

**American Accounting Association's Financial Accounting Standards Committee
Response to IASB Exposure Draft, "Share-Based Payment"**

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The Financial Accounting Standards Committee of the American Accounting Association ("the Committee") is charged with responding to requests for comment from standard setters on issues related to financial reporting. The Committee is pleased to respond to the IASB Exposure Draft on Share-Based Payment (hereafter, the ED). The comments in this letter reflect the views of the individuals on the Committee and not those of the American Accounting Association.

Our response is presented in four sections. First, we provide a brief outline of the Committee's views on principles-based standards along with an evaluation of the extent to which the ED achieves this ideal. In Section II we draw on existing research to consider various aspects of financial reporting for share-based payments. Section III summarizes our position. In a detailed appendix we assess, through a series of examples, alternative approaches to accounting for share-based payments. The appendix uses a residual income valuation framework to point out important weaknesses in the ED's approach to accounting for share-based payments, offers alternatives, and discusses important disclosures that overcome the weaknesses.

Our general position on accounting for share-based payments remains unchanged from that in the Committee's 1994 response to the FASB on the exposure draft for SFAS No. 123, *Accounting for Stock-Based Compensation* (AAA FASC 1994). In that letter, the Committee strongly endorsed recognition of the fair value of stock-based compensation as an expense. We now have more research evidence to support our views and advances in theory to organize our thoughts. Specifically, we rely on empirical research on the effects of SFAS No. 123 and theory related to a residual income valuation framework as a basis for our response.

Based on our analysis in the appendix, we believe that the IASB's Framework must be refined to more clearly define "investors" if the accounting for share-based payments is to reflect important characteristics of the economics of valuation. The Committee believes the IASB's approach to accounting for share-based payments, including differential treatment and classification of options settled in cash versus stock, is consistent with a clean-surplus residual income approach if investors are defined to include both existing and potential shareholders. This is the implicit position of the ED, which includes share-settled options in equity. Within a model where *all* elements of equity are considered residual outcomes from the measurement of assets and liabilities, then the ED's approach is logically consistent. Cash-settled options are liabilities and should be remeasured at each balance sheet date with changes (and their related tax effects)

flowing through the performance statement. Share-settled options are part of equity in this model, and thus are not periodically remeasured.¹

We have concerns, however, with this approach since it leads to an accounting standard that treats economically equivalent items differently, specifically, the ED's distinction between cash- and share-settled options. Such accounting lends itself to transaction structuring and arguably is not neutral. Additionally, because share-settled options are measured at grant-date and adjusted for changes in fair value through the exercise date, the ED allows considerable room for managers to exercise self-serving discretion in their choice of model estimates. Later, we provide evidence on such behavior as it currently exists. Further weaknesses in the ED emerge because fair values based on grant-date measurements form the core of the ED's accounting for share-settled options and no adjustments are made for forfeitures or expirations.

In the series of examples in the appendix, we evaluate the ED from the perspective of existing shareholders (i.e., we do not consider options as part of equity) and show which elements of the ED are sound and how identified weaknesses can be addressed. We recognize up front that the IASB and other standard setting bodies continue to wrestle with demarcations between liabilities and equity. Indeed, our Committee struggled with this issue in the past (AAA FASC 1999) and continues to do so. Our discussion should prove useful to that debate and well as the debate over share-based payments.

If investors are defined to include only current shareholders or if the option holders are viewed as non-equity claimants, then the Committee is opposed to the IASB's approach to accounting for share-based payments. Under this perspective, the Committee supports the classification of all share-based securities outstanding as debt with fair value measurement of that obligation at each balance sheet date. Changes in the obligation, along with related tax consequences, should be charged to earnings. Ultimately, exercise-date measurement of the net assets transferred to option holders is recorded.

Although there was disagreement among the Committee members on whether, for purposes of determining measurement bases for share-based payments, "investors" should include both existing and potential investors, there was agreement that:

- Share-based payments should be charged to earnings.
- The ED's principles-based approach to share-based payment is deficient in that economically similar events are treated differently.
- Cash-settled share-based payments should be remeasured to fair value at the balance sheet date with changes in fair value flowing through earnings.
- The fair value of share-settled payments should at least be disclosed in the notes to the financial statements so that appropriate adjustments can be performed in valuation.
- Sufficient disclosure should be made so that financial statement users can assess the quality of management's fair value estimates over the life of the options. Disclosures similar to those provided by U.S. property and casualty insurance companies for their

¹ However, for reasons discussed in the following sections, the Committee believes strongly that disclosure of the fair value of options outstanding post-grant is necessary in this case.

claim development, along with appropriate adjustments for time value of money issues seem a reasonable starting point.

I. A Principles-Based Standard for Share-based Payments

In a previous letter (AAA FASC 2003), the Committee wrote to the FASB of our support of principles-based standards and described characteristics that we believe principles-based standards should possess. In the letter, we emphasized that principles-based standards should: (1) use the economic substance, rather than the form, of a transaction to guide financial reporting, (2) provide a description of the economics of the transaction and any assumptions made in financial reporting for the transaction, and (3) if needed, provide implementation guidance in the form of examples, rather than rules.

The Committee is pleased with the principles-based direction of IASB standard setting for share-based payments. By adopting a general approach to share-based payments versus focusing solely on stock option compensation, the ED frames the issue as one of measuring the assets or services acquired. By expressing the logic in straightforward contexts (e.g., purchasing equipment in return for shares), the move to more controversial areas is made more-smoothly. The ED's repeated emphasis that entities do not make share-based payments without expecting to receive something in return forces the reader to focus on the economics of the transactions. It becomes clear that the 'do nothing' approach of APB 25 for stock option compensation is unacceptable.

However, within the Committee, there was agreement that the ED falls short of desired characteristics of a principles-based standard. For example, the ED supports significantly different accounting results for cash- versus share-settled options—securities that we consider economically equivalent. To be sure, the ED draws on the IASB's Framework to arrive at its recommendations, but in doing so the Framework's limitations come to the fore. For example, the Framework leaves open important issues related to the demarcation between liabilities and equity. The Framework does not reconcile disputes concerning whether share-settled options are equity or not because the definition of liability (a present obligation of the enterprise arising from past event, the settlement of which is expected to result in an outflow from the enterprise of resources embodying economic benefits) is subject to interpretation. Cash-settled options seem obvious enough to be liabilities—they ultimately involve an outflow of cash. But what about share-settled ones? They ultimately involve a redistribution of the net assets of the entity, when shares are distributed to option holders. Some argue that this is not an outflow of assets. But what if the shares ultimately distributed were treasury shares purchased by the enterprise in the open market? Acquiring those shares clearly involved an outflow of assets. Why should interjecting this transaction change the accounting for a share-based payment? It is apparent that the form of the transaction and not its substance is driving its financial reporting, an undesirable characteristic in a principles-based standard.

Within the Committee, there was disagreement as to the extent to which a principles-based standard for share-based payments needed to provide implementation guidance. Some argued that guidance beyond an indication that fair values ought to consider all relevant factors (e.g., forfeiture rates, non-transferability, inability to exercise the option during the vesting period, and

expected versus contracted lives) was not necessary. Others found the guidance helpful and argued that there are a number of places where the examples could be elaborated upon (e.g., where references are made to adjustments within equity for expired options). Nonetheless, all members agree that the ED's clear statement that its examples are not exhaustive and certain assumptions are rebuttable is a positive development.

