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Accounting

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PANEL 1: ACCOUNTING

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*Michael Zwecher****

Director, Merrill Lynch

PROFESSOR RAYMAR: Thank you, Alan. Thank you, Law School. I am very pleased to be here and leading this first panel.

I think the policy I am going to follow right here is to start off with my presentation. I am a Finance Professor at Fordham. I have had some experience—working on a paper and a little bit of consulting—with employee stock options. I would like to introduce my esteemed co-panelists up here. I am Steve Raymar. To my left is John Finnerty. To his left is Mike Zwecher.

I am just going to be fleshing out some of the basic issues that have to do with employee stock options. They have been in the news a lot of late. From what I have read, I often learn a little bit when I am reading the articles, but I am often more concerned

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about the fact that much that is of interest is not there.

The four sub-topics here are: what are employee stock options; how are they accounted for and taxed; some survey data on option usage; and some issues in employee stock options.

OVERVIEW¹

- What are Employee Stock Options
- How are ESO Accounted for and Taxed
- Some Survey Data on Option Usage
- Issues in ESO

Now, just so we do not misunderstand my expertise here, I am a finance professor, I am not an accounting professor, and I am certainly not a tax expert, so if anyone wants to correct me as we are going along, feel free.

What are employee stock options?

WHAT ARE EMPLOYEE STOCK OPTIONS

Call Options. Typically:

- 10 Year Life (3 - 4 Year Vesting)
- Forfeit or Exercise Upon Leaving Firm

3 Basic Varieties: NQSO

- (1) Fixed Price
- (2) Variable Price (Incentive Stock Options)
- (3) OSO / ISO – “Incentive Stock Options”

1. The boxes of text, charts and graphs appearing herein were presented as slides by the panelists during their remarks at this International Symposium on Risk Management and Derivatives.

Well, first of all, they are call options. If you do not quite know what a call option is, we will get to that on the next page. Typically, these call options have a ten-year life; they vest over a three- or four-year period. If an employee leaves the firm, they are forfeited, or if they are in the money, the employee can exercise them at that time.

The three basic varieties are: non-qualified stock options, two types; and then, tax-qualified, a third type.

- The first type, and by far the most common, are simple, fixed-price call options.
- The second are variable-price options, also called in the newspapers “incentive stock options.”
- A third type is “incentive stock options.”

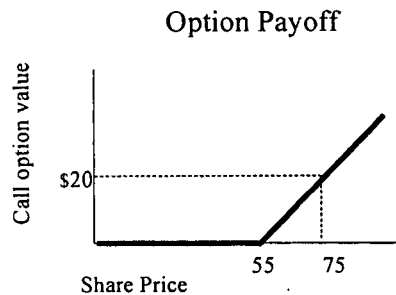
I learned a little bit visiting Mike about three weeks ago, and then, upon some further reading, realized that there are two types of incentive stock options: those that are so-called “tax qualified” and those that are not.

So there are three basic types.

This next formula provides a simple illustration of a call option payoff.

BLACK-SCHOLES CALL PRICE

$$C = S \cdot N(d_1) - X \cdot N(d_2) \cdot e^{-rt}$$



When it expires, or when the owner of the option wants to exercise that option, this is the payoff that would be achieved.

So, for instance, if the exercise price, meaning the price at which the owner of the option exercises the option and receives in turn the stock, denoted in the equation as X , is \$55 and if the stock price happens to be \$75, the employee can purchase that stock for \$55 and have a gain of \$20. That is called “in the money.”

If the option is out of the money, that means the stock price is below \$55, in which case it is not worthwhile to exercise that option.

“Exercise” that option means pay the \$55 and get the stock. So an employee would achieve that immediate \$20 payoff if the option is exercised.

Below is an explanation of the Black-Scholes Call Option Pricing Formula.² It is really not that hard, or that difficult. I am not going to take everybody through it, and I am not going to fill in

2. Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 J. POL. ECON. 637 (1973).

the gaps of what is not here.

EXPLANATION OF BLACK-SCHOLES FORMULA

$$C = S \cdot N(d_1) - X \cdot N(d_2) \cdot e^{-r}$$

S is the stock price;

C is the market value, or an estimate of the market value of the call option;

X is the exercise price;

e^{-r} is simply taking the present value, discounting from the future back to the present.

For this presentation, let's just say that $N(d_1)$ and $N(d_2)$ are roughly probabilities of the option finally being in the money—in other words, the option stock price finally being above \$50.

That is a simple way to present it. So the value of the call is in some probability related to the stock price minus the present value of the exercise price, again multiplied by some probability, and that gives you the call price. It is really not that difficult to deal with in any kind of computational sense.

On the question of “Is it accurate with respect to employee stock options?” John is going to lecture on that in a little while.

How are Employee Stock Options accounted for? Well, first of all, let's start off with a FAS 123³ illustration. FAS 123 is the accounting rule that is being written about and talked about so much of late, and I thank Professor Pat Williams for this little example.

3. ACCOUNTING FOR STOCK-BASED COMPENSATION, Statement of Financial Accounting Standards No. 123 (Financial Accounting Standards Bd. 1995).

HOW ARE ESO ACCOUNTED FOR AND TAXED

FAS 123 Illustration - (Fixed Price ESO)

Grant Date Assumptions - January 1, 2000

Options - 900,000 Employees - 3,000 Vesting Period - 3 years

Expected Option Life - 6 Years Expected Yearly Forfeitures - 3%

Stock Price when Granted - \$50 Exercise Price - \$50

Interest Rate - 7.5% Volatility - 30% Div. Yield - 2.5%

Black-Scholes Value = \$17.15

Thanks to Patricia Williams, Fordham Accounting Prof.

Let's suppose that on January 1, 2000, these options are granted. There are 900,000 of those options given to 3,000 employees and they vest over three periods, just to keep it simple, and the expected option life is six years. Even though they may have a ten-year expiration date, we are assuming the expected option life is six years. The expected yearly forfeiture is 3 percent. The stock price when granted and the exercise price are both \$50. The interest rate is 7.5 percent. Volatility is an estimate of the standard deviation of stock rate of return, 30 percent; and dividend yield is 2.5 percent.

Before we pass on here—the stock price when granted \$50, exercise price \$50—if you think about that previous diagram, what that means is that the immediate payoff value is zero, because the option has an immediate payoff value if the stock price is above the exercise price. So this has an immediate payoff value of zero, and that permits favorable accounting from the corporation's perspective. The Black-Scholes value here would be \$17.15 per option.

OPTIONS VESTED AND COMPENSATION COST

Number of Options Expected to Vest Over 3-Year Period :

$$821,406 = 900,000 \times .97 \times .97 \times .97$$

Total Compensation Cost:

$$\$ 14,087,113 = 821,406 \times \$ 17.15$$

Annual Compensation Cost for Each of Three Years:

$$\$ 4,695,704 = \text{Total Comp. Cost} / 3 \text{ Years to Vest}$$

No Future Changes (e.g., due to Stock Price or Forfeitures)

To continue, over a three-year period, 821,406 options would be expected to vest, each year being reduced by 3 percent. The total compensation cost is for companies that wish to follow or do follow FAS 123, or they have to also follow this procedure in the footnotes if they do not follow FAS 123 directly. So the total compensation cost is, if they use the Black-Scholes fair value estimate, a little over \$14 million. That is the total compensation cost, which would be the expense. If they were paying employees a salary, that would be noted as the expense. But here, under the next section, it says "it would be noted over three years." So if they are following FAS 123, then roughly \$4.7 million would be the expense per year.

There would be no future changes due to stock price or forfeiture. So one thing to keep in mind is if the stock price in the future fluctuates up and down, the ex-post realization of what the employee achieves may end up being much, much higher than that \$14 million, or much, much lower than that \$14 million—these days, typically lower.

I am coming into three little sections on the different employee stock options.

