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A Proposal for Expensing Employee Compensatory Stock Options for Financial Reporting Purposes

by Peter Hancock, Roberto G. Mendoza, and Robert C. Merton, Integrated Finance, Ltd.

Accounting Principles Board (APB) Opinion #25, issued in 1973, required firms that granted stock options to expense those options over the vesting period at their intrinsic value on the grant date. However, at-the-money options were considered to have no intrinsic value—regardless of maturity—if the exercise price equaled the current stock price at grant. As a result, virtually all option grants were at-the-money grants, which eliminated the need to record any related expense. In 1995, Financial Accounting Standards Board (FASB) Statement #123 required fair valuation of options at the grant date (using Black-Scholes or similar methods to determine fair valuation) but permitted the continued use of intrinsic value for income statement purposes, with footnote disclosure of fair value. A handful of companies began expensing their option grants, but most provided footnote disclosure only.

Amid considerable controversy, the FASB has proposed new rules that require fair valuation of option grants at the grant date (again, using Black-Scholes or “lattice” methods) and amortization of that value over the vesting period. After the vesting period, there is no additional recorded expense. While nearly everyone agrees in principle that options should be expensed, there is considerable disagreement as to method—and companies have voiced legitimate complaints about the new FASB rules, which require estimates of the number of options that will actually vest, when those options will be exercised, the company’s future dividend policy, and so on.

Integrated Finance Limited (“IFL”) has developed an accounting approach for employee stock options that matches option-based compensation expense with the timing and magnitude of the related *economic* expense. Paying employees with options has the same economic impact on the firm as paying the employees with cash and then selling options to those employees; the subsequent exercise or sale of the options is not an income statement item but a capital account transaction.¹ From this comparable-expense case, it

is correct reporting to both expense the value of the options and subsequently record dilution from the options in the capital account. Doing both is not “double expensing” of labor costs, as some have claimed. Our approach, which can be used with either closed-form or binomial valuation models, complements the FASB draft proposal by providing a realistic and manageable framework in which to apply the FASB recommendations. The IFL method is driven by the key insight that current-period compensation expense should reflect only that part of the option value that is earned independently of the obligation of continued employment.² Most stock option plans stipulate that if the employee resigns or is terminated, the maturity for *vested* options is truncated to 90 days. Hence, at any given point in time, an employee in fact owns (free and clear of any future commitment to work for the company) a 90-day option, even if the stated maturity of the option is ten years.³ The appropriate compensation expense in each accounting period is thus the value of the “extension” of the option’s maturity resulting from the employee’s continued employment.

For plans that have a vesting period, IFL proposes that the option value conferred at vesting be estimated quarterly beginning at the time of grant and that the corresponding estimated expense be revised and allocated as a pro rata accrual each quarter over the vesting period to reflect the then-current value of the option. The cumulative expense over the entire vesting period will equal the fair market value of the option at its vesting date. In the period after the option vests (“the vested period”), outstanding employee stock options should be expensed at the end of each quarter based on the incremental value of extending the option for an additional quarter, as described above. There is no option expense in the quarter when the option is either exercised or expires.

What are the benefits of the IFL approach? First of all, the amount and timing of the expense reflect the economics of the exchange of labor for valuable consideration—and the fair market value of that consideration is expensed to

1. For a more comprehensive discussion, see Zvi Bodie, Robert Kaplan, and Robert Merton, “For the Last Time: Stock Options Are an Expense,” *Harvard Business Review* (March 2003), pp. 63-71.

2. The idea that the expense should be only the value of that part of the option which is owned without requiring continued employment in the future was first presented by Jeremy Bulow and John Shoven in “Accounting for Stock Options,” Stanford University,

unpublished manuscript, January 15, 2004.

3. For some companies, the maturity because of termination may differ from 90 days. For a company with an N-day maturity provision, the underlying logic for quarterly accounting periods would still apply, and the expense each quarter would equal a 90-day extension of an N-day option. If the termination window is in fact 90 days, the extension and maturity conveniently match up, simplifying the valuation process.

the accounting period in which the employee earned it. Moreover, since valuations in the case of vested options will be based on maturities of no more than 90 days, one can use publicly traded options to determine the fair market value. Even for companies without traded options, Black-Scholes and other (lattice) models of option pricing provide reliable values for short-lived options. And by shortening the maturity to a maximum of 90 days, the IFL approach eliminates the need for difficult adjustments for early exercise or employee attrition (or changes in dividend policy) that complicate the pricing of longer options.

