

The Worked Example Group

Exposure Draft ED/2022/1

The Valuation of Growth Shares

Exposure Draft

The Valuation of Growth Shares

Comments to be received by 31 January 2023

Status of Exposure Draft ED/2022/1

This Exposure Draft has been prepared by the Worked Example Group (WEG) an independent body to flag different bases of valuation for growth shares and encourage dialogue and discussion about the valuation of growth shares within the valuation community and other interested parties.

This Exposure Draft is not issued by HMRC and does not represent an HMRC proposal but is intended to promote debate and discussion.

Background

Exposure Draft WEG ED/2022/1 *The Valuation of Growth Shares* is issued by the Worked Example Group (“WEG”) for comment only. The proposals may be modified in the light of comments received before being issued in final form. Comments need to be received by 31 January 2023 and should be submitted in writing by email to enquiries@sharevaluationweg.org.

Purpose

This WEG Exposure Draft is issued as there is currently no settled guidance on the appropriate use of Models for the valuation of special share classes for fiscal purposes. Consequently, there is no methodology for valuing Growth Shares which one can confidently expect will be accepted by HM Revenue and Customs (“HMRC”) in a future look back valuation review. This is recognised as a problem by HMRC and practitioners alike. Accordingly, the WEG has developed this Exposure Draft to explore this perceived problem in further detail, seeking the views of practitioners and other interested stakeholders, with the intention of reaching consensus on an appropriate valuation basis for Growth Shares for UK tax or fiscal purposes.

Invitation to Comment

All comments will be on the public record and posted on our website at <https://sharevaluationweg.org> unless the respondent requests confidentiality. Such requests will not normally be granted unless supported by good reason, for example, commercial confidence.

Disclaimer

To the extent permitted by applicable law, the WEG expressly disclaim all liability howsoever arising from this publication or any translation thereof whether in contract, tort or otherwise to any person in respect of any claims or losses of any nature including direct, indirect, incidental or consequential loss, punitive damages, penalties or costs.

Information contained in this publication does not constitute advice and should not be substituted for the services of an appropriately qualified professional.

Copyright © Worked Example Group

All rights reserved. Reproduction and use rights are strictly limited. Please contact the WEG for further details at enquiries@sharevaluationweg.org.

Contents

Terminology	6
Introduction	7
Why is the Worked Example Group issuing this Exposure Draft?	7
Structure of this WEG Exposure Draft	7
Who would be affected by the proposals?	8
Next step	8
Invitation to comment	8
The International Valuation Standards Council	8
Mercury Limited (Mercury).....	9
The current value of Mercury	10
The Current Value Model (CVM).....	11
Description of Model	11
The calculations	11
The arguments for CVM.....	11
The arguments against CVM	11
The Probability Weighted Expected Return Model (PWERM).....	13
Description of Model	13
The calculations	13
The arguments for PWERM	13
The arguments against PWERM.....	13
The Black Scholes Option Pricing Model (BSOPM)	15
Description of Model	15
The calculations	15
The Arguments for OPM	17
The Arguments against OPM	17
The Binomial Model.....	19
Description of Model	19
The Calculations	19
The Arguments for the Binomial Model	19
The Arguments Against the Binomial Model	19
Monte Carlo Simulation (MCS)	21
Description of Model	21
The DCF Model.....	22
Description of Model	22

Relevant Information 23
Description 23

Terminology

There are various terms used in this WEG Exposure Draft which we define, for the avoidance of doubt as to the intended meanings:

Base Value: The Value as applicable in respect of the Model used and may be that of the enterprise Value or the entire equity interest or a relevant class of equity at the Valuation Date.

European Call Option: an option, which provides the option holder with a right, but not an obligation, to purchase shares in a company at a stated date in the future.

Growth Shares: Shares with little or no participation in the Base Value as at the Valuation Date. They have a stated participation in the Value above a defined Hurdle Value.