(1) FIXED PRICE NOSO (MOST COMMON BY FAR)

- Include Cost in Income Statement via FAS 123 or Include Detailed Footnotes via APB 25.
- Exercise Value is Immediate Ordinary Taxable Income for the Employee, whether Shares Are Sold or Held.
- Exercise Value is Deductible Expense for the Firm.
- Related Tax Savings is Not Apparent in the Footnotes or in the Income Statement. Perhaps Observed as a Credit to “Additional (Equity) Paid-in-Capital,” or in Cash-Flow Statement, if Material.

The fixed-price non-qualified option is the most common by far. You are allowed to include the cost—perhaps that previous cost that I was illustrating—either in the income statement through FAS 123, or in detailed footnotes according to APB 25.⁴ So a company has historically, at least for the last eight or so years, been allowed to select which method.

The exercise value is immediate ordinary taxable income for the employee, whether their shares are sold or held. Now, that may not have a whole lot to do with the grand scheme of how options should be accounted for, but if you have read that some people have been bankrupted by the employee stock options, this is probably the reason why.

What could happen here is that when they exercise the option it is in the money, meaning that perhaps the stock price was \$100 and they only had to pay \$30 to buy the stock, so that \$70 difference is called the immediate payoff value and that is ordinary income. So what happens if after that the stock price happens to go to zero? Well, if they have held on to the stock, they obviously

4. ACCOUNTING FOR STOCK ISSUED TO EMPLOYEES, Statement of Accounting Principles Opinion No. 25 (Accounting Principles Bd. 1972).

end up with stock worth nothing, but they still have a tax bill because the \$70 is called ordinary income for the IRS. So they could be bankrupted by options if they exercised them, held on to them, and the stock price tanked.

The exercise value is a deductible expense for the firm. The related tax savings is not apparent in the footnotes or in the income statement.

I always find learning more about accounting and tax to be a frustrating endeavor in various ways, and this is one. You know, it would be very nice for APB 25 to say, "Okay, tell us what your tax savings are." But no, they do not say that, and it is very hard to find out what the tax savings are for a company when the options are exercised. They get added into additional paid-in capital or they show up in the cash flow statement, and there is no true rule about how that is done. You really do have to be an expert to find it out. You can estimate it, but it is not so easy to find out on your own.

Often, you have heard of basic Earnings Per Share ("EPS") and diluted EPS. The accounting technique for actually doing the dilution is listed on the next page. I do not think we need to go through all these examples. Just keep in mind the basic idea behind diluted EPS.

DILUTION FACTOR (TREASURY STOCK METHOD)

- Number of Shares is Increased by $Z = \# \text{ in-money Options Less } \# \text{ Shares that } \$ \text{ Exercise Proceeds Could Buy}$; e.g., if 10 options, $X = 30$, $S = 50$, then $Z = 4 = 10 - (300 / 50)$.

APB 25 Footnotes (Merck 1999 10-K)

- Total Beginning # ESO; Average X; # Granted / Exercised / Forfeited During Year; # Options Exercisable (and Average X).
- Reduction in Net Income and EPS as if FAS 123 Were Used.
- Average Black-Scholes Value, with Assumptions.
- Includes 3 Years of Each Prior Item. For Year-End 1999 Only, # Options Are Segmented by X-Range, in \$5 Intervals.

A quick summary. What is EPS? Some version of net income divided by number of shares outstanding.

What is diluted EPS? Roughly speaking, it is the same numerator divided by a bigger number of shares. How do you compute that bigger number of shares? Use the treasury stock method. That is what is being explained here. I am talking about dilution related to employee stock options. There are other types of dilution—for instance, with respect to convertible bonds and such—which I am not going to get into.

Let's go on to the APB 25 footnotes. This is actually quite important for the ongoing, interminable discussions in the newspapers. If companies do not expense their options, what do they do?

Well, as it said a few slides ago, FAS 123 instructs that if you do not put it in the income statement, you have got to put it in the footnotes.

Here is what the footnotes currently and for several years have contained: the total beginning number of employee stock options; "average X" means the average exercise price for the options; the

number granted; the number exercised; the number forfeited in any given year, or in that particular year; the number of options exercisable; and the average X of those options that are exercisable. Exercisable means (a) that they are in the money, and (b) that they are vested. "In the money" means the exercise price is below the stock price.

Continuing, reduction in net income and EPS as if FAS 123 were used. So again, companies are reporting the expense associated with their options on an ongoing basis. They have been reported by all companies.

Average Black-Scholes value with assumptions. And then, it includes three years of each of those prior items. And then, for year-end 1999 there is a little bit more data. That was for Merck's 1999 10-K.

Variable price non-qualified stock options.

(2) VARIABLE PRICE NOSO

- Vesting Depends on Performance Conditions.
- At Grant Date, X and / or # Shares is Variable.
- Accounting and Taxation are Like (1) — But
- Changes in Option Value May be Complex and Volatile, and Net Income Can Be Influenced Even if APB 25 is Used.

(3) QUALIFIED ISO

- Accounting is Similar to (2).
- Grant Size per Employee is Limited.
- After Employee Exercises the Option, any Related Tax is Deferred Until Stock is Sold.
- However, Alternative Minimum Tax May Apply.
- Company does Not Receive a Tax Deduction.

Just for thoroughness, I included a little bit about the less popular variety. I think we can read those on our own.

There is just one thing you should keep in mind: the reason

that Type (1) was more popular was because they did not have to show up in the income statement. Now that perhaps they will have to show up in the income statement, it may become the fact that Type (1) options will no longer be as popular as perhaps (2) or (3). So in the future we might be seeing more of these other types.

Next, some survey data.

SOME SURVEY DATA OF ESO USAGE

Overhang = Grants / Total Shares Outstanding. During 1998 - 2000:

- Merck & Microsoft Overhang Averaged about 7% & 15%

Industries with FAS 123 EPS Declines Over 10% , 1997 - 1999 :

- Health Care Specialty 13% 26% 38%
- Computer Networking 17% 20% 24%
- Commercial & Consumer Services 65% 22% 21%
- Communications Equipment 15% 15% 19%

1999 Diluted EPS & Pro Forma Diluted EPS for a Few Companies

- Chase \$6.27 vs. \$5.88 Delta Air \$7.20 vs. \$6.11
- Merck \$2.45 vs. \$2.3 Polaroid \$0.20 vs. \$.02
- Sears \$3.81 vs. \$3.71 Yahoo \$0.10 vs. \$ (.50)

This is just to give people a taste of the data, and is not indicated here for thoroughness.

It is useful sometimes to define a concept called "overhang," which is the number of option grants divided by the total shares outstanding. In a couple of cases during 1998–2000, Merck's and Microsoft's overhang averaged about 7 percent and 15 percent, respectively.

Above is a list of four industries with FAS 123 EPS declines of over 10 percent in that three-year period—in other words, industries that were using options to such an extent that if they were reporting those options, then their earning would take a big hit.

The likely reason for the decline in commercial and consumer services by 65 percent was because they were not quite as

profitable as, say, computers and networking.

Also included in the chart are some dollar examples: 1999 diluted EPS versus pro forma diluted EPS. Okay, so what is this lingo?

What is pro forma diluted EPS? Well, when the companies have to report their earnings in the footnotes, according to APB 25, they have to report their earnings. It is called pro forma diluted EPS, as if they had been reporting their option expense.

I always like to give Microsoft examples.

MICROSOFT 2000

- Number of Options Granted: 304 Mil.
- Pre-Tax FAS 123 Compensation: \$1.9 Bil (approx.).
- Fair Value of New Options Granted: \$11.145 Bil.
(Latter Number Ignores Forfeitures and Vesting).
- Basic EPS, Diluted EPS, Pro Forma Diluted EPS:
\$1.81 vs. \$1.70 vs. \$1.48.
- Reported and Pro Forma Provision for Income Taxes:
\$4.85 Bil vs. \$4.21 Bil.
- Tax Savings Due to Options: \$5.53 Bil (? No Taxes)
(198 Mil Options Exercised x 27.9 (Tax Rate x Payoff Value)).

