

# Discussion of “Which Approach to Accounting for Employee Stock Options Best Reflects Market Pricing?”

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**Abstract.** The objective of the Landsman, Peasnel, Pope and Yeah paper (in this issue) is to compare the value relevance of four methods of accounting for employee stock options (ESOs). My discussion provides a unifying framework for the theoretical analyses and the link between the theoretical analyses and the empirical investigation.

## 1. Theoretical analyses

The authors base their theoretical analyses on the residual income model:

$$MV_0 = BV_0 + \sum_{t=1}^{\infty} \frac{E_0[RI_t]}{(1+r)^t} \quad (1)$$

Where  $BV_0$  is the book value of equity at time 0 and  $RI_t$  is defined as  $NI_t - r * BV_{t-1}$  ( $NI$  is the net income and  $r$  is the discount rate).

The only assumption needed for RI to work as the present value of expected dividends is clean surplus. Assuming rationality, the RI model cannot be used to evaluate accounting policies. Feltham (1995) and Christensen and Feltham (2003) introduced the “super-clean surplus” concept. Specifically, if the accounting is “super-clean”, then the RI model characterizes the market value of the common shares currently outstanding (“pure” equity) at all dates. If on the other hand, we want to include in common equity the common shares currently outstanding and claims to common equity that might be exercised in the future (termed “mixed” equity), then the RI model will characterize the market value of the “mixed” equity.

To summarize the authors’ analytical analyses and to provide accounting intuition for the four proposed accounting methods, I will use the following simple numerical example: Assume an all equity firm that has at time 0 both assets and equity with a book

value and market value of \$100. Further assume that at time 0 the firm grants options valued at \$10 to its employees in return for future services with a present value of \$10. Hence, after the options grant the firm assets are \$110 and its equity has two components:  $V_e$ , the value of equity that belongs to the current shareholders (\$100) and  $V_{opt}$ , the value of equity that belongs to the future shareholders (\$10).

Under method 4 (termed the asset and liability method), an asset and a liability of \$10 are recorded at the grant date. In the future the asset is amortized and the liability is adjusted to reflect the market value. This method satisfies the “super-clean” accounting definition developed by Feltham (1995) and Christensen and Feltham (2003), as the future amortization of the asset must equal in expectation to the mark-to-market gains and losses of the liability. Furthermore, this method yields the correct accounting representation of equity value for current shareholders (e.g.,  $V_e = \$100$ ).

Under method 3 (termed 1993 FASB exposure draft), an asset and other equity of \$10 are recorded at the grant date, and in the future, the asset is amortized. In this case  $BV_0$  increases to \$110 and the future residual income stream reflects both the amortization of the asset and the future benefits from employee services, yielding an accounting representation of the combined equity of current and future shareholders of \$110. This corresponds to the “mixed” equity accounting developed by Feltham (1995) and Christensen and Feltham (2003). Notice however that this is just a labeling exercise as long as the FASB separates the book value into its two components of  $V_e = \$100$  and  $V_{opt} = \$10$ . Although method 4 is “superior” in the sense that the balance sheet value of shareholders’ equity at all future dates corresponds to market value, this distinction is

irrelevant for the RI model, which captures the same value in the form of initial book value plus the present value of future abnormal earnings.

Under method 2 (SFAS 123) there is no entry at the grant date and the option's value is amortized over the next  $T$  periods. In this case, the accounting violates clean surplus. This is because the equity distribution is not measured consistently with the requirements of the RI model, which requires market value measurement of the equity distribution at the time it occurs, not in future periods. This corresponds to the "dirty" surplus accounting developed by Feltham (1995) and states as follow in Christensen and Feltham (2003): "dirty surplus accounting can take many forms. One common form is to only record an equity transaction at the exercise date, but at an amount not equaled to the market value of the equity issued." To recover  $V_e = \$100$ , we should take into account the time value of money and adjust for the understatement by increasing the numerator (the amortization expense) or decreasing the denominator (the discount rate  $r$ ).

Under method 1 (APB 25), we record nothing ("dirty" surplus accounting). This is just a special case of method 2 with  $T = \infty$  and therefore  $V_e = \$110$ .