Hurdle Value: The value above which the Growth Shares participate. The Hurdle Value may be any amount. It is very commonly the Base Value or a higher figure. There may be more than one Hurdle Value for a share. The Hurdle Value may relate to equity Value or enterprise Value. Alternatively, there may be revenue or EBITDA Hurdle Values. The Hurdle Values may include ratchet mechanisms operating by reference to internal rates of return, returns on equity or market multiples.

Information Standard: The information deemed to be available to a purchaser of a parcel of shares in a notional transaction.

Liquidity Event: The realisation of the value in shares;

Liquidation Preference: The amounts due to different share classes assuming a members' voluntary liquidation or other form of realisation on the Valuation Date.

Model: A particular valuation technique used under one of the three valuation approaches of the market, income and cost approaches.

Option Cost: The price that a market participant pays for a Call Option contract. This is frequently a European option which can be exercised at one date in the future.

Strike Price or Exercise Price: The amount payable on exercising the Call Option. The Option Cost, together with the Strike Price, represent the amount that the Call Option holder has invested to acquire the shares which were the subject of the Call Option.

Value: the value as applicable in respect of the relevant Hurdle Value. The return of Value may be via dividend rather than participation in equity capital value.

Valuation Date: The relevant date at which the valuation is required.

Introduction

Why is the WEG issuing this Exposure Draft?

Background

The WEG Exposure Draft includes various Models which the WEG are aware are used for the valuation of Growth Shares in private companies. By the term "Growth Shares" we mean shares which have little or no participation in the existing Base Value within a company as at the Valuation Date; but do have a right to a proportion of the future growth in value above a pre-determined Hurdle Value. The Hurdle Value is often rather greater than the Base Value.

This WEG Exposure Draft is issued as there are currently no settled guidance on the appropriate use of Models used for the valuation of such share classes.

Various classes of Growth Shares may be used for wealth planning purposes as a means of transferring value from existing shareholders. Alternatively, they may be issued to members of the management teams of some private companies (both owner-managed and in a private equity setting), as a form of incentive to increase the value of the company.

Some of these share classes have rights and restrictions of significant complexity. They can therefore present significant valuation challenges.

The procedures for agreement of fiscal values between taxpayers and HMRC changed several years ago. Specifically, SAV withdrew the valuation check service that it had previously offered on an informal basis for the purposes of PAYE Health Checks and ITEPA Post Transaction Valuation Checks ("PTVCs"), with effect from 31 March 2016. For Growth Shares in particular, where those shares were treated as employment related securities for income tax purposes, these informal procedures provided both advisers and taxpayers alike with certainty. However, with the increasing use of Growth Shares as part of management incentivisation structures, the volume of clearance requests (often involving complex valuation scenarios) that SAV were receiving was absorbing considerable valuer resource but resulted in no change to the valuation proposed. At the time of their withdrawal, almost 90% of ITEPA PTVCs and PAYE Health Checks were accepted by SAV as submitted.

HMRC's replacement to their informal valuation check service was a very different system of review, whereby HMRC can be more selective around the cases they choose for referral to SAV. In the intervening period since the withdrawal of ITEPA PTVCs and PAYE Health Checks, this has begun to shine the spotlight on both the valuation methodologies employed as well as the overall quality of valuations prepared by valuers to support the fiscal value of Growth Shares. Ergo, a combination of aspects has driven a need for the WEG to explore via this Exposure Draft stakeholders' views on:

- (a) the various valuation methodologies used in practice; and
- (b) the degree and level of information that is arguably required, to feasibly undertake a fiscal valuation of Growth Shares.

Structure of this WEG Exposure Draft

The WEG Exposure Draft includes:

- (a) A simple example, Mercury Limited, which is used to illustrate different Models that we understand are currently being used in practice;
- (b) Details of these various Models for the valuation of complex share classes, including Growth Shares;

- (c) Discussion of related matters including the Information Standard and assumed time periods to a Liquidity Event; and
- (d) Questions inviting comments on the suitability or otherwise of the Models for the valuation of complex share classes including Growth Shares.

Who would be affected by the proposals?