In 2000, Microsoft granted 304 million options. They expressed FAS 123 compensation—that is, in the footnotes. If they had been following FAS 123, they would have had an additional expense of \$1.9 billion. The fair value of the new options granted in that year was \$11 billion, ignoring forfeitures and vesting. In 2000, its basic EPS was \$1.81, diluted \$1.70, and pro forma diluted \$1.48. So if FAS 123 had been followed, then its earnings would have been \$1.48. Its reported and pro forma provisions for income

taxes were \$4.85 billion versus \$4.21 billion.

The next item is interesting. The actual tax savings they achieved is on the order of \$5.53 billion. Does that mean no taxes? No, because there are alternative minimum taxes. But, like I said, I am not a tax expert and I do not know how to find these things so easily.

And, lastly, how did that \$5.53 billion come about? Again, no exact illustration, but an analyst has to estimate it. There were almost 200 million options exercised, and if you multiply that by 27.9, then you would get a tax savings of \$5.53 billion.

Again, this tax savings is the reduction in income taxes because companies are allowed to deduct option expense. They are allowed to deduct the option expense in their tax statements, even if they choose not to do it in their accounting statements. That 27.9 is just an estimate of tax rate times payoff value.

I have just listed several of the arguments that seem to be appearing in the press with great regularity.

ISSUES IN ESO / EXPENSING OPTION COSTS

- Options are Costs / But Not Cash Costs
- What if Employees and Suppliers are Paid Only in Options?
- Value of Option Grants Can be Approximated
- FAS 123 Fixes a Cost / Perhaps Never Realized
- Stock Grants Are Similar, but Expensed
- Hedging Options Grants / Not with Written Puts
- Account like FAS 133 / a Worse Solution
- Dilution And Income Statement Expense—Double Penalty?
- Lengthy Phase in Period if Switch to FAS 123 Disclosure
- Prospective / Modified Prospective / Modified Retroactive

I am not trying to put too much emphasis here on which ones are more meritorious, although in some cases I think you can tell by my tone or what you see. But let's start.

Options are costs. Some analysts and experts have said, "Look, you really should expense employee stock options because they are costs." Other people come back and say, "But they are not cash costs, so maybe you should not include them." And then, other people counter-argue, "Well, what if employees and suppliers are paid only in options? Then you would have an interesting outcome: everybody is being paid in options and there is no expense, so the company looks to be very profitable, but it

does not have much of a stock price.” So then, you get at the question of: what is an accounting statement supposed to try to indicate?

Third item: value of option grants can be approximated. John will point that out.

Next, FAS 123 fixes a cost. In other words, when the options are granted, there is a fair value assigned, and that fair value is expensed over time. That fair value is expensed over time even if the ex-post payoff value to employees is much, much higher or much, much lower based on what happens to the stock price.

Some people say, “Yeah, but it is never realized.” Then other people come back and say, “Well, the stock grants are similar and they are not expensed.” I really do not like those kind of arguments, because that is like saying, “Do not worry about this argument because we see it done over there.” Of course, then you could say, “What is being done over there is idiotic too.” So, as a finance professor, I am going to stay away from that.

Hedging option grants is a topic that I am interested in. A lot of companies actually hedge their grants. That has to do with the cost savings. That is a way to actually fix the cost of the option. But, a lot of companies have also lost several billion dollars through hedging strategies that are justifiable in some sense but really not hedging. If you ever read a lot about hedging with written puts, keep in mind that it is more a speculative strategy than a hedging strategy.

Another alternative to hedging options with FAS 123 is to hedge it with this broader accounting battleship that came out a couple of years ago, FASB-133⁵. Mike will point out that that is actually a worse solution.

Dilution and income statement expense. Should you expense an option? When you expense an option, you are reducing earnings. When you use dilution, you are increasing the number of shares. So when you do both, expensing the option reduces the numerator of EPS and dilution increases the denominator. That is the way it is supposed to be done. I have actually had some logical

5. ACCOUNTING FOR DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES, Statement of Financial Accounting Standards No. 133 (Financial Accounting Standards Bd. 1998).

difficulty with that one. Some people may try to convince me that it makes sense to do both. I do not really think it does make sense to do both, but that is neither here nor there.

Lengthy phase-in period if you switch to FAS 123 disclosure. The accounting gurus, instead of trying to figure out a way to make conversion to FAS 123 easier, they are trying to figure out a way to make it harder.

Accounting Principles Board (“APB”) footnotes are actually quite good, but they are often late. That is just another point.

Requiring income statements to clearly reflect ESO expense would make it visible to investors.

APB 25 FOOTNOTES ARE QUITE GOOD, THOUGH OFTEN LATE

- Requiring Income Statements to Clearly Reflect ESO Expense Would Make It More Visible to Investors, Might Reduce Corporate Excess, and Should Not Hurt (if Footnotes Continue to Show Detail). Negative Consequences Predicted by Detractors Are Unimportant. Since Options Are Substitutes for Salary, It Is Difficult to Justify Relegating them to Footnotes, Given Items that Are Required in Financial Statements.
- Since ESO Tax Deductions Are Distinct from Accounting, What Might Help More Would Be a Requirement that Financial Statements Clearly Indicate the Tax Savings Associated with Option Plans, and More Generally, What the Tax Bill Really Is.

It might reduce corporate excess. It should not hurt if footnotes continue to show detail. Negative consequences predicted by detractors are unimportant. Since options are substitutes for salary, it is difficult to justify relegating to footnotes given items that are required in financial statements. So the cynical viewpoint is that the financial statements contain so much junk in the first place that a little bit more cannot hurt.

The last part is since company tax deductions are distinct from Employee Share Option (“ESO”) accounting, it might be more helpful to actually illustrate what the tax savings are.

That is it for my presentation. I am going to pass along the podium to my esteemed colleague, John Finnerty. He is both a Fordham Finance Professor and an expert in many fields, currently a Principal with the Analysis Group.

MR. FINNERTY: Good morning. Thanks, Steve.

It is always very nice to come over here to the Law School and meet with my colleagues and see how the other half lives, with their wonderful facilities. Thank you very much for the opportunity to speak.

I am going to talk about valuing stock options. I understand this is primarily a legal audience, so, in contrast to what Professor Rechtschaffen told you, I am not going to stand up here and present a bunch of equations.

I do have a paper that I have written with a modified Black-Scholes-Merton model that I think demonstrates that you can take that model and adjust it and get reasonable values. I thought it best to spare this audience all those details.

INTRODUCTION

- Employee stock options (“ESOs”) are call options on their stock that companies issue to their employees.
- ESOs are a substitute for cash compensation but current accounting practice permits companies to limit reporting of this expense to the footnotes to their financial statements.
- More than 100 companies have announced that they intend to report this expense in their income statements, and a few are already doing so.

As Professor Raymar told you, employee stock options are call options. Call options are instruments that have been traded in the

public market in this country for thirty years. They are a substitute really for cash compensation. There are some companies, in fact, that have an explicit policy of substituting options for cash.

One of the advantages under current accounting rules is that you do not have to disclose the expense in the income statement; you can put it in the footnotes. Some former colleagues of mine when I was at PricewaterhouseCoopers LLP did a survey of about 500 10-K reports and found that not a single company disclosed the expense in the income statement; they all left it in the footnotes. I am going to explain to you why I think that happens. The current accounting rules result in a substantial overvaluation, and what company is going to want to overstate the expense in its income statement?

Lately, as all of you are aware, companies have found religion, so to speak, and more than 100 have announced that they are going to start expensing options. I have spoken with many of them and asked them, "Well, how are you going to do it?" The response I typically get is, "We will figure out a way."

There are at least three now that do report option expense: Boeing, Winn Dixie Stores, and A&B Property. So there are at least three that have already done it. Boeing has done it for at least a couple of years. So there are at least a few examples of companies that have been bold enough to actually report that expense in their income statement. They are about to be joined by a lot more.