II. Discussion of and Research Evidence on Financial Reporting for Share-Based Payments

Classification of Stock Options Outstanding and Grant-date versus Exercise-date Measurement

As discussed, it is difficult to determine the appropriate classification of stock options outstanding in the absence of a clear understanding of whether the firm is defined in terms of existing or existing and potential investors. The appropriate classification of stock options outstanding as a liability or equity and grant versus exercise-date measurement are closely intertwined and both depend on how the firm is defined. The ED touches on this point when it states,

Others who support exercise date measurement do not regard option holders as part of the ownership group, and therefore believe options should not be included in equity. Option holders, some argue, are only potential owners of the equity. (BC117)

In considering the classification issue the ED considers the question from a somewhat different perspective, however. That is, the ED discusses whether stock options outstanding meet the definition of a liability as defined in the Framework. The ED states,

The Discussion Paper rejected exercise date measurement because it requires share options to be treated as liabilities, which is inconsistent with the definition of liabilities in the conceptual frameworks of the G4+1 member bodies. Exercise date measurement requires share options to be treated as liabilities because it requires the remeasurement of share options after initial recognition, which is inappropriate if the share options are equity instruments. The Discussion Paper concluded that a share option does not meet the definition of a liability, because it does not contain an obligation to transfer cash or other assets. (BC92)

The definition of a liability in the Framework is as follows:

A liability is a present obligation of the enterprise arising from past events, the settlement of which is expected to result in an outflow from the enterprise of resources embodying economic benefits. (BC93)

The IASB continues that while this definition does not refer to the transfer of assets it is unlikely it was the intent of the authors of the Framework to broaden the definition of liability settlement to include the transfer of equity instruments. However, the "economic benefits"

transferred at the time of stock option exercise are not represented by the stock issued to the option holder on date of exercise. By issuing stock to the option holder at less than fair value, the company transfers economic benefits to the option holder equal to the difference between the market price of the stock on date of exercise and the exercise price. Thus, it is not necessary to expand the definition of a liability to incorporate the transfer of equity because the transfer of the economic benefit (the difference between exercise price and market value on date of exercise) is captured within the existing definition of a liability. This statement assumes a definition of the firm restricted to existing stockholders.

Research into the classification issue and grant-date versus exercise-date measurement is limited. One exception is Aboody (1996b). Aboody estimates a regression equation of price on ex-dividend current earnings, current book value, and stock options outstanding computed using exercise-date measurement. He documents a significant negative association between stock options outstanding and stock price indicating that stock options outstanding are value relevant. However, since Aboody defines his dependent variable in terms of price *per share* it is not clear if the significant negative association he documents should be interpreted as evidence that stock options outstanding are viewed as a liability or as evidence of the dilutive effect of stock options on price per share.

Measurement Issues

According to the Framework, expenses “usually take the form of an outflow or depletion of assets such as cash and cash equivalents, inventory, property, plant and equipment.” (§78) In contrast, BC90 of the ED explains, “grant date is the most appropriate measurement date for the purpose of providing a surrogate measure of the fair value of the services received.” In other words, compensation expense associated with share-based compensation is measured by the “fair value of the services received,” not by the actual or expected depletion of economic resources that eventuate. As discussed, this perspective is justified only if the firm is defined in terms of existing and potential investors and GAAP refrains from remeasuring equity. If the firm is defined in terms of existing stockholders, the firm suffers an outflow of economic benefits equal to the difference between the exercise price of the stock and the market price on the exercise date and *this entire difference represents the cost to the firm.*

Irrespective of the view one adopts about ‘equity,’ grant-date measurement will not likely capture this economic benefit in its entirety. That is, even with perfect foresight, the ultimate economic benefit transferred at exercise date will differ from grant-date value due to the unwinding of time value of money factors embedded in the grant-date valuation. Furthermore, grant-date measurement places significant weight on measurement issues as it necessarily employs estimates of the expected number of options to be exercised, expected volatility of share price, expected dividends, the risk-free rate of interest and the term of the option. In addition, for non-traded companies the current market price of the share must also be estimated. These issues include the impact of measurement error at grant date as well as the impact of managers’ reporting incentives. The significance of these issues is mitigated under exercise-date measurement.

Research shows that estimates of employee stock option fair value are sensitive to parameter estimates—particularly expected option life. For example, Collier and Higgs (1997) demonstrate the range in possible option values arising from alternative measures of stock return volatility and dividend yield employed in variations of the Black-Scholes pricing model. Applying methods acceptable under SFAS No. 123 to the options of six firms, they obtain widely different estimates of compensation expense depending on the alternative inputs used.² Early-stage research by Gooch and Lipe (2003) reports two key findings. First, there exist significant differences between the fair value of options reported at grant date and estimates of the exercise date intrinsic value of those options. The differences seem unlikely to be due to time value of money considerations. Second, there is an insignificant correlation between grant-date and exercise-date fair values. These results point to the need to disclose information allowing users to assess the reliability of the grant date estimates.

Existing research also demonstrates that employee stock option exercise patterns are difficult to predict and change over time. In a study of the option exercise behavior of over 50,000 employees at eight firms, Huddart and Lang (1996) find that employees tend to exercise options earlier than they would if they held ordinary options, leading to significant losses compared with the Black-Scholes value of the option. Carpenter (1998) provides insights into how modified models can be used successfully. However, Carpenter's evidence is limited to executives' stock options and Huddart and Lang document differences in exercise patterns across employee groups. Research intended to improve the models available to value employee stock options is ongoing. The Committee supports the IASB's decision to allow flexibility in the option pricing models employed thereby allowing managers' to take advantage of improvements in option pricing methodology as they occur.

Empirical findings of academic research, as well as anecdotal evidence, show that firms use discretion over accounting estimates to obtain their reporting goals (e.g., McNichols and Wilson 1988).³ While managers' ability to manipulate financial statement numbers through accounting estimates is constrained because eventually accrual accounting estimates are trued-up, a unique feature of grant-date measurement is that estimates are not trued-up. This makes grant-date measurement particularly vulnerable to earnings manipulation.

This reliance on estimates that are not trued-up provides managers with an opportunity to pick estimates strategically to attain reporting goals. For example, even if the number of forfeitures is as originally estimated, but the timing of forfeitures is earlier (later) than originally anticipated, total share-based compensation expense is under (over) reported relative to the value of the actual share option vested, other things being equal.

² They compared volatility of daily returns computed over 60 days, volatility of monthly returns computed over 60 months and Black-Scholes imputed volatility from traded options and also Value Line's estimate of "expected annualized dividend yield," a Wall Street Journal estimate where last quarterly dividend x 4/stock price, the sum of last 4 quarterly dividends/year end stock price, and the sum of last four quarterly dividends each scaled by stock price on the relevant declaration dates.

³ McNichols and Wilson (1998) show empirically that firms manage their earnings by underallowing to the provision for bad debts when income is extreme.

Evidence of estimate manipulation in the options arena is documented in existing research. For example, Aboody et al. (2002a) find that firms granting more options and firms with higher levels of CEO compensation assume shorter option lives. This drives down the fair value of such grants and stock compensation expense. Related work by Aboody and Kasznik (2000) finds that CEOs manage the timing of voluntary disclosures around option grant dates. In particular, bad news is disclosed early (leading to reduced strike prices) and good news is delayed (avoiding an increase in strike prices).

This discussion highlights several limitations of grant-date measurement vis-à-vis exercise-date measurement. Application of grant-date measurement gives rise to significant measurement issues that can impede the usefulness of the financial information produced by this approach. Measurement issues related to adequacy of option pricing methodologies may dissipate with time as pricing methodologies improve. Measurement issues related to managers' reporting incentives are more permanent, however.