The advantage of greater reliance on established pricing models also extends to the case of unvested options. At grant, the time horizon for valuation is the vesting period plus 90 days (typically 1.25-3.25 years), which is within a maturity range for reasonably effective model pricing and allows benchmark pricing to publicly traded LEAPs (Long-Term Equity Anticipation Securities). In both the vesting and vested periods, therefore, the IFL approach should lead to a greater degree of comparability in option valuation and expense allocation among companies. It is also consistent with the expensing of restricted stock.

In the remainder of the article, we will use examples to demonstrate the application of the IFL approach to both vested and unvested options.

Expensing of Vested Options

Consider three employees of XYZ Corporation, A, B, and C, each of whom has identical total compensation histories at XYZ and each of whom worked at XYZ for at least the entire year 2003. XYZ has an employee stock option plan that grants ten-year at-the-money options that vest immediately upon grant. If the employee leaves the firm, whether voluntarily or as a result of termination not for cause, the vested options must be exercised within 90 days. Thus, when the employee leaves the firm, the effective maturity of the vested options becomes 90 days.

Suppose that the price of XYZ shares is \$100 at the close of trading on December 31, 2003, and that each of the employees is granted a ten-year option with an exercise price of \$100 that vests immediately. To determine the valuation and allocation of the option expenses, consider what happens if employee A resigns from the firm the next day, January 1, 2004. The expiration date of A's option immediately becomes March 31, 2004. As is common for many listed companies, 90-day options on XYZ with the same \$100 exercise price as the granted options are trading in the

public market—and let's assume they have a value of \$8.20 per option on December 31, 2003.

Since employee A owns the option but will not perform any further work for the firm in the future, the fair market value of that option, \$8.20, must be a compensation expense for past effort. The option was granted and vested in the fourth quarter of 2003 and thus we would allocate the entire \$8.20 expense to that quarter.⁴ Since employees B and C had the same rights as employee A to leave the firm and retain the truncated option, we charge the same amount, \$8.20, as a fourth quarter compensation expense for each of them.⁵

Now let's consider what happens if on March 31, 2004, employees B and C are still at the firm and then, on April 1, 2004, employee B is terminated not for cause. The expiration date of B's option immediately becomes June 30, 2004. Suppose the March 31, 2004 closing price of XYZ is \$120 and the market value of a 90-day option with an exercise price of \$100 is \$22.54. How much of that option value did B earn as a consequence of having been employed by XYZ during the first quarter of 2004? On December 31, 2003, employees A and B were in identical economic situations with respect to XYZ. After that date, employee A no longer worked at the firm and employee B did. As of March 31, 2004, employee B will not perform any further work for XYZ—so the difference on March 31, 2004 between the value of the option owned by employee B and the value of the option owned by employee A must be the option-related compensation received by employee B for working in the first quarter of 2004. March 31, 2004 is the expiration date of employee A's option and so its value is then equal to its intrinsic value of \$20 (\$120 – \$100). Thus, the difference between the fair market value of employee B's option and the value of employee A's option is $\$22.54 - \$20.00 = \$2.54$, which is the compensation expense for B's option in the first quarter of 2004.

By working another quarter beyond A, employee B earns in effect a 90-day extension on the maturity of his option relative to A's option. The value of that extension in this case is exactly the *time value of a 90-day option*—the difference between the fair market value of a 90-day option and its intrinsic value. And since employees B and C were in identical positions on March 31, 2004 in terms of their relationship to XYZ, the compensation expense charged for C's option in the first quarter of 2004 should be the same as for B's, or \$2.54. Note that there is no compensation expense charged for A's option because A did not work at XYZ in the first quarter of 2004.

