



INTERNATIONAL VALUATION STANDARDS COUNCIL

EXPOSURE DRAFT

# Technical Information Paper 1

## **The Discounted Cash Flow (DCF) Method – Real Property and Business Valuations**

*Comments to be received by 30 April 2011*

January 2011

**Exposure draft**

# Technical Information Paper 1

## **The Discounted Cash Flow (DCF) Method – Real Property and Business Valuations**

*published January 2011*

This Exposure Draft is published by the International Valuation Professional Board (IVPB) for comment. The International Valuation Professional Board is an independent technical body of the International Valuation Standards Council (IVSC) responsible for the development of benchmark educational standards and guidance, and for the development of technical guidance to support the application of the International Valuation Standards.

Comments on this Exposure Draft are invited before 30 April 2011. All replies may be put on public record unless confidentiality is requested by the respondent. Comments may be sent as email attachments to [CommentLetters@ivsc.org](mailto:CommentLetters@ivsc.org) or by post to the **International Valuation Professional Board, 41 Moorgate, London EC2R 6PP, United Kingdom.**

Copyright © 2011 International Valuation Standards Council. All rights reserved. No part of this Exposure Draft may be translated, reprinted or reproduced or utilised in any form either in whole or in part or by any electronic, mechanical or other means, now known or hereafter invented, including photocopying and recording, or in any information storage and retrieval system, without permission in writing from the International Valuation Standards Council. Please address publication and copyright matters to:

International Valuation Standards Council  
41 Moorgate  
London EC2R 6PP  
United Kingdom  
Email: [ivsc@ivsc.org](mailto:ivsc@ivsc.org)  
[www.ivsc.org](http://www.ivsc.org)

## Note for Respondents

The IVSC publishes the International Valuation Standards ('IVS') that set out generally accepted concepts and principles for the conduct of valuations. The IVS are aimed at promoting confidence in and understanding of valuations by those who rely upon them. Although the IVS identify different valuation applications and methods commonly used for valuing different types of asset, their role is not to provide detailed guidance on these methods or their application.

In order to assist valuation professionals in identifying best practice the International Valuation Professional Board is preparing a series of Technical Information Papers ('TIPs'). TIPs do not form part of IVS and are published separately. Although the TIPs are designed to promote consistency of practice and support the application of the principles in the IVS, they are not intended to be mandatory.

It is proposed that this exposure draft will replace the current GN9 '*Discounted Cash Flow Analysis for Market Valuations and Investment Analyses*' (Revised 2007). GN9 predominantly focused on the valuation of real property assets. This exposure draft provides practical guidance for the application of the discounted cash flow approach for the valuation of businesses as well as real estate assets.

The intention of this Exposure Draft is to seek views from interested parties. The IVPB seeks comment on the proposed Technical Information Paper and would like respondents to express a clear overall opinion of the Exposure Draft. Responses to the specific questions are also invited.

## Questions for Respondents

The International Valuation Professional Board invites responses to the following questions. Not all questions need to be answered but to assist analysis of responses received please use the question numbers in this paper to indicate to which question your comments relate.

- 1 This Exposure Draft states that the DCF method should not be judged on the basis of whether or not the explicit cash flow assumptions are ultimately realized but rather on the degree of market support for the assumptions at the time they were made.

**Do you agree that the DCF method, if properly applied, can be used as a method to arrive at market value?**

- 2 The IVPB has concluded that although there may be distinct terms and types of analyses that apply respectively to real property valuations and business valuations, the underlying DCF method is identical in each case.

**Do you agree that the underlying DCF method described in this paper applies equally to the valuation of real property and businesses? If not, please explain the differences that you believe exist?**

- 3 This Exposure Draft states that the discount rate should be determined based on the risk associated with the cash flows (para 10), whether the DCF model is being used to determine a market value or investment value.

**Do you agree, or do you consider that other matters should be taken into account in determining the appropriate discount rate?**

- 4 A number of different methods are identified which can be applied to the calculation of the terminal value at the end of the cash flow period (growth, fading growth, net asset value, salvage value, etc). For long-life real property assets or going concern businesses the Board believes a constant growth model is the most commonly used method, coupled with a cross check for the reasonableness of the figure, eg by reference to the implied exit multiple.