Disclosure Issues

In the absence of exercise-date measurement, the importance of requiring disclosure of post-grant changes in the market value of outstanding stock options increases. In addition to providing users with sufficient information to value the firm, such disclosures provide users with sufficient information to assess the difference between management's estimates and subsequent realizations enables users to assess the quality of earnings. Hirst et al. (2003) provide evidence that individual investors use such reconciliations in assessing earnings quality and deriving security price estimates. Considerable research as to the usefulness of reconciliations is found in research on property and casualty insurers' claim development reserves (e.g., Petroni 1992; Petroni et al. 2000). Given the complexity of option measurement and the long periods over which estimates and actual realizations take place, disclosures similar to those by US property and casualty insurance companies would be helpful to users attempting to evaluate the quality of a firm's reporting.

Considerable research indicates that users incorporate information provided in financial statement footnotes. As Lipe (2001) and this Committee noted in its 2001 evaluation of the lease accounting proposed in a G4 + 1 Special Report (AAA FASC 2001), analysts (e.g., since Graham and Dodd 1934) and credit rating agencies (e.g., Standard and Poor's 2002) are aware of off-balance-sheet items and maintain that they adjust for such items in their analyses. Academic research suggests that market measures of equity risk and the market value of equity are associated with estimated liabilities generated using footnote disclosures of operating lease obligations (Ely 1995; Imhoff et al. 1993, 1995). Other academic accounting studies also demonstrate that footnote disclosure is useful for investors. For example, studies examining the valuation implications of footnote disclosures about pensions and post-retirement benefit obligations demonstrate the usefulness of footnote disclosure of disaggregated information relating to recognized numbers in the financial statements (e.g., Barth 1991; Choi et al. 1997).

We should caution that the research that examines the market's reaction to footnote disclosures implicitly assumes market efficiency (i.e., if the market impounds this information in price, it does so appropriately). However, papers in the finance and accounting literature

document instances of market inefficiency with respect to both accounting and non-accounting information. Footnote disclosure may have the effect of creating or enhancing opportunities for subsets of users to identify and exploit market inefficiencies. For example, research by Fairfield and Whisenant (2001) reports that analysts from the Center for Financial Research and Analysis successfully identify overvalued firms by analyzing the full set of disclosures provided in firms' SEC filings.

Hirst and Hopkins (1998) find that professional analysts are more likely to discover earnings management when earnings components are clearly reported in a performance statement than when they need to be determined through fundamental analysis. Aboody (1996a) shows that stock market participants react differently to asset write downs that are recognized in the financial statements by oil and gas firms adopting the full cost method than for firms using the successful efforts method that are required only to disclose asset write downs. These findings can be interpreted as evidence that capital markets value disclosure and recognition differently. As such, some argue that disclosure is not an adequate substitute for recognition and that the benefits of footnote disclosure are limited. Any recommendations for recognition as opposed to disclosure involve trade-offs between costs and benefits of various user groups, as well as the preparers.

Classification of Stock Compensation as Expense or Asset

Research on whether markets consider stock-based compensation an asset or an expense is limited. Bell et al. (2002) investigate the stock market's perception of the economic effect of employee stock options on firm value for 85 profitable software firms. They find that for at least this subset of firms, stock prices seem to treat employee stock option expense as an intangible asset. In other words, the market considers the use of employee stock options a net benefit to the firms. This evidence suggests that in some industries users may need sufficient information to adjust the balance sheet for intangible human capital assets. However, the creation of this human capital asset likely is not a function of the form of compensation. That is, one might expect that the market also would view payment of cash salaries as creating, at least in part, an asset for firms with significant intangible human capital assets.

Aboody et al. (2002b) build on the Bell et al. (2002) by explicitly estimating both stock compensation expense and the beneficial effect of motivating employees with stock-based compensation. Using analysts' forecasts of long-term growth in earnings to capture the benefits, they find that stock prices are negatively associated with SFAS 123 compensation expense, as one would expect.

The Dilutive Effects of Share-Based Payments

Our discussion to this point focuses on the impact of share-based payments on total firm value. This focus eliminates the issue of the dilutive effects of share-based payments on per share measures of firm performance and value. However, the dilutive effects of share-based payments are significant to individual investors.

Huson et al. (2001) examine whether stock returns are influenced by the extent to which a company has potentially dilutive securities outstanding. They argue and find that if some claimants can acquire equity interests in the firm for less than the market value, then a given level of earnings change (i.e., unexpected recurring earnings) will be priced lower due to the dilution.⁴ Interestingly, they also find that current reported measures of dilution appear to inadequately pick up the effect of dilutive securities. They note that under the US GAAP Treasury Stock method in SFAS No. 128, only options currently in the money are considered dilutive in determining EPS. Employee stock options generally are issued at or out of the money and are thus ignored in the EPS computation. Note that the Huson et al. (2001) paper uses data from the pre-SFAS No. 123 period (1970-1995). New data from SFAS No. 123 may alter some of their findings, but the essential finding that stock returns are associated with the level of dilutive securities seems robust.

Core et al. (2002) look at the dilution problem for employee stock options more directly and propose an alternative method to the treasury stock method for calculating the ‘denominator’ effect. They examine 731 employee stock options and find that their method on average leads to economic dilution 100% greater than the FASB’s treasury stock method. They also find evidence that market prices consider this additional dilution. Together, Huson et al. (2001) and Core et al. (2002) suggest that current EPS measures do not fully capture the dilutive effect of employee stock options and that the market corrects for this to some extent.

Repricings

Another proposal of the ED that deserves further consideration is the one dealing with repricing of share-options. While repricing (weakly) increases compensation cost incurred by the firm, it causes compensation expense recognized in the income statement to decline according to the ED’s proposal.⁵ This divergence between the actual cost and the reported expense has two adverse consequences. First, comparability across firms and over time may be impaired. Second, this type of accounting treatment may be costly to investors as firms may be motivated to reprice share options thereby diluting current shareholders value in order to inflate net income. Again, exercise-date measurement does not share this limitation. If the IASB continues with the ED’s grant-date measurement approach, the Committee suggests supplementing financial statements with footnote disclosure of pro-forma earnings using exercise-date measurement.

⁴ Their models incorporate potentially dilutive securities of all sorts including employee stock options, convertible debt and preferred stock.

⁵ To see that, consider Example 3 in Appendix B of the ED. In the absence of repricing, compensation expense would be:

Year 1:	$(460 + (40 \times 0.5)) \times 444.44 =$	213,331
Year 2:	$(410 + (50 \times 0.5)) \times 444.44 =$	193,331
Year 3:	$(400 + (10 \times 0.5)) \times 444.44 =$	179,998
Year 4:	$(390 + (10 \times 0.5)) \times 444.44 =$	<u>175,554</u>
		<u>762,214</u>

If repricing does occur, the compensation expense is lower, only 709,660.

III. Summary of the Committee's Position

The Financial Accounting Standards Committee is pleased with the IASB's principles-based approach to developing a standard for share-based payments. The Committee supports the goal of reporting stock-based compensation as an expense as well as the ED's considered treatment of share-based payments in general.

The Committee supports the approach of providing guidance in the choice of valuation models, but not requiring specific models. This allows firms and their advisors to adopt new methods as they are developed and to tailor general models to their specific circumstances. We are in favor of providing disclosure sufficient to allow users to compare models across enterprises and to assess the estimates used to measure share-based payments.

We are not in favor of the use of grant-date valuation with no subsequent adjustments for equity-settled share-based payments. This leads to artificial distinctions between cash-settled and equity settled options when their underlying economics are identical. As such, we anticipate that firms will engage in transaction structuring to obtain desired reporting outcomes, potentially limiting the representational faithfulness of financial reporting.

We suggest that exercise-date measurement be used for all share-based payments, regardless of settlement form. We suggest balance sheet date measurement with changes running through the performance statement solves this problem. Treating all outstanding options as either liabilities or a form of equity subject to remeasurement through exercise date affords financial statement users a perspective that ties directly into well-accepted valuation models and overcomes the problem of like events being accounted for differently.

