

Summary of the Testimony of Robert C. Merton  
H.R. 3574: Stock Option Accounting Reform Act  
March 3, 2004

This testimony takes issue with a number of the central propositions of the proposed Stock Option Accounting Reform Act:

I. Compensatory Stock Options are a real cost to the company and should be an expense

It is a basic principle of accounting that financial statements should record economically significant transactions. Issuing stock options is just such a significant transaction and footnote reporting is not a substitute for recognition on the income statement. Even if no cash changes hands, issuing stock options to employees incurs a sacrifice of cash, an opportunity cost that needs to be accounted for. Both accounting earnings and labor expenses relative to operating revenues are used by analysts to estimate performance of the firm and to compare efficiency and profit margins among firms. The form in which such compensation is paid by the firm should not determine whether it is expensed or not. H.R. 3574 holds that only options granted to the CEO and the top four most highly compensated executive officers of the firm should be expensed. That is not consistent with reflecting the entire economic cost of using options for paying for labor services to the firm. Other forms of compensation including salary, cash bonus and benefits are expensed for *all* employees and not just the top five officers of the firm.

II. The Cost to the Firm of Compensatory Options can be estimated

The value of compensatory options should be the economic cost to the firm of granting those options and *not* the value placed on these options by the employees who receive them. The value of those options can be estimated, using market prices or pricing models.

Financial institutions value and execute transactions involving all kinds of options and other derivative securities in large volume every day all around the world. There are many listed options traded on exchanges. There are convertible bonds and warrants underwritten and traded with long maturities (e.g. 25 years). Institutions offer in the over-the-counter (OTC) market customized and “exotic” options in which the latter contain complex terms. Over the past 30 years, these institutions have developed sophisticated pricing models that they use both to price and to manage the risk of options and other derivative securities.

A recommendation submitted to FASB for expensing compensatory stock options that I co-authored requires only the estimation of 90-day options values for vested options in standard type option plans. 90-day options are traded in the market for many publicly traded companies. Furthermore, many of the special terms in compensatory options that are believed to make their valuation difficult have little effect on the value of a 90-day option.

Estimates from option pricing models often differ from market prices, sometimes significantly. That fact does not imply that it is not possible to value an option with terms that are not precisely traded in the market. Financial statements should strive to be approximately right in reflecting economic reality rather than precisely wrong. H.R. 3574 holds that if a pricing model is used to determine the fair value of an option, the assumed volatility of the underlying stock shall be zero. It is the case that under the assumption of zero volatility, any pricing model used will give about the same estimate of value. Thus,

in effect, H.R. 3574 specifies the option-pricing model to use for expensing. This option valuation model is seriously flawed as an estimator of fair value. It is universally accepted that a large part of an option's value is the result of the volatility of the underlying stock price. But there are no real-world traded stocks whose volatility is zero and furthermore, technology firms which issue large amounts of options tend to have above-average levels of volatility. Thus the *mandated* approach of H.R. 3574 will uniformly undervalue all options and for at-the-money options it will uniformly undervalue the options by a large amount. This one provision will *de facto* preserve the current and past practice of not expensing options issued at or out of the money.

Current accounting standards require the estimation of useful economic life for depreciating plant and equipment; the costs of employee pension and other retirement benefits; and even contingent liabilities such as environmental cleanups. These estimates are surely made with error and none of these is traded precisely in the markets. And these estimates can significantly impact reported earnings. FASB sets standards for making these estimates and changes take place as new techniques evolve. Why should the case of setting standards for estimating stock option expense be singularly different?

### III. Will Expensing stock options hurt young businesses?

Many critics of expensing argue it will make life more difficult for the businesses that rely heavily on options to reward their entrepreneurial talent. We all recognize the vitality and wealth that entrepreneurial ventures, particularly those in the high-tech sector, bring to the U.S. economy, and I for one have no objection to policy measures that encourage and assist new ventures.

But I do question the policy effectiveness of doing so by essentially creating the benefits from a deliberate accounting distortion proportional to companies' use of one particular form of employee compensation. Indeed, some forms of incentive compensation, such as restricted stock, performance cash awards, and indexed or performance options, arguably do a better job of aligning executive and shareholder interests than conventional stock options do. Yet current accounting standards require that these, and virtually all other compensation alternatives, be expensed. The provisions of H.R. 3574 would in effect exempt only at-the-money stock options from expensing.

I find it rather difficult to accept the prospect that the financial accounting treatment of expensing options will have a profound effect on this Nation's economic prosperity. However, if such were the case, one less distorting approach than the valuation proposal in H.R. 3574 for delivering an accounting subsidy to entrepreneurial ventures would simply be to allow them to defer a percentage of their total employee compensation for some number of years. That way, companies could get the supposed accounting benefits from not having to report a portion of their compensation costs no matter what form that compensation might take.

Options can be a powerful incentive tool. But failing to record a transaction that creates such dramatic effects is economically indefensible and encourages companies to favor options over alternative compensation methods. It is not the proper role of accounting standards to distort compensation by subsidizing one form of incentive compensation relative to all others.

Stock options are not recorded as an expense on companies' books. But the arguments for this special treatment don't stand up. Let's end the charade.

# For the Last Time: Stock Options Are an Expense

by Zvi Bodie, Robert S. Kaplan, and Robert C. Merton



**T**HE TIME HAS COME to end the debate on accounting for stock options; the controversy has been going on far too long. In fact, the rule governing the reporting of executive stock options dates back to 1972, when the Accounting Principles Board, the predecessor to the Financial Accounting Standards Board (FASB), issued APB 25. The rule specified that the cost of options at the grant date should be measured by their intrinsic value – the difference between the current fair market value of the stock and the exercise price of the option. Under this method, no cost was assigned to options when their exercise price was set at the current market price.

The rationale for the rule was fairly simple: Because no cash changes hands when the grant is made, issuing a stock option is not an economically significant transaction. That's what many thought at the time. What's more, little theory or practice was available in 1972 to guide companies in determining the value of such untraded financial instruments.

APB 25 was obsolete within a year. The publication in 1973 of the Black-Scholes formula triggered a huge boom in markets for publicly traded options, a movement rein-

forced by the opening, also in 1973, of the Chicago Board Options Exchange. It was surely no coincidence that the growth of the traded options markets was mirrored by an increasing use of share option grants in executive and employee compensation. The National Center for Employee Ownership estimates that nearly 10 million employees received stock options in 2000; fewer than 1 million did in 1990. It soon became clear in both theory and practice that options of any kind were worth far more than the intrinsic value defined by APB 25.