**Do you agree that the most commonly adopted terminal value calculation at the end of the explicit forecast period is the 'constant growth' model, cross-checked for sensibility to an implied capitalisation rate or exit multiple? If not please identify what other method you most commonly use?**

- 5 The Exposure Draft explains that cash flows can be developed on the basis of alternative financial assumptions, eg inclusive or exclusive of anticipated inflation, inclusive or exclusive of tax etc. Providing the discount rate used is consistent with the financial assumptions in the cash flows the valuation result should not be affected by the alternative used.

**Do you agree that providing a discount rate is used that is consistent with the financial assumptions made in calculating the cash flows that the choice of using explicit or implicit financial assumptions in the cash flows should not affect the valuation result?**

- 6 This Exposure Draft is intended to identify best practice in the creation and application of discounted cash flow models. The Board has made the decision not to explain in detail the types of inputs that may be used in different situations or the investigations that may be appropriate. Neither are illustrative examples provided. The preliminary view of the Board is that detailed discussion of inputs or a limited range of examples is inappropriate because it could be misleading if it led readers to believe that these models were endorsed by IVSC or conversely, variations of these models in different situations were not appropriate. There are many industry specific sources for those who require training in the development and use of relevant DCF models.

**Do you agree that more detailed discussion and examples of the valuation inputs into a discounted cash flow model are inappropriate? If not how much additional information do you think should be included in best practice guidance?**

Exposure Draft

## **Technical Information Paper 1 The Discounted Cash Flow Method – Real Property and Business Valuations**

Technical Information Papers (TIPs) provide technical guidance for valuation professionals on generally accepted best practice. A TIP does not provide valuation training or instruction.

A TIP may give indications and examples of generally accepted best practice, including appropriate valuation methods and criteria for their use. It may also indicate that some approaches or methods are not normally considered appropriate in certain situations. However, a TIP will not direct that a particular approach or method should or should not be used in any specific situation. Responsibility for choosing the most appropriate methods is the responsibility of the valuer based on the facts of each valuation task.

## Introduction

- 1 The objective of this TIP is to describe the discounted cash flow (DCF) method and its application for the valuation of businesses and real property interests. It describes best practice in performing and reporting valuations using the DCF method. It also considers the different inputs that are appropriate for valuations where market value is the objective and those where investment value is required.
- 2 Various applications of the Income Approach, including DCF are used in the valuation of intangible assets. These methods are outside the scope of this paper. Methods used for valuing intangible assets are discussed in IVSC Guidance Note 4, Valuation of Intangible Assets (revised 2010).
- 3 Properly applied, the DCF method can provide an appropriate measure for either *market value* or *investment value*.<sup>1</sup> The DCF method may be more applicable than other methods if the asset or business is experiencing significant growth, has yet to reach a mature level of operations, or where the asset will have a defined life such as the case with assets and businesses in the energy and natural resource sector.
- 4 If a minority interest in a business is being valued, the possible applicability of a discount to the pro-rata value per share to reflect the lack of control and/or liquidity should be considered, if not already taken into account in the cash flows. In certain circumstances a Dividend Discount Model (DDM), which is a variant of the DCF method, may be a more applicable method to value a minority interest in an asset or business.

## Definitions

- 5 The following definitions are used in this TIP.

**Discounted Cash Flow (DCF)** – is a method utilizing explicit assumptions regarding the benefits and liabilities of ownership over the asset’s life including an exit or terminal value.

**Discount Rate** – is a market rate of return used to convert a monetary sum, payable or receivable in the future, into a present value.

**Free Cash Flow** – is the cash flow for an asset or business derived on an annual basis by deducting from income the expenses and capital related items required to operate the asset or business. This includes for real property assets maintenance and repair costs, leasehold improvements and capital works. For businesses this includes the annual capital expenditure requirements and any changes in annual working capital requirements.

**Free Cash Flow to the Firm (FCFF)** – is calculated before interest and debt repayments and may be discounted at the WACC. This results in an Enterprise Value of the business available to all capital providers and the market value of current net debt (external debt net of cash) should be deducted to arrive at the Equity Value of the business.

<sup>1</sup> IVS 103 - IVS Exposure Draft June 10

**Free Cash Flow to Equity (FCFE)** – Is calculated after the deduction from the cash flows of interest and debt repayment and should be discounted at the Cost of Capital/Equity Discount Rate. This calculation results in the Equity Value of the business.