ESOS ARE DIFFERENT FROM TRADED CALL OPTIONS

- Long life (10 years is common).
- Severe restrictions on transfer.
- Vesting requirement with forfeiture if the employee departs prior to vesting.
- Early exercise is common.

Why is valuing an employee stock option or a set of employee stock options difficult? There are four features that make this a little more complex than valuing a simple, market-traded call option:

(1) Ten-year option life. Now, that is actually not as difficult as you might think. There is a very vibrant over-the-counter options market. Market professionals value ten-year call and put options every day. So that is a problem that has been solved.

(2) Secondly, there are severe restrictions on transfer. Typically, you can only transfer these to a family-owned trust or a spouse. Some plans now are allowing some greater degree of transferability, but you certainly cannot go into the market and sell them. There is, as all of you are likely aware, a very vibrant private placement market for equity. They have very tight restrictions on transferability. Market professionals can value the appropriate discount for that lack of transferability. So I would argue that Problem (2) can be solved. It has been solved for equities. We can solve it for options.

Problems (3) and (4) are a little more difficult.

(3) There are vesting requirements. If you leave a company before your options vest, you leave them behind. Unless the company grants you an accommodation and accelerates the vesting, if you leave, you lose their entire value.

(4) And fourthly, because these instruments are not freely transferable, the only way you can get liquidity if you want the cash—so you can buy a second home, a boat, or whatever—is you have to exercise the options for stock and sell the stock. It is that desire for liquidity which accounts primarily for the early exercise.

Problems (3) and (4) are very similar to what we observe in the mortgage market. Individual homeowners decide to prepay, primarily in response to changes in interest rates. From time to time, they default or go bankrupt and there is a foreclosure on their home to pay the mortgage. So three and four would be solvable if we had adequate data. There is a data problem because companies do not publicly disclose, typically, the history of option exercise and forfeiture. Some exercise and forfeiture information does exist. I will show you some data that I have from a Coopers & Lybrand study that was done back in the mid-1990s. So (3) and (4) are solvable if we have the data.

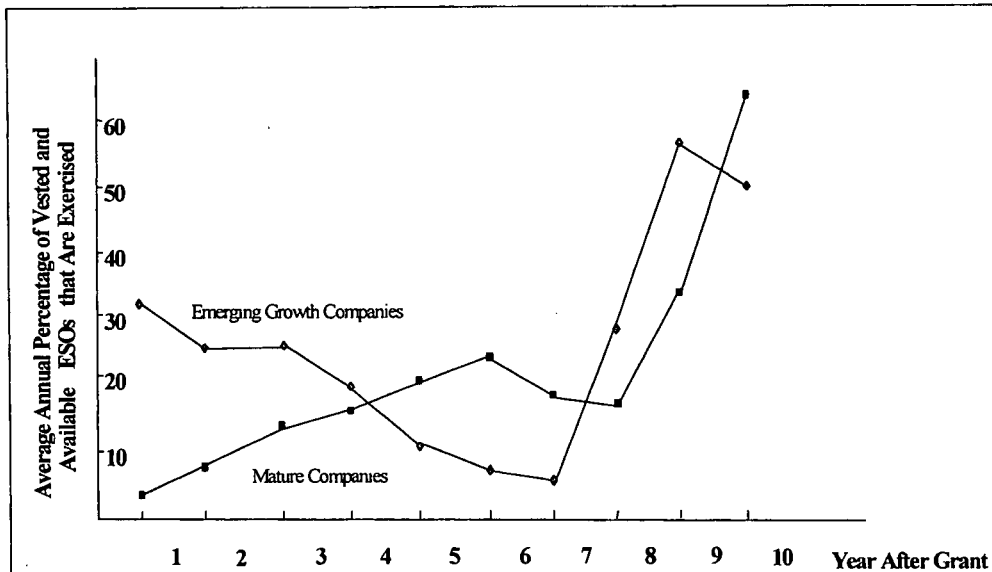
PATTERNS OF ESO EXERCISE

Figure 1. The Time Patterns of ESO Exercise Behavior for Emerging Growth and Mature Companies.

The figure compares the average annual percentages of vested and available ESOs that are exercised by emerging growth and mature company ESO holders without any adjustments for annual forfeitures

The data that I mentioned comes from a Coopers & Lybrand (“C&L”) study that was published in the mid-1990s, at the time FAS 123 came out. This data just gives you a flavor for the exercise rates and how they differ between different types of companies.

The C&L study makes an arbitrary distinction between newer, smaller companies, which they refer to as “emerging growth companies,” and what they refer to as “mature companies.” The difference is that at the time their study started, the mature companies had been public at least ten years and the emerging growth companies had been public a shorter period. Obviously, it is an absolutely arbitrary distinction.

But what is interesting, I think, is that—and other studies that

have looked at this issue have come to the same conclusion—the smaller companies tend to pay a higher percentage of compensation in the form of options; they tend to pay options to lower-level employees. Those option plans exhibit much higher rates of exercise early on. Cisco, for example, in estimating the value of its options, reports in its 10-K an average time to exercise of about three and a half years.

This data comes from before the “tech bubble.” If I were to show you data from 1997, 1998, and 1999, what you would find is that for the emerging companies, the exercise rates would be much, much higher in the early years than illustrated here—very high rates of exercise early on.

Mature companies are different. They tend to grant options to fewer employees, generally more senior employees, and their exercise rates tend to be relatively low in the early years and then pick up over time.

CURRENT ESO VALUATION PRACTICE

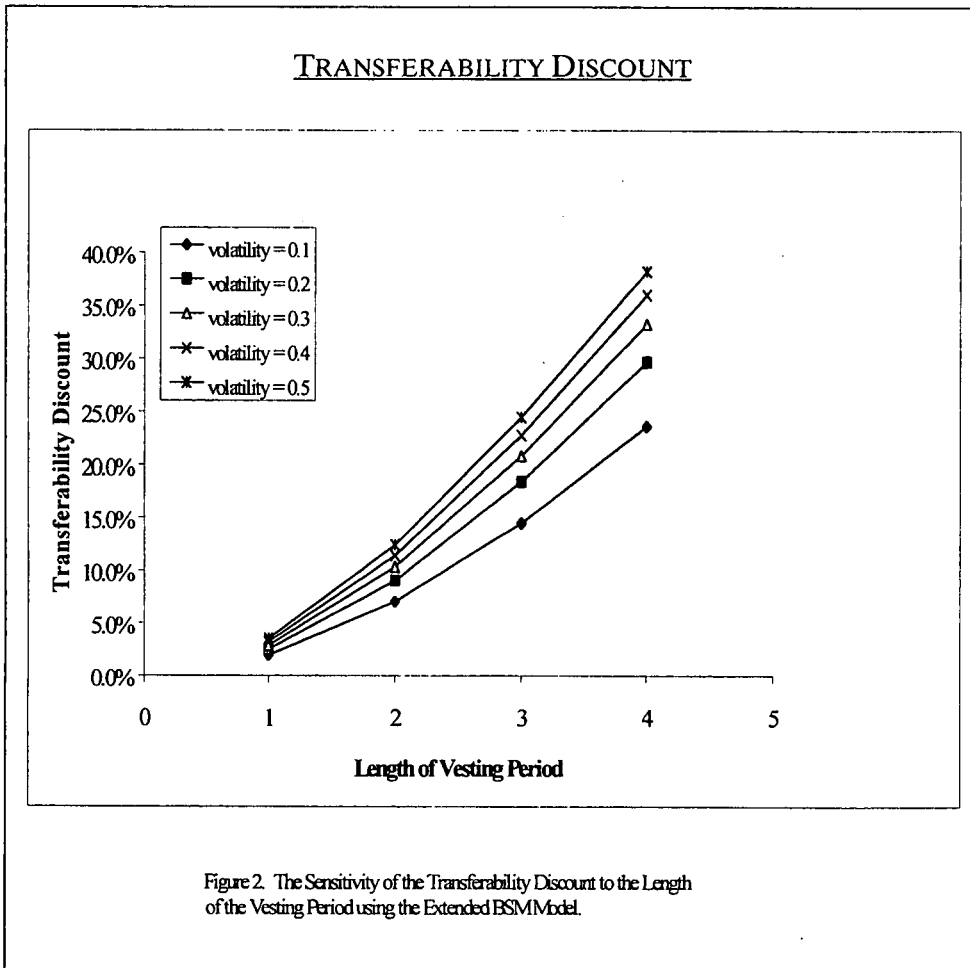
- Accounting rules require companies either to use a “standard” model to value ESOs or the quoted market price of an equivalent instrument, if such a price is available.
- Equivalent market-traded instruments do not currently exist.
- Most companies use the Black-Scholes-Merton (BSM) model with 2 adjustments:
 - Haircut for ESOs that are not expected to vest.
 - Use the average time to exercise in place of the expiration date in the model.
- Results in significant overvaluation.

