for the timing of cash flows and the future changes in cash flows (but these changes are calculated based on reversions from the existing income level to the current rental value with no explicit growth rates applied to the current rental value). In all implicit valuation methods, the common factor is that the model is based mainly on comparative property market evidence of both the current rental level and the capitalisation rate (identified by IVS as part of the market approach).

2.10 The capitalisation rate has various terminology depending on the form of the implicit method and the country where it is being applied. The most common are valuation yield, initial yield, income yield or equivalent yield. Generically, they can be called the capitalisation rate as they take the current income level and capitalise it to determine the asset value. Some jurisdictions also report the reversionary yield, which is the price or valuation divided into the current rental value.

Explicit DCF valuations

2.11 IVS 105 paragraph 40.1 states that the income approach provides an indication of value by converting future cash flow to a single current value. Under the income approach, the value of an asset is determined by reference to the value of income, cash flow or cost savings generated by the asset, discounted back to the valuation date. As indicated above, both implicit and explicit methods can be characterised as a discounted cash flow so the distinction here is between an implied future cash flow and an explicit one.

2.12 IVS 105 paragraph 40.2 states that the income approach should be applied and afforded significant weight under the following circumstances:

‘**a** the income-producing ability of the asset is the critical element affecting value from a market participant perspective, and

b reliable projections of the amount and timing of future income are available for the subject asset, but there are few, if any, relevant market comparables.'

2.13 Explicit DCF can be used for both market value and investment value (or worth) definitions. It requires the estimated future cash flows to be determined at various levels of detail but generally includes estimates of future change in both values and costs, and estimates of the most likely outcomes of anticipated events over a specified time horizon.

2.14 These two perspectives need reconciliation. Market value may not be affected by the perspectives of particular participants unless those perspectives are identified as being held by the market, rather than a single individual investor. Market value is based primarily on market evidence and is not an entity specific value to the particular individual. The choice of method is therefore based solely on which method(s) best identifies the market value as defined in IVS.

2.15 Investment value (or worth) can be affected by particular participants and perspectives, but market value and investment value (initially termed calculation of worth) are different bases of valuation and are not to be confused. Investment value can be different to market value regardless of individual investor perspectives due to market mispricing of assets or segments/sectors. In some texts, market value and investment value have been differentiated as what you need to pay (market value) against what you should pay for an asset, or what it is worth (investment value).

3 The context for applying explicit DCF methods

3.1 Explicit DCF is one of the methods a valuer may consider, and it is reconcilable with a need to produce reliable, objective estimates of value. This section sets out the scope of market evolution and gives illustrative examples of where explicit DCF may be applied.

3.2 Property investment valuation methods are used to value not just investment property, but in other situations including vacant and owner-occupied properties. The principles in this practice information relate to all occasions where an investment method might be used, including more specialised properties and uses, including residential investments.

3.3 There has been a reluctance in some jurisdictions to diverge from an implicit method of income capitalisation, while in others the movement to explicit DCF has been more pronounced. Where the implicit method remains the most effective and objective method, valuers may still consider this method the preferable option.

3.4 The circumstances where an implicit method is appropriate are most likely to occur where there is direct comparable evidence, and the characteristics of the asset are relatively simple. Direct comparable evidence relates mainly to the location, physical characteristics, lease structures and tenant quality. Markets where market evidence is more plentiful and/or the market includes smaller assets with more single lettings, are more likely to fit into the IVS context that recommends the market approach.

3.5 There are some investment assets that are not priced on income, for example, some very specialist locations with particular brand characteristics. Here, a direct comparison market approach might be more appropriate.

3.6 However, there are other markets that are less transparent or more sophisticated. They may be markets with larger assets, higher buildings, more multi-occupation, characterised by a relatively small number of very large transactions, each of which is more complex to analyse. Buildings could have a restricted market based on their physical characteristics. For example, they may have been purpose-built for a discontinued or diminishing use. There may be opaque markets where transactional data is scarce or difficult to verify. These markets may rely less on comparable transactions and more on the discounting of future cash flows. It is difficult to defend a purely comparative method where there are no good comparables, whereas a valuation developed within a rational cash flow framework is more easily justified. However, all valuation methods are less reliable where there is insufficient or unreliable data and it is for the valuer to decide which method(s) are best suited to any particular set of circumstances.

3.7 The choice of method could also relate to tenure and different contracts controlling occupation. The value of real estate is a combination of legal rights and property characteristics. Operational assets or those with complicated lease structures, management agreements or more individual rent determination clauses such as indexation or turnover may require more consideration of current and future cash flows generated from those contracts.

3.8 The type of property may be a relevant factor in the choice of valuation method. For example, operational real estate (such as hospitality and leisure or certain healthcare assets) have a history of property valuation attached to the cash flow generated by a reasonably efficient operator and there are examples of specific RICS guidance addressing these uses (see RICS Valuation – Global Standards VPGA 4 as an example) that should be used in conjunction with this practice information.

3.9 The valuer should justify their choice of method (see VPS 5 introduction) in their analysis and reporting, and provide appropriate written commentary that supports key inputs used and the principal reasons for the conclusions reached (VPS 3 section 2.2 (l)).

Alternatives to the implicit method

3.10 As indicated above, implicit capitalisation rate valuation can be placed into a simple cash flow framework. These simple reconciliations of implicit methods with explicit DCF methods can be used to make implicit valuations more transparent, identify the underlying assumptions behind the capitalisation rate and support any commentary on methods within valuation reports.

3.11 Every transaction analysis or valuation using the implicit method can be replicated by reference to a simplified explicit DCF model, which highlights the implied discount rate and/or income/capital change rate. This can be undertaken in terms of the simple mathematical relationship that the initial income yield plus any growth expectations equals the expected discount rate earned by the investment over the cash flow period. This simplified method has been called short-cut DCF in some texts and already exists in some valuation software; illustrative examples of implied rental growth/discount rate analysis is provided in Appendix A.

3.12 The implicit method could be replaced with a simplified short-cut explicit DCF model, and this is true for every valuation carried out by reference to an implicit capitalisation rate. This would increase the transparency of the basic application of the implicit method, without disturbing the basic premise behind the method or, in the vast majority of cases, affecting the valuation outcome. Although grounded in market evidence, short-cut DCF can be used to reconcile capitalisation rates, discount rates and growth rates – the main currency of an explicit DCF method. Appendix A sets out the basic analysis behind the application of short-cut DCF models, which are set out in valuation texts.

Valuers' responsibility in the choice of methods

3.13 Over the past few decades, the use and application of cash flow methods has developed at a different rate across the globe. Some routinely adopt explicit DCF methods while others are just starting to use them within practice, or are in a process of developing their use. Any movement towards explicit DCF valuation methods in jurisdictions that use a mainly implicit method may take some time as valuers and clients get used to changes in both the revised valuation and reporting formats. Despite the fact that a purely implicit method may not be necessary, evidence gathered for the development of this practice information suggests that the use of implicit methods is expected to continue where appropriate. This could lead to the use of several methods of valuation.

3.14 A valuation opinion formed by a mix of methods is encouraged in existing valuation guidance and may be appropriate in these circumstances. Market valuation based on sparse market evidence of prices and inputs can be less reliable than one produced by any method where substantive market evidence is available.

3.15 Where one method is used, it is entirely appropriate to use inputs/outputs from other methods to benchmark the valuation. For example, an explicit DCF valuation can be sense-checked against basic indicators such as initial, reversionary and equivalent yields, capital value per square metre, residual site value, etc. An implicit income capitalisation method can be benchmarked against growth and total return/discount rate implications as well as the other indicators set out in this paragraph and any others deemed appropriate by the valuer.

3.16 The choice of method or methods and any benchmarks used are a judgement call of the valuer depending on the basis of the valuation and the circumstances surrounding the particular asset.

3.17 Explicit DCF analysis is already driving some valuations of larger, more complex investment assets. However, the decisions on method are more difficult for less complex assets, where, for example, the information base may be insufficient to form a reliable opinion using just an implicit income capitalisation method. In these circumstances the short-cut DCF model does not necessarily improve the valuation as it is still based on a capitalisation rate derived from market evidence.

3.18 Red Book Global Standards require the valuer to justify any valuation method(s) reported (VPS 3 section 2.1(e)). This standard also applies to the use of explicit DCF models. Valuers should justify the methods adopted for all valuations (VPS 5), including investment so there should be no presumption that this requirement is more important when implicit models are deemed the most appropriate.

The application of explicit DCF methods to market value and investment value

3.19 The two relevant bases of valuation are market value and investment value, which are fully set out in the IVS and Red Book Global Standards. Market value is the most familiar and

used basis of valuation in most jurisdictions. It is solely the identification of the most likely exchange price of the asset at the date of valuation after proper marketing has taken place.

3.20 Market value is theoretically not forward- or backward-looking; it holds no explicit information concerning the future performance of the asset even though all pricing is predicated on that expected future performance. It holds no information as to the rationality or logic of prevailing market prices, nor does it have any shelf life beyond the date of valuation (although some courts have for practical reasons given it some shelf life).

3.21 Investment value (or worth) is a very different concept and is defined in IVS as the value of an asset to a particular owner or prospective owner for individual investment or operational objectives. This definition emphasises the perspective of particular participants in the pricing of the asset, which includes the owner and any prospective owners. However, significant parts of this value to the participants are based on market factors and therefore, many elements of the valuation method rely on the same or similar market-based information for both market value and investment value (or worth). In many cases, the value to an individual will mimic the value to another investor with similar perspectives, and previous definitions of investment value specifically included value to a group of participants as well as value to an individual as one of the criteria.