Exercise-date measurement leads to the eventual truing up of management's initial, grant-date measurements. With adequate disclosure of such changes, users can assess the quality of the estimates and adjust security prices as deemed fit. Furthermore, knowing that this truing up will take place in the future, management has greater incentive not to act opportunistically in the first place. The Committee believes that careful consideration of how periodic remeasurement adjustments are presented in the financial statements is important and falls within the purview of the IASB's project on performance reporting.

Finally, consistent with our view that share-based compensation should be reported in the performance statement, the Committee believes that associated tax consequences should not be treated as direct adjustments to equity. Doing so would result in a violation of clean surplus accounting which is the basis for our recommendation for exercise-date measurement of costs and periodic remeasurement of the outstanding options to fair value.

Appendix—Accounting for Share-Based Payments from a Valuation Perspective

In this appendix, we contrast a series of alternative ways to account for share-based payments. We take a stance that is neutral from a public policy perspective. That is, we are agnostic as to whether such payments are good or bad. Further, we adopt as a basic premise that better accounting treats economically like items in a like manner. As such, we take the position that cash-settled and equity-settled options should be treated similarly. We ground our analysis of share-based payments in a valuation perspective. We believe this is appropriate for several reasons. First, the IASB's *Framework for the Preparation and Presentation on Financial Statements* emphasizes a decision usefulness perspective for financial reporting. The Framework states that the objective of financial reporting is to provide information about the financial position, performance, and changes in financial position of an entity that is useful to a wide range of users in making economic decisions. Moreover, the IASB adopts the position in the Framework that investors are the user group of primary focus. It states,

As investors are providers of risk capital to the enterprise, the provision of financial statements that meet their needs will also meet most of the needs of other users that financial statements can satisfy. (¶10)

Furthermore, the IASB's performance reporting project is focused on providing useful data to help determine return on assets and on equity.

Although the Committee appreciates that other perspectives may be held and might lead to different conclusions about the ED, we adopt this perspective to demonstrate the weaknesses in the ED and to offer alternatives that overcome them. We do not claim that this is the only, or even the best, perspective from which to evaluate the ED. We do, however, believe it to be an important and useful one.

Initially, we adopt a valuation perspective with the firm defined in terms of existing stockholders. Should the IASB choose to define the firm in terms of some other group of investors (existing and potential stockholders for example), our analysis would differ from that presented and would lead to different recommendations. This issue is discussed more fully elsewhere in the letter.

We use a series of examples to demonstrate appropriate accounting for share-based payments from a valuation perspective. We introduce this analysis with a brief discussion of firm valuation techniques. We couch our discussion in terms of total firm value to abstract away from the dilutive effects of share-based payments and focus, at least initially, on the implications of share-based payments for total firm (equity) value.

Concisely, we demonstrate that (ultimately) the fair value of the options at exercise date should be recorded in earnings and options treated as separate from the equity of existing shareholders on the balance sheet until exercised. This allows the financial statements to appropriately capture essential inputs to well-accepted valuation models (e.g., dividend discount, free cash flow, and residual income models). It leads to effectively identical treatment of cash-settled and equity-settled options. Furthermore, as we explain later, it avoids issues relating to

the gaming of grant-date estimates because there is an ultimate truing up to the economic benefits transferred from the existing equity holders to the option holders⁶ and avoids arbitrary choices that arise in accounting for options that can be settled in either cash- or share-based form (i.e., the ED arbitrarily considers these to be liabilities essentially). Through the examples, we are able to show the disclosures required to use the valuation models should grant-date measurement with no truing up be used (the ED's approach).

A Brief Discussion of Firm Valuation Techniques

The dividend discount model equates total firm equity value (hereafter firm value) at time t (P_t) to the present value of future expected dividends (DIV).⁷ That is,

$$P_t = \sum_{\tau=1}^{\infty} \frac{E_t(DIV_{t+\tau})}{(1+r)^\tau} \quad (1)$$

where E_t signifies the expectation at time t of what follows in the brackets, Σ signifies the summation of the terms that follow for all values of τ from 1 to infinity, and r is the cost of equity capital.

The dividend discount model forms the basis for several alternative valuation models that specify firm value in different terms, such as discounted abnormal earnings and book value or discounted cash flows. Value estimates produced by these models yield identical valuation estimates to those produced by the dividend discount model itself, provided key assumptions are met.

Our discussion focuses on one of these models: the Residual Income Valuation (RIV) model. We use this model, in part, because it builds directly on accrual accounting. More importantly, however, the RIV model proves to be a useful tool in assessing the appropriateness of accounting for share-based payments from a valuation perspective. Use of this model to frame our discussion illustrates aspects of accounting for share-based payments that are important to an informed debate regarding this issue.⁸

The RIV model is given by the following equation:

⁶ A review of major textbooks on financial statement analysis reveals little coverage of the role of stock-based compensation in business analysis and security valuation. Soffer and Soffer (2003) provide a well-developed discussion of the theoretical importance of estimating future grants of employee stock options and the market value of existing employee stock options (all net of taxes to the firm) in arriving at the value of common equity. Recent work by Li (2002) yields a similar result. That is, in equity valuation both the expected future employee stock options and the currently outstanding employee stock options are value relevant from a theoretical perspective. This thinking also seems to be gaining acceptance in practice (see for example Clement and Joseph Cohen 2002).

⁷ In theory, expected dividends are risk adjusted and are discounted at the risk free rate of interest. However, the adjustment for risk is typically moved from the numerator of the formula to the denominator by substituting cost of equity capital, r , for the risk free rate of interest.

⁸ Note that because the dividend discount model, discounted cash flow models, and the residual income model can be shown to be algebraically equivalent, our discussion does not depend on the choice of model. That is, what holds true for one should hold true for the others.

$$P_t = BV_t + \sum_{t=1}^{\infty} \frac{E_t(NI_{t+t} - rBV_{t+t-1})}{(1+r)^t} \quad (2)$$

Where: BV = book value
NI = net income

The RIV model (equation (2)) equates firm value to opening book value of equity plus the infinite sum of discounted “abnormal earnings.” Abnormal earnings are computed by comparing expected earnings ($E(NI)$) to the minimum level of earnings required by stockholders given the expected amount of equity invested in the firm ($E(BV)$) and their required rate of return (i.e. cost of equity capital (r)).

Ohlson (1995) shows that clean surplus accounting is a necessary condition for maintaining equivalence between the dividend discount model (equation (1)) and the RIV model (equation (2)). Clean surplus accounting is obtained when all items of gain or loss go through the income statement or alternatively all changes in assets/liabilities unrelated to dividends (broadly defined to include all transactions with owners) pass through the income statement. This relationship is captured by the following equation:

$$BV_t = BV_{t-1} + NI_t - DIV_t \quad (3)$$

In general, clean surplus is not a useful mechanism for choosing between alternative accounting practices. For example, it is impossible to argue for or against straight line and accelerated methods of depreciation based on clean surplus as neither violates the clean surplus equation. However, certain accounting practices currently in use violate clean surplus accounting. For example, items of income or loss that bypass the income statement through a direct adjustment to equity via other comprehensive income violate the clean surplus relation. Examples of this from US GAAP include accounting for gains and losses on available for sale securities and accounting for foreign exchange gains and losses in certain situations.

The Committee recognizes that the existence of accounting policies that violate the clean surplus equation is evidence of a broader set of concerns for financial information beyond a pure valuation perspective. However, an analysis of the extent to which certain approaches to accounting for share-based payments violate clean surplus accounting provides insights important to an informed debate of accounting for share-based payments.

