

# Chicago Fed Letter

## Common sense about executive stock options

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How do employee stock options affect the economic value of firms and the welfare of the general stockholders? This article explains how these instruments work and why shareholders should have better information about them.

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**Corporate** governance and executive compensation have recently come under increased public and legislative scrutiny. The use of stock options to motivate and reward employees, and executives in particular, has been a major focus of this debate. While executive stock options have gained the most attention, employee stock options are also of concern, since broad-based employee stock option plans may be far larger than executive stock option grants. These concerns have led to demands for greater transparency of employee and executive stock option programs, and to counter-arguments that changes in their accounting treatment are not needed or may be harmful.<sup>1</sup>

In this *Chicago Fed Letter*, I explore the impact of employee stock options on the economic value of the firm and the welfare of the general stockholders.<sup>2</sup> Viewed from this perspective, employee stock options represent a real wealth transfer from the firm to the employees at the expense of other stockholders. Where the number of outstanding stock options is large, for instance at firms with broad-based employee stock option plans, the value of the wealth transfer can materially impact the stockholders' claims. I argue that this transfer should be made transparent to the stockholders and show how this can be done. For firms with limited executive stock option plans, transparency as to the value of wealth being transferred to executives is critical to stockholder monitoring of executive compensation, even if the aggregate numbers involved are small relative to the total value of the firm.

Employee stock options are rights to purchase shares at a specified price, the strike price, on or before a given date. This is termed an American "call option." If the price of the stock rises above the strike price on or before the expiry date, the holder of the call option can purchase the stock at the strike price and resell it at the higher market price, pocketing the difference. Unlike traded options, employee stock options are issued by companies directly to senior management or to key employees. When an employee stock option is exercised, the firm sells shares to the employee at the strike price. These shares can either be newly issued shares or old shares previously repurchased by the firm and held as "treasury stock." The employee can then sell the shares on the market to realize the difference between the stock price and the strike price. A variation on the employee stock option, called a stock appreciation right (SAR), avoids the issuance/sale of stock by paying the employee the difference in value in cash. Employee stock options typically have a vesting period during which the employee may not exercise the options. If he leaves the firm during the vesting period the option is usually forfeited. After the vesting period, the options become American call options and may be exercised whenever the employee finds it advantageous to do so, though again they may be forfeited if the employee leaves the firm, or may expire unexecuted.

The theory behind granting options to employees is that an employee who stands

to profit personally when share prices increase will work harder to ensure that this comes about.<sup>3</sup> At first firms simply gave employees stock or loans with which to buy stock. However, in 1993 Congress passed a law limiting the tax deductibility of compensation to \$1 million per executive. Stock grants were included in the applicable forms of compensation. Stock options, however, were not. Options, which give the manager the same upside potential as holding stock (though not the same downside risk), were seen as an ideal substitute, because their accounting impact was much less than outright stock grants, if they were expensed at all.

In 1972, the Accounting Principles Board (APB), the predecessor of the Financial Accounting Standards Board (FASB), which today sets generally accepted accounting standards, issued Opinion 25, mandating that employee stock options should be expensed at their intrinsic value at the time of issue. The intrinsic value is the difference between the strike price and the current market price of the stock. No follow-up reporting was required (except for stock appreciation rights, which companies have to mark-to-market by reporting changes in their intrinsic value). Firms responded by simply granting stock options with a strike price at or slightly above the current market price, so that no expense needed to be recognized.

Because companies found it easy to circumvent APB 25, several initiatives were started to mandate the consistent expensing of stock options, though without result. Financial Accounting Standard (FAS) 123, issued by FASB in October 1995 suggested, but did not require, that companies expense the fair value (what the option is theoretically worth) of stock options at time of issuance. FAS 123 provided guidance on determination of fair value and suggested improved disclosure, in footnotes, of details of executive stock options issued (number) and exercised (value). FAS 148, issued in 2002, required standardized fair value expensing in footnotes for newly issued options.

In response to recent scandals, a number of companies that had not previously expensed their employee stock options have begun to do so voluntarily, though most remain opposed to mandating the disclosure. In 2002, the International

Accounting Standards Board (IASB) issued a draft proposal for “Accounting for Share-Based Payments” that requires employee stock options to be expensed at fair value at time of issue (comment period ends March 7, 2003). And FASB has issued a comparison of FAS 123 and the IASB proposal with a call for comments preliminary to considering whether it should propose changes in U.S. accounting standards (comment period ended February 1, 2003).

### The arguments against

Arguments against expensing stock options include the following:

- Firms that make heavy use of stock options, particularly high-tech firms, fear that expensing options will depress or wipe out their (reported) earnings, perhaps making it more difficult to raise external funds.
- The value of stock options is dependent (in part) on the stock price. Therefore, accounting for stock options expense will introduce volatility into (reported) earnings.
- There is no agreed method for valuing stock options; therefore, the reported options expenses could be inconsistent and may be subject to manipulation.

These arguments do not claim that options have no real value, rather that expensing them is problematic. Others claim that options do not constitute a bona fide expense.