**Gross Present Value (GPV)** – is the summation of the discounted inflows and outflows of the asset or business at the appropriate discount rate over the holding period in a DCF model. In a valuation that is done to arrive at market value, where discounted cash flows and the discount rate are market derived, the resulting GPV should be indicative of the market value. If the price is already known and deducted from the GPV, the resultant benchmark will be the Net Present Value (NPV)

**Internal Rate of Return (IRR)** – is the discount rate that equates the present value of the net cash flows of a project with the present value of the capital investment. It is the rate at which the Net Present Value equals zero.

**Investment value** - is the value of an asset to the owner or a prospective owner for individual investment or operational objectives.

**Market Value** – is the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently, and without compulsion.

**Net Present Value (NPV)** – is the GPV of the real property or business at the appropriate discount rate less the Price or Value of the asset or business. It is the surplus or deficit in relation to price/value. A positive NPV indicates that the real property or business is achieving above the target/hurdle rate; a negative NPV indicates that the target/hurdle rate is not being achieved based on the forecasts in the cash flow used.

**Weighted Average Cost of Capital (WACC)** – The cost of capital (discount rate) determined by the weighted average, at market value, of the cost of equity and debt in a business's capital structure.

## The DCF Method - Overview

- 6 The value of any asset or business is a reflection of the present value of the benefits and liabilities of that asset or business. Although there are distinct terms and inputs used in applying the DCF method to valuations of real property and businesses, the underlying method is identical in each case.
- 7 A DCF analysis results in a value indication of the asset or business based upon the present value of the expected future cash flows that will accrue to the owner. It requires:
  - explicit assumptions or projections to be made about future income and the expenditure involved in achieving or maintaining that income;
  - the application of an appropriate discount rate to calculate the present value of those future cash flows.

- 8** Cash flows for future periods are constructed using actual or projected income, (cash inflows) and actual or projected expenditure (cash outflows). The cash flows normally consist of a series of periodic receipts and expenses over a forecast period followed by a terminal value. The duration of the forecast period is normally for the period for which changes in the cash flows are known, eg because they derive from contractual rights or obligations, or are otherwise reasonably predictable. Once the forecast cash flows have stabilised a terminal value can be calculated. In cases where the asset is of indefinite life the terminal value will reflect the benefit of the cash flows from the end of the forecast period into perpetuity.
- 9** The cash inflows and outflows may be contractual or estimated. The cash flow model should be constructed so as to accurately reflect known future events, eg contract terminations, contract reviews or known future liabilities. Estimated or projected cash flows will need to be based on appropriate assumptions. The suitability of these assumptions will depend upon the purpose of the valuation. If a DCF model is being used to indicate investment value, the assumptions may be very different from those that would be suitable when using one to indicate market value. These differences are discussed later.
- 10** When the forecast period is short the calculation of the terminal value becomes more critical as it represents a higher proportion of the current value. Where this is the case vigilance is required to ensure that the assumptions made in constructing the cash flow used in the terminal value calculation are appropriate and that there are no probable changes that would be better reflected by extending the forecast period to allow them to be explicitly reflected.
- 11** The discount rate will reflect the risk associated with the cash flows. Where the objective of the DCF model is to estimate market value, the discount rate should reflect market participants' view of risk, which may be determined from the discount rates, or return, implied by recent transactions involving similar assets. If there have been no recent transactions then it may be necessary to estimate an appropriate discount rate by considering the risk premium that would be required by an investor, ie the additional return required over that obtainable from a 'risk free' asset such as a AAA rated bond. Calculating the risk premium requires consideration of matters such as the certainty and security of the income, the strength of any counterparty and the prospects for future income growth.