The WEG expects that the proposals in this Exposure Draft will affect all entities with complex share classes. The effect will vary between entities. In summary, the effects may relate to both financial reporting measurement and also the values of such share classes for the purposes of taxation. This WEG Exposure Draft considers only tax values and does not extend to the valuation of shares for the purposes of financial reporting, which approaches the concept of value by reference to the provisions contained within the relevant accounting standards.

We recognise that ordinary shares in highly geared capital structures may share many of the qualities of growth shares. However, such share structures are outside the scope of this WEG Exposure Draft.

Next step

The WEG will consider all comments received and other feedback from its consultations on this Exposure Draft when finalising the proposals.

Invitation to comment

The WEG invites comments on the proposals in this Exposure Draft, particularly on the questions set out below. Comments are most helpful if they:

- (a) Address the questions as stated;
- (b) Contain a clear rationale;
- (c) Identify any wording in this Exposure Draft which is unclear;
- (d) Include any alternative Models or variations of Models that the WEG should consider, if applicable.

Respondents need not comment on all the questions. The WEG is interested in receiving input on the suitability of the Models for the fiscal valuation of complex share classes.

If commentators consider that other Models, or variations of the Models to deal with specific circumstances, should be applied, we would like to be provided with full details.

The International Valuation Standards Council

International Valuation Standards 2022, as issued by the International Valuation Standards Council (IVS 2022), has included details of three Models for the valuation of complex capital structures in IVS 200: Businesses and Business Interests. IVS 200 also states: “*For complex capital structures, being those that include a form of equity other than just common stock, valuers may use any reasonable method to determine the value of equity or a particular class of equity.*”¹

The three Models suggested by IVS 2022 are:

- (a) The Current Value Model (CVM);
- (b) The Option Pricing Model (OPM);

¹ IVS 2022 200.130.5

(c) The Probability-Weighted Expected Return Model (PWERM)

This Exposure Draft includes these three Models as Models of possible use for the valuation of Growth Shares. We are aware that there are some advocates for the use of DCF for the valuation of Growth Shares. We have also included a section relating to this valuation method. The Binomial Model is sometimes used for the valuation of options; as the number of time intervals approaches infinity the Binomial Model approaches the outputs of the Black Scholes Option Model. We also include a section relating to this valuation method. Monte Carlo simulation may also be used when the terms of growth shares are especially complex. The OPM, Binomial Model and Monte Carlo simulation are built on the same valuation principles, but they differ in their functionalities and circumstances of use.

Mercury Limited (Mercury)

In this Exposure Draft we consider a relatively small company, Mercury. We use this sample company in some of the alternative Models which we cover in this document.

The owners of Mercury, an unquoted company, established that the company has an equity Value at the Valuation Date of £20m. This comprises an enterprise value of £21m less (net) debt of £1m. They want to incentivise the management to grow the business. The owners consider that there is sufficient momentum in the business already that the growth in value of the equity to £25m will be relatively easy to achieve, but after that growth will become much harder.

The owners want to incentivise the managers to grow the equity above the Hurdle Value of £25m. They are awarding them equity in a new class of Growth Shares (100 A ordinary shares with a nominal value of £1 each (the "A shares")) which gives this share class the rights to 20% of the value of the equity above the first Hurdle Value of £25m. If the equity value increases above £40m, the A shares have the rights to 40% of the value above that second Hurdle. For example, if the company were sold for an equity value of £50m the 100 A shares would receive £7m, being £3m (20% of £15m (£40m less the first Hurdle Value of £25m)) and £4m (40% of £10m (£50m less the second Hurdle value of £40m)).

The owners of Mercury anticipate that an exit will take place in more than five years but less than ten years from the present date. No dividends are expected to be paid: the cash generated from profits will be used to fuel growth.

For simplicity, in this example we have ignored any fiscal valuation implications associated with:

- (a) whether joint elections between the employee and employer company under section 431 of ITEPA 2003 have been entered; and
- (b) on-line share reporting requirements associated with employment related securities ("ERS").