Employee stock options do not fit the usual definition of an expense—the ultimate transaction, which occurs only if the option is eventually exercised, is the sale of stock. How can that be an expense?

- Stock options only affect the equity portion of the balance sheet, and therefore do not impact the operations of the firm.
- It is necessary only to account for the possible dilution (increase in shares outstanding) from issuance of new shares to employees when they exercise—implying that the price at which the firm sells new shares is unimportant.

Arguments that stock options have no effect on the value of the firm are incorrect. As I show below, a firm’s financial condition changes when stock options are

exercised. This affects future profitability and thus indirectly the stock price. Those who argue that what happens to the shareholders’ wealth is immaterial to the financial accounts of the firm ignore the purpose of having the accounting done in the first place.

### Economic impact of employee stock options

To understand the economic effects, consider the following example: Assume a company with five shares outstanding, trading at \$80. The employee has a stock option for one share at a strike price of \$50. For regular stock options, the firm has a choice of issuing new shares or purchasing old shares to resell to the executive. For an SAR, the transactions that take place at exercise are predetermined.

Two methods have identical effects on the firm’s balance sheet, income, and stock performance. The firm either pays the employee \$30 directly or purchases a share of stock for \$80 and sells it to the employee for \$50, leaving shares outstanding at five and reducing the firm’s assets (and the book value of equity) by \$30. The reduction in assets can be expected to reduce future income and so future earnings per share. If not fully anticipated prior to the exercise of the option, the stock price is likely to decline to reflect the reduced value of the pro rata claim on assets and earnings.<sup>4</sup>

The effect of the third method of exercising employee stock options on the general stockholder, the sale of new shares to the employee at the strike price, is more subtle. The sale in this instance increase assets; however, it also increases the number of shares outstanding. To see that the general stockholder is worse off, consider the alternative of selling the new share in the market. The market would value the new share and revalue the old ones based on its assessment of the firm’s ability to invest the proceeds profitably. If the firm was expected to make as good use of the new equity as it has of the old, the value of the firm would increase commensurate with the increase in outstanding shares, and the stock price should be unaffected (remain at \$100). However, in selling the employee the stock at only \$50, the firm value would increase less than the increase in the number of shares and, therefore, the per-share value must decline.

These examples show that the *exercise* of employee stock options invariably involves a loss of value for stockholders and is thus a transfer of wealth from stockholders to the employee.<sup>5</sup> Of course, the loss may be less than was expected at the time the option was issued and the resulting increased effort the executive expends on their behalf may more than compensate for the potential loss in value at the time of exercise. Or it may not. If the stockholders properly anticipate these effects, the stock price will first respond at the time the option is issued instead of when it is exercised and will adjust as the potential loss in the value of their claims on the firm's assets and net earnings changes. To facilitate this, accounting statements need to contain information that will let investors assess the potential loss in value embedded in stock options that have been granted but not yet exercised. Without this information, they cannot value their own claim on the firm or monitor the executives' compensation. It is also desirable for the value of outstanding options to be reflected on the balance sheet, so that the book value of the stockholders' equity is minimally impacted by the event.

### How are employee options valued?

The most straightforward solution is the least likely to be adopted: Firms could simply purchase stock options from third parties and give them to their employees. This would involve a one-time, certain cost. If the options were exercised, the costs would accrue to the option writers and not to the firm and its shareholders. This would, of course, involve a cash outlay at the time of the option was issued (purchased). That this form of employee stock option is not widely adopted reveals something of the motive behind their current usage—to transfer value to the employee without the appearance of an actual expenditure.

Because employee stock options are not traded, their valuation necessarily depends on models. The Black-Scholes and binomial models are the most common.<sup>6</sup> The theoretical value depends on a number of factors, some of which are unambiguous (strike price, current stock price, expiry date, vesting date); some of which are relatively unimportant (interest rate); and several of which are both important and difficult to measure (stock

price volatility and probability of vesting), opening the potential for mispricing and manipulation.

A normal option is usually worth more than its intrinsic value. Options that have not yet vested are worth somewhat less than a vested option, though how much less depends entirely on how likely the employee is to leave.<sup>7</sup> Adjusting for the possibility of forfeiture of options before they vest may reduce the theoretical value of unvested options below their intrinsic value. Similarly, if the employee would lose any vested, but unexercised, options upon leaving the firm, the value of his option will be less than it would if he could keep it upon leaving, though in this case the forced-exercise-adjusted value would still exceed the intrinsic value.

While the valuation of options is fraught with ambiguities, I note two facts: First, the ambiguities become smaller as time passes and eventually disappear; and, second, ignoring the complexities of vesting and forced-exercise results in valuation that is conservative (i.e., higher). The convergence of theoretical value to (the observable) intrinsic value over time means that modeling errors are much less important if options are *both* expensed at issuance and then marked-to-model over time. Over time, the errors in estimating original option expense and subsequent gains and losses to outstanding options will cancel out.<sup>8</sup>

### Accounting and economics

Employee stock options involve two economic considerations that accounting is ill equipped to deal with: opportunity cost and contingencies. Opportunity cost involves the counter-factual "what might have been." Consider the simple example of the sale of an asset for more than its book value but less than its market value. Since the asset is on the books at its book value, rather than true value, the transaction would appear as a gain or positive income. What is economically important is the market value of the asset, not its book value, so the firm is worse, not better off. The stockholders would not be pleased if they were made aware of the transaction, and if the sale was to an executive it might be considered improper, if not illegal. The same informational problem applies to employee stock options; by definition they are designed to sell something for less than their

market price (unless it is an SAR). Accounting also fails to see unissued or repurchased shares of the firm's stock as having value. When such shares are sold, either to the market or to an employee, there is no accounting benchmark for reporting whether an economic gain or loss was made on the sale.