4. If the grant is considered compensation for work done throughout the entire previous year, then strict accounting principles would call for an allocation of the total award among each of the preceding quarters; this could be done by quarterly accruals, with the difference between the accrued and actual amounts "trued up" at the time of grant (when the value of the award is determined).

5. The strictly correct way to do the accrual is that for each day the employee works, the option's life is extended by one day (to be a "renewed" 90-day option from an 89-day

option). Because a quarter is roughly 90 days, we simplify by approximating that if the employee is still working at the beginning of the quarter, then he or she has earned an option that expires at the end of that quarter, even if the employee leaves immediately (in effect, we assume that employees only leave or are fired on the first day of the quarter). If the truncation period is materially shorter than the accounting reporting interval, then we should do some intra-period accruals.

Table 1 **Example: Stock Expense During Vested Period**

Option Description: 10-year maturity, \$100 strike price, vests immediately, maturity truncated to 90 days if terminated, initial stock price \$100

	Employee A	Employee B	Employee C	Company
Timeline				
December 31, 2003	Granted option	Granted option	Granted option	Expenses three 90-day options Stock price \$100 90-day option value = \$8.20 Expense = \$8.20 x 3 options = \$24.60
January 1, 2004	Resigns Now owns an option expiring March 31, 2004			
March 31, 2004	Option expiring Option value \$20	Employed	Employed	Expenses the extension of two options for 90 days Stock price \$120 90-day option value = \$22.54 Time value of 90-day option = \$2.54 Expense = \$2.54 x 2 options = \$5.08
April 1, 2004		Terminated without cause Now owns an option expiring June 30, 2004		
June 30, 2004		Option expiring Option value \$0	Employed	Expenses the extension of one option for 90 days Stock price \$90 90-day option value = \$3.72 Time value of 90-day option = \$3.72 Expense = \$3.72 x 1 option = \$3.72
September 30, 2004			Employed	Expenses the extension of one option for 90 days Stock price \$140 Option value = \$40.92 Time value of 90-day option = \$0.92 Expense = \$0.92 x 1 option = \$0.92
December 31, 2004			Employed	Expenses the extension of one option for 90 days Stock price \$160 Option value = \$60.57 Time value of 90-day option = \$0.57 Expense = \$0.57 x 1 option = \$0.57
First Quarter 2005				Option exercised
March 31, 2005				No expense Total expense = \$34.89

We now derive the quarterly expenses for employee C if he continues to work for XYZ for another year. Suppose that on June 30, 2004, the stock price is \$90 and the fair market value of a 90-day option on XYZ with a \$100 exercise price is \$3.72. Since B's option expires on June 30, its fair market value is its intrinsic value, which is zero. Since the only difference between B and C is that C worked the second quarter of 2004 and B didn't, the option-based compensation charge for C for that quarter

is the \$3.72 difference between the value of his option and B's worthless option.

Suppose that on September 30, 2004, the price of XYZ stock is \$140, and the fair market value of a 90-day option with an exercise price of \$100 is \$40.92. The option-related compensation charge for C for the third quarter is the value of an extension of his option maturity date for another 90 days, or \$0.92 (\$40.92 less the \$40.00 intrinsic value). Finally, suppose that the stock price on December 31, 2004

is \$160 and the fair market value of a 90-day option with an exercise price of \$100 is \$60.57. In that case, C's option-based compensation charge for working the fourth quarter of 2004 would be $\$60.57 - \$60.00 = \$0.57$.

Now suppose that the stock price of XYZ on March 31, 2005 is \$175, but that C exercises his option some time on or before March 31. An employee with the same option as C on December 31, 2004 but who left the firm on January 1, 2004 could have exercised at exactly the same time that C did during the first quarter of 2005 and would have received the identical payout. In this sense, C can be viewed as having earned no option-based compensation *as a consequence of his working for XYZ in the first quarter of 2005* and, hence, there is no expense. And since his option no longer exists, there will be no expense for it in any later quarter. The entire series of expenses is summarized in Table 1.