Notwithstanding these caveats, the directors of Mercury have concluded that the Company's shares are not readily convertible assets ("RCAs"). Consequently, the directors are not under a statutory duty to determine the "*best estimate*" of the relevant fiscal market value(s) of the Growth Shares. Whilst the Growth Shares are not RCAs (in this instance), they are ERS for income tax purposes. Members of management who receive Growth Shares are therefore under a statutory duty to disclose their receipt on the employment pages of their income tax self-assessment ("ITSA") returns. On this basis, the directors of Mercury feel that they are under a moral obligation to provide these employees with the relevant fiscal value(s) of the Growth Shares to enable those particular employees to fulfil their ITSA obligations to HMRC.

The current value of Mercury

Valuations of Mercury were undertaken using different approaches and methods. They all converged on a valuation for the entire equity of £20m on the Valuation Date. The valuations were computed using the following methods:

- (a) EBITDA multiple of 6 on EBITDA of £3.5m less £1.0m of interest-bearing debt;
- (b) EBIT multiple of 7 on EBIT of £3.0 million less £1.0m of interest-bearing debt;
- (c) Profit before tax multiple of 6.7 on profit before tax of £3.0m;
- (d) Price-earnings ratio of 8.4 on profit after tax of £2.4m;
- (e) A PWERM: the values and the probabilities were:

	Value	Probability	Weighted
	£'000	%	£'000
Highest	26,000.0	15%	3,900.0
Higher	21,865.0	20%	4,373.0
Median	19,600.0	40%	7,840.0
Lower	16,385.0	20%	3,277.0
Lowest	12,200.0	5%	610.0
PWERM valuation			20,000.0

- (f) A discounted cash flow valuation using a mid-year discount rate of 17% and terminal growth of 3% after five years of discrete projections. The discrete projections incorporated an initial period of high growth in sales and profits. Various other models were run, as a form of sensitivity analysis, with changes to the rates of growth, capital expenditure, working capital movements and discount rates.

The various calculations supporting the DCF equity valuation of £20.0m are given in Appendix 1. We are using these values in the rest of this Exposure Draft.

The Current Value Model (CVM)

Description of Model

CVM uses conventional and established business valuation techniques. It attributes values to the different share classes based on the position at the Valuation Date, assuming a realisation of the entire equity at that date. Shares are valued at their Liquidation Preference in a notional sale of the entire share capital at the Valuation Date. This means that the value of the Growth Shares is their nominal value.

The calculations

The CVM allocates the enterprise value or equity value to the securities assuming an immediate sale of the enterprise.

On this underlying assumption of an immediate sale, the equity value of Mercury of £20m would be allocated:

- (a) the A shares would have a Liquidation Preference of £100; and
- (b) the balance would be attributed to the ordinary shares.

The arguments for CVM

Regardless of the valuation approach and Model employed, the proponents of the CVM recognise that the Base Value for the equity of Mercury of £20m is the determinant of value.

The allocation of value on a conventional basis does not provide for the attribution of value to classes of equity to the extent that they participate in value above the Base Value.

If the A shares are allocated any value greater than nominal value, it is arguable that this has the effect of undervaluing the ordinary shares.

The CVM reflects the position at the Valuation Date. Any value in the A shares in Mercury is contingent on the value of the entire equity increasing by more than 25% above the Base Value.

The arguments against CVM

It is evident that the owners of the ordinary shares would not agree to transfer the value above the Base Value or Hurdle Value to an unconnected third party for negligible consideration. It is however possible to envisage a notional hypothetical transaction in which the ordinary shareholders reduce their exposure by agreeing to transfer the rights to the value above the Base Value for reasonable consideration.

The CVM does not recognise the optionality value in the A shares.

International Valuation Standards state that CVM should only be used:

- (a) when a liquidity event is imminent,
- (b) when an enterprise is at such an early stage of its development that no significant common equity value above the liquidation preference on any preferred equity has been created,
- (c) no material progress has been made on the company's business plan, or
- (d) no reasonable basis exists for estimating the amount and timing of any such value above the liquidation preference that might be created in the future.²

² IVS 2022 200.130.11

Question 1

Do you consider that CVM is a reasonable basis for the value of the A shares of Mercury?
Please give your reasons in stating whether or not you agree.

