



CONFERENCE PAPERS

A brief history of the Australian discounted cash flow practice standard

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Keywords *Investment property, Valuation, Standards*

Abstract *The increasing complexity of investment properties has necessitated the application of more advanced valuation and analysis techniques. Following the property cycle of the 1980s/1990s, and the recommendations of several reporters, the DCF method has been promoted in Australia for certain income-producing properties. The Australian Property Institute disseminated an information paper in 1993 that discussed DCF and suggested a performance approach to its application. Following this, a practice standard was produced in 1996 that was highly prescriptive but which contained a number of confusing passages. With the benefit of hindsight, its publication was premature and it was withdrawn from circulation. A rewrite was commissioned and an exposure draft was circulated in early 1999. It has been prepared as a performance standard in which the valuer is called on to follow a method while disclosing the specifics. However, a number of considerations remain to be finalised, for example, the application of the term cash flow to net operating income, income after finance and income after finance and tax. The preparation of standards is an evolutionary process and the present coverage of the DCF practice standard reflects the market in which it applies.*

1. Introduction

Investment property and property capable of returning financial flows is traditionally valued by the income approach. This traditional process requires that the valuer computes the annual net operating income and capitalises it by the application of a capitalisation rate derived from the analysis of comparable market sales evidence. The capitalised net operating income is the present value of the investment stream expected to be derived from the property into the future. Thus the investment stream has been discounted. This traditional approach is a real cost approach. No allowance is made for inflationary factors such as rental growth and this is reflected in the adoption of a real capitalisation rate. This process is ideal for single user properties. Only two variables are required to complete the valuation.

Over the past two decades, the complexity of property developments and investments has grown substantially. Large multi-tenanted properties contain individual lessees where leases have been agreed on many different bases in

respect of rent reviews and outgoings recoveries. Thus a single property can have leases with different rent review cycles, net and gross leases, leases with reviews to market rental values or to a specified index, with and without caps and collars, and leases in which rentals have been agreed at different stages in the property market cycle. The application of an appropriate capitalisation rate to such a variable net operating income is no longer practical given the unlikelihood of obtaining directly comparable evidence. Valuers have turned to the financial market for methodologies that are applicable in these circumstances where each lease needs to be separately modelled. The process that has been adopted is discounted cash flow (DCF). It involves the projection of net operating income for a period of years (usually ten years) at the termination of which a hypothetical disposal of the property takes place. In Australia, the financial flows are normally on a before interest and tax basis (i.e. earnings before interest and tax). True DCF should be undertaken on an after interest and after tax basis, but as interest rates and tax rates can vary from entity to entity, the outcome is usually construed as being an investment valuation rather than a market valuation. The DCF process requires the combination of many variables.

The many variables and assumptions required for DCF analysis, combined with different ways of allocating them on a time scale, led to a significant number of combinations and permutations and, ultimately, a lack of trust in the results. As a result of this, the then Australian Institute of Valuers and Land Economists (AIVLE) resolved to standardise the methodology. The evolution of the guidance on DCF provided to its members by the Australian Property Institute (API or the "Institute") and its predecessor bodies (being the Australian Institute of Valuers (AIV), Australian Institute of Valuers and Land Administrators (AIVLA) and AIVLE) mirrors the evolution of the property market in Australia over the last 20 years.

While the following does not seek to provide a comprehensive chronology, it serves to illustrate the changes in the property market, the gradual acceptability of DCF as a valuation method and the corresponding change in the approach of the Institute to its codification over the period. The purpose of this paper is to describe the various attempts at standardisation leading up to the current (1999) draft Practice Standard and its associated Guidance Note. First, the early history is discussed in the context of the need for a Standard in the face of the 1980s/1990s property cycle. Second, the reaction of the profession is outlined which led to the Institute's 1993 Information paper. Third, the 1996 Standard is broadly outlined together with reasons for its review. Fourth, the principles of the 1999 draft are discussed and the content is outlined. Finally, some suggestions for future development of DCF process and standard are provided.

The popular term discounted cash flow is used throughout this paper to refer to the discounted financial flows whether they are before interest and tax

or after interest and tax or some other combination. The standard applies to "members developing discounting models (generally known as discounted cash flow models)..." (Australian Property Institute, 1999, p. 1).