3.22 Investment value (or worth) is often used to identify the price that should be paid and does not have the actual price, or the most likely selling price determined by the market approach, as an input into the assessment. During decision-making investment value is often compared to the market value for any differences.

3.23 It is not the purpose or role of this practice information to state when each valuation basis should be used. Normally a market value is required for most purposes, but investment value has a role to play in acquisition, sale and portfolio monitoring purposes, often as a benchmark for the market valuation or price. The basis of valuation should be clearly stated in both the instructions and the report and, where both are provided, the valuer should clearly state the differences between the bases and the information they provide.

3.24 The purpose of the investment value (or worth) is to identify the rational or logical price in the marketplace based on either individual or group participant perspectives. Implicit income capitalisation methods have no role to play in assessing investment value (or worth), and a common method is to use explicit DCF to determine the present value of the asset. Implicit income capitalisation methods do not take into account the particular perspectives of either individuals or groups. As indicated previously, market value is the discovery of the price that needs to be paid and is not an analysis of the rationality or logic of the price. Implicit or explicit DCF methods can both be used to identify market value.

3.25 Where explicit DCF is used for both market value and investment value (or worth), because the concepts and definitions of value are different, the sourcing and application of inputs into the model are also different. Different answers for the same asset can be expected in many cases where the market price of the asset does not fully represent the present value of the anticipated future cash flow. History has shown repeated cycles of

over- and under-priced property markets, with investment values being both under and over market values.

3.26 In summary, explicit DCF can be used for either basis of value, but as the outcomes can be different, so can the application of the methods. Red Book Global Standards VPS 3 reporting requirements mean the application of explicit DCF methods should be set out for the two bases of value separately. Many of the inputs and their sources of data and evidence could be the same, and the valuer and other stakeholders in the process need to determine precisely which valuation basis is being agreed (in accordance with Red Book Global Standards VPS 1) and produce the appropriate outcome. The basis of valuation must be set out clearly in the report (VPS 3 section 2.1 (e)).

4 Applying explicit DCF methods to the basis of market valuation

4.1 The market value objective aims to estimate the most likely selling price and ignore any individual participant perspectives unless they mirror market perspectives (for example, the risk appetite of similar institutional investors who may make up the market for a particular asset or class of assets). So, a market valuation determines the most likely exchange price, and the primary evidence for the market price is other transaction prices.

Differences between the inputs for market value and investment value

4.2 Where the basis of valuation is market value, it is considered inappropriate to use any input specifically related to an individual investor or stakeholder without confirmation that these represent market levels from other sources. A brief commentary on the treatment of finance and tax issues is included in section 5.

4.3 Valuers will typically record the source of all inputs. For reference, valuation reporting and method standards are contained in Red Book Global Standards VPS 3 and VPS 5.

4.4 Prices in the market are reflections of the expectations of investors and the major inputs into the explicit DCF method will be part of these expectations. Information on these expectations can inform these inputs in a market valuation, paying due regard to the primacy of actual transaction information.

4.5 Many of the inputs into an explicit DCF method may not change regardless of whether the value assessment is to find the market value or the investment value, which is defined as the worth to a particular investor. This is also the case for an assessment of the investment value for a group of investors rather than an individual investor. In a market valuation, any attempt by clients to influence these inputs can compromise the objectivity of the valuation (this may also be the case for an investment valuation if the input is one that should be based on market evidence). Where any input is specified by clients, and does not fit any reasonable assumption that could have been made in the market, the valuation should be reported as an investment value to the individual client and not as a market valuation.

4.6 As a market valuation is, wherever possible, grounded in transaction information, the comparable analysis process is central to all market valuations and the accuracy of the valuation can often be tied to the quantity and quality of the comparable evidence.

4.7 Where relevant transactions exist, they can be used to derive one or more of the main items in the explicit DCF. Normally this is the discount rate, but where a market level of discount rate can be verified from other sources, other items can be assessed by reference to market transactions. It is not the role of the valuer to adjust market valuations where they think market price levels are too high or too low, but an explicit DCF analysis, coupled

with appropriate commentary, can help inform investors and other stakeholders of the implications behind prevailing price levels.

4.8 The common approach to analysis of transactions is to, in essence, carry out the valuation by the appropriate method had the outcome not be known, and then use the actual outcome to derive one or more of the inputs.

4.9 This analysis process will be iterative in the case of a multi-input DCF model. The use of sensitivity testing and other forms of risk analysis can help identify the inputs that have the most impact on the outcome and the extent of that impact. The relationships between the inputs may also be an important aspect of any analysis of valuation variation.

Existing guidance on explicit DCF inputs

4.10 IVS details several inputs into the model and, in addition to the discount rate, these can be simplified to forecasts of income change, discounting period and exit value. More detailed discussions around these broad categories include:

a currency, real and nominal values and discount rates

b discounting periods

c stabilisation of cash flows over a full economic cycle, different types of cash flow and cash flow expectations

d depreciation issues

e exit values, including salvage/land value

f constant growth models and

g income capitalisation.

4.11 Other categories of relevant information might include tenure, physical characteristics, lease/sublease information, rents and rental values, costs of ownership and management, refurbishment/redevelopment, finance, gearing and taxation. IVS also discuss various forms of discount rate determination. These discussions mirror the main texts on explicit DCF.

4.12 Some of the inputs into a cash flow model are generic to all valuation bases and to both implicit income capitalisation and explicit DCF methods. The next section concentrates on those inputs in an explicit DCF that should not be affected by the basis of the valuation and are generic to both market value and investment value.

4.13 It should be noted that there are also some aspects, such as issues relating to the physical characteristics of the building, which are of equal importance and require similar treatment in both implicit and explicit valuations. These are not discussed here. However, some basic inputs utilised in an explicit DCF may need to be assessed in the context of the method and will require different treatment.

Market-based inputs for an explicit DCF valuation

Rent and rental value

4.14 There are three major elements to the issue of rents and rental values. The valuer assesses the rent actually being paid and what amount represents the market rental value. The third element is the forecast of rental values over the discounting period.

4.15 Rental income can be complex given the increasingly diverse and flexible arrangements for the occupation of property in different jurisdictions. Rent can often be established from a lease contract, but it may also be wrapped up in payments for services attached to the occupation of the property. In some countries, rental value estimates are complicated by the need to assess the actual or prospective lease occupational contracts at the current time and at any prospective lease expiry or rent revision dates. The need to identify either the current net income or potential net income can be similar for implicit or explicit methods of valuation.

4.16 Future rents and rental values are closely tied to expected lease events during the discounting period.

4.17 The use of incentives and inducements to let in some jurisdictions can lead to different levels of rent at different lease events, dependent upon type of rent determination and assumptions made about lease terms. These assumptions may be explicitly stated.

4.18 Rents may or may not be tied to property markets dependent on the specific lease contract. Rent revisions may be to the market rent at the time or based on non-property market indicators. These could be financial indicators, such as consumer or retail prices, or based on construction prices or turnover. The different bases of rent raises issues of how they are identified and treated in an explicit cash flow model. Property-risk-adjusted discount rates may be entirely inappropriate for significant elements of the cash flow; for example, a long-term lease with index-linked retail price revision clauses might not have the same risk profile as a lease with reviews to market rent due to potentially less volatility in the cash flow in the future.

4.19 Indicative forecasts of rental values are available for many mature markets. Forecasts can be at a national, regional or local level for a wide variety of property sectors. Forecasts can be based on anything from an extrapolation of existing time series data to econometric modelling of economic and property market variables. As national data is usually more comprehensive than regional or local data, national forecasts are easier to produce.

4.20 For the purposes of valuation, any forecasts applied to individual properties may require considerable qualitative review for asset specific and local market variations in demand and supply side determinants from those used in national, regional and city/town markets.

4.21 Accuracy of forecasting has been called into question by a number of research investigations. Criticisms include underestimating the volatility of the actual outcome and the

presence of significant momentum in the forecasts. Forecasts tend to confirm the current market: if a market is rising, the forecasts maintain that it will continue to rise and vice versa.

4.22 Forecasts for turnover or index-linked leases may be based on appropriate indicators that are not property market-based.

4.23 There is also the complication of whether rental value change is assessed at the location or specific property level, which raises the issue of the impact of depreciation and obsolescence and the level of rental value in any exit value assessment. In some cases, forecasts are based on past data of how a location grew, while others are based on data from actual properties. Locations can grow at a higher rate than actual properties that are depreciating through time. The valuer needs to be aware of the basis of any information they utilise in their valuations, whether based on a hypothetical location time series or from a time series of existing properties. (See Appendix C.)

4.24 In the absence of a reliable set of forecasts, the valuer is faced with attempting to identify a market-based input with little market-based evidence. Past data can be used to identify trends, and these may take account of real value trends after inflation has been stripped out of any time-series data. Expected inflation can be added back to any real value trends.

4.25 Data provided by clients can be used for both market value and investment value. However, both data provided by clients and the extrapolation of past trends and inflation may not be based on either rigorous analysis or verifiable market information. Valuers are referred to Red Book Global Standards VPS 3 reporting requirements (including VPS 3.2 (j)), as well as the approaches and methods coverage in VPS 5.

4.26 Forecasts and forecasting are sometimes used by valuers, but with caution. The qualitative assessment of how the forecast informs the explicit DCF for the individual asset can be an important component of the reporting of the assessment of rental value and rental value change within the method. Given the significance of this variable, a valuer will commonly provide their reasoning for adopting a certain forecast or rental growth model and may apply risk analysis testing of the impact on the outcome of any expected variability in the forecasts. Risk analysis is addressed later in this practice information, including Appendix B.