FASB initiated a review of stock option accounting in 1984 and, after more than a decade of heated controversy, finally issued SFAS 123 in October 1995. It recommended – but did not require – companies to report the cost of options granted and to determine their fair market value using option-pricing models. The new standard was a compromise, reflecting intense lobbying by businesspeople and politicians against mandatory reporting. They argued that executive stock options were one of the defining components in America's extraordinary economic renaissance, so any attempt to change the accounting rules for them was an attack on America's hugely successful

model for creating new businesses. Inevitably, most companies chose to ignore the recommendation that they opposed so vehemently and continued to record only the intrinsic value at grant date, typically zero, of their stock option grants.

Subsequently, the extraordinary boom in share prices made critics of option expensing look like spoilsports. But since the crash, the debate has returned with a vengeance. The spate of corporate accounting scandals in particular has revealed just how unreal a picture of their economic performance many companies have been painting in their financial statements. Increasingly, investors and regulators have come to recognize that option-based compensation is a major distorting factor. Had AOL Time Warner in 2001, for example, reported employee stock option expenses as recommended by SFAS 123, it would have shown an operating loss of about \$1.7 billion rather than the \$700 million in operating income it actually reported.

We believe that the case for expensing options is overwhelming, and in the following pages we examine and dismiss the principal claims put forward by those who continue to oppose it. We demonstrate that, contrary to these experts' arguments, stock option grants have real cash-flow implications that need to be reported, that the way to quantify those implications is available, that footnote disclosure is not an acceptable substitute for reporting the transaction in the income statement and balance sheet, and that full recognition of option costs need not emasculate the incentives of entrepreneurial ventures. We then discuss just how firms might go about reporting the cost of options on their income statements and balance sheets.

#### FALLACY 1: Stock Options Do Not Represent a Real Cost

It is a basic principle of accounting that financial statements should record economically significant transactions. No one doubts that traded options meet that criterion; billions of dollars' worth are bought and sold every day, either in the over-the-counter market or on exchanges. For many people, though, company stock option grants are a different story. These transactions are not economically significant, the argument goes, because no cash changes hands. As former American Express CEO Harvey Golub put it in an August 8, 2002, *Wall Street Journal* article, stock option grants "are never a cost to the

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*Zvi Bodie is a professor of finance at Boston University's School of Management. Robert S. Kaplan is the Marvin Bower Professor of Leadership Development at Harvard Business School. Robert C. Merton is the John and Natty McArthur University Professor at Harvard Business School and a winner of the 1997 Nobel Memorial Prize in Economic Science. They are all based in Boston.*

company and, therefore, should never be recorded as a cost on the income statement."

That position defies economic logic, not to mention common sense, in several respects. For a start, transfers of value do not have to involve transfers of cash. While a transaction involving a cash receipt or payment is sufficient to generate a recordable transaction, it is not necessary. Events such as exchanging stock for assets, signing a lease, providing future pension or vacation benefits for current-period employment, or acquiring materials on credit all trigger accounting transactions because they involve transfers of value, even though no cash changes hands at the time the transaction occurs.

Even if no cash changes hands, issuing stock options to employees incurs a sacrifice of cash, an opportunity cost, which needs to be accounted for. If a company were to grant stock, rather than options, to employees, everyone would agree that the company's cost for this transaction would be the cash it otherwise would have received if it had sold the shares at the current market price to investors. It is exactly the same with stock options. When a company grants options to employees, it forgoes the opportunity to receive cash from underwriters who could take these same options and sell them in a competitive options market to investors. Warren Buffett made this point graphically in an April 9, 2002, *Washington Post* column when he stated: "Berkshire [Hathaway] will be happy to receive options in lieu of cash for many of the goods and services that we sell corporate America." Granting options to employees rather than selling them to suppliers or investors via underwriters involves an actual loss of cash to the firm.

It can, of course, be more reasonably argued that the cash forgone by issuing options to employees, rather than selling them to investors, is offset by the cash the company conserves by paying its employees less cash. As two widely respected economists, Burton G. Malkiel and William J. Baumol, noted in an April 4, 2002, *Wall Street Journal* article: "A new, entrepreneurial firm may not be able to provide the cash compensation needed to attract outstanding workers. Instead, it can offer stock options." But Malkiel and Baumol, unfortunately, do not follow their observation to its logical conclusion. For if the cost of stock options is not universally incorporated into the measurement of net income, companies that grant options will underreport compensation costs, and it won't be possible to compare their profitability, productivity, and return-on-capital measures with those of economically equivalent companies that have merely structured their compensation system in a different way. The following hypothetical illustration shows how that can happen.

Imagine two companies, KapCorp and MerBod, competing in exactly the same line of business. The two differ only in the structure of their employee compensation packages. KapCorp pays its workers \$400,000 in total

compensation in the form of cash during the year. At the beginning of the year, it also issues, through an underwriting, \$100,000 worth of options in the capital market, which cannot be exercised for one year, and it requires its employees to use 25% of their compensation to buy the newly issued options. The net cash outflow to KapCorp is \$300,000 (\$400,000 in compensation expense less \$100,000 from the sale of the options).

MerBod's approach is only slightly different. It pays its workers \$300,000 in cash and issues them directly \$100,000 worth of options at the start of the year (with the same one-year exercise restriction). Economically, the two positions are identical. Each company has paid a total of \$400,000 in compensation, each has issued \$100,000 worth of options, and for each the net cash outflow totals \$300,000 after the cash received from issuing the options is subtracted from the cash spent on compensation. Employees at both companies are holding the same \$100,000 of options during the year, producing the same motivation, incentive, and retention effects.

In preparing its year-end statements, KapCorp will book compensation expense of \$400,000 and will show \$100,000 in options on its balance sheet in a shareholder equity account. If the cost of stock options issued to employees is not recognized as an expense, however, MerBod will book a compensation expense of only \$300,000 and not show any options issued on its balance sheet. Assuming otherwise identical revenues and costs, it will look as though MerBod's earnings were \$100,000 higher than KapCorp's. MerBod will also seem to have a lower equity base than KapCorp, even though the increase in the number of shares outstanding will eventually be the same for both companies if all the options are exercised. As a result of the lower compensation expense and lower equity position, MerBod's performance by most analytic measures will appear to be far superior to KapCorp's. This distortion is, of course, repeated every year that the two firms choose the different forms of compensation. How legitimate is an accounting standard that allows two economically identical transactions to produce radically different numbers?