2. Ancient history (the need for a DCF standard)

A doctoral thesis (Greaves, 1972) led to the rise of DCF as a valuation method in the UK. However, the decision by Jacobs, J in the High Court of Australia (*Albany and Ors v. The Commonwealth of Australia* (1976)) seems to have contributed to the fall of DCF as a valuation method in Australia. The judgement of Jacobs, J stated:

I am not satisfied of the suitability in this case of a method of valuation based on discounted cash flow.

The valuation profession and the Institute focused primarily on the words "not satisfied of the suitability" to justify discarding DCF as a practical alternative valuation approach for much of the next 20 years. It was not until the turmoil in the property industry in the early 1990s that the words "in this case" achieved the level of attention that they deserved in a balanced consideration of the suitability of DCF as a valuation technique.

With Jacobs, J as primary evidence, the valuation profession's concerns about the number of assumptions required, the use of forecasting and the forward looking nature of DCF were sufficient to prejudice its widespread use through the early 1980s. Reflecting this attitude, the Institute's key teaching text (Rost and Collins, 1984) contained only three pages devoted to DCF the text for which remained unchanged through to the 1993 edition. This may be compared to the UK where the first edition of the premier undergraduate teaching (Baum and Mackmin, 1979) contained two passages on DCF, one of ten pages and the other of six pages including worked examples.

Research at the University of Sydney in the 1980s, under the supervision of Professor RTM Whipple, was dedicated to the application of financial modelling, in particular DCF, to the valuation and analysis of property. This led to the publication of several articles in the *Journal of Valuation* and elsewhere (Robinson, 1985, 1986a, 1986b, 1986c, 1987a, 1987b), to two texts (Robinson, 1989; Rowland, 1993) and to a substantial component of Whipple's magnum opus (1999).

This level of attention to DCF in an Institute text did not emerge until the publication of "Valuation principles and practice" in 1997, almost 20 years later (Westwood, 1997).

During the property boom of the late 1980s, asset prices spiralled with the resurgence of the entrepreneur, the easy availability of finance and a metamorphosis in the approach to risk. There were unprecedented structural changes to the economy including the deregulation of the financial system, floating of the exchange rate and the introduction of 16 new foreign banks. Property transactions were numerous as values moved upwards and the industry's interest in DCF was minimal. However, there then followed a series

of events that served to focus attention firmly back onto DCF. By early 1990, numerous groups including Estate Mortgage, Tricontinental, State Bank of Victoria and the Pyramid Building Society had collapsed. In June, 1990, the major independent unlisted trust managers announced a suspension or deferral of redemptions (Hutcheson, 1991). Those property transactions that did take place did so at record low prices (in some cases less than 25 per cent of replacement cost).

The valuation profession was widely and very publicly criticised for its role in these collapses and the resulting Report of the Property Economic Task Force (Norman, 1992) advocated *inter alia* greater use of DCF to avoid the inability of traditional methods to adapt to a rapidly falling (or rising) market. This was repeated in similar reports elsewhere (Greenwell Report, 1976; Trott Report, 1986) in the UK and it foreshadowed the Mallinson Report (1994). In the midst of this turmoil, the latest edition of the Institute's principal text, Rost and Collins (1993) continued to state that DCF "... is an accounting technique ..." and "the method has not been regarded as suitable for determining the present market value of the property" (p. 112). While, at page 615, the authors acknowledge that Jacobs, J "expressed no opinion whether or not the method might be an appropriate basis for valuing land in other circumstances and in other cases", at page 617 they state "... the technique is not one which is readily accepted by valuers...". As discussed above, the new edition of the Institute's principal text offered three pages on DCF out of 680 and continued to provide members with minimal guidance.