The examples demonstrate the nature and existence of clean surplus violations associated with four alternative approaches to accounting for share-based payments, including the ED’s approach. Our examples are based on assumptions drawn from a working paper by Kirschenheiter et al. (2002). They illustrate the importance of accounting for share-based payments in a fashion that captures the exercise-date measurement of the options and treats options as a liability (or as a form of equity separate from that related to existing shareholders and remeasured as needed).

Assumptions for Hypothetical Firm

A1: *Investment opportunity.* The firm invests in a productive asset that generates a 15 percent operating return (before taxes). All revenues and operating expenses are in cash, so operating pre-tax cash flows are also 15 percent of beginning investments.

A2: *Taxes.* The corporate tax rate is 1/3 (33.33%), so both after-tax profits and after-tax cash flows from the asset equal 10% of the beginning investment in each year.

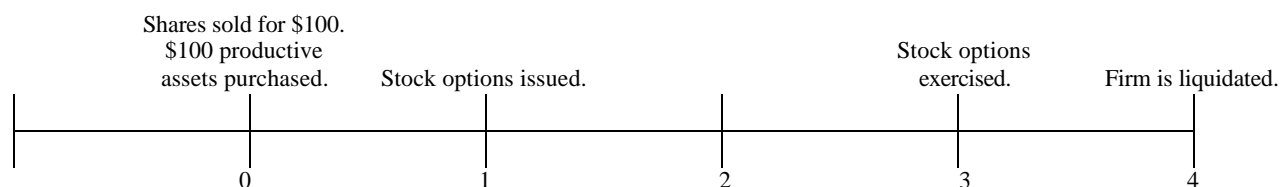
A3: *Investment policy.* The firm invests \$100 in the asset at time 0, reinvests all after-tax profits each year, and the firm is liquidated immediately after the end of year 4.

A4: *Financing.* The initial \$100 investment is financed by issuing 100 shares of stock at fair value of \$1 each.

A5: *Cost of capital.* Equity investors expect a return of 10%, after corporate taxes. Given A2, the investment opportunity described in A1 has a zero net present value (NPV).

A6: *Option issue.* At the end of year 1, employees receive 78.57 stock options (worth \$0.191 each), in lieu of \$15 in cash wages. The options vest immediately, are issued at the money (exercise price equals the year 1 share price of \$1.10), appreciate 10% per year, and are exercised at the end of year 3, by which time they are worth \$18.15. The cash saved at grant (\$15 less \$5 in taxes) is invested in productive assets, and at exercise the firm sells productive assets worth \$12.10. This amount plus \$6.05 in tax savings (realized from option exercise) plus the \$86.43 received from employees at exercise (78.57 options at \$1.10) are used to repurchase 78.57 shares at the prevailing market price of \$1.331 per share.

A time line of these events is:



At the end of the Appendix are the balance sheets and income statements for the hypothetical firm under four alternative approaches (Cases A through D) to account for share-based payments to employees. To focus our analysis on the primary issue of clean surplus, we assume employees render services in the year of stock option grant. We also assume that stock options are not forfeited or expire unexercised. Forfeitures and expiry can be incorporated into the analysis and doing so yields conclusions regarding appropriate accounting for these events. The Committee demonstrates this aspect of accounting for share-based payment toward the end of this section, in Case E.

Case A accords with the approach proposed in the IASB exposure draft. Stock option expense and the estimated related tax effect are charged against income in year 1 based on the

fair value of options at grant date. Stock options outstanding are classified as equity and no adjustment is made for changes in the fair value of stock options outstanding post grant.

Case B is a modified version of the approach proposed by the IASB. Similar to Case A stock option expense and the estimated related tax effect are charged against income in year 1 based on the fair value of options granted and stock options outstanding are classified as equity. However, in this case changes in the fair value of stock options outstanding post grant are accounted for (along with related tax effects) via a direct charge to equity.

Case C is a modified version of Case B. In this case, in keeping with Cases A and B, stock option expense and the estimated related tax effect are charged against income in year 1 based on the fair value of options at grant date and stock options outstanding are classified as equity. Similar to Case B changes in the fair value of stock options outstanding post grant along with the related tax effect are accounted for but in this case the adjustment flows through income.

Case D is similar to the previous cases in that stock option expense and the related tax effect is charged against income in year 1 based on the fair value of options granted. However, unlike the previous cases, stock options outstanding are classified as a debt obligation in Case D. Similar to Case C, changes in the fair value of stock options outstanding along with the related tax effect are recorded as adjustments to net income. This case is equivalent to the ED's treatment of cash-settled share-based payments.

Valuation of Hypothetical Firm – Dividend Discount Approach

The dividend discount formula (equation (1)) generates a value estimate for the firm at the end of year 0 of \$100. The firm pays one dividend – a liquidating dividend of \$146.41 at the end of year 4 and the firm's cost of equity capital is 10%. \$146.41 discounted back 4 periods at 10% is \$100.00, which is equivalent to the market price of the stock of the hypothetical firm at the end of year 0. We use this as a benchmark against which to compare Cases A-D.

Valuation of Hypothetical Firm – RIV Approach

Provided a given approach for accounting for share-based payments does not violate clean surplus, firm value computed using the RIV model should be identical to firm value obtained using the dividend discount formula (i.e. \$100). Accordingly we compute firm value using the RIV model and data from the balance sheets and income statements provided in Appendix A prepared under each of our Cases A through D. A firm value produced by the RIV model that deviates from \$100 is evidence of a clean surplus violation.

Case A (i.e. grant-date measurement, no subsequent changes—the ED approach)

$$P_t = 100 + \frac{(10 - (10\% \times 100))}{(1.10)^1} + \frac{(12 - (10\% \times 125))}{(1.10)^2} + \frac{(13.20 - (10\% \times 137))}{(1.10)^3} + \frac{(13.31 - (10\% \times 133.1))}{(1.10)^4} = 99.21$$

The firm's investment at time 0 is a zero NPV investment and returns to the hypothetical firm's investors an amount equal to their required return. Accordingly, abnormal earnings (i.e. all terms following the \$100 book value at time 0) should be zero. In Case A, however, the second and third abnormal earnings terms are non-zero, do not cancel each other out, and firm value deviates from \$100. This demonstrates that the IASB approach to accounting for share-based payments violates clean surplus. Moreover, it indicates that before investors use the RIV model to value a firm, an adjustment is necessary to correct this violation or valuation errors result. The information needed to make the appropriate adjustments is discussed following Case D.

Case B (i.e., exercise-date measurement with changes charged directly to equity, options part of equity)

$$P_t = 100 + \frac{(10 - (10\% \times 100))}{(1.10)^1} + \frac{(12 - (10\% \times 125))}{(1.10)^2} + \frac{(13.20 - (10\% \times 137.5))}{(1.10)^3} + \frac{(13.31 - (10\% \times 133.1))}{(1.10)^4} = 99.17$$

In Case B, stock options are adjusted for changes in market value post grant but the gain or loss is recorded directly in equity. Clean surplus is again violated as evidenced by the second and third abnormal earnings terms being non-zero. This arises because the gain or loss on stock options outstanding does not flow through net income but is adjusted directly through equity.

Case C (i.e., exercise-date measurement with changes charged to earnings, options part of equity)

$$P_t = 100 + \frac{(10 - (10\% \times 100))}{(1.10)^1} + \frac{(11 - (10\% \times 125))}{(1.10)^2} + \frac{(12.10 - (10\% \times 137.5))}{(1.10)^3} + \frac{(13.31 - (10\% \times 133.1))}{(1.10)^4} = 97.52$$

In Case C, stock options are adjusted for changes in market value post grant and the resulting gain or loss is included in the computation of net income. This appears to overcome the clean surplus problem discussed in Case B. However, the second and third abnormal earnings terms continue to be non-zero. This is because classifying stock options outstanding as equity creates a normal earnings "hurdle" which is too high.