#### FALLACY 2:

### The Cost of Employee Stock Options Cannot Be Estimated

Some opponents of option expensing defend their position on practical, not conceptual, grounds. Option-pricing models may work, they say, as a guide for valuing publicly



How legitimate is an accounting standard that allows two economically identical transactions to produce radically different numbers?

traded options. But they can't capture the value of employee stock options, which are private contracts between the company and the employee for illiquid instruments that cannot be freely sold, swapped, pledged as collateral, or hedged.

It is indeed true that, in general, an instrument's lack of liquidity will reduce its value to the holder. But the holder's liquidity loss makes no difference to what it costs the issuer to create the instrument unless the issuer somehow benefits from the lack of liquidity. And for stock options, the absence of a liquid market has little effect on their value to the holder. The great beauty of option-pricing models is that they are based on the characteristics of the underlying stock. That's precisely why they have contributed

to the extraordinary growth of options markets over the last 30 years. The Black-Scholes price of an option equals the value of a portfolio of stock and cash that is managed dynamically to replicate the payoffs to that option. With a completely liquid stock, an otherwise unconstrained investor could entirely hedge an option's risk and extract its value by selling short the replicating portfolio of stock and cash. In that case, the liquidity discount on the option's value would be minimal. And that applies even if there were no market for trading the option directly. Therefore, the liquidity – or lack thereof – of markets in stock options does not, by itself, lead to a discount in the option's value to the holder.

Investment banks, commercial banks, and insurance companies have now gone far beyond the basic, 30-year-old Black-Scholes model to develop approaches to pricing all sorts of options: Standard ones. Exotic ones. Options traded through intermediaries, over the counter, and on exchanges. Options linked to currency fluctuations. Options embedded in complex securities such as convertible debt, preferred stock, or callable debt like mortgages with prepay features or interest rate caps and floors. A whole subindustry has developed to help individuals, companies, and money market managers buy and sell these complex securities. Current financial technology certainly permits firms to incorporate all the features of employee stock options into a pricing model. A few investment banks will even quote prices for executives looking to hedge or sell their stock options prior to vesting, if their company's option plan allows it.

Of course, formula-based or underwriters' estimates about the cost of employee stock options are less precise than cash payouts or share grants. But financial statements should strive to be approximately right in reflecting

economic reality rather than precisely wrong. Managers routinely rely on estimates for important cost items, such as the depreciation of plant and equipment and provisions against contingent liabilities, such as future environmental cleanups and settlements from product liability suits and other litigation. When calculating the costs of employees' pensions and other retirement benefits, for instance, managers use actuarial estimates of future interest rates, employee retention rates, employee retirement dates, the longevity of employees and their spouses, and the escalation of future medical costs. Pricing models and extensive experience make it possible to estimate the cost of stock options issued in any given period with a precision comparable to, or greater than, many of these other items that already appear on companies' income statements and balance sheets.

Not all the objections to using Black-Scholes and other option valuation models are based on difficulties in estimating the cost of options granted. For example, John DeLong, in a June 2002 Competitive Enterprise Institute paper entitled "The Stock Options Controversy and the New Economy," argued that "even if a value were calculated according to a model, the calculation would require adjustment to reflect the value to the employee." He is only half right. By paying employees with its own stock or options, the company forces them to hold highly non-diversified financial portfolios, a risk further compounded by the investment of the employees' own human capital in the company as well. Since almost all individuals are risk averse, we can expect employees to place substantially less value on their stock option package than other, better-diversified, investors would.

4.42  
8.91  
9.90  
5.26  
6.87  
6.21  
1.77  
2.54  
2.26  
3.1  
3.02  
2.70  
1.15  
73  
89  
10.95  
2.02  
5.19  
6.98  
10.95  
17  
5.19  
1.05  
15.30  
15.96  
22.99  
0.95  
25.99  
15  
20.46  
21.35  
14.80  
44  
21.52  
12.40

## The Real Impact of Forfeiture and Early Exercise

Unlike cash salary, stock options cannot be transferred from the individual granted them to anyone else. Nontransferability has two effects that combine to make employee options less valuable than conventional options traded in the market.

First, employees forfeit their options if they leave the company before the options have vested. Second, employees tend to reduce their risk by exercising vested stock options much earlier than a well-diversified investor would, thereby reducing the potential for a much higher payoff had they held the options to maturity. Employees with vested options that are in the money will also exercise them when they quit, since most companies require employees to use or lose their options upon departure. In both cases, the economic impact on the company of issuing the options is reduced, since the value and relative size of existing shareholders' stakes are diluted less than they could have been, or not at all.

Recognizing the increasing probability that companies will be required to expense stock options, some opponents are fighting a rearguard action by trying to persuade standard setters to significantly reduce the reported cost of those options, discounting their value from that mea-

sured by financial models to reflect the strong likelihood of forfeiture and early exercise. Current proposals put forth by these people to FASB and IASB would allow companies to estimate the percentage of options forfeited during the vesting period and reduce the cost of option grants by this amount. Also, rather than use the expiration date for the option life in an option-pricing model, the proposals seek to allow companies to use an expected life for the option to reflect the likelihood of early exercise. Using an expected life (which companies may estimate at close to the vesting period, say, four years) instead of the contractual period of, say, ten years, would significantly reduce the estimated cost of the option.

Some adjustment should be made for forfeiture and early exercise. But the proposed method significantly overstates the cost reduction since it neglects the circumstances under which options are most likely to be forfeited or exercised early. When these circumstances are taken into account, the reduction in employee option costs is likely to be much smaller.

First, consider forfeiture. Using a flat percentage for forfeitures based on historical or prospective employee turnover is valid only if forfeiture is a random event, like a lottery,

Estimates of the magnitude of this employee risk discount – or “deadweight cost,” as it is sometimes called – range from 20% to 50%, depending on the volatility of the underlying stock and the degree of diversification of the employee’s portfolio. The existence of this deadweight cost is sometimes used to justify the apparently huge scale of option-based remuneration handed out to top executives. A company seeking, for instance, to reward its CEO with \$1 million in options that are worth \$1,000 each in the market may (perhaps perversely) reason that it should issue 2,000 rather than 1,000 options because, from the CEO’s perspective, the options are worth only \$500 each. (We would point out that this reasoning validates our earlier point that options are a substitute for cash.)