Observations on the Effect of Maturity Truncation

The provision in standard option plans that truncates the maturity of a vested option to 90 days upon the employee's leaving the firm has a substantial effect on the magnitude of option expenses and on the allocation of those expenses to various accounting periods. To demonstrate how substantial this effect can be, consider what would occur if the plan in our hypothetical situation were changed so that vested options retained their full stated maturity (in this case, ten years from time of grant) upon termination of employment.⁶ In this case, the options held by employees A, B, and C would have had the identical value at all points in time, regardless of whether they continued to be employed by the firm beyond the vesting date.

Using the same logic that leads to a charge of the value of the 90-day option on December 31, 2003 as an expense to the fourth quarter of 2003, we would instead charge to that quarter the year-end value of a *ten-year* at-the-money option. The fair market value of such an option with the stock price at \$100 might be around \$50. So with no maturity truncation, there would have been a \$150 total charge to earnings in the fourth quarter of 2003 for the three employees' options and no further expense after that, regardless of whether the employees left XYZ.⁷ By contrast, the total expense charged for these options with the truncation provision was \$34.89, with allocations of \$24.60 for the fourth quarter of 2003, \$5.08 for the first quarter of 2004, \$3.72 for the second quarter of 2004, \$0.92 for the third quarter of 2004, \$0.57 for the fourth quarter of 2004, and no further expenses thereafter.

The large difference (\$150 versus \$35) in the cumulative expense and its distribution across accounting periods caused by the maturity truncation provision is not simply a result of employees with vested options leaving the firm. If all three employees had instead remained at the firm and then exercised in March 2005, the cumulative expenses would still have been only \$47.85. Furthermore, even if the stock remained deep in the money at each quarter's end from March 2005 to December 2013 and all three employees stayed at the firm and did not exercise before the expiration date, the total expenses charged on the options, \$65.35, would still be considerably less than \$150. And that smaller total expense would be distributed over 40 quarters from the fourth quarter of 2003 through the third quarter of 2013 instead of concentrated in the quarter when granted.⁸

As discussed in the circulated FASB Draft Proposal, the prospect of early exercise of a long-dated option can have a significant effect on its valuation and should be taken into account. However, as we see here for plans with a maturity truncation to 90 days upon leaving the firm, no vested option expense valuation involves a maturity of greater than 90 days. Therefore, our proposal's failure to take account of early exercise possibilities will have at most a relatively small effect on such valuations.

Expensing of Unvested Options

Consider the same circumstances described in the preceding example except that XYZ's option plan now has a one-year (four-quarter) vesting period from time of grant. Thus, the at-the-money ten-year options granted to employees A, B, and C on December 31, 2003 will vest on December 31, 2004, provided that the employee has not left the firm as of that date. If the employee leaves the firm for any reason prior to that date, the options are forfeited and the employee receives nothing. Because continued future employment during the vesting period (one year from grant in this example) is a condition for the employees to receive the options, it could be argued that no expense is incurred until the options vest. In that case, there would be no expense until the option date and then, as described in the preceding example, the value on the vesting date of a 90-day option with a \$100 exercise price would be charged as an expense to the fourth quarter of 2004.

We would argue, however, that some of the employees' effort to remain at XYZ during the vesting period is attributable to the grant of the options. If so, there should be an

6. Even plans with maturity truncation for termination often contain an exception if termination is a consequence of retirement on or after a specified retirement age. In that case, the retiring employee's vested option retains its entire stated maturity. In the quarter when an employee qualifies for that exception, the expense for maturity extension should be the time value of an option with the remaining stated maturity, not 90 days.

7. There is no further expense because the options held by the employees contain no greater obligations than if options were issued by the company to non-employee investors for capital infusion. Hence, for financial reporting, the subsequent value of the

option including its intrinsic value at time of exercise or expiration is not a compensation expense in return for services to the firm but a capital account matter. It is for that same reason that we expense the intrinsic value, if any, only at the time of vesting and subsequently expense only the time value of the 90-day maturity extensions.

8. Along the lines in the preceding footnote, there is no option expense for the quarter in which the option expires since the employee does not need to work that quarter to receive the full stated maturity remaining in the option.

