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## Share Based Payment Accounting

### Introduction

The main rules for Share Based Payment (“SBP”) accounting are set out in the International Accounting Standards (“IFRS2”) and its UK domestic equivalent (“FRS20”). The SBP standards apply to all UK reporting entities except for small businesses which prepare their accounts under the Financial Reporting Standard for Smaller Enterprises (“FRSSE”).

The concept underlying the SBP standards is that all the elements of an employee’s remuneration package (including share based incentives) should be charged in the employer’s financial accounts as an expense on a consistent and fair basis.

The SBP standards actually contain the accounting rules for two quite different regimes. Awards of options, shares and interests in shares are generally accounted for as Equity Settled SBPs while cash bonuses linked to the share price (ie phantoms) are generally accounted for as Cash Settled SBPs. In most cases it is relatively easy to distinguish between the two types of awards, but this is not always the case and the International Accounting Standards Board (“IASB”) has struggled to develop an entirely coherent framework for distinguishing between Cash and Equity Settled SBPs. For example, where there are share buyback arrangements, awards of shares that might look like Equity Settled SBPs may in fact need to be classified as Cash Settled SBPs.

### Cash Settled Share Based Payments

A Cash Settled SBP gives rise to a liability in the financial statements, the value of which is linked to the share price of the business. Potentially the liability could be satisfied by an asset other than cash - for example shares, but as the shares were not awarded at the outset and the liability could have been settled in cash, the award is normally treated as a Cash Settled SBP. However, if the original intention was to issue shares or it became the regular practice for the awards to be settled in shares, then an Equity Settled SBP treatment from the outset might be more appropriate.

The accounting treatment of Cash Settled SBPs is in line with traditional accounting for business expenses. The liability is recognised as a creditor until it is paid and the corresponding double entry is a debit to the business expense - wages and salaries. The creditor and total expense is not fixed until the liability is finally established. Therefore, if the bonus scheme straddles financial periods, an estimate of the liability at each period end is required. Where the employee’s cash bonus is linked directly to the share price the period end estimate should normally reflect the value of the share(s) at the period end. If the bonus scheme rewards growth and is more analogous to an option then the SBP standards suggest using option pricing theory mathematics (see below) to determine the period end value. However, in an important distinction from Equity Settled SBPs, any such period end Cash Settled SBP estimates are always corrected or “trued up” when the final outcome is known.

### Equity Settled Share Based Payments

The accounting cost for an Equity Settled SBP is largely determined at the date of grant, and is based on a theoretical “fair” or “market” value of the award at that date.

If the award is a share, the “fair value” should broadly reflect the market value of the share at the date of grant less a discount for the risk of forfeiture in the event of the employee leaving or a failure to satisfy a performance condition. If the company is quoted, a market value of the shares should be readily available, but if the company is unquoted, some form of share valuation is likely to be necessary. As the share based incentive awards are usually over the equivalent of small minority holdings, the valuation of the unquoted shares usually reflects a discount for lack of marketability and influence.

If the award is an option, there is not usually a quoted market value available for the option and you would therefore have to calculate a theoretical fair value for the options using some form of option pricing theory (see below). This fair value also has to be adjusted for the risk of forfeiture in the event of participants leaving or a performance condition not being satisfied.

The “fair” value of the award is measured as at the date of grant. This is usually taken to be the date on which the option documentation is executed and dated. However the SBP standards refer to the date of grant as being when the terms of the award have been agreed by both parties and all conditions necessary for the awards to be made have been satisfied including, where necessary, shareholder approval. This means that sometimes it may be possible to measure the fair value at the date that management approves the award rather than when the award is actually executed.

The “fair value” or total cost of the award is then usually spread over the “vesting period” i.e. the period between the date of grant and when the award becomes exercisable. The costs should then be allocated into those accounting periods, treating them as a wages and salaries expense in the Income Statement. As no cash leaves the business the corresponding credit entry is not a liability but a credit to shareholders funds on the Balance Sheet.

Strictly speaking the SBP standards do not insist on the use of Black Scholes option pricing theory mathematics to value options but auditors can be reluctant to accept any alternative methodology.