The Probability Weighted Expected Return Model (PWERM)

Description of Model

The PWERM uses any of the valuation methods under the three approaches to derive values for a business. A number of different possible future valuation outcomes are produced based on various assumptions regarding future trading performance and possible exits for the shareholders of the business. These may range from the very optimistic to the most pessimistic outcomes.

The different outcomes are allocated over the share classes. Those outcomes are then discounted back to net present value using an appropriate discount rate.

International Valuation Standards state: "Typically, the PWERM is used when the company is close to exit and does not plan on raising additional capital."³

The PWERM is often used by Private Equity, which has a strong focus on a timed exit, once the value of the business has been increased.

The calculations

The valuations under PWERM were based on a number of different approaches, Models and assumptions.

The range of values, as discounted to net present value, and the probabilities are tabulated above.

The different values include two values that are above the Base Value of £20m. The weightings assume that there is a 35% probability of the current value being above the Base Value. The probability of the valuation being above the first Hurdle Value of £25m is 15%. The PWERM does not include any scenarios in which the value is above the second Hurdle Value.

The valuation which is greater than the Hurdle Value is £26m and the excess is £1m. This is allocated, with £200,000 being attributable to the A shares and the balance to the ordinary shares.

The probability of this outcome is assessed at 15%. The A shares as a class are therefore valued at £30,000.

The arguments for PWERM

PWERM overtly considers future values and attaches probabilities to their occurrence. If an exit is anticipated in seven years PWERM considers a range of possible outcomes at that point. By looking at different possible future outcomes it is accessible to clients.

It recognises the imprecision within estimates of the future by producing various possible alternatives.

The arguments against PWERM

The five specific net present values for the equity of £12m to £26m imply that these are the five alternative future outcomes. It is far more likely that there are many different potential outcomes with a continuum of potential values between the highest and lowest values projected. It is also likely that there are potential outcomes below the lowest value and above the highest value projected.

The weightings involve significant subjectivity.

³ IVS 2022 200.130.22

For sophisticated investors such as private equity, PWERM can often be the model of choice as significant emphasis is placed by these investors on the statistical modelling of various future outcomes, which typically means that subjectivity is materially reduced.

For smaller businesses that are not accustomed to the preparation of detailed projections, it is unlikely that the skills will exist to produce a range of different projections and to attribute probabilities to them.

If such skills are present, this is a Model that requires significant time and resources to be properly developed.

Question 2

Do you consider that PWERM is a reasonable basis for the valuation of the A shares of Mercury? Please give your reasons in stating whether or not you agree.

Question 3

If you consider PWERM to be a reasonable basis of valuation for companies with different attributes to Mercury, what are those attributes?

Question 4

If you consider it to be a reasonable basis, what techniques do you consider should be used for:

- (a) Deriving a range of different Values?
- (b) Calculating the probabilities that should be given to each of those Values?

The Black Scholes Option Pricing Model (BSOPM)

Description of Model

The BSOPM uses the Black Scholes Merton Model for the pricing of European Call Options.

The BSOPM allocates the Base Value over different bands of value and therefore over different securities in a company according to their respective rights.

The advocates of the use of a European Call Option for valuing Growth Shares point to the perceived similarities between a Growth Share and an Option:

- (a) as the initial Value of a Growth Share is generally modest, its downside risk is equally modest, but there is significant upside potential;
- (b) both market options and Growth Shares may be dealing with value which is above the Base Value of the underlying security;
- (c) with a Call Option the Strike Price has to be paid if the option is exercised. In exchange the holder gains the full benefits of ownership of an ordinary share; with a Growth Share there is no need to pay a Strike Price. However, the holder is denied a share in the value up to the Strike Price.