Next, I'll discuss current valuation practice. Professor Raymar talked a little bit about FAS 123 and APB 25.

What FAS 123 requires is that companies use either of two approaches. The published articles only really talk about the use of a standard model, but there is actually a provision in FAS 123 that anticipates the possibility that a market for these options or similar options may develop. So what FAS 123 says is: if there are truly comparable market-traded instruments, you can use the prices for those. Unfortunately, such instruments do not now exist, but I am quite confident that the brain trust on Wall Street is hard at work trying to develop these, now that companies are going to expense their options.

In the alternative, FAS 123 requires companies to use a so-called standard model, like the Black-Scholes-Merton model or the binomial model, and they can make two adjustments. They can substitute into that model the average time to exercise rather than the expiration date, and they can base that on historical data or a forecast of the future exercise rates. Secondly, they can subtract out from the number of options that are granted the fraction that they expect not to vest; and again, they can estimate that from the historical data.

The problem with that is these instruments are not tradable, they are not exercisable during the vesting period, and as a result, the true value of these instruments is much less than what is being reported in companies' financial statements. We know when we look at the private market for common stock that stock that is locked up for two years typically has a discount of between 25 and 35 percent relative to the prices of comparable equities. Employee stock options usually vest over longer periods. Options are much more volatile than stocks. As a result, the discounts for options ought to be substantially greater than the discounts for comparable stocks. That is really what results in the significant overvaluation of employee stock options under FAS 123.



I have developed a valuation model. I mentioned that I have a paper on this subject that I would be happy to share with people who are interested.

I have actually estimated an appropriate transferability discount. What I have done is take a look at the exercise and forfeiture patterns for a sample of about eleven companies. I have taken this approach to calculating the discount and allowed explicitly for the fraction of options that you would expect to exercise during the vesting period, based on the patterns that I have observed for the eleven companies in my sample.

What I find is that the discount, when you allow for the

forfeiture and exercise patterns observed historically, is relatively small for the first year of vesting, under 5 percent. But notice that it is very sensitive to the length of the vesting period. Portions of the option grant are going to vest over four years. Depending upon how volatile the stock is—in other words, how much risk the option holder is exposed to—the discount can be anywhere from about 30, up to about 40, percent. I have only graphed this for stock volatilities up to 50 percent.

If you were to go back and look during the “tech bubble,” you would find that many of those stocks had volatilities of 70–80–90 percent. So on the four-year vesting portion of the option grant the appropriate discount may be as much as 60–70–80 percent. So the Black-Scholes-Merton value vastly overstates the value of employee stock options when you properly allow for the restrictions on transferability.

There are stories every day in the papers of people who at one time had millions of dollars worth of options that became worthless because the company’s stock went to zero before the options vested. That is the risk we are talking about. It is the risk that with these highly volatile stocks, what goes up may come down.

ACADEMIC APPROACHES TO ESO VALUATION

- Very complex binomial true or contingent claims models exist.
- Valuation can be very accurate but many of the complex models are not very practical.
- They usually require variables we cannot observe, such as each ESO holder’s wealth and degree of risk aversion.

Just a few comments on the academic approaches to employee stock option valuation. There are a number of studies that have appeared in the academic literature. These tend to be very complex contingent claims models.

In fairness to them, they can be very accurate. They are elegant models, one in particular is a binomial tree model. I was speaking to somebody from the International Accounting Standards Board who had looked at the literature and said, "There is one particular wonderful model, but you need twenty different parameters in order to apply it, and you need to know the individual's wealth, and you need to know the individual's degree of risk aversion, and you need to know the individual's gain from changing employment, and seventeen other factors." He could not figure out how to estimate those parameters. Unfortunately, I could not help him either.

So the problem with the academic approaches is that, while they are elegant mathematically and potentially very accurate, they are impractical. You just cannot get the data you would need to apply them.

A MIDDLE GROUND

- Adapt the BSM model for the distinctive ESO features.
- General formula:
Value of Probability(1 - Transferability
ESO = ESO Vests (1) X Discount (2))
X Weighted Average of BSM Values Conditional on
Alternate Exercise Dates (3).
- Use the actual patterns of ESO exercise and forfeiture for a representative sample of ESO plans over a full stock market cycle to estimate factors (1), (2), and (3).

A middle ground between the simple Black-Scholes-Merton model and the more complicated academic models is what I am going to suggest. I decided not to put the formulas in my presentation, but what I am going to give you instead is really the intuition.

Options are granted, typically, with multiple vesting dates. So

what is typical is something like the following: a company will grant a set of options, and have 25 percent vest after one year, 25 percent the second year, 25 percent the third year, and 25 percent the fourth year. You can take that grant and treat it as though it is four separate grants, with the first one having a one-year restriction period, the second one having a two-year, and so on, and apply the approach that is illustrated in the middle of this slide. I can use historical data to estimate the fraction of the options that will fail to vest during the one-, two-, three-, or four-year periods.

Secondly, I can use the information from the private equity placement market to figure out what is an appropriate transferability discount in the one-year, two-year, three-year, and four-year cases.

And then, lastly, by considering different possible exercise dates post-vesting, I can actually treat the option as though it is a series, really a portfolio of Black-Scholes-Merton-type options, and I can apply the Black-Scholes model to each of the exercise dates, and calculate a weighted average of these values based on the fractions that I expect to exercise on each of those dates. Then, I can multiply by the first two factors and come up with a value that it turns out is very consistent with the values that have been published by authors of papers that have these more complex academic models in them.

How do you estimate the exercise and forfeiture rates? The only way you can do that is by getting company data. I will give you an example of a situation that is really somewhat similar.

Back when the mortgage-backed securities market was getting developed, back in the early 1980s, market participants had the same problem: how do you estimate the prepayment rates and how do you estimate the default rates? There was very limited data. The Federal Housing Administration has some data that it published, but it required a period of years while the securities industry and the financial services industry gathered the data. Today, every major bank and every major securities firm has a huge database of prepayment data and default data which they use in their estimation of the values of mortgage-backed securities.

I would argue that today we are able to value mortgage-backed instruments that are far more complex than employee stock options. The stock option valuation problem is very solvable

because we have the mathematical machinery. As long as we can get the data, we can do the same kinds of estimations we did with mortgages and mortgage-backed securities and apply the mortgage-backed valuation approach. Or, you can use the simpler approach that I have described here and adjust the Black-Scholes model.