Black Scholes is a formula which provides a mathematical basis for calculating the price or market value of a share option. The formula which is summarised below has its critics but it nonetheless won Black and Scholes a Nobel Prize for Economics. It is by no means straightforward to solve algebraically even for those with significant mathematical skills but the formula can be converted into an excel spreadsheet which can be used to calculate the value of an option (i.e. the “V” in the formula).

$$\frac{1}{2} \sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS \frac{\partial V}{\partial S} + \frac{\partial V}{\partial t} - rV = 0$$

The diagram illustrates the components of the Black-Scholes formula. Arrows point from labels to terms in the equation:
 

- volatility** points to  $\sigma$
- Price of share** points to  $S$
- with respect to risk-free interest rate** points to  $r$
- rate of change** points to  $t$
- Value of Option** points to  $V$

Whether this formula is appropriate for valuing employee share options is open to question as it makes a number of assumptions which are clearly invalid. For example it assumes that the underlying entity does not change. While this is true for a commodity such as a metal, it is obviously not true for a business. It assumes that the returns on equities follow what is known as a random path, and that the market has no knowledge of previous price movements or expectations of future movements; assumptions which are clearly false. It also assumes that the option is capable of continuous trading which is not the case

for an employee share option where the opportunities to exercise (let alone trade) the options are usually quite limited.

Notwithstanding these and other defects, from necessity and convenience, the Black Scholes approach has become the normal basis for the valuation of options for employee share schemes in financial statements.

In order to calculate the value of an option using Black Scholes there are 6 basic factors or assumptions. These are:

Market value of the shares at the date of grant

- Exercise price of options
- Expected life of the option
- Expected future dividend yield
- Expected future volatility of the share
- Risk free rate of capital

There is usually a considerable amount of subjectivity in some of these assumptions (e.g. future volatility) and the SBP standards require the above assumptions to be disclosed in the Notes to the Accounts. Most financial statements include numbers which are based on subjective assumptions but such assumptions are not normally explicitly stated in the financial statements, and the users of these accounts rely on the auditors to ensure that the underlying assumptions are reasonable. The SBP level of disclosure is exceptional and is an indication of the standard setters own lack of familiarity and confidence in Black Scholes mathematics. The disclosure was intended to give the users of accounts the opportunity to recalculate the SBP accounting charges for themselves, although in practice few ever do.

Most accounting estimates and provisions are revised in the light of better information and this is the case with Cash Settled SBPs. For Equity Settled SBPs a much more restrictive regime applies. Once the fair value of an award is calculated none of the assumptions used in the Black Scholes calculation can be changed even if they prove to be hopelessly inaccurate. The SBP standards also require that no corrections be made to the estimates at the date of grant for

the outcome of market based performance conditions being different from that assumed at the date of grant.

The SBP standards draw a distinction between non-market based performance measures and market based performance measures. Examples of a non market measure would be profit, sales or Earnings Per Share while share price or Total Shareholder Return targets would be market based measures. The SBP standards require the expenses charged to be corrected or "trued up" where the number of awards that actually vests is different from the number assumed to vest at the date of grant where employees have forfeited awards because they have either left or non market performance conditions have not been met. However, as noted above, no such "truing up" is permitted for the failure to satisfy market based performance measures so the type of performance condition chosen can have a significant impact on the ultimate accounting charge.

The Black Scholes formula can be solved algebraically, so there is no need to resort to complex mathematical techniques such as Monte Carlo modelling (which are used where a formula cannot be solved algebraically) for basic Black Scholes calculations. Monte Carlo modelling is a mathematical simulation technique which in simple terms involves modelling millions of different scenarios and then statistically analysing the results to arrive at a value. Where you have a formula which cannot be solved by algebra it provides a technique for calculating an answer which has become quite popular with the wide availability of powerful computers.

However, Monte Carlo modelling can be useful where there are market based performance conditions, as it can be difficult to make normal accounting estimates of the impact of such conditions on the fair value of the award at the date of grant. As the financial results are not automatically "trued up" for any errors when calculating the fair value of awards with market based performance measures, auditors are usually more comfortable when a more sophisticated mathematical technique such as Monte Carlo is used. But, as a Monte Carlo simulation for options still uses Black Scholes mathematics the fundamental weaknesses of the Black Scholes approach identified above are not remedied by a Monte Carlo approach.

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