Lease events during the discounting period

4.27 Existing lease terms are typically assessed in the context of assessing the timing of any future lease events during the discounting period. The property could be vacant, and the lease event is a potential future letting requiring assumptions concerning the terms of that letting. The event could be a rent revision. It may be a break option within the existing lease or an expiry of the existing lease. In those circumstances, there could be a continuation or renewal of the existing lease terms, or revised lease terms to the existing tenant, or a new lease to a new tenant. With a lease expiry where the existing tenant does not renew, there is the need to assess any potential void period, as there is with an investment property that is already vacant.

4.28 The wide variety of lease events creates issues for the assessment of rent. Research has shown in several jurisdictions that the level of rent is affected by the negotiation type at each lease event and whether tenants have renewal rights within existing leases. For example, where rents are negotiated between landlord and existing tenant with renewal rights, they have been able – in some cases – to obtain lower rents than where they have no renewal rights, and have to compete with new tenants to retain the tenancy.

4.29 The level of rent can be affected by lease terms. Where rents are fixed under statutory terms of leases that prevent the granting of inducements to let, they may well be lower than where the market operates with a system of inducements such as rent-free periods or periods of reduced rent, capital payments by the landlord to tenant, contributions to tenant fit-out by the landlord, etc.

4.30 Rent-free periods and void periods are usually explicitly stated in the cash flow. These could be based on individual assessments for individual leases, while significant multi-let buildings can be based on longer-term vacancy rates and generic letting terms within the building.

4.31 For a single-point estimate of the value, the valuer will determine the most likely outcome of the lease events across the asset in the discounting period. The decisions regarding lease events can also be an important aspect of any risk analysis concerning the potential variation around any single-point valuation outcome.

4.32 Some jurisdictions have very good data on the propensity of tenants to stay in the property or to break their lease when they have the opportunity. This data can be utilised to provide broad indications of the probability of tenants staying or leaving. It may be inappropriate to make broad assumptions that every tenant leaves or stays unless there is strong evidence to support those positions. In jurisdictions lacking data on this topic, the valuer will look to outline how they have arrived at their assumption for these lease events.

4.33 Market information on lease structures and the level of inducements to let and void periods, if any exist, can also be used to justify reletting assumptions and to set any parameters for any variation analysis.

4.34 In an explicit DCF method, where lease events have been specifically included in the cash flow, the actual level of rents, expected rents and their timing based on these assumptions can be used in the assessment, rather than any values based on adjustments to effective rents excluding these assumptions.

4.35 It should be noted that rent and timing inputs related to existing and future lease events, including voids, can be included in an implicit method with corresponding adjustments to capitalisation rates.

Depreciation and obsolescence

4.36 Property value is a function of the value of the land and the value of the buildings on the land. While the land is generally permanent, many buildings have a finite life due to obsolescence; therefore, the life cycle of the building is an important component of a cash

flow. Buildings can be affected by physical deterioration but are more likely to become obsolete due to economic, functional, legal or physical obsolescence. Technological, legislative, social or other changes require buildings to have different designs and configurations to make them more useful to occupiers.

4.37 Depreciation in value has been measured in some studies by the decline in the value of a property relative to a new building in the same location. Depreciation is a relative concept, which means that a building can be nominally appreciating in value while suffering relative depreciation in value. The level of deterioration or relative depreciation in value can be arrested by refurbishment activity. Physical depreciation can, in some instances, be rectified by regular maintenance. Technological change can sometimes be rectified by refurbishment or retrofitting. In some cases, the only remedy is redevelopment, which is the ultimate cure for the relative depreciation of buildings.

4.38 Land/location is not immune to obsolescence, and a range of social and economic changes can profoundly affect the value of a specific location relative to other locations.

4.39 The treatment of depreciation and obsolescence within an explicit DCF commonly relates to three aspects.

4.40 The first is the assessment of the likely timing and costs of any future refurbishment or redevelopment, and the behaviour of the costs over the waiting period.

4.41 The second aspect is the impact of obsolescence on the rental value and therefore future income of the asset. There are two elements to this. The first is the relative decline in value compared to a new asset in the same location. This is affected by property type and the level of building value compared to land value. The second is the shape of that decline and whether the relative decline occurs in the early, middle or later life of the building.

4.42 The third aspect is the impact of obsolescence on the exit value, which is a function of both the impact on rental value and on the capitalisation rate. Capitalisation rates generally rise with increased age as buildings become less attractive to occupiers than newer assets in the same location (although age is not necessarily the driver of any obsolescence). A building with no physical changes over, say, a ten-year discounting period will generally have a lower rental value and a higher capitalisation rate than its newer counterparts, which will have improved specifications.

4.43 Theoretically, age is not the causal factor of depreciation. Some buildings or building types do not suffer depreciation in value; in some instances, older buildings command higher rental values than their newer counterparts, and the valuer needs to be aware of the characteristics that cause depreciation.

4.44 For example, the life cycle of smaller retail assets in good locations that have retained tenant demand during the retail revolution that occurred in many countries are virtually free of building-related depreciation, especially in historic town centres. Location value often dominates building value and building configurations do not change much. Many office markets, on the other hand, have seen some major technical improvements over the last few

decades, creating some obsolescent buildings with a life cycle of only a few decades before redevelopment.

4.45 The increasing importance of the three pillars of ESG is expected to have a major impact in the future. The three pillars are environmental (an organisation's impact on the planet), social (the impact an organisation has on people and community), and governance (reporting transparently, honestly and clearly on an organisation's activity). Increased focus on ESG by owners and occupiers of buildings and by governments has already led to changes in the life cycle of buildings and to expected rates of future depreciation in buildings. Examples include legislation to stop the reletting or sale of buildings that do not comply with minimum energy standards. RICS' Sustainability and ESG in commercial property and strategic advice details further considerations around ESG and its impact on valuation.

4.46 The impact of depreciation on the exit value in an explicit DCF valuation method is discussed in paragraph 4.51. The impact on income in an explicit DCF method is on the rental growth rate. If forecasts of rental growth are used to determine the growth rate, the basis of those forecasts is important to understand. Some forecasts are based on the assessment of a growth rate in the location that measures the amount of growth expected from a new building at the beginning of the forecast period compared to another, different, new building at the end of the forecast period. This growth rate is not obtainable by an existing building that is suffering relative depreciation and so rental growth in the location cannot be used unadjusted in a cash flow, unless it follows a redevelopment or major refurbishment.

4.47 If the forecasts used are based on evidence of actual buildings and their growth rate, they cannot be used unadjusted to determine the cash flow of the actual asset being valued until there is any major refurbishment or redevelopment activity within the cash flow period that changes the nature of the building.

4.48 In summary, if the growth rate is based on growth in the location, the rental growth rate applied within the method needs to be reduced by the rate of rental depreciation to a property specific growth rate. Where the rental growth rate is based on actual properties, no adjustment is necessary.

4.49 If a refurbishment or redevelopment is included in the cash flow, the location growth rate may need to be used in assessing the future level of rental value of new or refurbished property rents after refurbishment/redevelopment.

4.50 To assess market value, it may be necessary to make a number of different redevelopment and refurbishment assumptions within the valuation to test for the optimal market outcome. A particular client may have a specific plan for the asset, and this can be used, but it would constitute a departure from market value to investment value (or market value subject to a special assumption if it does not constitute the optimum development option).

Exit value

4.51 An explicit DCF is usually made up of an assessment of the income stream over the discounting period plus a terminal or exit value at the end of the period.

4.52 The exit value is commonly based on an assessment of the expected rental value of the asset at the end of the discounting period.

4.53 The expected rental value can be capitalised at the end of the period to identify the exit value as a single capital sum. There are a number of assumptions that could be made. The exit value could be:

a a residual site value assuming redevelopment, refurbishment or a major change of use. If the property is expected to have reached the end of its life cycle, the exit value may be the land value excluding the building (or some form of salvage value).

b based on an assessment of a future market value at the end of the discounting period or

c based on a capitalisation rate assuming long-term stabilised levels of future rental change and discount rates beyond the discounting period.

4.54 A redevelopment or site value method could be based on a valuation of the completed development less all development costs (a residual or cash flow development appraisal) after a reasonable development period or a direct comparison with similar development site values and prices, adjusted for future value change. Where a gross development value using a rental growth assessment is required, the expected growth rate will coincide with a forecast of growth in the location. RICS' Valuation of development property applies.

4.55 Where an expected market value of the existing asset is assessed as the exit value, the changing nature of the market and the property over the discounting period will be assessed. The method for assessing the market value of the asset at the end of the discounting period can be based on an implicit income capitalisation method, although this would seem incongruous for an explicit DCF model that is replacing the implicit model. Where an implicit capitalisation of the exit rental value is undertaken, both rental value and exit yield can be adjusted as appropriate.

4.56 The rental growth will be net of depreciation as the property asset will be depreciating over the discounting period. This will also have an effect on the capitalisation rate, which would normally rise as the property ages and gets nearer to the prospective end of its life cycle. If explicit refurbishments have been modelled in the cash flow, the impact of these changes may be included in any assessment of the rental value and exit yield. The rental value after redevelopment or major refurbishment might be based on comparables of similar new or recently upgraded properties coupled with a growth rate that reflects growth in the location.

4.57 In addition to any changes in the physical nature of the asset, expected changes to the quality of the location and the tenure can also be taken into account.

4.58 Another major factor is the state of the market. It is usually unreasonable to assume that the state of the market will be the same as existing and therefore the current capitalisation rate, adjusted for any physical changes, is an unreliable indicator. Unless the discounting period is so short that the valuer feels confident that they can assess cyclical movements in time, the capitalisation rate might be assessed given normal market conditions, regardless of whether existing markets are stronger or weaker than this more normal state. Past long-term or stabilised capitalisation rates could be used to identify past cycles, but the past is not necessarily an indication of the future. For example, interest rates were kept historically low post-global financial crisis by many national governments for well over ten years.