But while it might arguably be reasonable to take deadweight cost into account when deciding how much equity-

based compensation (such as options) to include in an executive’s pay packet, it is certainly not reasonable to let deadweight cost influence the way companies record the costs of the packets. Financial statements reflect the economic perspective of the company, not the entities (including employees) with which it transacts. When a company sells a product to a customer, for example, it does not have to verify what the product is worth to that individual. It counts the expected cash payment in the transaction as its revenue. Similarly, when the company purchases a product or service from a supplier, it does not examine whether the price paid was greater or less than the supplier’s cost or what the supplier could have received had it sold the product or service elsewhere. The company records the purchase price as the cash or cash equivalent it sacrificed to acquire the good or service.

independent of the stock price. In reality, however, the likelihood of forfeiture is negatively related to the value of the options forfeited and, hence, to the stock price itself. People are more likely to leave a company and forfeit options when the stock price has declined and the options are worth little. But if the firm has done well and the stock price has increased significantly since grant date, the options will have become much more valuable, and employees will be much less likely to leave. If employee turnover and forfeiture are more likely when the options are least valuable, then little of the options’ total cost at grant date is reduced because of the probability of forfeiture.

The argument for early exercise is similar. It also depends on the future stock price. Employees will tend to exercise early if most of their wealth is bound up in the company, they need to diversify, and they have no other way to reduce their risk exposure to the company’s stock price. Senior executives, however, with the largest option holdings, are unlikely to exercise early and destroy option value when the stock price has risen substantially. Often they own unrestricted stock, which they can sell as a more efficient means to reduce their risk exposure. Or they have enough at stake to contract with an

investment bank to hedge their option positions without exercising prematurely. As with the forfeiture feature, the calculation of an expected option life without regard to the magnitude of the holdings of employees who exercise early, or to their ability to hedge their risk through other means, would significantly underestimate the cost of options granted.

Option-pricing models can be modified to incorporate the influence of stock prices and the magnitude of employees’ option and stock holdings on the probabilities of forfeiture and early exercise. (See, for example, Mark Rubinstein’s Fall 1995 article in the *Journal of Derivatives*, “On the Accounting Valuation of Employee Stock Options.”) The actual magnitude of these adjustments needs to be based on specific company data, such as stock price appreciation and distribution of option grants among employees. The adjustments, properly assessed, could turn out to be significantly smaller than the proposed calculations (apparently endorsed by FASB and IASB) would produce. Indeed, for some companies, a calculation that ignores forfeiture and early exercise altogether could come closer to the true cost of options than one that entirely ignores the factors that influence employees’ forfeiture and early exercise decisions.

New Eng Busn	WEB	800
NJ Com Dev	NJ	2.6
RBI NJR	s	8.9
APM Excl	NXL	7.6
WSKies Sat	ADS	7.51
YCominy Bco	NEZ	20
Times A	NYT	2.1
Castle	NCT	2.8
WOLF NWL		26.9
Newfld Expl	NFX	13.2
NewHaled	NHL	0.6
NewOrl Min	NEI	7.0
NewPRes	NR	5.6
Newscorp	ADS	15.9
Newsp AP	NWA	3.2
WEEK	WXY	7.8
COG GAS		11.3
Nidep ADS	NJ	1.3
KEES	RIKE	20.0
OBBS	NDV	2.7
POE	NYS	8.3
INIB	NTS	0.9
NiSanc	NI	2.6
NiSOSAIES	Z	2.6
NiSBI	NISB	8.6
NobT	NE	7.2
Noble Engy	NBL	4.3
orka	NOK	8.4
araHidg	MM	6.8
Orida	NRO	2.4
adsm	JWN	3.8
NorFASo	NFC	1.4
Norsk	NHY	9.7
Nortek	NTK	3.2
Nortel	NW	6.6
NoEuroOil	NR	8.4
RockBco	NFB	9.7
E-Unit	NU	9.7

Suppose a clothing manufacturer were to build a fitness center for its employees. The company would not do so to compete with fitness clubs. It would build the center to generate higher revenues from increased productivity and creativity of healthier, happier employees and to reduce costs arising from employee turnover and illness. The cost to the company is clearly the cost of building and maintaining the facility, not the value that the individual employees might place on it. The cost of the fitness center is recorded as a periodic expense, loosely matched to the expected revenue increase and reductions in employee-related costs.

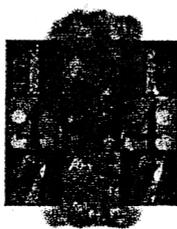
The only reasonable justification we have seen for costing executive options below their market value stems from the observation that many options are forfeited when employees leave, or are exercised too early because of employees' risk aversion. In these cases, existing shareholders' equity is diluted less than it would otherwise be, or not at all, consequently reducing the company's compensation cost. While we agree with the basic logic of this argument, the impact of forfeiture and early exercise on theoretical values may be grossly exaggerated. (See the sidebar "The Real Impact of Forfeiture and Early Exercise.")

### FALLACY 3: Stock Option Costs Are Already Adequately Disclosed

Another argument in defense of the existing approach is that companies already disclose information about the cost of option grants in the footnotes to the financial statements. Investors and analysts who wish to adjust income statements for the cost of options, therefore, have the necessary data readily available. We find that argument hard to swallow. As we have pointed out, it is a fundamental principle of accounting that the income statement and balance sheet should portray a company's underlying economics. Relegating an item of such major economic significance as employee option grants to the footnotes would systematically distort those reports.

But even if we were to accept the principle that footnote disclosure is sufficient, in reality we would find it a poor substitute for recognizing the expense directly on the primary statements. For a start, investment analysts, lawyers, and regulators now use electronic databases to calculate profitability ratios based on the numbers in com-

The people claiming that options expensing creates a double-counting problem are themselves creating a smoke screen to hide the income-distorting effects of stock option grants.



panies' audited income statements and balance sheets. An analyst following an individual company, or even a small group of companies, could make adjustments for information disclosed in footnotes. But that would be difficult and costly to do for a large group of companies that had put different sorts of data in various nonstandard formats into footnotes. Clearly, it is much easier to compare companies on a level playing field, where all compensation expenses have been incorporated into the income numbers.