The principal catalyst for the Institute to finally consider DCF in detail may be contended to have been the incidence of lease incentives in diminishing, often to nil, the cash flow available from investment property. Though granted for a lease that started from 1 February 1986, the cash incentive of \$162,000 for the partnership of Kinsey, Bennett and Gill did not come to prominence until its assessability for taxation was considered in the Cooling case (*Federal Commissioner of Taxation v. Cooling* (1990) 44 ALR 121). This decision was followed on 5 April 1991, by Income Tax Ruling IT 2631, issued by the Federal Commissioner of Taxation to clarify the taxation status of different forms of incentives (Parker, 1992). A 1992 survey found that valuers were having regard to incentives through cash flow valuation methodologies (Parker, 1993). The survey found that there was a trend towards the use of DCF principally due to:

- the requirements of clients;
- volatility of income streams;
- the need to reflect rent free periods; and
- the need to consider capital expenditure.

This echoed the findings of a survey of investing institutions by McIntosh (1993), that noted:

The lack of a standard approach may be creating some delay in the wider adoption of the (DCF) technique... (p. 407).

The status and credibility of the valuation profession continued to decline to a nadir in late 1991 with the headline: "Valuation standards fall to 'World low'" in the *Courier Mail* on 8 November 1991, and the report in the *Australian Financial Review* on 3 December 1991, of two valuations of Grosvenor Place alleged to be \$120 million or 16.6 per cent apart.

Against this backdrop, there was a marked increase in interest from Institute members in Continuing Professional Development seminars concerning the use of financial calculators and basic DCF mathematics. The need for formalised guidance by the Institute on DCF was gaining recognition.

3. Modern history (the 1993 Information Paper)

In addition to the collapse of both the property market and the unlisted property trust industry and the incidence of incentives, the increasing role of DCF was also driven by:

- increased affordability and availability of computers and the development of usable software;
- the emergence of degree courses producing computer literate graduates as trainee valuers;
- the absence of comparable evidence;
- the increasing focus on the role of property as an investment asset class, competing with equities and bonds; and
- an explosion in the size of the professional investor market with a focus on securitisation, emphasis on cash flows and total familiarity with DCF.

In December 1992, JLV Research and Consultancy published its authoritative paper comparing capitalisation with DCF (Jones Lang Wootton, 1992). Following a brief consideration of the key components of the DCF and a reconciliation of the DCF with capitalisation, the paper concluded that the valuer could get the same answer provided the inputs were carefully considered. It was even suggested in the paper that DCF had advantages over capitalisation.

As stated above, the credibility of the valuation profession was under threat and calls for the use of explicit methods such as DCF were becoming deafening. The Institute had to act to protect its credibility and that of its members and to provide some guidance to members on that method which the market and financial press were demanding should be adopted. It was time to acknowledge the validity of DCF and to give members some form of framework for DCF within which to work.

Finally, in September 1993, the Institute published an Information Paper on Discounted Cash Flow (AIVLE, 1993) (IP). At only 3.5 pages, the paper was short and reflected the attitude of the Institute towards DCF prevailing at that time. It was acknowledged that the Courts did not adequately test DCF, concerns were expressed about forecasting and DCF was deemed a "useful"

technique provided that it was used in conjunction with another technique. The 1993 IP was carefully constructed to avoid being prescriptive and it did not include a preferred model or template. In addition, it avoided detailed mathematics and did not attempt to supplant a textbook or course notes. Valuers clearly could not learn how to carry out DCF from the 1993 IP but were offered general guidance concerning industry practice in various aspects. For example, Section 5.7 does not specify a term for the cash flow but states:

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The period of the cash flow adopted is likely to vary, dependent on the particular property and its specific lease covenants. However, it should be within a time frame, which can be predicted with some degree of confidence. In most instances, the time frame will usually be not less than five years and not more than 15 years (AIVLE, 1993).

Further, the discussion of the discount rate is less than eight lines (Sections 5.2, 5.3 and 5.4), providing a simple overview of the relevant issues with clarity.

The 1993 IP was almost chatty in style, providing broad guidance that encouraged further consideration of the DCF approach. It left the reader clearly aware that he or she had to look elsewhere for "how to" guidance or an explanation of the mathematics. As such, the 1993 IP reflected the prevailing attitude towards DCF, being little more than a position statement that acknowledged that more work needed to be done:

The Australian Institute of Valuers and Land Economists encourages more discussion and research into the use of DCF analysis and the appropriate growth and discount rate assumptions applicable to various property categories (Section 8.6) (AIVLE, 1993).