4.59 An alternative basis for the exit capitalisation rate is a long-term stabilised growth rate assumed for the property after the discounting period and a long-term discount rate. In this method, the capitalisation rate is a function of the discount rate less the anticipated growth rate. The valuer is free to adapt the long-term growth model as they see fit. For example, assumptions of capitalisation + growth rate will determine discount rate (cap rate + g = DR) or assumptions of discount rate and capitalisation rate will determine expected (implied) growth (DR – cap rate = g).

4.60 All of the above issues relating to the quality of the property at the exit date, and what that might mean for future refurbishment/redevelopment options, can be important considerations in the assessment of long-term growth rates, discount rates and, therefore, capitalisation rates.

4.61 The issue of purchaser's costs (PCs) is relevant to the assessment of exit value in some jurisdictions. Capitalisation rates can be analysed from market transactions and reported either net or gross of PCs. Where they are reported normally net of PCs, the assessment of a market level of capitalisation rate by reference to comparables may also include a deduction for PCs from the final exit value. Where the capitalisation rate is assessed as gross of PCs, or the assessment of capitalisation rate is made from a long-term stabilised assessment using the growth formulae above, the exit value may not be adjusted for PCs. In effect, the first assumption assumes a notional sale of the property at the end of the holding period using a market value assessment, the latter assumes a longer-term hold under stabilised conditions.

Costs

4.62 Costs attached to the assessment of the cash flow may be based on market norms for the particular jurisdiction. These may include property management fees, maintenance and the use of service charges, insurance, all irrecoverable expenditure, and transaction and marketing fees on lettings, renewals and rent revisions. Where the property is assumed to be (or is) vacant, additional costs may fall on the landlord/investor, such as occupier taxes and tenant responsibilities for maintenance and insurance.

4.63 Where appropriate, sale and acquisition fees need to be assessed both on the assumed purchase of the asset and assumed sale price/exit value. Also, as above, where it is normal in the particular market, conventions concerning the treatment of purchaser acquisition costs and yield analysis will be observed.

4.64 There are a number of inputs that might require a slightly different approach by the valuer if the valuation basis is market value. But the risk measurement material set out above is entirely appropriate to the determination of both market value and investment value.

Holding period

4.65 The discounting period in a market value would typically be based on market evidence or norms. In the case of leasehold investments, it could be based on the head-lease expiry date. Freeholds require a termination date that could be based on market norms (a number of markets default to around ten years). The discounting period could also be based on the anticipated timing of specific events, such as lease expiries or optimum redevelopment or refurbishment, with a reversion to residual value at the point of major redevelopment/ refurbishment. Another approach would be to assess the longer-term cyclical behaviour of real estate markets and establish a cash flow period over a full cycle, with a final reversion to a stabilised income and discount rate.

Discount rates and risk

4.66 Having established the cash flow and timing, the final stage is to discount the cash flow to the present value by applying a discount rate. As indicated in Appendix A, the basis of the discount rate is the required rate of return, sometimes called the target rate of return or the hurdle rate.

4.67 The discount rate can be underpinned by evidence from either property markets or financial markets, or both, and the approach depends primarily on the basis of valuation.

4.68 For the purposes of market valuation, a market observed discount rate can be assessed from market transactions. These can be assessed in an explicit DCF framework, although any one of the major inputs can be derived from the price after assumptions are made for the other inputs. The discount rate can be analysed by reference to the transaction price for all comparable properties when assumptions have been made concerning all other inputs into the cash flow. In this case, the best estimate of the cash flow would be assessed, and a basic internal rate of return analysis carried out to determine the return generated by the price or market value. Market levels of discount rate can be generated by reference to this transaction-based material.

4.69 As indicated above, discount rate is not the only item that can be derived from an analysis of prices using the explicit DCF model. Others may include rental growth rates, exit values/yields or any of the other major inputs. What is important is that the valuer reapplies the analysis of comparables in a consistently logical and market facing manner for the property that they are valuing.

4.70 Market value discount rates can be assessed by reference to the required return delivery mechanism set out above, i.e. based on observations of capitalisation rates and assumptions of expected growth rates. This is similar to the market analysis of capitalisation rates to assess either implied growth rates or discount rates, set out in Appendix A. More

complex transactions require a more complex analysis taking into account the more expansive set of inputs required for more complex investments using an explicit DCF format.

4.71 For market valuation where there is no market evidence of discount rates or the delivery inputs of growth and capitalisation rate, a first principles required return basis can be adopted. This approach to setting discount rates is set out in the next section. The discussion on risk measurement and pricing in section 5 and Appendix B is also appropriate for an explicit DCF valuation to determine market value where market evidence for inputs and discount rates is not available.

5 Applying explicit DCF methods to the basis of investment value

5.1 Investment value has been characterised in the past as the calculation of the worth of the asset. The objective is not to identify the market price that 'needs' to be paid in any transaction, but rather to identify the price that 'should' be paid.

5.2 Virtually all of the existing professional guidance and many of the textbooks on explicit DCF methods implicitly or explicitly address the basis of valuation as investment value (or worth), not market value. As the IVS definition relates investment value to the individual buyer and seller (or any other stakeholder within the process), this leads to a combination of:

a market factors affecting the value and

b the perspectives of different individuals/clients involved in any transaction process.

5.3 In previous definitions of investment value both market and individual client perspectives were clearly identified, and this section also makes the distinction between market-based inputs and individual client-based objectives clear.

5.4 In reporting any opinion of investment value it is important that the investment valuation framework being adopted is clearly defined. Inputs based on the requirements of a particular investor should be recorded in the valuation report.

5.5 There are a number of issues that could be based on either market norms or be characterised as perspectives of the individual investor that would distinguish market value from investment value. These include the management of the asset, the discounting period, finance and taxes and the discount rate.

5.6 The management of the building could include the actual plans of investors, the letting policy or the plans to redevelop or refurbish (or not) the asset. The discounting period could include the actual plans of the client regarding holding period with a specific plan for the asset over the foreseeable future. The actual financial package for the building could be used and the investor may have some specific tax liabilities (or benefits). Finally, the investor may have a specific target rate of return or specific criteria for assessing a target rate of return.

5.7 These could all be specified as inputs that would affect the valuation of the property to the individual investor. In those circumstances the valuation is an investment value and would not be represented as the market value unless all of those assumptions can be verified as legitimate market-based inputs.

Discount rate

5.8 An investment value is not based on transaction prices; therefore, the discount rate can be based on first principles, which include financial rates of return, and the assessment of a risk premium.

5.9 For the purposes of investment value (or worth), the discount rate can also be based on the particular investor's rate of return (but see paragraph 5.4 and 5.19).

5.10 A first principles approach can be applied in a number of different ways. In addition to a financial market risk-free rate of return plus a risk premium for investing in the property asset, it can also be based on other financial market approaches, including capital asset pricing models (CAPM), or on a company's weighted average cost of capital (WACC) (see Appendix B). There does not appear to be any major consensus in either the academic or practice literature concerning the best approach to the determination of the rate to discount an asset specific cash flow. WACC analysis can be used to distinguish between debt, equity and total rates of return and requires details of the proportion of debt to equity, the overall return requirements and the rates of return on debt or equity so is very entity specific

5.11 The risk-free rate (RFR) can be assessed in real or nominal terms, with the difference being based on expected inflation in prices. Real RFR + expected inflation = nominal RFR. The type of income being assessed will typically match the type of discount rate. In many property valuations, income flows are assessed as nominal or actual, and any growth would include expected inflation or deflation on actual prices. A nominal RFR can be used in these circumstances rather than a real return (such as the yield on an index linked government-backed bond). Where an analysis of real returns is required, cash flows would then be reduced for expected inflation to identify real levels of cash flow and may be discounted using real rates of return after inflation has been stripped out.

5.12 Proxies for the RFR can be based on government bonds if the government is deemed to be the safest form of default-free investment. The long-term rate is often assessed from bonds whose maturities are similar to the asset's discounting period. The redemption yield at the valuation date can be used, but an argument can be made for using a long-term average rate, especially when used in long-term stabilised outcomes for the exit value.

5.13 The choice of discount rate will generally accord with either an assessment of the required return or an assessment of how returns are delivered. The required return is delivered by a combination of initial yield/cap rate plus any growth. In an investment valuation, the choice can be based on a required return rather than the delivery mechanism.

Requirement			**Delivery**		
risk free rate	+ risk premium	= discount rate	Cap rate	+ growth rate	= total return (discount rate)

5.14 The risk premium for individual property assets is made up of a generic property risk premium based on the performance and volatility of property versus other investments,

with adjustments for the individual characteristics of the cash flow. The risk premium is a function of a property market risk premium, a sector risk premium, a location risk premium and an asset risk premium.

5.15 The asset risk premium might include, for example, issues surrounding the tenant and lease structures, the building quality, including the depreciation factors indicated above, and any micro-location issues. In an explicit DCF, many of these issues with lease, building and location have been taken into account explicitly in the cash flow (lease events, depreciation, rental value and rental growth), so the risk premium is a function of any uncertainty around these estimates of the amount and does not reflect the lack of any adjustments. In less sophisticated cash flows, it may reflect a reduced number of inputs into the model.

5.16 Where the discount rate applied does not accord with market perspectives and is applied in the context of an investment value for the particular client, this should be made clear in the valuation report in accordance with paragraph 5.4.