What's more, numbers divulged in footnotes can be less reliable than those disclosed in the primary financial statements. For one thing, executives and auditors typically review supplementary footnotes last and devote less time to them than they do to the numbers in the primary statements. As just one example, the footnote in eBay's FY 2000 annual report reveals a "weighted average grant-

date fair value of options granted during 1999 of \$105.03" for a year in which the weighted average exercise price of shares granted was \$64.59. Just how the value of options granted can be 63% more than the value of the underlying stock is not obvious. In FY 2000, the same effect was reported: a fair value of options granted of \$103.79 with an average exercise price of \$62.69. Apparently, this error was finally detected, since the FY 2001 report retroactively adjusted the 1999 and 2000 average grant-date fair values to \$40.45 and \$41.40, respectively. We believe executives and auditors will exert greater diligence and care in obtaining reliable estimates of the cost of stock options if these figures are included in companies' income statements than they currently do for footnote disclosure.

Our colleague William Sahlman in his December 2002 HBR article, "Expensing Options Solves Nothing," has expressed concern that the wealth of useful information contained in the footnotes about the stock options granted would be lost if options were expensed. But surely recognizing the cost of options in the income statement does not preclude continuing to provide a footnote that explains the underlying distribution of grants and the methodology and parameter inputs used to calculate the cost of the stock options.

Some critics of stock option expensing argue, as venture capitalist John Doerr and FedEx CEO Frederick Smith did in an April 5, 2002, *New York Times* column, that "if expensing were ... required, the impact of options would be counted twice in the earnings per share: first as a po-

tential dilution of the earnings, by increasing the shares outstanding, and second as a charge against reported earnings. The result would be inaccurate and misleading earnings per share."

We have several difficulties with this argument. First, option costs only enter into a (GAAP-based) diluted earnings-per-share calculation when the current market price exceeds the option exercise price. Thus, fully diluted EPS numbers still ignore all the costs of options that are nearly in the money or could become in the money if the stock price increased significantly in the near term.

Second, relegating the determination of the economic impact of stock option grants solely to an EPS calculation greatly distorts the measurement of reported income. Such fundamental profitability and productivity measures as return on investment, return on capital employed, and economic value added, which are based on accounting income, would not be adjusted to reflect the economic impact of option costs. These measures are more significant summaries of the change in economic value of a company than the prorated distribution of this income to individual shareholders revealed in the EPS measure. This becomes eminently clear when taken to its logical absurdity: Suppose companies were to compensate all their suppliers—of materials, labor, energy, and purchased services—with stock options rather than with cash and avoid all expense recognition in their income statement. Their income and their profitability measures would all be so grossly inflated as to be useless for analytic purposes; only the EPS number would pick up any economic effect from the option grants.

Our biggest objection to this spurious claim, however, is that even a calculation of fully diluted EPS does not fully reflect the economic impact of stock option grants. The following hypothetical example illustrates the problems, though for purposes of simplicity we will use grants of shares instead of options. The reasoning is exactly the same for both cases.

Let's say that each of our two hypothetical companies, KapCorp and MerBod, has 8,000 shares outstanding, no debt, and annual revenue this year of \$100,000. KapCorp decides to pay its employees and suppliers \$90,000 in cash and has no other expenses. MerBod, however, compensates its employees and suppliers with \$80,000 in cash and 2,000 shares of stock, at an average market price of \$5 per share. The cost to each company is the same: \$90,000. But their net income and EPS numbers are very different. KapCorp's net income before taxes is \$10,000, or \$1.25 per share. By contrast, MerBod's reported net income (which ignores the cost of the equity granted to employees and suppliers) is \$20,000, and its EPS is \$2.00 (which takes into account the new shares issued).

Of course, the two companies now have different cash balances and numbers of shares outstanding with a claim on them. But KapCorp can eliminate that discrepancy

by issuing 2,000 shares of stock in the market during the year at an average selling price of \$5 per share. Now both companies have closing cash balances of \$20,000 and 10,000 shares outstanding. Under current accounting rules, however, this transaction only exacerbates the gap between the EPS numbers. KapCorp's reported income remains \$10,000, since the additional \$10,000 value gained from the sale of the shares is not reported in net income, but its EPS denominator has increased from 8,000 to 10,000. Consequently, KapCorp now reports an EPS of \$1.00 to MerBod's \$2.00, even though their economic positions are identical: 10,000 shares outstanding and increased cash balances of \$20,000. The people claiming that options expensing creates a double-counting problem are themselves creating a smoke screen to hide the income-distorting effects of stock option grants.

Indeed, if we say that the fully diluted EPS figure is the right way to disclose the impact of share options, then we should immediately change the current accounting rules for situations when companies issue common stock, convertible preferred stock, or convertible bonds to pay for services or assets. At present, when these transactions occur, the cost is measured by the fair market value of the consideration involved. Why should options be treated differently?

#### FALLACY 4:

#### Expensing Stock Options Will Hurt Young Businesses

Opponents of expensing options also claim that doing so will be a hardship for entrepreneurial high-tech firms that do not have the cash to attract and retain the engineers and executives who translate entrepreneurial ideas into profitable, long-term growth.

This argument is flawed on a number of levels. For a start, the people who claim that option expensing will harm entrepreneurial incentives are often the same people who claim that current disclosure is adequate for communicating the economics of stock option grants. The two positions are clearly contradictory. If current disclosure is sufficient, then moving the cost from a footnote to the balance sheet and income statement will have no market effect. But to argue that proper costing of stock options would have a significant adverse impact on companies that make extensive use of them is to admit that the economics of stock options, as currently disclosed in footnotes, are not fully reflected in companies' market prices.

More seriously, however, the claim simply ignores the fact that a lack of cash need not be a barrier to compensating executives. Rather than issuing options directly to employees, companies can always issue them to underwriters and then pay their employees out of the money received for those options. Considering that the market

systematically puts a higher value on options than employees do, companies are likely to end up with more cash from the sale of externally issued options (which carry with them no deadweight costs) than they would by granting options to employees in lieu of higher salaries.

Even privately held companies that raise funds through angel and venture capital investors can take this approach. The same procedures used to place a value on a privately held company can be used to estimate the value of its options, enabling external investors to provide cash for options about as readily as they provide cash for stock.