VALUE OF ESOs AT TIME OF GRANT

T_v	<u>1</u>		<u>2</u>		<u>3</u>		<u>4</u>		<u>Total</u>
Number of ESOs:	750,000		750,000		750,000		750,000		3,000,000
BSM Value per ESO	\$10.11		\$10.11		\$10.11		\$10.11		
$D(T_v)$	2.89%		10.33%		20.82%		33.26%		
Fraction that Vest.	0.97		0.94		0.90		0.87		
Year	P_T	$B^?V$	P_T	$B^?V$	P_T	$B^?V$	P_T	$B^?V$	
1	0.000	\$0.00	0.000	\$0.00	0.000	\$0.00	0.000	\$0.00	
2	0.188	\$0.92	0.000	\$0.00	0.000	\$0.00	0.000	\$0.00	
3	0.146	\$0.88	0.182	\$1.09	0.000	\$0.00	0.000	\$0.00	
4	0.113	\$0.78	0.141	\$0.98	0.176	\$1.22	0.000	\$0.00	
5	0.088	\$0.68	0.110	\$0.84	0.137	\$1.05	0.170	\$1.31	
6	0.068	\$0.57	0.085	\$0.71	0.106	\$0.88	0.132	\$1.10	
7	0.053	\$0.47	0.066	\$0.59	0.082	\$0.73	0.102	\$0.91	
8	0.041	\$0.38	0.051	\$0.48	0.064	\$0.60	0.079	\$0.74	
9	0.032	\$0.31	0.040	\$0.39	0.049	\$0.48	0.062	\$0.60	
10	0.025	\$0.25	0.031	\$0.31	0.038	\$0.39	0.048	\$0.48	
T_E	0.098	\$0.99	0.123	\$1.24	0.153	\$1.55	0.191	\$1.93	
Fraction Expected to be Available for Exercise	0.852		0.828		0.805		0.784		
Fraction Expected to be Forfeited	0.148		0.172		0.195		0.216		
Value of ESO Before Transferability Discount	\$6.23		\$6.62		\$6.89		\$7.07		
$V_R^{(1)}$	\$6.05		\$5.94		\$5.46		\$4.72		
Average V_R									\$5.54
V_R as a % of BSM Value:									54.82%
Total Value of ESOs:	\$4,536,633		\$4,453,164		\$4,092,604		\$3,540,673		\$16,623,074

NOTE:

(1) Value of ESO accounting for probability of vesting, and the transferability discount.

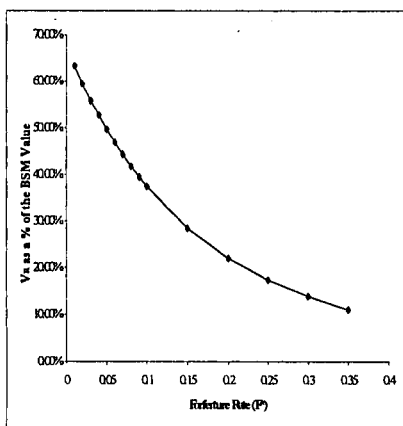
ESOs are valued at time of grant assuming stock price = \$25, exercise price = \$25, risk-free rate = 6%, share price volatility = 30%, option price volatility = 49.5%, dividend yield = 2%, time to expiration = 10 years, graded vesting equally over 4 years, $E^*=0.2204$, and $F^*=0.0335$.

Next I have a simple example. I have an option at the time of grant on a \$25 stock. I have taken the option grant and I have broken it into its four tranches and estimated the value for each one of them using the model whose intuition I have described on the previous slide.

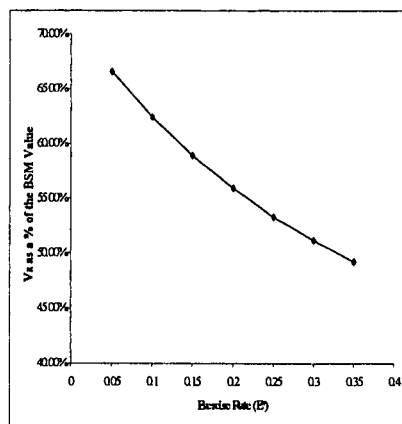
The value that I come up with for the employee stock options is about 55 percent of the unadjusted Black-Scholes-Merton value. I have provided the component calculations for you so you can see the different elements that are in the formula in the previous slide.

This bears out my point that at the time of grant, these options are worth about half of what the unadjusted Black-Scholes-Merton model tells you they are worth.

SENSITIVITY OF ESO VALUE TO EXERCISE AND FORFEITURE RATES



(a)



(b)

Figure 3. The Sensitivity of the Ratio of the Correct Value (V_R) to the BSM Value with Respect to the Forfeiture Rate and the Exercise Rate.

ESOs are valued at the time of grant. The valuations assume stock price = \$25, exercise price = \$25, risk-free rate = 6%, stock volatility = 30%, dividend yield = 2%, time to expiration = 10 years, and graded vesting equally over 4 years. In panel (a), $E^* = 0.2204$, and in panel (b), $F^* = 0.0335$.

I have illustrated in the next slide the sensitivity to forfeiture and exercise rates. Again, this is using actual data.

The forfeiture rates tend to vary between about 3 percent per year and 5 percent per year. There is a little variation even outside

that range, but for most companies, it is in that 3–5 percent range.

The exercise rates, however, tend to be much more variable. As a result, the option values are much more sensitive to that particular parameter.

What is driving the exercise rate more than anything else is the stock price. What we observe in the data is, if a company's stock price rises dramatically, the exercise rate spikes up. If a company's stock price volatility increases dramatically because people are risk-averse, they react to that heightened risk by exercising their options at a higher rate.

And, thirdly, as the options season and get closer to expiration, the remaining time value is less and less; so, as I showed you in an earlier slide, the exercise rate again tends to accelerate, particularly for the more mature companies. People recognize they either use them or lose them, so as the expiration date approaches, they tend to increase the rate at which they exercise.

In my data, the average exercise rate was about 22 percent per year, but there was a lot of variability around that average.

FAS 123 VALUE UNDERSTATES THE TRUE ESO VALUE

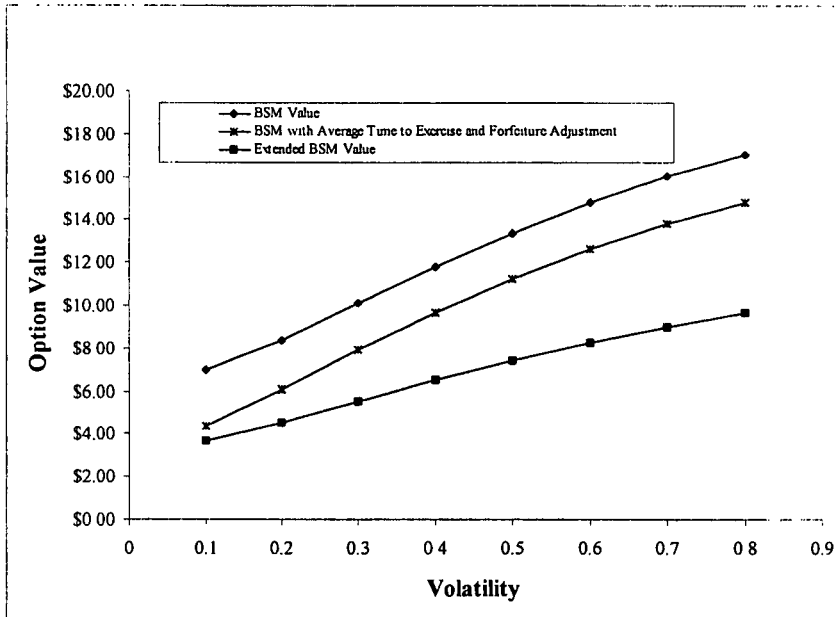


Figure 4 A Comparison of the BSM Value, Extended BSM Model Value, and the BSM Value Adjusted for Expected Forfeitures and Calculated Using the Average Time to Exercise.

The above slide compares the Black-Scholes-Merton value to the FAS 123 value and to the value that comes out of the model that I am proposing. The upper curve is the unadjusted Black-Scholes-Merton value. The bottom curve is what I will call the "true value," the value that comes out of the model that is using actual exercise and forfeiture rates.