Finance and taxes

5.17 The treatment of finance and property-based taxes may be complex in valuations as they are often based on the ability of an individual and company to raise finance or on wider tax affairs of the individual or company. In market valuations, the individual nature of taxation arrangements makes the incorporation of taxation of income and capital/capital gain difficult to include. Finance is less problematic as there is evidence of market rates of interest, levels of borrowing, etc. in many jurisdictions. While the general levels of availability and costs of finance are influential on the general level of asset prices in a market, individual finance arrangements should not enhance the market value of the individual asset; it just distributes that asset value between equity and debt in accordance with the risk reduction or increase, depending upon the financing terms. This principle can be disturbed by the tax treatment of financial arrangements.

5.18 While inappropriate in most jurisdictions for market value, assessing the value of net of tax and net of finance returns to equity and debt will be more appropriate for the assessment of investment value to the individual. However, deriving net of tax and/or net of finance returns from an assessment of market value would add to the transparency of valuations.

5.19 For investment value to the particular individual, it is appropriate to take into account client perspectives, but it is important that paragraph 5.4 is taken into account and the valuation report identifies the value of the asset subject to the particular financial arrangements, and makes these assumptions clear.

Risk measurement and pricing

5.20 Risk is a significant part of property pricing. Risk measurement has been characterised in many texts as a measurement of the extent to which an actual outcome can vary from the expected outcome. Where a risk premium is added to a risk-free rate

to identify the discount rate to assess a single-point property valuation for an individual property asset, the property risk is adjusted for within the discount rate. But risk is inherent in the cash flow, not the discount rate, and a more sophisticated risk assessment includes some reflection on each of the cash flow inputs. The risk attached to each of the inputs can inform the choice of overall risk premium to be added to the risk-free rate.

5.21 Some of the inputs into the cash flow hold much less uncertainty than others. Rent is often fixed under a lease contract, so the only risk is that of default of the contract. In some circumstances, a default can add to the value. Some costs are currently fixed, such as purchaser and seller tax rates, but there is uncertainty as they could change in the future during the discounting period.

5.22 Other inputs generally have more uncertainty attached. Rental value estimates are based on the quality of the comparable evidence or accounting information, including potential lease terms and inducement complications. Rental growth estimates may prove to be very inaccurate, and exit values are based on a number of uncertain inputs, for example, rental growth rates and future or stabilised capitalisation rates.

5.23 The risk attached to different inputs implies that there are different levels of risk across different aspects of the asset cash flow and these may require different discount rates within the same valuation. Explicit DCF methods can accommodate that.

5.24 The discounting period adopted can shift the weight of uncertainty; for example, a short discounting period can place major weight on the exit value, while a long or infinite discounting period increases the weight of value applied to the income flow assessments and less or no weight on exit value. Equally, a shorter discounting period may mitigate the reliance on longer-term forecasts, which may be beneficial in opaque markets where data is scarce.

5.25 The risk attached to the inputs supporting the cash flow assessments can be assessed by a range of techniques, from simple sensitivity analysis, through to the assessment of different scenarios and sophisticated mathematical simulations. All of these techniques require elements of qualitative judgement and the setting of parameters and cannot be assumed to provide definitive quantitative assessments of the risk of each individual asset valuation.

5.26 There is a distinction between property risk and property valuation uncertainty/variation. It is possible to have a very certain valuation of a very uncertain and risky property asset. A market valuation is primarily based on transaction evidence, and where that evidence exists for very similar properties with very similar characteristics, the market valuation will not be subject to significant variation. However, the asset and the comparable asset could both have a very uncertain cash flow and be classed as a risky asset, but whatever the basis of the analysis and valuation, some anchoring on the comparable price is very likely.

5.27 This scenario is less likely with investment value (or worth) assessments where the primary influences on valuation uncertainty are the same as the primary influences on the risk of the asset, based on the uncertainty of the inputs.

Appendix A Implicit vs explicit DCF valuations

This appendix sets out the technical issues concerning the differences between implicit capitalisation rate valuations and more explicit DCF valuations. It is recognised that there are many variations in application. An implicit model could be very explicit about the timing and level of the cash flow and be specific about void periods, rent-free periods and future lease events. An explicit model could be applied very simply with few inputs. The major distinction is the treatment of value growth or decline; whether it is implied in the choice of discount (capitalisation) rate or explicitly addressed in the cash flow and not implied in the discount rate used. This appendix sets out the basic mathematics reconciling the two methods.

A1 Reconciling explicit and implicit models

The two valuation methods are closely related, and all income approaches can be reconciled mathematically as discounted cash flows.

The differences relate to assumptions concerning the cash flow through time. At the simplest of levels, an implicit valuation is an explicit DCF valuation assuming no change in the level of rental value or capitalisation rate through time. In these circumstances the two methods reconcile, and the capitalisation rate and the discount rate are equal.

The basic differences can be illustrated using a single tenant property let at its market rental value.

This example assumes that the property is fully occupied and let at the current market rent. In this scenario, using the implicit method, the valuer only needs to capitalise the rent; in other words, divide the rent by the yield in order to achieve the value.

Example 1

Assume a fully let property with a market rent of #1,000 and a yield of 10%. What is the value of the property using the implicit income capitalisation method? How is the capitalisation method a DCF?

Value = Rent / Yield = #1,000/10% = #10,000.

Figure 1: Rack-rented property as capitalisation method

First, the assumption is that #1,000 is an annual cash flow that starts at the end of Year 1 and runs into perpetuity, as shown in Figure 2.

Figure 2: Rack-rented property as DCF method (nominal values)

The implicit method uses an infinite summation of the present value factors that deconstructs to the simplest of formulae (rent/discount rate).

The explicit method identifies the present value of each individual cash flow and sums them.

Present Value (PV) =

Cash flow x (1 + discount rate) $^{-\text{period}}$

= 1000 x (1+ 10%)$^{-1,-2,-3...,-n}$

Present Value (PV) for period 1 = 1000 x (1+ 10%) $^{-1}$ = 909.09

Present Value (PV) for period 2 = 1000 x (1+ 10%) $^{-2}$ = 826. 45

Present Value (PV) for period 50 = 1000 x (1+ 10%) $^{-50}$ = 8.52

Present Value (PV) for period 100 = 1000 x (1+ 10%) $^{-100}$ = 0.07

Figure 3 now shows the present values of the cash flows in Figure 2.

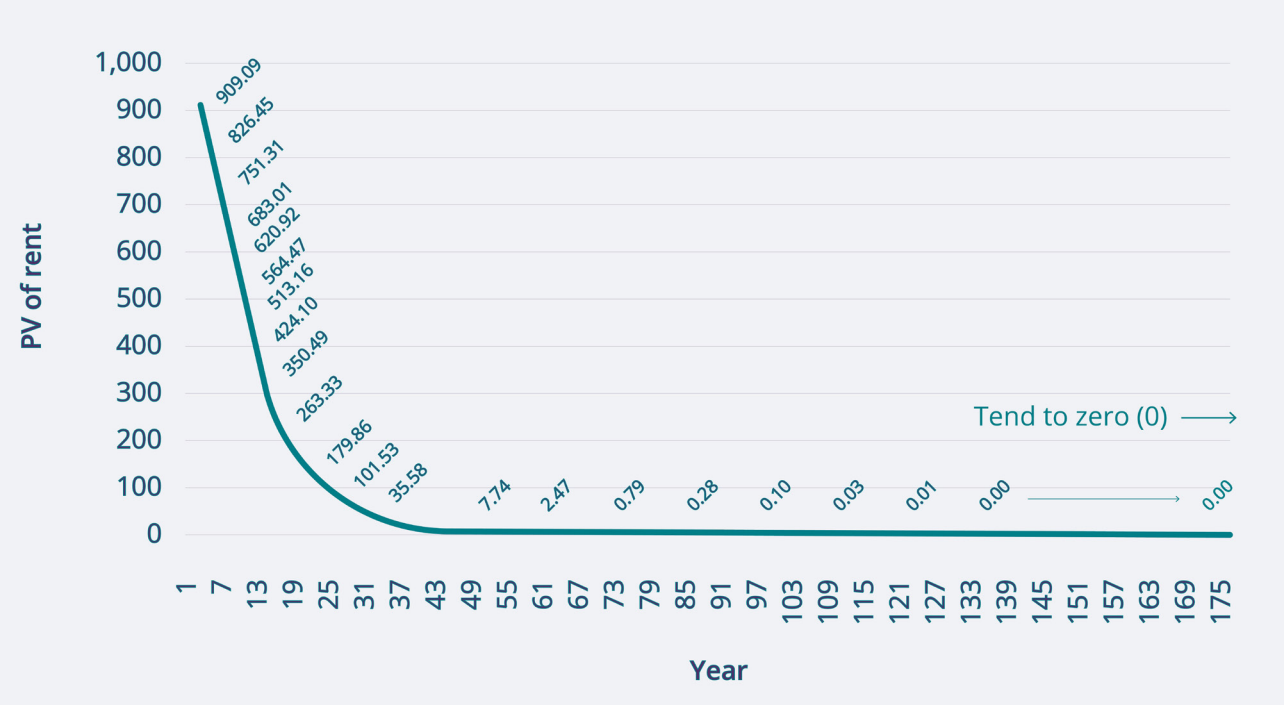


Figure 3: Rack-rented property as DCF method (present values)

The PVs of the individual future rents tend to 0 (zero).

Figure 4 shows the cumulative sum of PVs. At the end of the curve, the NPV tends to have the same value as derived through the capitalisation method.