That's not to say, of course, that entrepreneurs should never get option grants. Venture capital investors will always want employees to be compensated with some stock options in lieu of cash to be assured that the employees have some "skin in the game" and so are more likely to be honest when they tout their company's prospects to providers of new capital. But that does not preclude also raising cash by selling options externally to pay a large part of the cash compensation to employees.

We certainly recognize the vitality and wealth that entrepreneurial ventures, particularly those in the high-tech sector, bring to the U.S. economy. A strong case can be made for creating public policies that actively assist these companies in their early stages, or even in their more established stages. The nation should definitely consider a regulation that makes entrepreneurial, job-creating companies healthier and more competitive by changing something as simple as an accounting journal entry.

But we have to question the effectiveness of the current rule, which essentially makes the benefits from a deliberate accounting distortion proportional to companies' use of one particular form of employee compensation. After all, some entrepreneurial, job-creating companies might benefit from picking other forms of incentive compensation that arguably do a better job of aligning executive and shareholder interests than conventional stock options do. Indexed or performance options, for example, ensure that management is not rewarded just for being in the right place at the right time or penalized just for being in the wrong place at the wrong time. A strong case can also be made for the superiority of properly designed restricted stock grants and deferred cash payments. Yet current accounting standards require that these, and virtually all other compensation alternatives, be expensed. Are companies that choose those alternatives any less deserving of an accounting subsidy than Micro-

soft, which, having granted 300 million options in 2001 alone, is by far the largest issuer of stock options?

A less distorting approach for delivering an accounting subsidy to entrepreneurial ventures would simply be to allow them to defer some percentage of their total employee compensation for some number of years, which could be indefinitely – just as companies granting stock options do now. That way, companies could get the supposed accounting benefits from not having to report a portion of their compensation costs no matter what form that compensation might take.

## What Will Expensing Involve?

Although the economic arguments in favor of reporting stock option grants on the principal financial statements seem to us to be overwhelming, we do recognize that expensing poses challenges. For a start, the benefits accruing to the company from issuing stock options occur in future periods, in the form of increased cash flows generated by its option motivated and retained employees. The fundamental matching principle of accounting requires that the costs of generating those higher revenues be recognized at the same time the revenues are recorded. This is why companies match the cost of multiperiod assets such as plant and equipment with the revenues these assets produce over their economic lives.

In some cases, the match can be based on estimates of the future cash flows. In expensing capitalized software-development costs, for instance, managers match the costs against a predicted pattern of benefits accrued from selling the software. In the case of options, however, managers would have to estimate an equivalent pattern of benefits arising from their own decisions and activities. That would likely introduce significant measurement error and provide opportunities for managers to bias their estimates. We therefore believe that using a standard straight-line amortization formula will reduce measurement error and management bias despite some loss of accuracy. The obvious period for the amortization is the useful economic life of the granted option, probably best measured by the vesting period. Thus, for an option vesting in four years,  $1/48$  of the cost of the option would be expensed through the income statement in each month until the option vests. This would treat employee option compensation costs the same way the costs of plant and equipment or inventory are treated

It is not the proper role  
of accounting standards  
to distort executive  
and employee  
compensation  
by subsidizing one  
form of compensation  
relative to all others.



when they are acquired through equity instruments, such as in an acquisition.

In addition to being reported on the income statement, the option grant should also appear on the balance sheet. In our opinion, the cost of options issued represents an increase in shareholders' equity at the time of grant and should be reported as paid-in capital. Some experts argue that stock options are more like contingent liability than equity transactions since their ultimate cost to the company cannot be determined until employees either exercise or forfeit their options. This argument, of course, ignores the considerable economic value the company has sacrificed at time of grant. What's more, a contingent liability is usually recognized as an expense when it is possible to estimate its value and the liability is likely to be incurred. At time of grant, both these conditions are met. The value transfer is not just probable; it is certain. The company has granted employees an equity security that could have been issued to investors and suppliers who would have given cash, goods, and services in return. The amount sacrificed can also be estimated, using option-pricing models or independent estimates from investment banks.

There has to be, of course, an offsetting entry on the asset side of the balance sheet. FASB, in its exposure draft on stock option accounting in 1994, proposed that at time of grant an asset called "prepaid compensation expense" be recognized, a recommendation we endorse. FASB, however, subsequently retracted its proposal in the face of criticism that since employees can quit at any time, treating their deferred compensation as an asset would violate the principle that a company must always have legal control over the assets it reports. We feel that FASB capitulated too easily to this argument. The firm does have an asset because of the option grant—presumably a loyal, motivated employee. Even though the firm does not control the asset in a legal sense, it does capture the benefits. FASB's concession on this issue subverted substance to form.

Finally, there is the issue of whether to allow companies to revise the income number they've reported after the grants have been issued. Some commentators argue that any recorded stock option compensation expense should be reversed if employees forfeit the options by leaving the company before vesting or if their options expire unexercised. But if companies were to mark compen-

sation expense downward when employees forfeit their options, should they not also mark it up when the share price rises, thereby increasing the market value of the options? Clearly, this can get complicated, and it comes as no surprise that neither FASB nor IASB recommends any kind of postgrant accounting revisions, since that would open up the question of whether to use mark-to-market accounting for all types of assets and liabilities, not just share options. At this time, we don't have strong feelings about whether the benefits from mark-to-market accounting for stock options exceed the costs. But we would point out that people who object to estimating the cost of options granted at time of issue should be even less enthusiastic about reestimating their options' cost each quarter.

...

We recognize that options are a powerful incentive, and we believe that all companies should consider them in deciding how to attract and retain talent and align the interests of managers and owners. But we also believe that failing to record a transaction that creates such powerful effects is economically indefensible and encourages companies to favor options over alternative compensation methods. It is not the proper role of accounting standards to distort executive and employee compensation by subsidizing one form of compensation relative to all others. Companies should choose compensation methods according to their economic benefits—not the way they are reported. 

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To order, see page 143.



## **Proposal by Integrated Finance Limited for Expensing Employee Compensatory Stock Options for Financial Reporting Purposes**

### **Introduction**

Integrated Finance Limited (“IFL”) has developed an accounting approach for employee stock options that matches the expense of option-based compensation to the timing and magnitude of economic transfer. The approach, which is adaptable to either closed-form or binomial valuation models, complements the FASB draft proposal by providing a specific framework in which to apply the FASB recommendations.