Firm value (the left-hand side of the model) is defined in terms of existing stockholders, not existing and potential stockholders. As a result, classifying stock options outstanding as equity (in the right-hand side of the model) leads to an inconsistency in how the firm is defined for the left and right-hand sides of the valuation equation. This gives rise to a second source of clean surplus violation. While Case C corrects for the first source of clean surplus violation by including the gain or loss on stock options post grant in the computation of net income, it does not correct for this second source of clean surplus violation.

When stock options outstanding are classified as equity, book value incorporates stock options outstanding beginning on the date of issuance of the option, even though the market value of stock options outstanding is not included in firm value (P_t) as defined. Including stock options outstanding in equity creates, therefore, an inconsistency between the groups of investors that define the left and right-hand sides of the valuation equation. This inconsistency could be corrected taking the perspective that the firm is defined in terms of existing and potential shareholders and defining the left-hand side of the equation in terms of the market value of outstanding stock plus the market value of options outstanding to be consistent with this perspective. The IASB Framework gives little guidance in terms of identifying which group or groups comprise “investors” as the term is used in paragraph 10 of the Framework, however.

Case D (i.e. exercise-date measurement with changes charged to earnings, options part of liabilities)

$$P_t = 100 + \frac{(10 - (10\% \times 100))}{(1.10)^1} + \frac{(11 - (10\% \times 110))}{(1.10)^2} + \frac{(12.10 - (10\% \times 121))}{(1.10)^3} + \frac{(13.31 - (10\% \times 133.1))}{(1.10)^4} = 100$$

In Case D, stock options are adjusted for changes in market value post grant and the resulting gain or loss is included in the computation of net income. In contrast to the previous cases, however, stock options outstanding are classified as a debt obligation. In Case D, all of the abnormal earnings terms are zero indicating that this approach is unique among the four cases in that it does not violate clean surplus. From a clean surplus perspective, this approach is correct in two respects. First, changes in the market value of the stock options flow through income. Second, shareholders’ equity is increased for the capital transaction between the firm and the option holders but only at the point the option holders become shareholders of the firm. This is consistent with the definition of the firm in terms of existing shareholders.

Forfeitures and Expiration of Stock Options

When a valuation perspective from the point of view of existing shareholders is adopted, our analysis demonstrates that stock options outstanding should be classified as an obligation. When stock options outstanding are viewed as an obligation (as in Case D), the extinguishment of that obligation at zero “cost” to the firm because of forfeiture or expiration (i.e. the obligation is extinguished and the sacrifice of economic benefits is avoided) gives rise to a gain on extinguishment of debt. This gain and the related tax effect should flow through net income. Note, that the extinguishment of debt is considered a transaction distinct from the recognition of stock compensation. The suggestion is not that stock compensation expense previously recorded be reversed when the option is forfeited or expires unexercised. Instead stock compensation expense recorded to date is left intact to reflect the cost of the benefits received from employees through services rendered prior to the forfeiture or expiration of the option, an important goal of the ED. The extinguishment of debt is a distinct transaction that gives rise to a gain on extinguishment that is recorded, along with the related tax effect, through income.

To illustrate how case D can accommodate the effect of forfeitures, we alter Assumption A6 in our hypothetical firm example as follows:

A6: *Option issue and forfeiture.* At the end of year 1, employees receive 78.57 stock options (worth \$0.191 each), in lieu of \$15 in cash wages. The options are issued at the money (exercise price equals the year 1 share price of \$1.10), and appreciate 10% per year. At the end of year 2 the employees leave the employ of the company and forfeit their options, by which time they are worth \$16.50. The cash saved at grant (\$15 less \$5 in taxes) is invested in productive assets and is held until the final liquidating dividend is distributed to the shareholders of the firm.⁹

Valuation of Hypothetical Firm with Forfeiture – Dividend Discount Approach

The dividend discount formula generates a value estimate for the firm at the end of year 0 of \$109.09. Given perfect foresight, the market anticipates the liquidating dividend of \$159.72. The liquidating dividend of \$159.72 discounted back 4 periods at 10% is \$109.09. Note that the value of the firm is higher under this scenario as the market anticipates receiving the benefit of investing the cash savings arising from the use of stock options to compensate employees and subsequently avoiding the distribution of stock at less than fair value due to the forfeiture of the option.

Valuation of Hypothetical Firm With Forfeiture – RIV Approach

$$P_t = 100 + \frac{(10 - (10\% \times 100))}{(1.10)^1} + \frac{(22 - (10\% \times 110))}{(1.10)^2} + \frac{(13.20 - (10\% \times 132))}{(1.10)^3} + \frac{(14.52 - (10\% \times 145.20))}{(1.10)^4}$$

$$P_t = 109.09$$

In Case E, all of the abnormal earnings terms are zero except for the second abnormal earnings term. In Year 2, the firm experiences positive abnormal earnings due to the forfeiture of the stock options. The abnormal earnings amount is the after-tax gain on the extinguishment of debt of \$11. The value of the firm computed under the RIV model and the value of the firm computed under the dividend discount model are identical indicating that clean surplus is maintained when forfeitures are accounted for as extinguishments of debt valued at fair value.

Concluding Comments Regarding the Valuation Perspective

To evaluate the proposals in the ED, the Committee adopted a valuation perspective from the point of view of existing shareholders. From this perspective, accounting for share-based payments as illustrated by Case D has a number of desirable characteristics including like treatment of like events (i.e., cash- and share-settled options are treated similarly).

If, however, the IASB defines the firm in terms of existing and potential investors then the IASB approach represents clean surplus accounting. This could be demonstrated with

⁹ To simplify the analysis we assume the market has perfect foreknowledge of the employees' actions. This eliminates the need to develop an expectation pertaining to the probability of forfeiture. In reality, embedded in the market's expectation of future cash flows would be an expectation of forfeiture of stock options that do not vest immediately. Expectations of earnings and book values incorporating a consistent expectation of forfeiture could also be derived. The imposition of an expectation on forfeiture complicates the analysis and detracts from the central point, which is to illustrate the implications of forfeiture for clean surplus when stock options are accounted for as obligations.

appropriate adjustments to Case A to make the analysis consistent with this perspective. Expense measurement of share-based payments and classification of stock options outstanding that varies with the form of settlement (cash or stock) could be better justified by reference to the Framework. However, the outcome is that economically like events are treated differently—something we consider undesirable. Should the IASB adopt this position it is critically important that users define the firm similarly or have sufficient information to make the appropriate adjustments should they choose to define the firm differently.

This analysis and discussion identifies a significant weakness in the Framework. That is, at present there is no mutual understanding of what is meant by “investors.” Refinements to the Framework that allow the IASB to apply a consistent definition of “investors” going forward and the education of users regarding the IASB’s perspective on this issue are needed. The Committee views this as a particularly important point, given the critical role the Framework plays in the formation of principles-based standards.

Necessary Disclosures

Case D demonstrates the type of information investors require to properly value the firm. Specifically, users require information regarding changes in the market value of stock options post grant. Should investors define the firm in terms of existing shareholders, the market value of stock options outstanding post grant is needed to make appropriate adjustments to the right-hand side of the valuation formula.¹⁰ Moreover, separate disclosure of stock options outstanding on the balance sheet facilitates the reclassification of this balance between debt and equity for these users. What may not be readily apparent from the analysis, however, is that fair value information is needed regardless of whether the firm is defined in terms of existing or existing and potential stockholders.