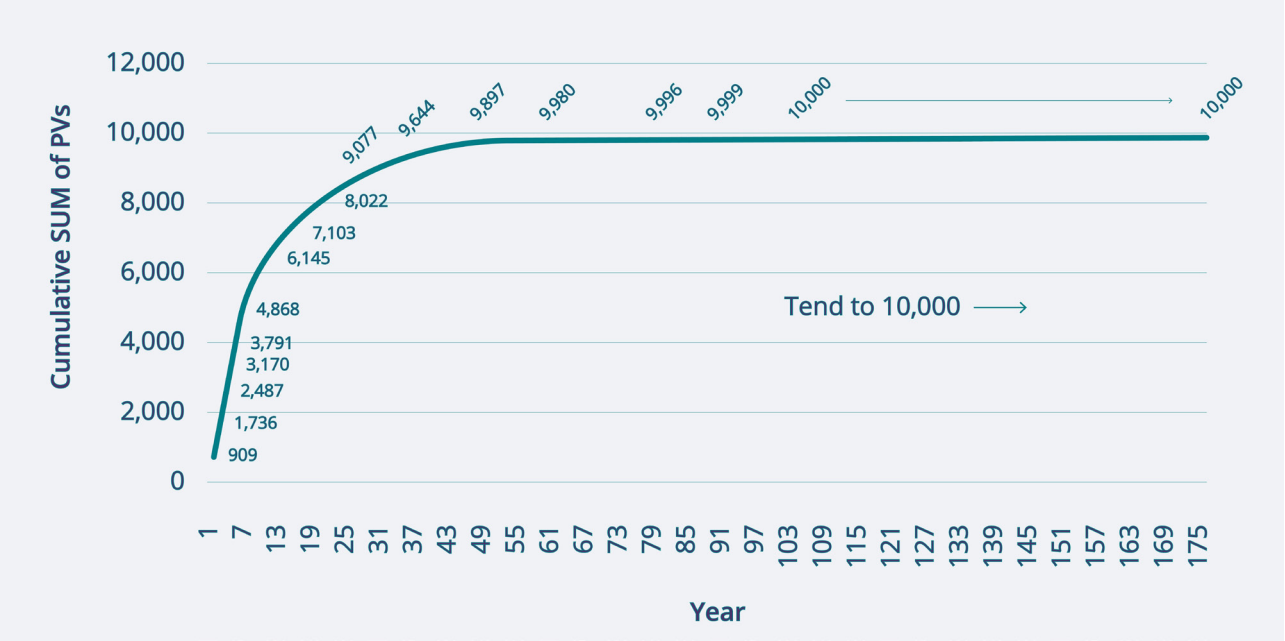


Figure 4: Cumulative sum of PVs (NPV)

These calculations illustrate the point that the implicit income capitalisation method of rent/yield gives the same result as a DCF in perpetuity if it is assumed that:

- rents do not grow
- yield is the discount rate
- rents are received at the end of the period.

Where rents are received in advance, the implicit method can be adjusted by adding an extra period's rent (R/Y + R) and this would reconcile with a simple explicit DCF.

Implicit capitalisation rate models

Capitalisation rates and discount rates are normally different due to expectations that cash flows will adjust through time in both real and nominal terms.

There is a basic relationship between capitalisation rate, growth and discount rate based on the Gordon Growth Model where Value = Rent (#1) / (DR–g). If the market growth is expected to be 2% per annum and the discount rate is 12%, DR-g = 12% - 2% = 10%, which is the capitalisation rate. 1/10% = the value. Table 1 illustrates this.

Discount rate	Growth rate	Cap rate
12%	2%	10%
12%	3%	9%
10%	2%	8%

Discount rate	Growth rate	Cap rate
8%	3%	5%
6%	2%	4%

Table 1: Gordon growth model discount, rate and cap rate combinations

The Gordon Growth Model is based on several assumptions: the income is received periodically in arrears and is reviewed at the beginning of each year (in other words the rental level is assessed at the beginning of the period but paid at the end). It is an infinite model so where a future sale is anticipated, it also implies initial capitalisation rate and exit capitalisation rate are the same, i.e. capital growth = rental growth.

Many cash flows do not have these assumptions. Where it is normal for the rent to be fixed for a longer period than the payment period, the basic formulae of capitalisation rate plus growth rate = discount rate may need to be amended for the delay in receiving any growth in income. For example, where there is an assumption of market growth of 2% per annum and five-yearly rent revision periods, growth is only reflected in the cash flow every five years. Therefore, a discount rate of 12% and a growth rate of 2% will not produce a capitalisation rate of 10%.

Setting aside for a moment the complication of periodic rent changes, a commonly used property pricing model for commercial property investments is therefore:

$$k = RFR + rp - gl + d$$

where:

k = the capitalisation rate (or initial yield of a fully let property)

RFR= the risk-free rate

rp = the risk premium

gl = the expected rate of rental growth in the location

d = expected depreciation

RFR and rp combined make up a required or target rate of return (r); gl and d combined together produce net expected rental growth in the actual property (gp). On that basis, a simplified growth model becomes:

$$k = r - gp$$

In the case of example 1, k (10%) = r (12%) – gp (2%)

A simple cash flow model states that the capitalisation rate is a function of the target rate or discount rate less the expected growth rate.

Where market value is the required basis, the value will be based on observed prices, but these prices can be analysed for basic levels of expected growth and discount rate. This can be reported to give clients additional basic information on the cash flow-based implications of the property price/value.

This analysis can be undertaken by assuming either the discount rate to determine the implied rental value growth rate or by a forecast of expected growth to determine the discount rate. So discount rate and net rental growth form the foundation of a fuller analysis of transactions than reliance on just capitalisation rate.

Example 2

A freehold shop property has just been let on a ten-year lease with five-year rent reviews at a net rent of #200,000 p.a. and was subsequently sold for #4,000,000.

Ignoring any issues surrounding purchaser's costs, basic analysis is that the capitalisation rate = #200,000/#4,000,000 = 5%

To find implied growth, assume a target rate of 7.75%. Using a rearrangement of the formulae above of k = r − gp to gp = r - k, the implied rental growth required to get a capitalisation rate of 5% to a target rate of 7.75% is 2.75% pa.

To find implied target rate r = k + gp. If the expected growth is 2.75%, the implied target rate is 7.75% (5% + 2.75%)

A major input into the implied method is the expected level and timing of rental change. If periodic rent revisions take place more than annually, it needs to be adjusted for the period of those rent revisions. The less frequent the revisions, the greater the amount of market rent growth needed to deliver a specific target rate of return if it is higher than the capitalisation rate.

Calculation of implied rental value growth or implied target rate or return

Capitalisation rate (k)

Assumed target rate of return (r)

Timing frequency of rent revisions (t)

Implied annual rental value growth rate (gp)

There are a number of formulae that can be used to calculate the implied constant annual rental value growth rate. They all reconcile, as they are based upon identical assumptions (and, therefore, limitations).

The basis of the method set out below is an equation in which the target rate is made up of the capitalisation rate plus the annual amount required to replace the expected capital gain over the review period.

The capital gain is equal to (1 + gp)^t - 1

The annual sinking fund formula incorporating r and the review term t is r / ((1 + r)^t – 1)

The appropriate formulae for the implied target rate is:

r = k + r/((1+r)^t-1) × ((1+gp)^t - 1)

As the target rate appears on both sides of the equation, it needs a trial and error, goal seek solution to derive the target rate from a known growth rate, capitalisation rate and periodic ret revision term.

To amend for implied growth rate, it needs some rearrangement:

First, cap rate (k) = r - r/((1+r)^t-1) × ((1+gp)^t - 1)

Let p = rental growth over the review period (t),

Then k = r – (r/((1+r)^t-1) × p). gp may then be derived from p, as (1 + p) = (1 + gp)t .

Example 3

Determine the implied rental growth rate needed to get a 5% initial return up to deliver a 7.75% per annum total return given a 5% capitalisation rate or initial yield and based upon five-yearly rent revisions:

k = r − (r/((1+r)^t-1) × p)

0.05 = 0.0775 – 0.17131 × p

p = 0.16053 (16.05% increase in rental value every five years)

1 + p = (1 + gp)t

1.16053 = (1 + gp)^5

gp = ((1.16053)^(1/5) − 1

gp = 0.0302 (3.02% p.a.)

The market rent will need to grow by 3.02% annually to deliver a 7.75% total return given five-yearly rent reviews.

A second formula is based on a DCF or NPV method to the problem. The outlay is the capital value (Rent1/k); the inflows represent the value of the income until the first review; the property is then assumed to be sold at the first review. The rental value on review is capitalised at the same capitalisation rate as represented by the current purchase, and the capital value obtained is then entered as an inflow at the first review.

The equation for a rental income of #1 is:

1/k = ((1 – (1 + r)^-t) / r) + ((1 + gp)^t) x (1/(k((1+r)^t)))

Rental growth can be derived as above by rearranging the formula.

The sensitivity table below sets out the various discount rate/growth rate permutations for a 5% capitalisation rate and a five-year periodic revision of rents.

Target rate (%)	6.00%	6.50%	7.00%	7.50%	8.00%	8.50%	9.00%
Growth rate (%)	1.10%	1.65%	2.20%	2.75%	3.30%	3.84%	4.39%

There are huge simplifications with this analysis. Although it looks like it covers the period to first review, in this case five years, in reality it assumes constant growth and discount rates into the long-term future, and static capitalisation rates. It does not mimic a more sophisticated explicit cash flow, but it does give some transparency as to the basic rental change/discount rate assumptions driving prices which are hidden within the implicit income capitalisation method. These analyses can be used to create some synergies between the different approaches and the underlying assumptions inherent within prices, and could be used by valuers choosing to adopt implicit income capitalisation methods to add justification and transparency to the reporting of the valuation.