The IFL approach is driven by the key insight that only the part of the option value earned without the obligation of continued employment should be treated as an expense.<sup>1</sup> We pay specific attention to the fact that most stock option plans stipulate that if the employee resigns or is terminated then the maturity for the *vested* option 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) only a 90-day option, even if the stated maturity of the option is 10 years.<sup>2</sup> Thus, the “extension” of the maturity as a consequence of the employee’s continued employment is the appropriate expense in each accounting period. This approach to expensing vested options in turn has implications for plans that require a vesting period. For such plans, IFL proposes that the option value to be conferred at vesting be estimated quarterly beginning at time of grant and that the corresponding estimated expense be revised and allocated as a pro-rata accrual each quarter over the vesting period.

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<sup>1</sup> The idea that only the value of the part of that option which is owned without requiring continued employment in the future should be expensed was first presented in “Accounting for Stock Options,” Jeremy Bulow and John Shoven, Stanford University, unpublished manuscript, January 15, 2004.

<sup>2</sup> 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.

## **Summary: IFL Process for Expensing Employee Stock Options**

For vested employee stock options that expire 90 days after employee termination, IFL proposes:

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 is either exercised or expires.
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.

## **Benefits of the IFL Process for Expensing Employee Stock Options**

1. It reflects the actual economics of the exchange of labor for valuable consideration by charging the fair market value of what the firm has transferred to the employee and by allocating that expense to the accounting period in which the employee worked to receive that transfer.
2. In the vested period, valuation typically will not be based on maturities greater than 90 days, for which there are traded options; even 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. In the vested period, because the termination-linked option maturities generally are 90 days, adjustments in valuation for early exercise before expiration are not likely to be needed or material.
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 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 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. It is an option-expense approach that is consistent with expensing restricted stock.

### Detailed Illustration of the IFL Process for Expensing Employee Options

We demonstrate the specific application of the recommended approach by means of two hypothetical examples, one for vested options and the other for unvested options.

#### ***Example #1: 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 has worked at *XYZ* for at least the entire 2003. *XYZ* has an employee stock option plan, which grants 10-year at-the-money options that vest immediately upon grant. If the employee leaves the firm, whether voluntarily or as a result of having been terminated not for cause, the vested options must be exercised within 90 days. Thus, upon leaving the firm, the effective maturity of the vested option becomes 90 days. On December 31, 2003, the price of *XYZ* shares is \$100. Suppose each of the employees is granted a 10-year option with an exercise price of \$100, which 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 his 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 at \$8.20 per option. Since employee *A* owns that option and 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 4<sup>th</sup> Q 2003 and thus we would allocate the entire \$8.20 expense to that quarter. It is difficult to justify allocating any of the expense to an earlier quarter unless there was a specific allocation of the option prior to the 4<sup>th</sup> Q 2003, which, in effect, would have been a grant. Furthermore we want to avoid a process that causes periodic restatements of earlier quarter income. Since employees *B* and *C* had the same rights to leave the firm and retain the option value that *A* has, we charge the same amount, \$8.20, as a 4<sup>th</sup> Q compensation expense for each of them as well.

Continuing with the example, consider what happens if on March 31, 2004, both employees *B* and *C* are at the firm and on April 1, 2004, employee *B* is terminated not for cause. As a result, the expiration date of *B*'s option immediately becomes June 30, 2004. Suppose the March 31, 2004 closing price on XYZ is \$120 and the fair market value of *B*'s 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 being employed by XYZ during the 4<sup>th</sup> quarter? On December 31, 2003, employee *A* and employee *B* were in identical economic situations with respect to XYZ. Subsequently, employee *A* did not work at the firm and employee *B* did. Thus, since employee *B* will not perform any further work for XYZ in the future, the difference in the value of the option owned by employee *B* and the value of the option owned by employee *A* on March 31, 2004 must be the option-related compensation received by employee *B* for working in 1<sup>st</sup> Q 2004. March 31, 2004 is the expiration date of employee *A*'s option and so its value is its intrinsic value,  $(\$120 - \$100) = \$20$ . Thus, the difference between the fair market value of employee *B*'s option and employee *A*'s option is  $\$22.54 - \$20.00 = \$2.54$  and that is the compensation expense for *B*'s option in the 1<sup>st</sup> Q 2004. In effect, by *B* working another quarter beyond *A*, he received 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. Since on March 31, 2004, employees *B* and *C* were in identical positions in terms of their relationship to *XYZ*, the compensation expense charged for *C*'s option in the 1<sup>st</sup> Q 2004 should be the same as for *B*'s or \$2.54. Note that there is no further compensation expense charged for *A*'s option because he did not work at *XYZ* in 1<sup>st</sup> Q 2004.

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, \$0. Since the only difference between *B* and *C* is that *C* worked the 2<sup>nd</sup> Q 2004 and *B* didn't, the option-based compensation charge for *C* is the difference between the value of his option, \$3.72, and *B*'s, which is worthless.

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, then the option-related compensation charge for *C* having worked for the 3<sup>rd</sup> quarter is the value of an extension of his option maturity date for another 90 days, \$40.92 - \$40.00 = \$0.92. 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, then *C*'s option-based compensation charge for working the 4<sup>th</sup> Q 2004 would be \$60.57 - \$60.00 = \$0.57. Suppose that the stock price of *XYZ* on March 31, 2005 is \$175 but *C* had exercised 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, 2005 could have exercised at exactly the same time that *C* did during the 1<sup>st</sup> Quarter of 2005 and would have received the identical payout. Thus, *C* earned no option-based compensation as a consequence of his working for *XYZ* in the 1<sup>st</sup> Q 2005 and hence, there is no expense. And of course since his option no longer exists, there will be no expense for it in any later quarter. The entire time path of expensing is summarized in Table 1.