For such a range of volatilities, it is remarkable that the true value is about half the Black-Scholes-Merton value. In the example I gave you, in which the volatility of the stock is only 30 percent, I concluded that the employee stock options were worth about half what the Black-Scholes-Merton model said they are. That conclusion remains valid when I allow for even very high volatilities.

The curve in the middle of the slide makes the adjustments to the Black-Scholes-Merton model that are permitted under FAS 123. If you compare the bottom curve to the middle curve, you can see that the options are still very much overvalued.

It is interesting that for low-volatility stocks, the degree of overvaluation is actually fairly small, in the range of maybe about 5–10 percent. For very high-volatility stocks, like the high-tech stocks, that overvaluation is closer to 50–75 percent.

I think that is a very interesting point, because as you may have read in the *Wall Street Journal* about who is really objecting to the expensing, the companies that are the most vociferous are the high-tech companies. Why would the high-tech companies be the ones that would object the most? Because they are the ones that are most disadvantaged because they have the highest-volatility stocks. The larger companies, with 10–20–30 percent volatilities, are not quite so vocal because they are not as adversely affected. But the Intels, the Microsofts, the Ciscos—these companies are more adversely affected by the current accounting rules and the requirement that they use a valuation methodology that results in an overvaluation. So it is not surprising that they are the ones that would object the most to current accounting practice.

CONCLUSION

- It is possible to modify the BSM model to value ESOs with a reasonable degree of accuracy.
- The true ESO value appears to be lower than the value companies are required to report under current accounting rules, which do not permit a discount for lack of transferability.

By way of conclusion, I would make two points.

First, I think it is possible to modify the Nobel Prize-winning Black-Scholes-Merton model to value employee stock options with a reasonable degree of accuracy.

Second, the true employee stock option value is lower—in

fact, it is for many companies substantially lower—than what the current accounting rules require, mainly because these rules do not allow a discount for lack of free transferability. I think that what you will see in the future is, particularly the companies that have announced they are going to expense the options, that they will suggest to the accounting authorities that they consider adjusting the accounting rules to more properly value stock options by allowing a reasonable discount for the lack of transferability.

Thank you very much.

PROFESSOR RAYMAR: Thank you.

Our final speaker, Mike Zwecher.

MR. ZWECHER: Good morning. It is good to be back here and to see some familiar faces.

As some of you may know, I used to be an Assistant Professor here at Fordham. Now I run the Quantitative Risk Management group at Merrill Lynch.

I should say that everything I say here ought to be considered to be my views and not necessarily the views of my employer. Of course, nothing that I am going to say is earth-shattering or controversial—well, except for the last thing.

What I am going to talk about today, briefly, is the marking to market of Over-The-Counter (“OTC”) contracts. For the most part, the interesting ones are derivatives. For the most part we’ll focus on, derivatives instruments, but I’ll mention other OTC contracts. OTC contracts do not always have readily observable prices, although typically we can infer enough about the parameters relevant to the price to find a fairly safe estimate of the price.

This topic is of heightened interest now, partly because of the accounting scandals that have befallen many firms. And there is always a general skepticism about earnings and whether, due to the timing of recognition and vagaries of valuation, reported earnings are only approximations to “true” earnings.

Currently, some of these accounting rules are under either revision or proposed revision. There is an Emerging Issues Task Force looking at mark to market in the energy industry right now that I might have a chance to allude to.

But anyway, when we talk about “mark to market” what do we mean? What we mean is the fair value in an arm’s-length

transaction at which an instrument would trade. By “instrument” what I mean is an option of some sort, or some financial contract. Many of these are complicated and when we are talking OTC, we are often talking about very complicated types of contracts.

WHY MARK TO MARKET?

Reliability vs. Relevance

- Historical cost is highly reliable but valuation at historical would not provide relevant information to shareholders (Manhattan = \$24).
- Accrual may materially misrepresent value of trades when bulk of P&L front/back loaded.
- In principle MTM is best estimate of where asset would trade in arm’s-length transaction.
- MTM provides appropriate incentive to risk-manage positions properly. Without MTM, attempts to properly hedge a position will induce P&L volatility as MTM-
implied risk parameters diverge from accrual-
implied risk parameters.

Mark to market is very important because, along with the prices that you obtain performing a mark to market, price sensitivities to input parameters provide information on how to hedge. Hedging is usually accomplished by taking an offsetting position in a traded instrument. By hedging, you can reduce your risk. So if you are marking to market, and hedging, you have reduced your risk and will not show much Profit and Loss (“P&L”) as market parameters move around. Without mark to market, if you attempt to hedge with listed products, that is going to induce volatility and potentially misleading bias into the P&L that you report. That means that you may forgo trades that are quite profitable simply because hedging would show spurious volatility.

OVERVIEW OF MARKING AND RESERVING POLICY

- Goal is to find a value of portfolio based on “orderly liquidation.”
- Estimate mid-market value taking model-specific valuation adjustments where necessary.
- Move longs to bid and shorts to offer (reserving policy).
- Reserve for high-concentration positions (e.g., position size entails multiples of the average daily volume).
- Reserve for other non-standard features (e.g., credit component).

When we do mark to market what we are trying to do is find what would be the value in an arm’s-length transaction. Now, that does not mean what is the “fire sale” price. That means find the value based on an orderly liquidation.

Typically, what we have are contracts where in our trading arm we are both long and short, similar types of contracts, so we do not simply want to be finding what the bid price is or the offer price. Typically, what we will do is we will estimate a mid-market value between the bid and the offer and then make an adjustment on the portfolio, depending on whether on net we are long or short, to bring the portfolio towards the bid or the offer for the net position.

We will also have a reserving policy for things like high-concentration positions. High-concentration positions would be positions where we own something like, say, thirty days’ of average trading volume in an underlying and to try to either unload or recover those shares or that underlying would significantly move the market. You clearly want to take that into account when you are doing your valuation.

Then, there are reserves for other non-standard features. For

example, many derivatives contracts are exchange-traded. Those that are not exchange-traded have counterparty risk. If there is counterparty risk, you may want to adjust the values appropriately for that feature.

So again, with OTC trades, typically, we are away from the realm of what is exchange-traded and we are in the realm where it is in a broker market, a dealer market, or it is well known only to those that know it well.

OVERVIEW OF ISSUES (1)

For OTC trades few prices directly observable.

- Example 1: Long-dated put option at 50% of spot
 - Exchange-traded instruments exist only for a few strikes on a few dates.
 - Of the available quotes, how many are stale?

- Example 2: Private Equity, held for sale
 - Are there suitable proxies for a comparative (“comp”) valuation?
 - Are reserves reflecting the inherent limits to hedging the position appropriate?

So, for example, one simple OTC contract might be a long-dated put option with a strike price that is 50 percent of spot. Here with a put option what you have is the opportunity to sell shares at a specified price, 50% of spot in this example, by a specific date. Typically, in this context, a firm like Merrill Lynch would be providing down-side protection for a counterparty, although not necessarily. As Professor Finnerty noted, many firms have used written puts as a way of funding and hedging employee stock option plans.

So when we have got these long-dated trades, we may have to try to value the options and value them in an unbiased fashion. So how do you do that?

Well, typically, what we observe is that there are several inputs

that are required to value an option. For Black-Scholes, it is a small handful of inputs, which are, for the most part, observable. The one unobservable input is the appropriate volatility.

As we all remember from algebra, if you have one equation with one unknown, you can almost always solve for the unknown. With options in the listed market we observe the option's price and some of the inputs, volatility being the hardest input to actually observe, so we infer volatility and we calculate what we call an implied volatility that way. From the listed market we calculate several implied volatilities, one volatility for each strike and each expiration. For OTC contracts we then either interpolate or extrapolate from that volatility surface to the volatility that we need to value the contract. So with a long-dated put it would simply be an extrapolated volatility that would be the driving feature of the pricing.