Table 2 **Example: Stock Expense During Vesting Period**

Option Description: 10-year maturity, \$100 strike price, 1-year vesting period, option surrendered if terminated prior to vesting, initial stock price \$100

	Employee A	Employee B	Employee C	Company
Timeline				
December 31, 2003	Granted option	Granted option	Granted option	Expenses the accrued value of three options, maturing on March 31, 2005, spread over 5 quarters Stock price \$100 Option value (maturity of March 31, 2005) = \$18.75 Expense = \$18.75 / 5 x 3 options = \$11.25
First Quarter 2004 March 31, 2004	Resigns	Employed	Employed	Expenses the accrued value of two options maturing on March 31, 2005 Stock price \$120 Option value (maturity of March 31, 2005) = \$30.40 Expense = \$30.40 / 5 x 2 quarters x 2 options = \$24.32, less \$11.25 previously expensed = \$13.07
Second Quarter 2004 June 30, 2004		Terminated without cause	Employed	Expenses the accrued value of one option maturing on March 31, 2005 Stock price \$90 Option value (maturity of March 31, 2005) = \$9.14 Expense = \$9.14 / 5 x 3 quarters = \$5.48, less \$24.32 previously expensed = -\$18.84 (credit)
September 30, 2004			Employed	Expenses the accrued value of one option maturing on March 31, 2005 Stock price \$140 Option value (maturity of March 31, 2005) = \$42.75 Expense = \$42.75 / 5 x 4 quarters = \$34.20, less \$5.48 previously expensed = \$28.72
December 31, 2004			Employed	Expenses the accrued value of one option maturing on March 31, 2005 Stock price \$160 Option value (maturity of March 31, 2005) = \$60.57 Expense = \$60.57 / 5 x 5 quarters = \$60.57, less \$34.20 previously expensed = \$26.37 Total expense = \$60.57

accrual of some of the option expense to the fourth quarter of 2003 as well as to each quarter in 2004, including the fourth quarter when the option actually vests. The IFL-recommended accrual method is to take at the end of each quarter the fair market value of an option that expires 90 days after the option vests (or March 31, 2005 in our example) and charge that amount on a pro rata basis, less the cumulative amount of the option value already expensed in the preceding quarters.

Suppose that on December 31, 2003, the fair market value of a one-year-and-90-day option on XYZ (that is, an

option that expires on March 31, 2005, or 90 days after the vesting period) with an exercise price of \$100 is \$18.75. The value of the three options granted to employees A, B, and C is \$56.25. Since there are five quarters to which the option expense is to be allocated in the vesting period, the total expense in the fourth quarter of 2003 is \$11.25 (= \$56.25/5).

On March 31, 2004, the stock price is \$120 and the fair market value of a one-year option (again, expiring on March 31, 2005) on XYZ with an exercise price of \$100 is

\$30.40. Because employee A left the company during the quarter, A's option was forfeited, its value is now zero, and the combined value of the two options granted to employees B and C is \$60.80. Since this is the second of five quarters for expense allocation, the charge for the first quarter of 2004 is \$24.32 (= \$60.80 x 2/5) less the previous cumulative expense of \$11.25, or \$13.07. On June 30, 2004, the stock price is \$90 and the fair market value of a nine-month option on XYZ with an exercise price of \$100 is \$9.14. Because employee B was terminated during the quarter, B's option was forfeited, its value is now zero, and there is only employee C's option remaining. Since this is the third of five quarters for expense allocation, the charge for the second quarter of 2004 is \$5.48 (= \$9.14 x 3/5) less the previous cumulative expense of \$24.32 (= \$11.25 + \$13.07), or -\$18.84, which is a *credit* to earnings of \$18.84.

On September 30, 2004, suppose that the stock price is \$140 and the fair market value of a six-month option on XYZ with an exercise price of \$100 is \$42.75. Since this is the fourth of five quarters for expense allocation, the charge for the third quarter of 2004 is \$34.20 (= \$42.75 x 4/5) less the previous cumulative expense of \$5.48, or \$28.72. On December 31, 2004, Employee C's option becomes vested. The stock price is \$160 and the fair market value of a 90-day option on XYZ with an exercise price of \$100 is \$60.57. Since this is the last of five quarters for expense allocation, the charge for the fourth quarter of 2004 is \$60.57 less the previous cumulative expenses of \$34.20, or \$26.37.