Members were provided with more detailed guidance in a Research Note (Toxward, 1993) which provided both commentary and examples. It reinforced the proposals of Jones Lang Wootton (1992) concerning the potential usefulness of DCF.

By 1994, the impetus was already building for the introduction of more formalised guidance to members on DCF, though there was debate concerning the extent to which this should be prescriptive and codified. Under the direction of the Institutes NSW Land Economy Professional Board, a discussion paper was developed in 1994 (Ragan *et al.*, 1994) reported in Crean (1994). The views of members were canvassed by the Institute through a national seminar programme in mid 1995, with the discussion paper refined thereafter by a committee of ten in Sydney (Boydell and Gronow, 1997).

Through a survey of major users of valuation reports, Newell (1995) quantified the trend towards the use of DCF, noting:

DCF analysis is now included in 68 per cent of outside valuations, this being a major increase on the level of 36 per cent seen five years ago. Half of the respondents (50 per cent) now required DCF analysis to be included in all valuation reports (p. 359).

Further, throughout this period, the focus on the detail of DCF continually intensified with numerous technical papers in the Institute journal including Boyd (1995), Magree (1995) and Redfern (1996). McIntosh (1996) updated his survey of major institutions, *supra*, noting that:

Over 90 per cent of the respondents indicated that they either always or usually used DCFs for valuations ... (p. 273).

Finally, Practice Standard No. 2 titled "Discounted cash flow" was issued by the Institute on 1 September, 1996 (AIVLE, 1996).

4. Recent history (the 1996 Practice Standard)

The 1996 Standard, at 32 pages, was almost ten times longer than the 1993 IP. While it identified the need in the industry for more comprehensive guidance on DCF, it failed to distinguish between the role of a Practice Standard and that of a textbook. Rather than defer to one of the standard, non-API published texts, the 1996 Standard included extensive (but not comprehensive) mathematical formulae and descriptions together with numerous sections on the same topic which sometimes conflicted and generally confused (e.g. Murphy, 1997). For example, the discount rate is addressed in eight lines in Section 4.3 of the Standard, a further 17 lines in Section 4.3 of the Guidance Note and another two whole pages in the Glossary of Terms.

Notably, the 1996 Standard focused on the constituent variables without regard to the wider issues surrounding the inter-relationship between the variables, permitted only exceptional variation by practitioners from its wide ranging contents and remained steadfast to the valuation/investment worth dichotomy.

The 1996 Practice Standard has been characterised as:

- being prescriptive without being precise;
- providing detail exceeding the requirements for a Practice Standard but insufficient for a textbook;
- seeking to distinguish between the use of DCF as the primary method and otherwise, without justification;
- being very confused about the source of the discount rate – such ambiguity spawning numerous seminars on this topic alone;
- containing definitional inconsistencies; and
- containing the now infamous mathematical error.

The 1996 Standard generated considerable controversy having been described as an international embarrassment and a laughing stock in the general finance world. It was also publicly criticised in seminars and conferences (AIVLE/SIA, 1997; AIVLE, 1997), and Boydell and Gronow (1997) noted that it "... does not represent contemporary thinking..." (p. 60).

For a document so long in preparation, it was a very considerable disappointment and calls for its revision arose with its publication.

During the mid to late 1990s, the use of DCF continued to increase, fuelled particularly by the exponential growth of the listed property trust industry and

the superannuation industry, both of which were familiar and comfortable with DCF as a method of valuation. In some cases DCF was preferred to Discounted cash flow practice capitalisation.

Despite the introduction of such a prescriptive Practice Standard, evidence was limited that members were using it in their practice. Parker (1997a) outlined the results of the analysis of a portfolio valuation of 39 properties, comprising a mixture of commercial, retail and industrial properties. All were valued as at the same date and on the same basis but a very divergent range of discount rates were found to have been selected with little consistency evident within and across sub-sectors. A key feature of the survey was the finding that the selected discount rates lacked justification. Many recurrent house statements were found without any tailoring to the specific sub-sector or the characteristics of the property being valued. The same statement was found to be used for commercial, retail and industrial property and for both CBD and suburban commercial property.

