

What Reporting Officers Should Know about FAS 123

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The Financial Accounting Standard Board's (FASB) revised FAS 123 establishes financial accounting and reporting standards for stock-based employee compensation plans. It mandates that public and private corporations must expense the value of employee stock options in their financial statements for fiscal years beginning after June 15, 2005. It will increase the transparency of firms' accounting methods, and it is the right thing to do from the perspective of investors and the public. Firms should have been doing this all along - and some have.

Under the Sarbanes-Oxley Act of 2002, accounting statements have become much more important in terms of the legal liabilities of executives and the accuracy of reporting statements. Sarbanes-Oxley requires that the chief executive officer of a corporation certify that the numbers reported on the accounting statement are correct. The reporting officer is criminally liable if the numbers are not correct, and we have already seen several CEOs dismissed because of that.

FAS 123 has legal implications with respect to statute law, state laws and also regulatory bodies - the U.S. Securities and Exchange Commission (SEC) being the principal one. There are also indirect regulations coming from the New York Stock Exchange and FASB itself. FASB is not a government organization but it is an accepted rule-making authority. They do not have legal authority to prosecute firms or individuals, but the SEC does. Every publicly-owned company in America is regulated by the SEC, and this means that all public companies will have to abide by this regulation.

The accounting side of FAS 123 is complicated because, like all accounting regulations, there are many different ways you can do things. In this particular circumstance, FASB is not trying to impose anything on companies in terms of what kind of options can be awarded. Firms are free to do whatever they want. But, when options have different features, such as vesting schedules and so on, there can be accounting implications.

For instance, the rule says that a company awarding an employee an option has to report the fair market value of that option as if it had bought the option from a third party and turned it over to the employee. If there's a vesting schedule, the expense can be amortized over the term of the vesting schedule. If it vests a third, a third, and a third over three years, a company would be obliged to count one-third of the expense in each of the three years. There are many other accounting conventions.

FASB also said there are certain acceptable methods that can be used to come up with an option valuation. They mention explicitly something called the Lattice Method. They also mention Black Scholes, which is another option valuation method. They will not hold firms to any particular method, but the process will have to be auditable and produce a number that fair-minded people would say is correct. The truth is that there is only one method that will really work in this case - and that is the Lattice Method.

What I think is going to happen is that firms are going to look at the accounting regulation and initially try to pick the method they think will produce the lowest number. But that may not be acceptable to an auditor. We have already seen firms having to go back and do it again. It is not going to be permissible for firms to simply pick the method that gives the lowest answer.

Determining the Market Value of Stock Options

Determining what an option is really worth when you grant it to an employee requires understanding option valuation in generic terms. Here we have lots of guidance because these are marketable options. We have very good option theory and we know that an option's value depends on the following characteristics...

- Option value depends on the **volatility** of the returns of the firm on which the option is written. Volatility means the variation over time; like standard deviation. In the Black Scholes formula for instance, the standard deviation of the return is one of the key things that produces the value of the option. The higher the volatility - the more the option is worth. This is unlike most other things, where the higher the risk - the less it is worth. In the case of options, this goes the other way. The more volatile the stock price - the higher the value of the option. Everybody agrees on that, including FASB and the SEC. Companies generally know that, but a CFO may not be up to speed on option theory and how options in general are valued.
- Option value depends on **the term of the option** - the time between when it is granted and the expiration date. Obviously, the longer the term - the more valuable it is because you have a much bigger chance that it will go up sometime during that term and you will be able to exercise it at a high price. We know how that works in the case of Black Scholes and we know how it works in general.
- Option value also depends on the prevailing **interest rate**. When an option is exercised, you have to pay cash to the company and you receive the stock in return. So the discounted present value of the cash affects the value of the option. The higher the interest rate, the lower the discounted value of cash.
- The fourth thing that affects option value is whether a company pays **dividends**. If you are an option holder - you do not get the dividends.

When a company pays a big dividend, the price goes down and the option goes down too. When you value a company that pays dividends, you have to make a correction for that.

- Of course, the option value also depends on the **stock price** itself. When the price goes up, the option value goes up. The relationship is non-linear. If the option is way out of the money, meaning the exercise price is way above the stock price, it has a very different response to a change in the stock price than if it is deep in the money. When it goes way in the money, if the stock price is way above the exercise price, then the relationship is almost 1:1.

These characteristics are relevant for every option - whether it is an employee stock option, an exchange traded option, an option on currency or anything else. You have to understand exactly how each of these things affects options in general.