Contingencies are "might be's." Employee stock options contain several contingencies: the employee might leave and forfeit the option before it vests; the stock price may or may not go above the strike price; the employee may be forced to exercise early. FASB suggests, and IASB mandates, that vesting be handled by amortizing the initial fair value of the option over the vesting period, the idea being that the employee "earns" a proportion of the option during each intervening period. This ignores the fact that the option is not earned continuously, but all at once when the employee completes the stipulated period of service. However, the contingent (on the employee staying with the firm) liability is created when the options are issued. The possibility of forced exercise is handled by using "expected exercise date" rather than "expiry date" as an input to valuation models—an ad hoc adjustment that has little or no basis in option pricing theory, and one that replaces a known quantity with a subjective guess and serves only to reduce the reported value.

Other types of contingencies, e.g., bank loans that may or may not be paid back, are accounted for by creating a

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contra-accounts or reserves to capture the estimated loan defaults or returns. Since the gross loans or sales are relatively unambiguous and the offsets are clearly subjective (and subject to manipulation), the reader of these accounts is able to differentiate between the more and the less reliable components of information. Similarly, an employee may or may not forfeit their options before, and may or may not be forced to exercise after they vest. If the accounting treatment consisted of a straight (American) option model value and then an offsetting adjustment for estimated forfeitures and forced exercise, the reader could see the full potential value, as well as the firm's "best guess" of the value of the offsetting contingencies. This leaves one big uncertainty: the volatility input to the option valuation model. The easiest way to eliminate manipulation of this crucial number is to require a standard number be used, e.g., the Chicago Board Options Exchange's implied volatility index (VIX), allowing managers to report alternative estimates in the footnotes.

## Conclusion

The exercise of stock options involves a loss of value to the stockholder, just as real as the gain to the executive or employee. Outstanding stock options represent a liability to the firm in the economic sense, if not the usual accounting sense. This liability represents a senior claim on the firm's assets and a potentially important component of managers' compensation.

Transparency is therefore important. To achieve transparency, ensure comparability across firms, and reduce the scope for manipulation, the aggregate fair value of outstanding employee stock options should be reported on the balance sheet in as straightforward a manner as possible, with clearly differentiated "reserves" for forfeitures and forced exercises. This fair value could be accompanied (in footnotes) by information concerning the potential dilution represented by outstanding options. Firms that wished to offer non-standard models or inputs (e.g., volatility assumptions) could do so in footnotes.

Newly issued options should be expensed at fair value, as should changes in the value of outstanding options, since these represent ongoing gains and loss of value to stockholders. Then, the choice of model becomes a secondary consideration—over time any model errors will self-correct. Any hedges to reduce the risk associated with employee stock options should be similarly expensed and marked-to-market. Properly constructed, hedges can reduce the volatility associated with marking-to-market outstanding options, but they are not costless and they cannot eliminate the value transfer associated with the initial grants. To enable stockholders to monitor executives, the fair value of new option awards and aggregate outstanding options (vested and unvested) of senior executives should be noted in footnotes. The IASB proposals are a positive step in this direction.

<sup>1</sup> For concision, I use the term "employee stock options" to mean both executive and non-executive stock options. The accounting issues are the same, though the corporate governance issues differ.

<sup>2</sup> By general stockholder, I mean an outside stockholder who is not able to participate in the stock option plan.

<sup>3</sup> Recent cases such as Enron and WorldCom have shown that this also produces an incentive for fraudulent misrepresentations of the firm's condition to drive up the share price, something not anticipated in the theory.

<sup>4</sup> While the general stockholder may be indifferent between a cash-paid SAR and stock purchase and resale, the employee is not. The employee's preference depends on taxes and whether he can sell the share at the pre-exercise price.

<sup>5</sup> Hedging the value of the option may produce offsetting cash flows at the time of exercise. It is doubtful, however, that a perfect hedge could be constructed given the forfeiture and forced-exercise contingencies embedded in employee stock options, or that a hedge would be costless. In any case, hedging an asset or liability is not usually considered a valid reason for not reporting it.

<sup>6</sup> The details are unimportant. The binomial model is more flexible in handling vesting periods and forced exercise due to termination of employment.

<sup>7</sup> This is unlikely to be reliably reported in financial statements.

<sup>8</sup> The FASB proposal to modify FAS 123 concerns only expensing of options at issuance using fair value, so initial valuation errors will not disappear. The IASB, on the other hand, proposes accounting for changes in the value of outstanding options as well as expensing newly issued options.