## The DCF Method - Market Value

- 12** As an accepted method within the income approach to valuation, the DCF method involves the projection of a series of cash flows to either a real property interest, or a business. To this projected cash flow series, an appropriate, market-derived discount rate is applied to establish the present value of the income stream associated with the real property or business.
- 13** The use of the DCF method in a market valuation makes use of available market evidence and should reflect the thought processes, expectations, and perceptions of investors and other market participants as best as they can be understood. As a technique, the DCF method should not be judged on the basis of whether or not the specific DCF expectation was ultimately realized but rather on the degree of market support for the DCF expectation at the time it was undertaken. When the purpose of the valuation requires market value it is therefore important that the inputs into the DCF model are based on market evidence or reflect common market sentiment. If criteria specified by a particular owner or prospective owner is to be used it should be compared with market evidence and expectations. If it differs then it can only be used for giving an indication of *investment value*, not *market value*
- 14** All valuation inputs and assumptions should have regard to the conceptual framework for *market value* in the International Valuation Standards.<sup>2</sup> Sufficient research should be undertaken to ensure that cash flow projections or expectations and the assumptions that are the basis for the DCF method are appropriate, likely and reasonable for the subject market.
- 15** Assumptions of growth or decline in income would normally be premised on analysis of economic and market conditions and discussions with management about the expectation for the real property asset or business. Changes in operating expenses should reflect all expense trends and specific trends for significant expense items.
- 16** The DCF model is structured for a specified forecast period. The duration of the forecast period, components of the projected cash flow and specific items addressed will vary between real property assets and businesses.

### Real Property Assets

- a) The duration of the cash flow and the specific timing of inflows and outflows will be determined by events such as rent reviews, lease renewal, re-letting, redevelopment, or refurbishment. The appropriate duration is typically driven by market behaviour that is characteristic of the class of real property and its sector.
- b) In the case of investment properties, periodic cash flow is typically estimated as gross income less vacancy and collection losses and less operating expenses. The series of periodic net operating incomes, along with an estimate of the terminal value anticipated at the end of the projection period, is then discounted.

<sup>2</sup> | Ibid para 7

- c) In the case of development properties, estimates of capital outlays, development costs, and anticipated sales income are estimated to arrive at a series of net cash flows that are then discounted over the projected development and marketing periods.
- d) The frequency of inflows and outflows (monthly, quarterly, annually) should also be market-derived. Inflows and outflows should be appropriate and reasonably supported.
- e) An appropriate discount rate needs to be applied to the cash flow. If the frequency of the time points selected for the cash flow is, for example, quarterly, the discount rate must be the effective quarterly rate and not a nominal rate. Expenses may be placed at the accounting point in time rather than the point of time at which they are incurred. The best solution is to have a cash flow frequency that matches the timing of the most frequent aspect of the periodic cash flow.

### **Businesses**

- f) The forecast period in a business valuation normally is of such a length to enable the entity to achieve a stabilized level of earnings, or to be reflective of an entire operation cycle for a cyclical industry.
- g) There are two measures of free cash flow utilized in the DCF method when applied to a business valuation: Free Cash Flow to the Firm (FCFF) and Free Cash Flow to Equity (FCFE).
- h) As most businesses operate as going concerns (and are therefore not of limited life) consideration is required as to the terminal value of the operations at the end of the explicit forecast period. In calculating the terminal value, the potential of the business for further growth beyond the explicit forecast period must be considered. The 'constant growth model', which applies an expected constant level of growth to the cash flow forecast in the last year of the forecast period and assumes such growth is achieved in perpetuity, is a commonly used method. An alternative is the 'fading growth model' where the growth rate lessens over time. These results would normally be cross-checked for the reasonableness of the implied exit multiples.

i) Adjustments to 'normalise' free cash flow also need to be considered in the terminal year including:

- Ongoing capital expenditure versus depreciation expense
- The life of continuing intangible asset amortization expense
- The impact of economic cycles

j) In arriving at the market value of a business the results of the DCF method should be adjusted to reflect:

- Any tax losses available to off-set future profits
- Surplus assets not required in the day to day operations of the business
- Contingent liabilities not reflected on the balance sheet, such as pension deficits

k) The discount rate should be selected from comparable businesses in the market. When considering whether a business is comparable regard should be had to factors such as revenue, expenses, country risk, inflation, size, real rates of return, and income projections. Where data is available for a typical WACC rate for businesses in the sector this may also be used.

**17** Selection of the method for calculating the terminal value depends upon practices in the subject market as normally, it represents an estimate of the market value of the real property or business at the end of the forecast period. The DCF model should mirror those market practices. For a business the terminal value can be based on a projection of the FCF or FCFE, as appropriate, for the year following the last year of the forecast period capitalized at the appropriate rate. For real property it can be the anticipated rental income after considering the possible impact of void periods or re-letting costs capitalised at an appropriate rate.