The calculations

In the example of Mercury, the Base Value is allocated between the value up to £25m, the value up to £40m and the values above that level using the Black Scholes formula. The six inputs into the OPM were:

- (a) No dividends being paid;
- (b) Risk free rate 1.2% (yield to redemption on a seven year gilt);
- (c) Volatility of 15% (see below)
- (d) 7 years to a Liquidity Event for the A shares
- (e) Share price £20m;
- (f) Strike prices £25m and £40m.

The indicative value above £25m is £2.1m. Of this amount, £1.8m relates to the band from £25m to £40m and £0.3m relates to the value above £40m. 20% of £1.8m and 40% of £0.3m aggregates to £0.5m before discount. This figure is higher than the figure derived using PWERM as the implicit volatility within the PWERM model is far lower than 15%.

The risk-free rate, the Base Value and the Hurdle Values per share could be readily determined for Mercury. As the A shares do not pay dividends the dividend yield is nil. The more problematic assumptions concern:

- (a) the expected life of the awards (that is the time to a liquidity event), and
- (b) the expected future volatility.

The expected life of an award is inherently uncertain and requires a judgement by the directors of Mercury. We are assuming that the most likely period to a trade sale or some other Liquidity Event is seven years.

This WEG Exposure Draft does not seek to address the question of the adjustments for the discount for lack of control (DLOC) and the discount for lack of marketability (DLOM) which are generally outside the scope of this paper. However, it is recognised that there is also the prospect of some calibration between different assumptions of the expected time to a liquidity

event and the minority discounts applicable: we consider that the minority discount for a 7-year period to exit should be greater than that for an assumed 5-year or 3-year period to exit due to the linkage between time period and the DLOM.

The future volatility of the company's share value is also inherently uncertain and is much more difficult to forecast for an unquoted company than a quoted company: there is no history of actual share prices to guide a view as to future volatility.

Financial Reporting Standard 2, Appendix B, suggests that the average volatilities of broadly comparable quoted companies should be used if the market approach has been used for the valuation. If another valuation approach or metric has been used, such as net asset value, the volatility within that metric should be applied.

The question of volatility for share in private companies is challenging and is a large subject in its own right. .

The directors of Mercury decided to base their judgement of future volatility primarily by reference to comparable quoted companies.

The directors also considered, in assessing the future volatility of the Growth Shares, the implied volatility of the Growth Shares (as contrasted with the volatility of the ordinary shares) that can be mathematically derived from the difference between the Base Value and the Hurdle Values.

For the purposes of this example a volatility of 15% was assumed: this is broadly consistent with average market volatility over the long term in both the UK and the USA. It is therefore an understatement of the volatility of the shares of many public companies.

It is arguable that a small private company, valued on an "as if publicly traded" basis, may need to make an allowance for trading in the shares of the company taking place over several days, so as not to move the market. This may mean that the very short-term movements in the market prices of guideline public companies need to be averaged by a two-day or three-day moving average in order to obtain the actual volatility relating to significant parcels of shares.

The Black Scholes model uses the risk-free rate as one of the main inputs. This is conceptually sound as the seller of an option is able, through the process of dynamic hedging, to hedge their risk perfectly. In consequence, as perfect hedging equates to no risk, the internal rate of return is the risk-free rate.

The existing shareholders of Mercury are in a position similar to that of a seller of an option. However, they are not able to hedge their exposure. This therefore means that the risk-free rate appears not to be relevant for the calculations relating to the valuation of a Growth Share.

There is another distinction between a market call option and a Growth Share:

- market options assume a passive investor who has no impact on the underlying business performance; and
- Growth Shares are issued with the express intention of motivating senior managers of a corporate entity, where that motivation is designed with the purpose of the value of the private company increasing in consequence of their actions.

It is theoretically possible to establish empirically the impact of management share incentives on the performance of private companies. However, we are not aware of any such research that may have been undertaken in this area of interest to date. There will be cases in which the business does not flourish, despite the share awards; the expectation is that there will be

rather more cases in which the granting of share incentives does lead to enhanced profits and value.

The active involvement of the Growth Share recipients in the business may be seen (and therefore interpreted) as a possible justification for not substituting the internal cost of equity for the risk-free rate in the Black Scholes option model.