Summarizing, if the RI model is applied correctly, one should always be able to recover the value of equity to the current shareholders. Naturally, valuation errors will occur if appropriate adjustments are not made, and each of the four methods requires different adjustments. However, the authors' analytical analyses do not allow for such valuation errors, as they apply the RI model assuming no arbitrage (e.g., in their analyses  $t$  goes to infinity). In essence, if the authors want to rely on their analytical analyses to form predictable empirical predictions for the value-relevance of the four accounting methods, then the appropriate empirical tests should test for market inefficiency. Hence,

assuming bounded rationality (e.g., replicating the analytical analyses with a finite period), the authors can rank the four methods by the magnitude of the predictable mispricing.

## **2. Empirical analyses**

The authors link the analytical analyses with the empirical design by basing the empirical analyses on current equity book value and current residual income. However, these empirical proxies are disjoined from the theoretical analyses developed in the first half of the paper and cannot yield any analytical predictions for a ranking of the four accounting methods. Specifically, equation (1) includes the current book value and the infinite future stream of expected abnormal earnings. If the authors wish to retain the ranking of the RI model with regards to estimates of current shareholders' wealth in their empirical analyses, they should replicate the analytical analyses by developing a valuation model that includes only current book value and current residual income.

Alternatively, since the authors' empirical objective is to provide insight into whether single-period parsimonious representations are correlated with the information investors actually use, why not form conjectures about the value-relevance of each accounting method based on prior research and the noisiness of each measure?

Specifically, Aboody (1996), using a time period prior to SFAS 123 (1980-1990), contrasts methods one, two and four. He documents that investors incorporate the value of outstanding options into firms' market price. In addition, the FASB's method for calculating compensation expense has no explanatory power in the presence of the value of outstanding options. Hence, Aboody (1996) documents that method 4 dominates both

methods one and two. More recently, Li (2003), using a modified residual income model, documents that the firm's share price is negatively affected by both the value of outstanding options and option expense (methods 2 and 4). Finally, Bell, Landsman, Miller and Yeh (2002), using the exact same research design for their empirical tests, checks methods 1, 2 and 3 for the computer software industry and documents that method 3 dominates method 2 and both methods 2 and 3 dominate method 1.

Taken together, assuming no noise in constructing the accounting methods, we can conjecture that methods 3 and 4 are better than accounting method 2 and that all accounting methods should dominate method 1. The authors' results are generally consistent with conjectures based on findings of the above prior research. The paper's contribution is to document in a conclusive and comprehensive way that the FASB should consider marking to market the ESO value at the end of each reporting period.

However, I believe the authors' term of method 4, "Asset and Liability Method", obfuscates the issue. In my opinion there are two independent questions relating to the debate on stock options. One is whether the options should be classified as a liability or as equity. The second is how firms should record the options' compensation expense. The FASB's coupling of the two issues as one causes, in my opinion, a confusion regarding the accounting treatment.

Regarding the first question, I believe stock options should not be considered as debt. Stock options pose no credit risk to the current shareholders and hence it is inappropriate to classify them as debt for calculating default risk. Moreover, stock options are not mandatorily redeemable on a fixed or determinable date for cash; on the contrary, the options will provide external financing in the form of cash when exercised.

We can now turn our attention to the second question: How to account for this compensation expense. Since the FASB writes accounting standards that are intended to inform the current (rather than future) shareholders, clearly the current shareholders will have to pay off this contingent claim. I think that the appropriate classification is to have two equity components:  $V_e$  the value of equity that belongs to existing shareholders, and  $V_{\text{other}}$  the value of equity that belongs to future shareholders. Clearly, if the FASB is serving the current shareholders, there should be no impediment to marking to market  $V_{\text{other}}$ . There is no reason to use historical cost accounting that is applicable to  $V_e$  since  $V_{\text{other}}$  belongs to future shareholders and current shareholders would like to assess at the end of each reporting period the portion of the firm future shareholders own.

In summary, I believe that this paper supports the above accounting treatment (the creation of  $V_{\text{other}}$ ), as it documents that investors mark-to-market the options held by employees.

## References

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