Stock options for large companies such as General Motors are traded on the Chicago Board Options Exchange. Trades are originated by private individuals who go to the market buy and sell options. GM is not involved, but a contract is created and firm's stock price determines how that option goes up and down. We have lots of experience doing these kinds of options, and they help to understand employee option values because we can infer from the traded options what the market thinks of the volatility of the stock. This is called the *implied volatility*, and it is a key input in valuing employee stock options.

By taking the marketable options for a company that grants options, we can deduce what is called a term structure of volatility; not only what the volatility is today, but what the market believes it will be next month and all the way through the term of the option. That does not have to be a constant. It will change over time. From the marketed options we can infer what these volatilities are.

We could compute volatility from historical data, but that is not as good because option valuation should be based on a prediction of future volatility. Often, this is different than what it was in the past.

Other things that affect options are the time until expiration, the interest rate and the dividend process. Interest rates we can observe by looking at treasury interest rates. We know what the terms of the options are. And we can build a model about the dividends that are likely to be paid out by the company in the future. We also have implied volatilities. If these were regular options, that is all we would need. We could plug it into a variant of Black Scholes and get an answer.

Predicting Employee Behavior

The trouble is that the options reported under FAS 123 are not owned by Chicago option traders - they are owned by employees. And employees do funny things. They almost never hold options until the expiration date. They exercise them early, which is suboptimal. When an option is exercised early, there is an implicit loss: the option value that is remaining.

Typically, employee stock options have terms of ten to fifteen years while exchange-traded options usually have terms of two or three years. Such employee stock options are more valuable than an otherwise equivalent, but shorter, option would be on the options exchange. This must be taken into account. The longer terms of employee stock options also make things more complex because one is obliged to forecast things like implied volatilities over longer time periods to come up with a correct value.

So you have to look at employee histories and try to deduce how employees are likely to exercise their options in different future market conditions. This may depend on how quickly they retire or depart from the firm for other reasons. Most firms have lengthy experience with employee options from which to study such behavior patterns.

Anheuser-Busch is an example of a firm in a relatively stable industry where we can get a very clear idea of how many people are going to retire or leave the firm. In more turbulent industries, though, employees may change firms frequently and unpredictably, which makes it relatively difficult to predict employment patterns. The rate of departure, and the rate of option forfeiture, can be much greater for such firms so their options have less value.

Another consideration is employee behavior when options vest. If you were granted an option that had a ten-year life but the option did not vest for three years, and if the price shoots up during the three years prior to vesting, what would you do on the vesting date? A lot of people exercise these options immediately after vesting even though the expiration date is seven years further away. They take the money because they are afraid the stock price will fall.

In addition, employees tend to respond to fluctuations in stock prices. If a stock runs up a lot in price over a month or two, there will be more exercises. If it flattens out, exercises will dry up. In other words, the intensity of exercising depends on recent market conditions.

The labor market also has an impact. If many people move among firms in an industry, or if wage rates are fluctuating rapidly, exercise behavior will be affected. There are differences across individuals, genders and ethnicities. For instance, software engineers in India and California can behave differently. Older people do things differently than younger people. An employee who is making

\$100,000 a year and has \$500,000 worth of options will behave differently than one who is making \$500,000 a year and has \$100,000 worth of options.

Taking all such factors into consideration, a rich variety of employee behavior can be embedded within the Lattice Method. You imagine that the stock price follows some random path. Along that path, you predict how options would be exercised or forfeited at each point on the path. Then you do it for another random path and repeat this until you get a representative summary of what employees are likely to do on average across all possible stock price paths. Discounting the cash flows along each path back to the present and then averaging the present value provides a number that is a reasonable estimate of the correct value on the day the options are granted.

As firms respond to FAS 123 for the first time, many of them are likely to hire outside consultants. They may call on an accounting firm as long as that firm is not also its auditor. Or they could call on other specialty firms such as human resource consultants.

The role of the CEO or CFO in complying with FAS 123 would be to assure the collection of employee data and other inputs to the valuation process so that they are confident of producing a reasonable valuation. Some of these inputs, such as implied volatility, are extremely important. I think CEOs will work closely with consultants to be sure they are doing the work correctly.

A new consulting industry will probably develop to meet this need. Consulting will be required periodically as new options are issued. But this expense will be relatively minor considering the significant impact that the correct option valuation is likely to have on a firm's bottom line.