A2 Extending the analysis into a basic valuation model for market valuation

Where the income capitalisation method is deemed appropriate, there are alternatives based on short-cut DCF using the analysis of transactions set out above. There are variations on this theme, but they are short-cut versions of a cash flow model, making the same assumptions as above.

They can be combined with the above analysis to undertake single tenancy capitalisation rate-based valuations in a more transparent cash flow-based format. Multi-tenancy investments can be valued by the method using a lease-by-lease approach. There are examples in valuation texts of these applications.

A simple, illustrative example of the method is set out below based on example 3 inputs.

Example 4

Value the freehold interest in a property just let at its market rent of #100,000 with a five-yearly rent review period. Market capitalisation rates are at 5%. Assume a target rate of return of 7.75% and an input growth of 3.02% per annum.

An income capitalisation method:

Rental value	100,000
Capitalise in perpetuity at the capitalisation rate of 5%	20.0000

Valuation	2,000,000

Using an alternative cash flow approach:

Step one – analysis for implied rental growth to get a 5% capitalisation rate to a 7.75% target rate with five-yearly rent revisions. Growth = 3.02% pa.

Step two – valuation by short cut DCF.

Rent	100,000		
Capitalise five years at 7.75%	4.0192		
Value of first five years		401,916	
Reversion to current rental value	100,000		
Growth at 3.02% pa	1.16052		
Rent in year 5	116,052		
Capitalise in perpetuity at the cap rate of 5%	20.0000		
Discount five years at 7.75%	0.6885		
Value of reversion		1,598,084	
Valuation			2,000,000

Reconciliation to show that it is still a 5% cap rate.

Term rent	100,000		
Capitalise for five years at 5%	4.3295		
Value of term		432,948	
Rental value	100,000		

Capitalise at 5%	20.0000		
Discount five years at 5%	0.7835		
Valuation of reversion		1,567,052	
Valuation			2,000,000

The short-cut DCF valuation can allow for a more considered reflection of the target rate and growth rate, analysed from the capitalisation rate, than the income capitalisation method. It enables the valuer to report on the broad assumptions behind the market pricing rather than just the current capitalisation rate. It does rely on an assumption of either target rate or growth rate, but this assumption does not make much difference to the valuation solution as an increase in target rate generates a similar increase in implied growth rate.

Communication of the result is complicated by the fact that there are two unknowns, and one must be assumed to solve the other. The variation of results can be reported as a matrix to better inform clients of the underlying drivers of the price level.

	Growth rate				
Discount rate	0%	0.50%	1.00%	1.50%	2.00%
6.00%	6.00%	5.55%	5.10%	4.63%	4.15%
6.50%	6.50%	6.06%	5.60%	5.14%	4.67%
7.00%	7.00%	6.56%	6.11%	5.65%	5.19%
7.50%	7.50%	7.07%	6.62%	6.17%	5.71%
8.00%	8.00%	7.57%	7.13%	6.68%	6.23%

Table 2 : Table of capitalisation rates from combinations of discount and growth rates assuming five-year rent revision period

To summarise, the implicit valuation based on a capitalisation rate of, say, 5% found by comparable analysis of transactions, can be put into a cash flow framework, which reveals the underlying discount and growth rates implied by the price. Despite the simplicity of these indicators (in the sense that they do not identify other drivers of the price level and make some very simplifying long-term assumptions), they can add to the transparency and information content of the valuation without compromising the basic principle that, in many instances, the best evidence of market value/exchange price is the price of other directly

comparable assets. They also show up cases where the assets are not directly comparable, when using an implicit method would not identify that.

A3 DCF examples

Explicit DCF methods are set out in various valuation textbooks and there is no set format or menu of inputs. Any examples would therefore be illustrative rather than prescriptive and subject to variation. The basis of the valuation and the level of complexity required can differ from asset to asset and by custom and practice across different jurisdictions and for different purposes. It is recommended that stakeholders in this process requiring further or more in-depth advice on the modelling process acquaint themselves with the relevant texts in their particular regions.

Any increasing use of explicit DCF should be accompanied by the generation of additional data to aid the implementation of any change. Basic data on rents and capitalisation rates is routinely collected in databases supporting the valuation process. Given the additional inputs into explicit DCF models, it is incumbent on those data providers and collectors to support the creation of new data outputs such as discount rates and rental growth rates underpinning these valuations, just as they now publish capitalisation rates series to support the implicit valuation regime. This includes the major property performance measurement agencies and the major property consultants.

Appendix B Risk analysis techniques

Risk analysis can be an integral part of valuation. For example, a capitalisation rate is, to all intents and purposes, an all-risks-yield, encompassing all the risks associated with the property. A risk-adjusted discount rate accounts for all the risks either not quantified in the cash flow at all or for the uncertainty surrounding those that are explicitly included. Most investment valuations are an expression of the present value of the potential or expected future cash flow, so assumptions surrounding the performance of the asset are integral to the valuation of the asset.

There are numerous examples of risk analysis in basic valuation texts, and these will have different nuances across different jurisdictions. It would be inappropriate to set out a model answer; however, a summary commentary and appropriate illustrative examples are included here.

There are portfolio and other issues that bear on risk assessment. This document concentrates on assessing risk at an individual asset level, concentrating on the assessment of risk in a valuation context. It adopts a risk-adjusted discount rate method based on a risk-free rate plus risk premia, but there are other alternatives noted in section 4.

B1 Weighted average cost of capital (WACC)

Companies use a mixture of debt and equity to fund their activity, and each requires a return through interest, dividends, and share price growth. Only when an asset's rate of return exceeds the company's WACC will the asset add value to the company, so the target rate of return for investment by that company could be based on WACC.

WACC is calculated simply by assessing the weight of debt and the weight of equity and finding the weighted average of the cost of both, so:

$$WACC = Wd \times Rd + We \times Re$$

Where e and d stand for equity and debt, W equals the proportion or weight that each has in the total capital structure, and R is the required return for debt and equity.

This gives some basis for the discount rate at a portfolio level but does mean that if no investment is made at a return less than WACC, no investments will be made at a market risk level that delivers a lower return. So, no low-risk assets are purchased as they do not deliver enough return.

Also, many investors do not issue either equity or debt, so they have no market test for their WACC.

Despite this, a 2017 study into Hurdle rates by the Investment Property Forum found that a company's WACC is widely used as the hurdle rate. But there was also evidence that managers often use hurdle rates that are substantially higher than the company's cost of capital 'to correct for overly-optimistic cashflow projections in the projects they are asked to consider'.

B2 Capital asset pricing model (CAPM)

Theoretically, this model provides a rigorous method for the choice of risk premium. Unfortunately, it is almost impossible to apply to commercial real estate.

The method involves finding two major parameters. The first is the premium for holding risky assets in general (a whole market indicator of variation). The second is the beta of the individual asset, which is a measure of the sensitivity of the asset cash flows to wider market movements. Data limitations make the beta for an individual asset very difficult to measure, and certain asset-based risks are not picked up in the method anyway. It also assumes full diversification of the portfolio. The IPF research found that CAPM was more likely to be used by large companies than small ones, and public companies more likely than private ones.

Most risk analyses are based within a risk-adjusted discount rate framework, based on a risk-free rate plus risk premium assessed by reference to the possible variation of the cash flow from the expected cash flow.

B3 Valuation risk

The valuation risk is the fact that all valuations are opinions of value, and no valuer is expected to come up with the same valuation as another valuer. This expected variation between valuers has been verified in numerous courts and tribunals around the world.

Whether the valuation is carried out using implicit income capitalisation or more explicit cash flow methods, this variation exists. In the past, implicit income capitalisation has been defended on the grounds that the small number of inputs helps reduce valuation variation and the larger number of inputs and assumptions in a cash flow valuation increase valuation variation. This is no defence. The accuracy of valuations is far more dependent on the evidence base for the valuations and not on the method.

Section 4 suggests that valuation risk and property risk are not the same things, but they do have some major similarities in that the drivers of more variation in property investment may well also increase valuation variation. For example, the valuation of a long-term income stream in a well-located, high-quality property let to a very strong tenant would suggest a low volatility of possible income variation. This may well translate into a low measure of valuation variation as well as reduced property risk. The techniques for measuring this possible variation would be the same. But a similar property transaction may decrease the potential for valuation variation but have little or no effect on a property risk assessment.

B4 Risk analysis techniques

There are techniques available for measuring the potential valuation variation and/or property risk:

- sensitivity analysis
- scenarios and
- simulation.

Risk is usually defined by reference to the expected variation in potential returns, but can equally be assessed as the variation in price that ensues from any analysis of how the potential cash flow will vary through time.

It is not the role of this practice information to mimic basic textbooks and discuss risk analysis in any detail, but the techniques for assessing variation need some elaboration in the context of individual property appraisals.

Sensitivity analysis

Sensitivity analysis is the most basic form of analysis that identifies the impact of any individual variable on the outcome. Each input variable can be assigned a range of possible outcomes from best to worst. The range of values attached to the individual variable can be purely qualitative or both quantitatively and qualitatively established (for example, the rental value could be assessed as a range from all the available comparable transactions). They can be allocated some probability of occurring, but it can sometimes remain a crude and basic attempt to identify the impact that each input into the model has on the outcome.