The Arguments for OPM

The OPM provides an internally consistent set of values for Growth Shares with differing Base Values and Hurdle Values. By internally consistent we mean that values of Growth Shares for Mercury with a range of different Hurdle Values can be calculated.

The OPM is very simple to apply; it can apply different outcomes for different assumptions with very little time and effort.

It is very frequently used for financial reporting purposes in valuing options over Growth Shares and also Growth Shares themselves.

It is conceptually sound for the valuation of call options in the public markets, as it has the status of a mathematical proof.

The OPM is based on a lognormal distribution. It is arguable that the application of PWERM, if extended to a very large number of different potential outcomes with relevant weightings applied, should approximate the OPM outputs.

The Arguments against OPM

It is based on the concept of dynamic hedging of risk, and this is not available to the holders of the ordinary shares in a private company.

Volatility cannot be readily calculated for the shares of a private company.

Question 5

Do you consider that OPM is a reasonable basis for the value of the A shares of Mercury? Please give your reasons in stating whether or not you agree.

Question 6

If you consider it to be a reasonable basis, what techniques do you consider should be used for deriving the time period to a Liquidity Event?

Question 7

If you consider it to be a reasonable basis:

- (a) how do you think the concept of volatility should be addressed?
- (b) we have discussed above the possibility of averaging the prices of guideline public companies over several days as one possible technique. What techniques do you consider should be used to derive the notional volatility of shares in private companies? Any responses in this area would be particularly welcome.

Question 8

If you consider it to be a reasonable basis:

- (a) how do you think that the concept of dynamic hedging and the risk-free rate should be addressed?

- (b) do you consider that the distinction between passive investment in the markets and active investment by management in private companies is a relevant factor when considering an appropriate input variable for risk within an OPM?

The Binomial Model

Description of Model

The Binomial Model begins with the current value; that value is then increased and decreased by a series of discrete steps, based on the assumed volatility. After a pre-determined number of steps, a company value tree is produced. The strike price is then deducted from these values in order to give the future option value.

The values above the strike price are then discounted back, step by step, using a combination of a probability factor, averaging at each step and discounting at the risk-free rate. The values below the strike price are ignored.

A final single value is produced, which equates to the value of the call option.

The greater the number of steps that are included in the model, the closer the values are to those provided by Black Scholes.

The Calculations

The inputs into the model are the same as for the Black Scholes Model. The same subjectivities apply in respect of volatility and time period to an exit.

100 steps were applied to cover the 7-year period. 101 future values were produced, with a median value of £20m and a range from £0.4m to £1,058.2m. 42 of these future values exceeded £40m and 48 of the values exceeded £25m.

The present value of sums above £25m were £1.6m and the values above £40m had a present value of £0.2m. These outcomes were within 0.1% of the Black Scholes results.

The Arguments for the Binomial Model

It provides a visual representation of future possible values, based on assumed volatility. It may therefore be accessible for those seeking a greater understanding of the impact of the assumptions on the calculations.

The Arguments Against the Binomial Model

Compared to the BSOPM it is labour intensive. If the objective is to value a European call option, the BSOPM can produce the relevant figures far more quickly.

It is based on the concept of dynamic hedging of risk and this is not available to the holders of the ordinary shares in a private company.

Volatility cannot be readily calculated for the shares of a private company

Question 9

Do you consider that the Binomial Model is a reasonable basis for the value of the A shares of Mercury? Please give your reasons in stating whether or not you agree.

Question 10

If you consider the Binomial Model to be a reasonable basis for companies with different attributes to Mercury, what are those attributes?

Question 11

Has the use of the Binomial Model for the valuation of Growth Shares been fairly represented above? If it is not a fair representation, can you please provide fuller details of how the Binomial Model can be applied in the valuation of Growth Shares.

Monte Carlo Simulation (MCS)

Description of Model

MCS is a model that is used when the terms of growth shares are so complex that neither BSOPM nor the Binomial Model can be reasonably used.