Another example of an OTC contract would be private equity held for sale. So, for example, if you have a position in a company that is a private company, how do you value that position if you are keeping it in a trading account? One way to do it is to find suitable proxies—so-called “comp values”—and use those proxy values to value the shares.

Both of these methods are approximations, but they can be fairly close, and certainly closer than the alternative, which would be the value at either LOCOM, which stands for “lower cost or market,” or on an accrual basis.

OVERVIEW OF ISSUES (2)

Mark to Model may need to be used.

- Models may be biased, thus requiring a reserve methodology for model bias.
- Input parameters may not be directly observable.
 - Volatilities (strikes and maturities not coinciding with listed).
 - Forward Curves (on/off the run curve, beyond the energy curve).
 - Credit Spreads (dispersion around single A).
- Models and inputs normally ignore liquidity issues associated with large trades.
- Need for strong control groups to avoid Enron-style problems.

We call it “mark to market,” but in fact a lot of times it is really mark to model. That may be because, using models consistently across an entire array of products, we get a much better picture of the way to hedge than if we tried to mark some specifically to market and others using the models. So, even though we observe certain listed prices, we generally lump them all together and we use the information from the markets to make sure that our models are extremely close on the listed prices and pretty close on the further-away prices.

Models that we use may be biased, which is not a big deal by itself, as long as we understand the nature and magnitude of the bias. We may choose a biased model over an unbiased model for reasons of computational speed. When we have a biased model, we have a reserve methodology for the valuation bias in the model. That is part of what quantitative risk management is about, those valuation adjustments.

METHODS OF DEALING WITH UNOBSERVED PARAMETERS

- Interpolation between points (connect the dots inside the observed box).
- Extrapolation beyond observed range (projecting dots outside the box).
- Extrapolation adjusted for correlation between assets that have different windows of observability.
- Use of other data, e.g., historical (realized) volatilities and their spreads to implieds.
- Outside broker quotes.
- Testing the market.
- Last Trade.

The input parameters are sometimes not directly observable, with volatilities often the most crucial parameter. The usual suspect in any pricing discrepancy is volatility. For a book of options where the strikes and maturities may not coincide with what is in the listed market, we infer volatilities and hence prices. Using interpolation or extrapolation for this purpose generally works pretty well.

Forward curves are sometimes hard to observe. So, for example, in energy markets, if you are trying to trade electricity, there is no forward curve that goes out twenty years that is observable, but electricity contracts can go out for twenty to thirty years. So you need to be able to try to infer a forward curve so that you can value those appropriately.

What I've mentioned thus far are some of the technical topics associated with valuing a portfolio of OTC contracts.

One of the crucial things that is implicit in a good market process is independent validation, a control group.

Without independent validation, you get into several problems, the most notable of which is probably the Enron problem. I think the fundamental view of many in my area is that the biggest part of Enron's implosion was that there was not an independent control group that could do battle with the business side to independently value the portfolio. And so, without that control, that internal control, there are some biases, some incentives to cheat, that they had the incentive and they ran with it.

USING UNOBSERVED PARAMETERS

- The further away from the liquid listed markets, the less precision in the marks, i.e., the less certain one becomes about where the bid or offer sits.
- Reserves are used to move long positions to bid and shorts to offer.
- The reserve band should widen as one moves to the realm of the uncertain.
- The lower the precision the greater the care and oversight required to avoid either excessively aggressive or conservative recognition of income.

There are several methods to use to deal with unobserved parameters. I have already mentioned them a bit:

- We can interpolate.
- We can extrapolate.
- We can extrapolate from one market to another.
- We can also try to get quotes from other sources, from other brokers. We can call around. There are services. For example, Totem is one service that collects quotes on input parameters, specifically volatilities, from various brokers, and then strips the names off, collates them, and feeds them back, so you can get an independent validation that way.

- Sometimes we will have traders test the marketplace by selling a small piece of a position into the market to see what kind of a price it fetches.

VALIDATION OF MARKS

- MTM is a tool that needs to be wrapped in a controlled process.
- In typical years individual traders have a bias to conservatism whereas management has a bias to smooth P&L and show “outperformance.”
- As important as the marks themselves, is the need for independent verification of the marks in a way that is independent of the front office.

The upshot is that the further away from the listed liquid markets, the less precision that you have. So as we move away from the listed liquid markets, in practice what we typically do is we adjust our reserving policy to take into account distance from what is observable. So the further away you go, the bigger the reserves you typically take. It is in those less-liquid, less-transparent markets where firms ought to be spending greater time to make sure that they have the proper oversight, to make sure that the marks are not too conservative or too aggressive.

To me, the salient feature of a good mark to market is that it needs to be wrapped in an independent control process, and it is the commitment to control that determines whether it works or not.

While we talk about firms that have been overly aggressive in recognizing phantom earnings, there are two biases that partially countervail each other. Both however, point up the need for strong internal control.

Typically, in normal years, traders have an incentive to have a bias towards conservatism, especially towards the end of the year. Once the bonus pool is fixed, you are not going to get any extra

bonus by recognizing a little extra P&L this year, so what you would rather do is defer it until next year. So, typically, in the fourth quarter, the later you go in the fourth quarter, the battle is to avoid losses suddenly showing up which will then be reversed the first two weeks of the next year, as the bonus pool gets filled up, miraculously, in January. This means that individual traders have a bias to conservatism once their bonus pool is fixed thus creating a honey pot for next year's pool.

Whereas management always wants to show that they have reached some astronomic performance level, their bias is generally towards "more, more, more." It is sort of like Audrey, the plant in "The Little Shop of Horrors." When it comes to revenue, the management refrain is always "Feed Me."

So again, I think the main issue for valuation is not whether you can do it or not. We can do it. It is technical, and probably most of it you would find somewhat dry and dull. The real question is: what kind of controls are wrapped around that process to make sure it works? It is not the inexactness of the tools—the tools are as good as the people who use them. The problem is that you have got to make sure that the rules are applied internally consistently and that they are applied at all.

AREAS FOR STRENGTHENING CONTROLS

- It is the lack of controls, not the inexactness of the tools that led to Enron's and Dynegy's problems (As well as Barings, AllFirst, BT and others). Therefore, there is a need for strong internal controls.
- Aligning the interests of managers shareholders via the use of compensation and coercion schemes. What's the penalty for a board member who fails to be aware of a problem?
- What to make of the title CEO and Chairman of the Board?

The problems that we have seen in most of the blow-ups that have occurred lately have not been problems because of inexactness or the inability to mark to market; they have simply been caused by internal failures to have oversight, failure to have internal oversight.

The question really, then, is: How do you align the interests of managers and shareholders? Controls must be independent and control should not flow up only to management, but to an independent board.

I guess the only hand grenade I will throw out there is in a control environment, or if the goal is to align interests of bond holders and shareholders and managers, then what do you make of the title "CEO and Chairman of the Board?" It is a question I just throw out there.

I guess that is really all I wanted to say. And I am happy to entertain any questions. Thank you.

PROFESSOR RECHTSCHAFFEN: I have one question. Are you suggesting that it is oxymoronic to have somebody who is a CEO and a Chairman because of operational mismanagement considerations?

MR. ZWECHER: I think the analogy would be to have someone be President and Chief Justice. Effective oversight requires strong and independent boards, a rubber-stamp board is useless to shareholders.

PROFESSOR RECHTSCHAFFEN: On that note, I want to thank the panel very much for being here.

I want to recognize two important guests who are with us who you will be hearing from a little bit later on.

First of all, Governor Susan Schmidt Bies, who is a Member of the Board of Governors of the Federal Reserve System. Thank you very much for being here. I want to recognize the fact that Governor Bies emphasized to me that she wanted to be here early to hear the other panels so she could bring some of this information back to Washington with her and she could participate and give us her thoughts after she has heard what some of the other people have said.

I also want to recognize Neel Foster, who is a Member of the Financial Accounting Standards Board, who now knows how to value options. Thank you for being here.