Should the IASB choose to focus on a definition of the firm in terms of existing and potential investors, disclosure of the market value of stock options outstanding post grant is still needed by users. This information is needed to make appropriate adjustments to the left-hand side of the valuation formula. Since the securities employed in share-based payments are generally not publicly traded, reliable estimates of fair value are not readily available in the absence of firm disclosure of this information.

¹⁰ Since the equivalence of valuation models derived from the dividend discount model is maintained only if all assumptions applied are internally consistent, this statement is true regardless of the form of the valuation model employed.

Case A: Accords with the approach proposed in the IASB exposure draft. Stock option expense and the estimated related tax effect is charged against income in year 1 based on the fair value of options granted, stock options outstanding are classified as equity and no adjustment is made for changes in the fair value of stock options outstanding post grant.

Case A – Balance Sheet	Year 0	Year 1	Year 2	Year 3	Year 4
Assets					
Productive Assets	100	120	132	133.10	146.41
Deferred Tax asset	-0-	5	5	-0-	-0-
<i>Total Assets</i>	100	125	137	133.10	146.41
Stockholders' Equity					
Common Stock and PIC	100	100	100	97.90	97.90
Stock Options	-0-	15	15	-0-	-0-
Retained Earnings	-0-	10	22	35.20	48.51
<i>Total stockholders' equity</i>	100	125	137	133.10	146.41
Notes: Year 0 – Productive assets: Initial investment (100). Common stock: 100 shares issued for \$1 each. Year 1 – Productive assets: Opening balance (100) plus 10% after-tax return (10) plus after-tax cash salary savings (10). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Stock options outstanding: ($15 = 78.57 \times 0.191$). Common stock: 100 shares issued for \$1 each. Retained earnings: Year 1 net income (10). Year 2 – Productive assets: Opening balance (120) plus 10% after-tax return (12). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Common stock: 100 shares issued for \$1 each. Stock options outstanding: ($15 = 78.57 \times 0.191$). Retained earnings: Opening balance (10) plus Year 2 net income (12). Year 3 – Productive assets: Opening balance (132) plus 10% after-tax return (13.20) less sale of asset purchased with cash salary saving of \$10 in year 1 (12.10). Deferred tax: Tax savings realized on exercise. Common stock: Opening balance (100) less treasury stock repurchased at market value ($104.58 = 78.57 \times 1.331$) plus issue of stock to option holders ($86.43 = 78.57 \times 1.10$) plus additional tax savings on option exercise ($((1.331 - 1.10) \times 78.57 \times 1/3) - 5$) plus balance in stock option account (15). Stock options outstanding: Balance eliminated when exercised. Retained earnings: Opening balance (22) plus Year 3 net income (13.20). Year 4 – Productive assets: Opening balance (133.10) plus 10% after-tax return (13.31). Deferred tax: Tax savings realized on exercise. Common stock: No change. Stock options outstanding: No change. Retained earnings: Opening balance (35.20) plus Year 4 net income (13.31).					
Case A – Income Statement	Year 0	Year 1	Year 2	Year 3	Year 4
Pre-tax earnings on invested assets (15% return)		15.00	18	19.80	19.97
Savings on salary		15	-0-	-0-	-0-
Stock option expense		(15)	-0-	-0-	-0-
Pre-tax income		15	18	19.80	19.97
Income taxes (1/3)		(5)	(6)	(6.60)	(6.66)
Net income		10	12	13.20	13.31

Case B: Stock option expense and the estimated related tax effect is charged against income in year 1 based on the fair value of options granted, stock options outstanding are classified as equity and an adjustment is made through equity for changes in the fair value of stock option outstanding post grant net of tax.

Case B – Balance Sheet	Year 0	Year 1	Year 2	Year 3	Year 4
Assets					
Productive Assets	100	120	132	133.10	146.41
Deferred Tax asset	-0-	5	5.50	-0-	-0-
<i>Total Assets</i>	100	125	137.50	133.10	146.41
Stockholders' Equity					
Common Stock and PIC	100	100	100	100	100
Stock Options	-0-	15	16.50	-0-	-0-
Retained Earnings	-0-	10	21	33.10	46.41
<i>Total stockholders' equity</i>	100	125	137.50	133.10	146.41
Notes: Year 0 – Productive assets: Initial investment (100). Common stock: 100 shares issued for \$1 each. Year 1 – Productive assets: Opening balance (100) plus 10% after-tax return (10) plus after-tax cash salary savings (10). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Stock options outstanding: ($15 = 78.57 \times 0.191$). Common stock: 100 shares issued for \$1 each. Retained earnings: Year 1 net income (10). Year 2 – Productive assets: Opening balance (120) plus 10% after-tax return (12). Deferred tax: Tax savings associated with stock option expense ($5.50 = 16.50 \times 1/3$) deferred until exercise date. Common stock: 100 shares issued for \$1 each. Stock options outstanding: ($15 = 78.57 \times 0.2101$). Retained earnings: Opening balance (10) plus Year 2 net income (12) less after-tax change in fair value of stock options charged directly to stockholders' equity. Year 3 – Productive assets: Opening balance (132) plus 10% after-tax return (13.20) less sale of asset purchased with cash salary saving of \$10 in year 1 (12.10). Deferred tax: Tax savings realized on exercise. Common stock: Opening balance (100) less treasury stock repurchased at market value ($104.58 = 78.57 \times 1.331$) plus issue of stock to option holders ($86.43 = 78.57 \times 1.10$) plus balance in stock option account (18.15). Stock options outstanding: Balance eliminated when exercised. Retained earnings: Opening balance (21) plus Year 3 net income (13.20) less after-tax change in fair value of stock options charged directly to retained earnings. Year 4 – Productive assets: Opening balance (133.10) plus 10% after-tax return (13.31). Deferred tax: Tax savings realized on exercise. Common stock: No change. Stock options outstanding: No change. Retained earnings: Opening balance (33.10) plus Year 4 net income (13.31).					
Case B – Income Statement	Year 0	Year 1	Year 2	Year 3	Year 4
Pre-tax earnings on invested assets (15% return)		15	18	19.80	19.97
Savings on salary		15	-0-	-0-	-0-
Stock option expense		(15)	-0-	-0-	-0-
Pre-tax income		15	18	19.80	19.97
Income taxes (1/3)		(5)	(6)	(6.60)	(6.66)
Net income		10	12	13.20	13.31

Case C: Stock option expense and the estimated related tax effect is charged against income in year 1 based on the fair value of options granted, stock options outstanding are classified as equity an adjustment is made through income for changes in the fair value of stock option outstanding post net of related tax effect.