The common justification for the discount rate selected was that it was "considered appropriate", without supporting quantitative analysis and with supporting qualitative commentary mixing the rationales derived from market with property specific issues and having little apparent clarity. One report was found to adopt an NPV which was the same as the valuation derived by capitalisation and generated an IRR of 14.79 per cent (being precise to two decimal places) on which the valuer commented:

IRR reasonable for this type of property, given the tenancy structure and limited purchaser market for the building in the current climate.

Further, Parker (1997b) details the findings of a valuer survey where practitioners were asked to identify the acceptable ten year discount rate for a prime CBD office building in Sydney on certain defined assumptions, specifically designed to remove ambiguity. The survey found an enormous range of discount rates to be identified despite the given assumptions, with a range of 9.5-15 per cent for the one property. While the mode was found to be 12 per cent, this rate was selected by less than half of the respondents. Such a lack of consensus was contended not to provide confidence in the ability of valuers to select discount rates.

Accordingly, it was evident that despite the publication of the 1996 Standard, there was still very considerable scope for improvement in the application of DCF by Institute members. It was apparent that the demand on members for skills in the use of DCF by their clients was outstripping the Institute's provision of guidance in terms of both quality and speed. The need for focused attention by the Institute was evident and emerged in three principal forms. In early 1997 the Institute published its new textbook which contained an excellent chapter by Webster (1997) on the practice of DCF. CPD seminars on aspects of DCF became common and were well supported by the

Institute membership. The third and final principal form of attention was the complete rewrite of the 1996 Standard, which started with a committee review in late 1997/early 1998.

5. The present (the 1999 Draft Practice Standard and Guidance Note)

5.1 Principles

Following the review, the revised 1996 Standard was issued to divisions of the Institute for comment in March 1998. The comments received were both extensive and fundamental, underlining the level of concern about the 1996 Standard around Australia. It was contended that the draft comprising the revised 1996 Standard:

- contained previously identified fundamental errors that had not been corrected;
- was incorrect in theory in places, whereas it should be a definitive statement of theory;
- did not reflect current professional practice, whereas it should be the definitive guide to current practice;
- was unnecessarily prescriptive and did not allow adequate flexibility for the practitioner;
- contained a list of references which did not indicate a thorough literature review; and
- did not meet the needs of the Institute members.

It was determined that the 1996 Standard did not need to be reviewed, it needed to be rewritten. Accordingly, the 1996 Standard was withdrawn from circulation and was not included in the Institute's new compendium of Practice Standards, Guidance Notes and related documents "Professional Practice 1999" (API, 1998).

The rewritten draft Practice Standard and Guidance Note was issued for comment to divisions of the Institute in September, 1998. Following the incorporation of comments received, the draft Practice Standard and Guidance Note were referred to the National Professional Board of the Institute in January, 1999.

The 1996 Standard attempted to prescribe the contents of a discounted cash flow. It was felt that this approach was outmoded for a number of reasons; it:

- led to unnecessary disputes about the mechanics of discounted cash flow and forced valuers to use unnecessarily detailed calculations;
- reduced the professional nature of the exercise to the potential adoption of a "black box" model into which the values adopted for the input variables are fed to generate a result the meaning of which is often unclear to the user - "garbage in; garbage out";

- placed a rigid framework on the use of DCF which precluded flexibility; Conference papers: Discounted cash flow practice
- attempted to be an instruction booklet on DCF processes.

Thus, for the 1999 Draft Standard it was decided to empower the professional valuer by creating a performance standard in which the valuer is required to disclose the input variables and explain how and why certain values are adopted for these variables. This is a fundamental aspect of the 1999 Draft Standard as it requires the valuer to actively consider the inter-relationship between input variables. In addition, it gives the valuer the flexibility to depart from the standard provided reasons are given. Section 1 of the Practice Standard provides an introduction and establishes the mandatory status of the standard and the activities to which it applies. The main application is to market valuations and investment analysis where DCF techniques are to be used.

Section 5 of the Draft Standard details the responsibilities of the valuer who uses DCF models. It is a particular requirement of the standard that only valuers with the appropriate experience should be involved in the preparation of DCF valuations and that the use of a proprietary model does not obviate the need for the professional valuer to exercise professional judgement. In other words, the valuer must know what the model is doing in order to adopt it correctly in particular circumstances. Furthermore, the valuer is responsible for ensuring that the data used in the DCF model are properly researched and that the forecasts, projections and assumptions adopted by the valuer have a reasonable basis.