## The DCF Method – Investment Value

**18** When the purpose of the valuation requires investment value to be estimated, the inputs used such as the discount rate, discount period and cash flow assumptions may not be the same as those that would be used by a general market participant.

**19** The cash flows may be market derived or be specific to the asset or business being valued. The discount rate will used will normally be determined by entity specific criteria, eg a target rate of return, an opportunity cost or the entity's WACC rate. An example could be where a DCF model is used to calculate the investment value to a prospective buyer of a business. The prospective buyer may wish to determine at what value the actual cash flows of the target would generate its required target rate of return before entering the market.

## Internal Rate of Return

**20** A DCF model can also be used to calculate the internal rate of return (IRR) of an investment. The IRR is the discount rate at which the net present value of all the cash flows, including the cost of acquisition equals zero.

## The DCF Method – General

- 21** Cash flows can be developed using alternative financial assumptions. This will be determined by either market practice in the relevant sector, by the availability of data or a combination of both. For example cash flows may be:
- Gross or net of tax
  - Gross or net of debt finance costs
  - Reflective or non-reflective of anticipated inflation or deflation, often referred to as 'growth explicit' or 'growth implicit' models.
- 22** The nature of the cash flows used will need to be reflected in the discount rate adopted. For example the cash flows in a model might have explicitly taken into account forecast inflation over the duration of the cash flow. It would therefore be important to adopt a discount rate that reflected only the risks associated with the forecasts, and not one that reflected the potential for the current income to grow in line with inflation. In other words if a growth explicit cash flow is used, the discount rate should also be growth explicit. Care should be taken to ensure consistent assumptions in the analysis of any data used to support both the cash flow and the discount rate used in the model. Providing all other inputs remained constant and that the discount rate assumptions are consistent with the cash flow assumptions there should be no difference in the result of a valuation carried on either alternative. .
- 23** IVS 104 *Scope of Work* and IVS 105 *Valuation Reporting*<sup>3</sup> require all assumptions that are to be made in the course of a valuation assignment to be recorded. IVS 105 further requires the valuation approach to be identified together with the key for the conclusions.
- 24** In order to comply with the requirements of IVS 105 and to enable users of valuations to properly understand the valuation is good practice to disclose and discuss the assumptions made in the DCF model in the report. Examples of information that would normally be provided, where relevant, include but are not limited to:
- The forecast period including the commencement date of the cash flow and the number, frequency and term of the periods employed.
  - The components of cash inflow and cash outflow grouped by category and the rationale behind their selection.
  - The projected income and the rate at which income is projected to change where applicable.
  - The projected operating expenses and the rate at which expenses are projected to change.
  - The treatment of ancillary expenses and losses.
  - The derivation of, or rationale for, the discount rate.
  - The basis for adopting the terminal value calculation.

<sup>3</sup>IVS Exposure Draft June 10

- The annual effective rate at which periodic interest is calculated, where finance debt or debt service (payment of interest and principal) is a component of the projected periodic cash flow.
  - The rate(s) of taxation used and quantification of net operation losses where applicable.
  - The reasoning behind any provision for incentives, where applicable.
  - The treatment of any capital expenditures incurred in the acquisition or improvement of the relevant asset.
  - Identification of the cash flow model, by product name and version if it is proprietary software; describe the methods and assumptions inherent in the model; and specify the dates on which the model was employed.
  - Debt finance or debt service (payment of interest and principal) per period and the annual effective rate at which periodic interest is calculated, if applicable.
  - The net cash flows per period (the sum of inflows less the sum of outflows).
  - The discount rate or rates that are applied to the net cash flows and the rationale behind and support for their selection. If multiple rates are used, then the different rates must be applied to the appropriate part of the cash flow. e.g. for equity cash flows the rate to use will be the cost of equity.
  - A sensitivity analysis on the impacts of key operating forecasted data and the critical financial assumptions (discount rate, perpetuity growth rate) on the valuation results
- 25** When another valuation method is used as well as DCF, it is recommended that the report contain either a reconciliation between the result obtained in the DCF and the result obtained by the other method, or a clear rationale provided for preferring one or other of the methods as the better indicator of value.