Scenarios

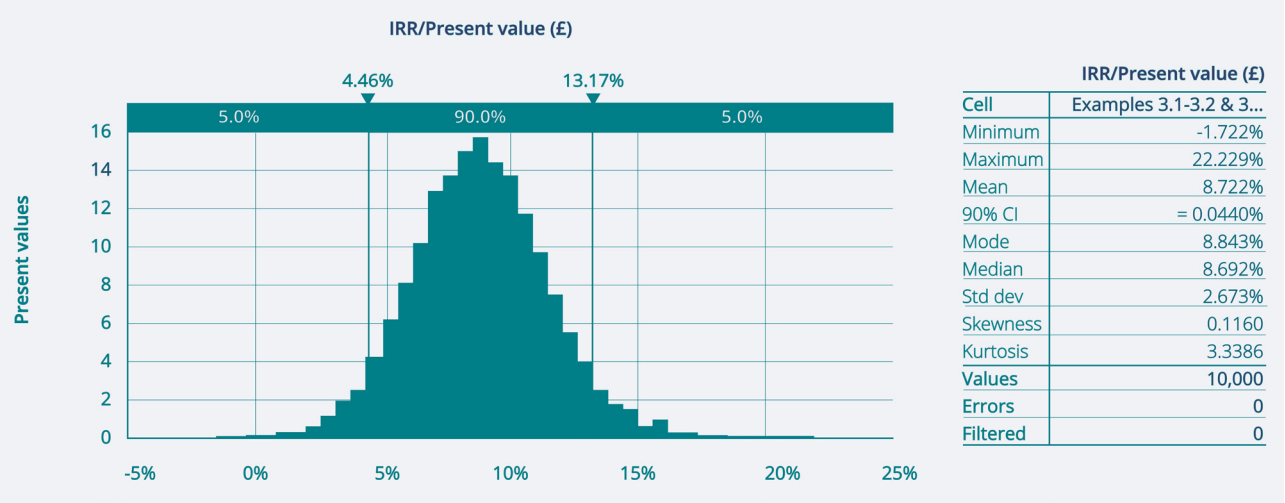
Scenarios is in some ways a more thoughtful approach but can suffer from the same level of subjectivity. Scenarios can be developed based on projecting economic conditions and assessing how each input might be affected, including making assumptions about the relationship between the different inputs. For example, where research has been undertaken into the behaviour of some of the normal inputs into a cash flow, such as rental value, and the economic drivers of those inputs, a scenario can be set up whereby the economic expectations are varied from best to worst case, and the research used to adjust the property valuation inputs accordingly. It is a useful method for such items as lease events where each of the possible outcomes can be set up, and the consequences of each outcome for the cash flow modelled.

Simulations

Simulations are the most mathematically sophisticated model, but they do require subjectivity around the range and probability of each input and the correlations between the different inputs. Once the inputs and their characteristics are inputted, the simulation randomly selects a set of inputs from across the ranges, taking into account correlations and

probabilities, and produces a valuation. It then repeats that random selection process as many times as instructed, often thousands of times, and builds up a picture of the different valuations, which forms into a distribution giving means, mediums, variation, etc. that can be used to form an opinion of the variation.

Figure 5 shows a typical output from a simulation model testing the variation in IRR from a fixed price based on a range of inputs.



IRR/Present value (£)

Cell	Examples 3.1-3.2 & 3...
Minimum	-1.722%
Maximum	22.229%
Mean	8.722%
90% CI	= 0.0440%
Mode	8.843%
Median	8.692%
Std dev	2.673%
Skewness	0.1160
Kurtosis	3.3386
Values	10,000
Errors	0
Filtered	0

Figure 5: Typical simulation model output

The outcome from these models can be used to determine the level of variation around the property, which in turn informs the level of risk premium. In this case, the mean IRR is expected to be 8.7%, but there is a standard deviation of 2.7%. Statistically, this represents approximately an 85% chance that the return will be no less than 6%, a 90% chance of no less than 4.5%, and a 95% chance of no less than 3.3%.

For the assessment of investment value (or worth), the pricing implications are that this level of expected downside risk may or may not be acceptable to the client, depending on their risk aversion. The price can be adjusted accordingly.

In the context of market valuation, existing transactions can be analysed in this framework. This would be time-consuming, where detailed knowledge of the transacted asset and its environment is unknown. However, the asset's risk profile can be identified by reference to the risk premium and expected variation of transacted assets. This may be possible using simple sensitivity techniques. In the absence of evidence, the market level of acceptable risk becomes a subjective and qualitative judgement.

At present, property risk advice and valuation advice are often separate. A move to principally a cash flow regime for commercial investment valuation could lead to valuation variation and property risk assessments being an integral part of a more sophisticated valuation report for properties requiring an explicit DCF valuation method.

Appendix C Depreciation and obsolescence

The measurement of depreciation and the application to the valuation is an evolving area. Most research attempting to measure rates of depreciation has used past data to determine the rates. The past is not necessarily an indication of the future so rates should generally be treated with caution.

The way in which depreciation impacts on value is also subject to an evolving research environment. Most studies show that for commercial property, high street retail has minimal building-related depreciation as a significant portion of the value is in the location. Other forms of retail suffer higher levels of depreciation as do industrial/logistics and offices. More difficult is the assessment of the shape of depreciation. Do buildings start to depreciate as soon as they are not new, or does it really start when a newer building has a better specification, which may take a number of years? If this is the case, buildings will have a mid-life decline until they become older. Once a building gets older, the rate of relative depreciation against a new building will reduce to virtually zero. For example, the decline in value of, say, a 50-year building against one that is 49 would tend towards zero. How will legislative and changes in the requirements of owners and occupiers due to the climate emergency affect the life cycle of buildings, and change the shape and level of depreciation in investment property?

Although the shape of rental depreciation is difficult to determine, the rate is more straightforward. The past rate of relative decline is the difference between the value of the existing building and the value of a new building in the same location. Adjusting for the age of the existing building gives an average annual rate of decline.

Figure 6 illustrates the difficulties of modelling rental values within an explicit DCF framework. There are two rental growth rates operating in a valuation: growth in the location and growth in the existing asset. While the existing asset is in place the rental growth rate is the location growth less the depreciation rate, which equals growth in the property.

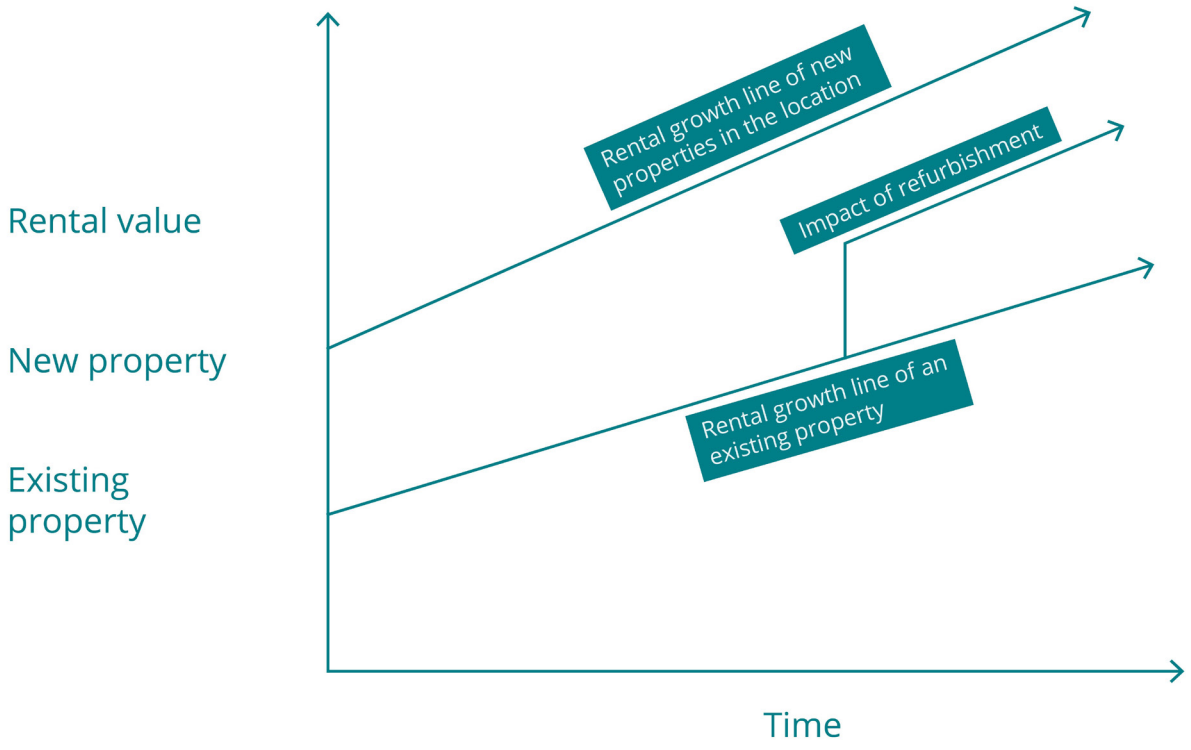


Figure 6: Model of rental depreciation and the impact of refurbishment

In many buildings, as they age or deteriorate through time, the gap between their rental value and that of a refurbished or new building becomes wider. This makes redevelopment or major refurbishment an increasingly viable option. If this option is expected to be exercised in the cash flow period, the costs of undertaking the improvements may be incorporated, but also the relative improvement after the works are completed may also be captured in the income flow.

The improvements relate to two elements. First, the enhanced rental value for a changed asset. This can be captured by assessing the current rental value of a new building and then increasing it by the growth rate in the location. In the case of refurbishment, the rental value may be lower than for redevelopment, but the principle will be the same. Assess the current rental value of the refurbished property and grow it by the location growth rate as shown in Figure 6.

Once the property has been assumed to be let at this enhanced figure, any cash flow after this event will change at the property growth rate, not the location, as it is now a real property suffering depreciation.

The second element is the capitalisation rate upon exit value. This may be the capitalisation rate for the redeveloped or refurbished building, which would be expected to be lower than for the original building, this reduction being part of the economic argument for the capital expenditure.

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