5.2 Content

The content of the draft Practice Standard and Guidance Note is paraphrased in this section. In addition, the documents contain three attachments:

- (1) Glossary of terms.
- (2) Readings including accounting standards and finance market guidelines as well as academic and professional texts and recent journal articles.
- (3) Basic after tax and finance cash flow line items for a DCF spreadsheet.

5.2.1 *Draft Practice Standard*. Section 2 covers the industry standards for discounted cash flows and these are:

- Transaction expenses should be included and the valuer must give reasons for their exclusion.
- The cash flow frequency must be stated (e.g. annual, monthly) and reasons must be given for the adoption of a particular frequency and its timing (e.g. in advance, in arrears).
- The term of the cash flow must be stated giving reasons for its adoption especially where the valuer is instructed as to the term to be used.

- The proceeds of resale at the end of the cash flow term should be calculated by capitalising the net operating income projected for the year following the cash flow term. If another method is used, this should be stated giving reasons.
- If sales evidence is analysed for the purposes of providing inputs to the model, it must be done in the same way in which the relevant variables are applied in the model.
- The results must be presented on a before tax and before interest basis. After tax and interest results must be calculated separately.
- A single discount rate should be used. Reasons must be given if more than one discount rate is applied in the model. Results must be converted to an annual effective interest rate where applicable.
- Non-conventional investments (where there is more than one cash flow sign reversal) must be noted as such. Consideration should be given to the use of the available financial techniques to avoid the potential of multiple internal rates of return (or no internal rate of return).
- Properties in portfolios should be treated individually before aggregation.

Section 3 covers the components of discounted cash flows:

- The commencement date of the cash flow must be stated.
- Part periods should be treated as the last period in the cash flow and adjusted appropriately.
- Inflows and outflows shall be treated separately. Similar cash flows may be grouped but different types of cash flows shall be treated separately.
- Different cash flows, including inflows and outflows, shall have separate (but not necessarily different) rates of change (i.e. rates of growth or decline).
- Allowances shall be made for vacancies.
- Provisions for future capital expenditure shall be included where applicable either as a lump sum or as a periodic allowance or both.
- Inflows and outflows shall be separately totalled.
- The net cash flow (or net operating income, i.e. inflows less outflows) should be shown for each period and reasons shall be given if not so shown.
- Finance and tax details shall be grouped separately from the other cash flows. The timing of tax payments and receipts shall be taken into account as well as the timing of capital injections and repayments and interest payments.
- The prevailing tax rate of the liable entity shall normally be used.

- The gearing ratio shall be stated giving reasons. Interest rates shall be shown as annual effective interest rates and converted to periodic interest rates where relevant.
- The relevant prevailing market interest rates should be used. If other rates are used, reasons shall be given.

It is a particular requirement that the basis on which values for the investment variables are adopted are fully described:

- Projections, forecasts and estimates of growth or decline must be supported by sales evidence or other sources.
- Cash flows must be supported by primary evidence such as tenancy schedules and outgoing budgets.
- The imputing of market rental values must reflect current market practice in relation to lease terms such as incentives and rent reviews.
- Cash flows must reflect anticipated changes over the term of the projections, e.g. rates of inflation.
- Cash flows must be adjusted to reflect vacancies, non-recoverable outgoing and reletting costs where leases expire during the term of the cash flow.
- All assumptions must be tabulated

Section 4 covers the reporting requirements that emphasise that the valuer must disclose the details of the method which has been used as well as the specific data which have been applied in the DCF model.

5.2.2 Guidance note. The guidance note mainly concerns the concepts used in DCF valuation and analysis. Section 1 sets the scene in which the guidance notes are referred to as an embodiment of good practice and it also makes reference to the appropriateness of the technique.