*Observations on the effect of truncation of maturity drawn from this example:*

The provision in standard option plans that calls for the maturity of a vested option to truncate to 90 days upon the employee leaving the firm has a very 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 the expensing that would occur in the same hypothetical situation, if the plan terms are changed so that vested options retain their full stated maturity (in this case 10 years from time of grant) even if the employee leaves the firm, voluntarily or as a result of having been terminated not for cause.<sup>3</sup> Under this condition, the options held by employees A, B and C would have had the identical value at all points in time, independently of continued employment beyond the vesting date. By analysis parallel to that leading to a charge of the value of the 90-day option on December 31, 2003, as an expense to 4<sup>th</sup> Q 2003, we would instead charge the value of a 10-year at-the-money option on that date to the 4<sup>th</sup> Q 2003. The fair-market value of such an option with the stock price at \$100 might be around \$50. So without the plan provision of the maturity truncation, there would have been a \$150 charge to 4<sup>th</sup> Q 2003 earnings for the three employees' options and no further expense after that, whether or not the employees left XYZ.<sup>4</sup> In contrast, the total expense charged for these options with the truncation provision was: \$34.89, allocated: \$24.60 for 4<sup>th</sup> Q 2003; \$5.08 for 1<sup>st</sup> Q 2004; \$3.72 for 2<sup>nd</sup> Q 2004; \$0.92 for 3<sup>rd</sup> Q 2004; \$0.57 for 4<sup>th</sup> Q 2004 and no further expenses thereafter.

The large difference (\$150 vs. \$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 have been only \$47.85. Furthermore, provided that the stock remained deep in the money at each quarter end from March 2005 to December 2013, even if all three employees had stayed at the firm and did not exercise before the expiration date, still the total expenses charged on the options, \$ 65.35, would be considerably less than \$150. And that smaller total

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<sup>3</sup> 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.

<sup>4</sup> 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.

expense would be distributed over 40 quarters from 4<sup>th</sup> Q 2003 through 3<sup>rd</sup> Q 2013 instead of concentrated in a single quarter, 4<sup>th</sup> Q 2003.<sup>5</sup>

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 thus such considerations should be taken into account. However, as we see here for plans with a maturity truncation to 90 days after leaving the firm, no vested option expense valuation involves a maturity of greater than 90 days. Therefore, not taking into account early exercise possibilities will have a relatively small effect on that valuation.

***Example #2: Expensing of Unvested Options.***

Consider the same circumstances described in the preceding example but now XYZ's option plan has a one-year (4 quarter) vesting period from time of grant. Thus, the at-the-money 10-year maturity 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. Under that approach, 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 4<sup>th</sup> Q 2004.

If however, as we believe, some of the employees' effort to remain at XYZ during the vesting period is attributable to the grant of the options, then there should be an accrual of some of the option expense to quarters Q4 2003, Q1 2004, Q2 2004, Q3 2004, as well as Q4 2004, when the option actually vests. The IFL-recommended accrual method is at the end of each quarter to take the fair-market value of an option that expires 90-days after the last quarter of the vesting period and allocate as an expense charge to each quarter the pro-rata value of that option for the number of quarters since grant less the cumulative amount of the option value already expensed in these earlier quarters. In our example, the

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<sup>5</sup> 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.

expiration date of the option used for valuation in each quarter of the vesting period will be 90 days after the vesting date, namely March 31, 2005.

Suppose that the fair-market value of a one-year-and-90-day option on XYZ with an exercise price of \$100 on December 31, 2003 is \$18.75. The value of the three options granted to employees A, B, and C is \$56.25. Since there are 5 quarters among which the option expense is to be allocated in the vesting period, ( $\$56.25/5 =$ ) \$11.25 is the total expense in Q4 2003.

On March 31, 2004, the stock price is \$120 and the fair-market value of a one-year option on XYZ with exercise price \$100 is \$30.40. Because employee A left the company during the quarter his option was forfeited, its value is now \$0, and the combined value of the two options granted to employees B and C is \$60.80. Since two of the 5 quarters for expense allocation are completed, the charge for Q1 2004 is ( $\$60.80 \times 2/5 -$  previous cumulative expense  $=$ )  $\$24.32 - \$11.25 =$  \$13.07. On June 30, 2004, the stock price is \$90 and the fair-market value of a 9-month option on XYZ with an exercise price of \$100 is \$9.14. Because employee B was terminated during the quarter his option was forfeited, its value is now \$0, and there is only employee C's option remaining. Since three of the 5 quarters for expense allocation are completed, the charge for Q2 2004 is ( $\$9.14 \times 3/5 -$  previous cumulative expense  $=$ )  $\$5.48 - \$24.32 =$  (\$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 6-month option on XYZ with an exercise price of \$100 is \$42.75. Since four of the 5 quarters for expense allocation are completed, the charge for Q3 2004 is ( $\$42.75 \times 4/5 -$  previous cumulative expense  $=$ )  $\$34.20 - \$5.48 =$  \$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 exercise price \$100 is \$60.57. Since five of the 5 quarters for expense allocation are completed, the charge for Q4 2004 is ( $\$60.57 -$  previous cumulative expenses  $=$ )  $\$60.57 - \$34.20 =$  \$26.37.

Note that as a design feature of the IFL approach, the total cumulative option expense during the entire vesting period is equal to the fair-market value of vested options at the end of the quarter in which they vested, \$60.57. Thus, the cumulative expense as of the time of vesting is the same as it would have been if

there had been no expensing of the options until they vest. However, the recommended accrual method of expenses permits an allocation of the expenses across the quarters in which some of the option-based compensation expense actually occurred, using 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.<sup>6</sup> The entire time path of expensing through the vesting period is summarized in Table 2.

*Observations on the effect of introducing a vesting period drawn from this example:*

It is self-evident that the value of a vested option is greater than the value of an otherwise identical but unvested option at a given point in time. Thus, it may seem inconsistent that the cumulative expense of \$60.57 for the unvested options in Example #2 exceeds the cumulative expense of \$34.89 for the vested options in Example #1. However, this outcome is primarily the result of the particular time path followed by the stock during the vesting period, which ends up deeply in the money on the vesting date. For example, with the same employee termination pattern, 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 vested case of Example #1 would have been \$65.60 and the cumulative expense of the granted options for the unvested case of Example #2 would have been only \$8.20.<sup>7</sup> Thus, the after-the-fact differences in expenses between vested and unvested options depend on the time path followed by the stock during the vesting period and can be either larger or smaller.

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<sup>6</sup> 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 it is not proposed for that reason.

<sup>7</sup> 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.

**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
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<i>Timeline</i>	<u>Employee A</u>	<u>Employee B</u>	<u>Employee C</u>	<u>Company</u>
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

**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
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<i>Timeline</i>	<u>Employee A</u>	<u>Employee B</u>	<u>Employee C</u>	<u>Company</u>
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	resigns			
March 31, 2004		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		terminated without cause		
June 30, 2004			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