MCS is based on the modelling of a very large number of transactions with a number of variables using random number generation.

As an example, there may be ranges of possible values that may be simulated via an MCS for sales' volumes, sales' prices, costs of sales, other costs, earnings, equity and enterprise values etc.

The aim of the MCS is, to an extent, to reduce the subjectivity around estimating the probability weightings associated with the PWERM and the material impact that it has on the valuation outcome.

Question 12

Do you consider that MCS is a reasonable basis for the value of the A shares of Mercury? Please give your reasons in stating whether or not you agree.

Question 13

If you consider MCS to be a reasonable basis for companies with different attributes to Mercury, what are those attributes?

The DCF Model

Description of Model

DCF is widely used for deriving the value of shares. It is conceptually the purest form of valuation technique as the value of a business interest is the net present value of future cash flows.

The assumption with Mercury is that the DCF method has been used under the income approach to support the Base Value of £20m.

If DCF is to be used as a means of computing the value of Growth Shares, we assume that it must be combined with a Model, such as PWERM, in order to derive a range of possible values.

Question 14

Do you consider that DCF is a reasonable basis for the value of the A shares of Mercury? Please give your reasons in stating whether or not you agree.

If you consider DCF to be a reasonable basis for companies with different attributes to Mercury, what are those attributes?

Question 15

If using DCF please state how you apply DCF in order to derive a range of values.

Question 16

Has the use of DCF for the valuation of Growth Shares been fairly represented above? If it is not a fair representation, can you please provide fuller details of how DCF can be applied in the valuation of Growth Shares?

Relevant Information

Description

The valuation of shares in private companies for tax purposes requires consideration of the information that is deemed to be available to market participants in arriving at the market value of the relevant shares.

The HMRC views on this matter are given in SVM 114000 of the Shares and Assets Valuation Manual. In SVM114040 a rough guide is provided in respect of holdings of less than 25% of the voting capital. SVM114040 also considers the nature of the investment and states the following:

“There will be cases where the size and cost of the investment may appear small but due to the nature of the investment any prudent purchaser would require further information and ‘demand as a condition of buying’. An example of such an investment would be where the value is wholly dependent on the company achieving a growth target and where there is some provision for an early exit. Such arrangements are commonly called ‘Growth Shares’. Clearly in such circumstances the growth prospects are intrinsic to the investment and no sale would proceed without access to additional information such as company forecasts.”

Question 17

What are your views on the Information Standard that should be applied for considering the market value of Growth Shares? Please give your reasons in support of your views.

Question 18

Do you consider the guidance currently provided by HMRC at SVM114000 provides practitioners and taxpayers alike with sufficient clarity as to the type and extent of additional information when considering the market value of Growth Shares? If not, how may guidance at SVM114040 be improved to offer additional clarity on the type and extent of additional information to which a prospective purchaser of Growth Shares may require access as a condition of sale?

Question 19

Are there growth shares that are too complex to value? What features would make them so?

Question 20

Are there other techniques to the valuation of growth shares that might be appropriate? If so, please give details and a rationale for their use.

Appendix 1

DCF Calculations

DCF case	17.00%					
Growth	10.000%	8.000%	7.000%	5.000%	3.000%	3.000%
Year	1	2	3	4	5	Terminal
PBT	3,259	3,520	3,766	3,955	4,073	4,196
Add depreciation	535	556	584	602	620	638
Capital expenditure	(845)	(555)	(680)	(450)	(638)	(658)
PAYE movement	18	16	15	11	7	7
Working capital increase	(448)	(394)	(373)	(285)	(179)	(185)
	2,520	3,143	3,313	3,833	3,883	3,999
Taxation	(633)	(652)	(704)	(753)	(791)	(815)
Cash flows to equity	1,887	2,491	2,609	3,080	3,092	3,184
Discount factor mid year	0.9245	0.7902	0.6754	0.5772	0.4934	0.4934
Terminal value						22,746
NPV	1,744	1,969	1,762	1,778	1,525	11,222
Value	20,000					