Section 2 covers DCF concepts, in particular the conventional measures of internal rate of return, present value and net present value. Reference is made to additional measures such as modified internal rate of return. The discount rate is covered in some detail calling on the valuer to discuss the manner in which the discount rate has been assessed. It refers to the analysis of sales evidence to arrive at a discount rate for market valuation purposes and it refers to the client's required rate of return for investment valuation purposes. Finally, the guidance note suggests that valuers adopt a discount rate having regard to the explicit factors within the cash flow. Consistency is required. The increased focus on the qualification and role of the discount rate is a key aspect of the Draft Guidance Note.

Section 2 also refers to uncertainty and suggests that valuers should consider the use of sensitivity analysis and scenario analysis to gauge the effect on the results of changes in the significant investment variables. In sensitivity analysis, the variables are changed one at a time and in scenario analysis, the variables are changed as a group that defines the scenario.

Finally, section 2 suggests that the cash flow frequency should reflect the perceived timing of the majority of the cash flows. It notes that the term of the cash flow varies from case to case and that the discount rate should reflect the adopted term.

Section 3 of the guidance note covers the use of qualifications and disclaimers and these are dealt with in detail in a separate guidance note (Australian Property Institute, 1998).

6. The future

The conventional wisdom in Australia is to apply the DCF methodology to the net operating income stream. This is comparable to company account calculations of earnings before interest, tax, depreciation and abnormal (EBITDA). True cash flows are strictly speaking a "bottom line" comparable to a company's earnings after interest, tax, depreciation and abnormal (EAITDA). Finance industry practice is well versed in the concept of true cash flow, but property industry practice remains firmly entrenched in market valuation (estimate of price) culture in a hypothetical homogeneous market. This is a market in which individual entities with different access to finance, different rates of tax and different investment attitudes are excluded. However, the concepts of most probable selling price and most probable buyer provide the key to market valuation on a basis of true cash flow or EAITDA.

The Guidance Note makes reference to a number of techniques that are yet to be adopted as commonplace, e.g. scenario analysis. Most DCF modelling is carried out using deterministic processes, i.e. the model creates an exact relationship between the variables from which the outcome can be determined. However, the requirement for assumptions, projections and forecasts in discounted cash flow suggest that outcomes are determined by chance. Thus there is a requirement for the profession to adopt stochastic processes in DCF models which reflect the element of chance or probability. These processes may be applied to investment analyses and estimates of most probable selling price. A detailed description of stochastic processes is beyond the scope of this paper.

The advent of electronic spreadsheets has made DCF processes accessible to valuers over the past decade. However, in recent times, a number of proprietary spreadsheets and provide useful templates for application to individual properties (often requiring modifications). Others are driven by electronic databases and these are achieving widespread use. Recent packages include Cougar (1991) and Dyna (1999). The proposed standard does not preclude the use of such packages, or require the valuer to modify the packages, but it does require that the valuers who use these packages understand the embedded valuation and financial analysis functions as discussed above.

7. Conclusion

The methodologies that have evolved in the finance and property industries have done so as the industries themselves have evolved, particularly in respect

of the analysis required for decision making. The current state of the practice standard is simply a stage in the continuing evolution, revision and improvement of discounting methodologies as applied to the analysis of real estate. It remains to be approved by the Institute (as at January, 2000). The 1999 draft reflects a maturing in use and acceptability of DCF which is being client driven by listed property trusts and securitisers who are comfortable with the methodology. However, the draft may have been overtaken by the maturing of the market.

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The main users of DCF are at the "top" end of the market in property values and prices and also complexity. It is assumed that these users are highly conversant with advanced financial modelling and use Dyna, Cougar and various other proprietary packages or "house" templates. Users need only refer to the software manual for details of the universally accepted methodologies and they need neither a Practice Standard nor a Guidance Note. The next group of users is at the "middle" of the market where DCF is usually applied as a check method and sophisticated techniques are unnecessary. These users need guidance on DCF principles and practice and it is suggested that a Guidance Note is probably sufficient. The last group are at the "lower" end of the market where DCF is rarely used, e.g. residential properties. Substantial training would be required for this group.

Meanwhile, graduates from property based programs throughout Australia (and elsewhere) are continuing to be trained in the necessary applications of financial analysis and modelling to the real estate market. Therefore, it is suggested that the 1999 Draft Standard and the associated documents be revised in the form of a Guidance Note.

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