Case C – Balance Sheet	Year 0	Year 1	Year 2	Year 3	Year 4
Assets					
Productive Assets	100	120	132	133.10	146.41
Deferred Tax asset	-0-	5	5.50	-0-	-0-
<i>Total Assets</i>	100	125	137.50	133.10	146.41
Stockholders' Equity					
Common Stock and PIC	100	100	100	100	100
Stock Options	-0-	15	16.50	-0-	-0-
Retained Earnings	-0-	10	21	33.10	46.41
<i>Total stockholders' equity</i>	100	125	137.50	133.10	146.41
Notes: Year 0 – Productive assets: Initial investment (100). Common stock: 100 shares issued for \$1 each. Year 1 – Productive assets: Opening balance (100) plus 10% after-tax return (10) plus after-tax cash salary savings (10). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Stock options outstanding: ($15 = 78.57 \times 0.191$). Common stock: 100 shares issued for \$1 each. Retained earnings: Year 1 net income (10). Year 2 – Productive assets: Opening balance (120) plus 10% after-tax return (12). Deferred tax: Tax savings associated with stock option expense ($5.50 = 16.50 \times 1/3$) deferred until exercise date. Common stock: 100 shares issued for \$1 each. Stock options outstanding: ($15 = 78.57 \times 0.2101$). Retained earnings: Opening balance (10) plus Year 2 net income (11). Year 3 – Productive assets: Opening balance (132) plus 10% after-tax return (13.20) less sale of asset purchased with cash salary saving of \$10 in year 1 (12.10). Deferred tax: Tax savings realized on exercise. Common stock: Opening balance (100) less treasury stock repurchased at market value ($104.58 = 78.57 \times 1.331$) plus issue of stock to option holders ($86.43 = 78.57 \times 1.10$) plus balance in stock option account (18.15). Stock options outstanding: Balance eliminated when exercised. Retained earnings: Opening balance (21) plus Year 3 net income (12.10) less after-tax change in fair value of stock options charged directly to retained earnings. Year 4 – Productive assets: Opening balance (133.10) plus 10% after-tax return (13.31). Deferred tax: Tax savings realized on exercise. Common stock: No change. Stock options outstanding: No change. Retained earnings: Opening balance (33.10) plus Year 4 net income (13.31).					
Case C – Income Statement	Year 0	Year 1	Year 2	Year 3	Year 4
Pre-tax earnings on invested assets (15% return)		15	18	19.80	19.97
Savings on salary		15	-0-	-0-	-0-
Stock option expense		(15)	(1.50)	(1.65)	-0-
Pre-tax income		15	16.50	18.15	19.97
Income taxes (1/3)		(5)	(5.50)	(6.05)	(6.66)
Net income		10	11	12.10	13.31

Case D: Stock option expense and the related tax effect is charged against income in year 1 based on the fair value of options granted, stock options outstanding are classified as debt and changes in the fair value of stock options outstanding post grant along with related tax effect are recorded in net periodic net income.

Case D – Balance Sheet	Year 0	Year 1	Year 2	Year 3	Year 4
Assets					
Productive Assets	100	120	132	133.10	146.41
Deferred Tax asset	-0-	5	5.50	-0-	-0-
<i>Total Assets</i>	100	125	137.50	133.10	146.41
Liabilities					
Stock Options Outstanding	-0-	15	16.50	-0-	-0-
Stockholders' Equity					
Common Stock and PIC	100	100	100	100	100
Retained Earnings	-0-	10	21	33.10	46.41
<i>Total stockholders' equity</i>	100	110	121	133.10	146.41
<i>Total liabilities plus equity</i>	100	125	137.50	133.10	146.41
Notes:					
Year 0 – Productive assets: Initial investment (100). Common stock: 100 shares issued for \$1 each.					
Year 1 – Productive assets: Opening balance (100) plus 10% after-tax return (10) plus after-tax cash salary savings (10). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Stock options outstanding: ($15 = 78.57 \times 0.191$). Common stock: 100 shares issued for \$1 each. Retained earnings: Year 1 net income (10).					
Year 2 – Productive assets: Opening balance (120) plus 10% after-tax return (12). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Common stock: 100 shares issued for \$1 each. Stock options outstanding: ($15 = 78.57 \times 0.191$). Retained earnings: Opening balance (10) plus Year 2 net income (12).					
Year 3 – Productive assets: Opening balance (132) plus 10% after-tax return (13.20) less sale of asset purchased with cash salary saving of \$10 in year 1 (12.10). Deferred tax: Tax savings realized on exercise. Common stock: Opening balance (100) less treasury stock repurchased at market value ($104.58 = 78.57 \times 1.331$) plus issue of stock to option holders ($86.43 = 78.57 \times 1.10$) plus additional tax savings on option exercise ($((1.331 - 1.10) \times 78.57 \times 1/3) - 5$). Stock options outstanding: Balance eliminated when exercised. Retained earnings: Opening balance (22) plus Year 3 net income (13.20).					
Year 4 – Productive assets: Opening balance (133.10) plus 10% after-tax return (13.31). Deferred tax: Tax savings realized on exercise. Common stock: No change. Stock options outstanding: No change. Retained earnings: Opening balance (35.20) plus Year 4 net income (13.31).					
Case D – Income Statement	Year 0	Year 1	Year 2	Year 3	Year 4
Pre-tax earnings on invested assets (15% return)		15	18	19.80	19.97
Savings on salary		15	-0-	-0-	-0-
Stock option expense		(15)	(1.50)	(1.65)	-0-
Pre-tax income		15	16.50	18.15	19.97
Income taxes (1/3)		(5)	(5.50)	(6.05)	(6.66)
Net income		10	11	12.10	13.31

Case E: Stock option expense and the related tax effect is charged against income in year 1 based on the fair value of options granted, stock options outstanding are classified as debt and changes in the fair value of stock options outstanding post grant along with related tax effect are recorded in net periodic net income. At the end of year 2 the employee leaves the employ of the company and forfeits his/her options. The extinguishment of the stock option obligation with current market value of \$16.50 at that time gives rise to an after-tax gain on extinguishment of debt of \$11.

Case E – Balance Sheet	Year 0	Year 1	Year 2	Year 3	Year 4
Assets					
Productive Assets	100	120	132	145.20	159.72
Deferred Tax asset	-0-	5	-0-	-0-	-0-
<i>Total Assets</i>	100	125	132	145.20	159.72
Liabilities					
Stock Options Outstanding	-0-	15	-0-	-0-	-0-
Stockholders' Equity					
Common Stock and PIC	100	100	100	100	100
Retained Earnings	-0-	10	32	45.20	59.72
<i>Total stockholders' equity</i>	100	110	132	145.20	159.72
<i>Total liabilities plus equity</i>	100	125	132	145.20	159.72
Notes: Year 0 – Productive assets: Initial investment (100). Common stock: 100 shares issued for \$1 each. Year 1 – Productive assets: Opening balance (100) plus 10% after-tax return (10) plus after-tax cash salary savings (10). Deferred tax: Tax savings associated with stock option expense ($5 = 15 \times 1/3$) deferred until exercise date. Stock options outstanding: ($15 = 78.57 \times 0.191$). Common stock: 100 shares issued for \$1 each. Retained earnings: Year 1 net income (10). Year 2 – Productive assets: Opening balance (120) plus 10% after-tax return (12). Deferred tax: Tax savings associated with stock option expense eliminated upon forfeiture of option. Common stock: 100 shares issued for \$1 each. Stock options outstanding eliminated on forfeiture. Retained earnings: Opening balance (10) plus Year 2 net income 22. Year 2 includes both stock option expense for year 2 arising from the mark-to-market adjustment and the gain on extinguishment of the stock option obligation arising from the forfeiture of the stock options. Year 3 – Productive assets: Opening balance (132) plus 10% after-tax return (13.20). Deferred tax: No change. Common stock: No change. Stock options outstanding: No change. Retained earnings: Opening balance (32) plus Year 3 net income (13.20). Year 4 – Productive assets: Opening balance (145.20) plus 10% after-tax return (14.52). Deferred tax: No change. Common stock: No change. Stock options outstanding: No change. Retained earnings: Opening balance (45.20) plus Year 4 net income (14.52).					
Case E – Income Statement	Year 0	Year 1	Year 2	Year 3	Year 4
Pre-tax earnings on invested assets (15% return)		15	18	19.80	21.78
Savings on salary		15	-0-	-0-	-0-
Stock option expense		(15)	(1.50)	-0-	-0-
Gain on settlement of obligation		-0-	16.50	-0-	
Pre-tax income		15	33.00	19.80	21.78
Income taxes (1/3)		(5)	(11.00)	(6.60)	(7.26)
Net income		10	22.00	13.20	14.52

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