Note that as a design feature of the IFL approach, the total cumulative option expense during the vesting period is equal to the fair market value of the vested options at the end of the quarter in which they vested, or \$60.57. Thus, the cumulative expense as of the time of vesting is the same as it would have been had there been no expensing of the options until they vest. However, the recommended accrual method of expenses permits an allocation of the expenses to the quarters in which some of the option-based compensation expense actually occurred, using the best available estimates of fair market value at the time of each accrual. It also ensures that the cumulative expenses are the actual expenses incurred as of the vesting date without a need to restate earlier periods' earnings or expenses.⁹ The entire series of expenses in the vesting period is summarized in Table 2.

Observations on the Effect of a Vesting Period

At any given point in time, the value of a vested option is greater than the value of an otherwise identical but unvested option. Thus, it may seem inconsistent that the cumulative

expense of \$60.57 for the unvested options in the second example exceeds the cumulative expense of \$34.89 for the vested options in the first example. However, this outcome is primarily the result of the particular price path followed by the stock during the vesting period, which ends up deeply in the money on the vesting date. With the same employee termination pattern, and had the stock of XYZ instead remained unchanged at \$100 throughout the year from December 31, 2003 until December 31, 2004, the cumulative expense of the granted options for the immediate vesting case would have been \$65.60 and the cumulative expense of the granted options for the unvested case would have been only \$8.20.¹⁰ In either case, the IFL method provides a consistent and economically defensible method of expensing stock options.

Summary

In the case of vested employee stock options that expire 90 days after employee termination, IFL proposes the following:

1. In the period after the option becomes vested ("the vested period"), outstanding employee stock options should be expensed at the end of each quarter for the incremental value of extending the option for an additional quarter. There is no option expense in the quarter when the option either expires or is exercised.

2. In the pre-vested period ("the vesting period"), employee stock options should be expensed based on an option maturity of the quarter-end date when the option vests plus the termination-linked time frame dictated by the company option plan—typically, the quarter-end date when the option vests plus 90 days.

3. The expense of an unvested employee stock option should be spread over the vesting period on a pro rata basis and recalculated each accounting period during vesting to reflect the then-current value of the option; the cumulative expense charge over the entire vesting period will equal the fair market value of the option at its vesting date.

The benefits of the IFL process for expensing employee stock options are as follows:

1. It reflects the actual economics of the exchange of labor for valuable consideration by charging the fair market value of the consideration provided to the employee and by allocating that expense to the accounting period in which the employee worked to receive the consideration.

2. In the vested period, valuation typically will not be based on maturities greater than 90 days, for which there are traded options available for pricing purposes; and even

9. Robert Kaplan and Krishna Palepu present an accrual method for expensing options during the vesting period in "Expensing Stock Options: A Fair-Value Approach," *Harvard Business Review* (December 2003). While their method and the one presented here are different, they share a similar accounting philosophy. The IFL approach will typically produce a "smoother" time path of expenses than the Kaplan-Palepu procedure, although we

do not propose it for that reason.

10. This specific time pattern of stock price remaining at the money at the end of each expense period maximizes the expenses of the vested options because it maximizes the time value of the options at each expense date.

when traded prices are not available, most agree that the Black-Scholes and other (lattice) models of option pricing are more accurate for shorter-maturity options.

3. Because termination-linked option maturities generally are 90 days, adjustments in valuation for early exercise before expiration are not likely to be needed or material in the vested period.

4. At grant, the time horizon for valuation is the vesting period plus 90 days, typically 1.25-3.25 years, which is within a maturity range for reasonably effective model pricing and also allows benchmark pricing to publicly traded LEAPs (Long-Term Equity Anticipation Securities). Furthermore, because options cannot be exercised prior to vesting, any need to estimate early exercise dates is eliminated.

5. In both the vesting and vested periods, the IFL approach should lead to a greater degree of comparability in

option valuation and expense allocation among companies.

6. The approach is consistent with the expensing of restricted stock.

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