



VALUE MATTERS™

The Complimentary Electronic Newsletter for Attorneys and Other Professional Advisors to Business

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Valuing Employee Stock Options

A Guide for Choosing Either Lattice or Black Scholes

Matthew R. Crow, ASA, CFA

As I draft this, comfortably ensconced in seat 6F on a flight home from the September meeting of the Appraisal Issues Task Force (AITF) in New York, it is admittedly difficult to believe the furor that erupted last year over the FASB's proposal to expense stock options. Currently, SFAS 123R is headed for the compliance phase, and the topic for discussion at the AITF is now the future of purchase price allocation, or SFAS 141R. Looking out my window at 35,000 feet I can see for hundreds of miles, and from that perspective it is apparent that 141R is but one part of the FASB's herculean effort to drag financial reporting out of the iron age and into the information age. Nevertheless, at 500 miles an hour I'm still not moving as fast as the changes in financial accounting as I know it, and pooling accounting doesn't look so bad.

Right now, finance professionals at companies across America are working late trying to figure out how best to value their equity based compensation to be ready to comply with SFAS 123R. This involves a range of considerations, but chiefly among these is choosing whether to value employee stock options using a closed form approach, such as the Black Scholes Option Pricing Model (Black Scholes), or some kind of lattice model such as a binomial model. In the initial exposure draft, the FASB favored lattice models over Black Scholes, but in the end sanctioned the use of either methodology. So how should a company decide how to value their employee stock options? Mercer Capital has done option analyses for many years and for many different purposes. We tend to think that Black Scholes is generally more user friendly simply because it has only six inputs ("user" can be defined here as company management, auditors, and the investment community). Despite this, lattice models have generated quite a loyal following because they are far more flexible and are, therefore, thought to offer more precise indications of value. In the end, the models consider similar ranges of behavior in different ways, but typically do not result in materially different conclusions of value. So "getting the right answer" is not the primary criteria in choosing a valuation methodology for compliance with SFAS 123R.

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Black Scholes. Black Scholes essentially has six inputs, four of which are entirely objective and two of which (typically the most sensitive two, by the way) are the product of reasonableness and informed judgment:

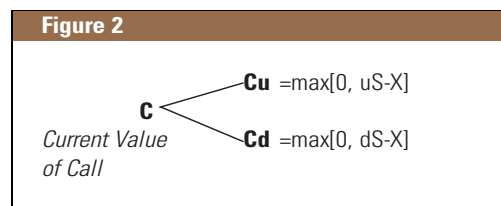
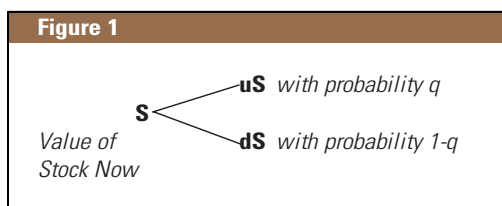
1. The underlying stock price - objectively knowable
2. The risk free rate of interest - objectively knowable
3. The strike price - objectively knowable
4. The dividend yield - this can usually be projected with some degree of certainty
5. The volatility factor – conventional wisdom says that this is a product of the underlying stock's trading history or the imputed volatility embedded in publicly traded options on the underlying stock. But conventional wisdom can be lacking; the volatility factor is a forward looking expectation, which may or may not comport with history (in our experience historical volatility can change rapidly under changing market conditions). Imputed volatility on publicly traded options is also forward looking, but usually for much shorter timeframes than an employee stock option. As a result, this input involves analytical judgment, even if that judgment is to be a slave to history.
6. The expected term or life of the option – again, this is a judgment call. Exercise history is important because auditors will ask for it and because people think so but the input is, again, a forward expectation and history might not be predictive of future events. If your history covers the stock existing in pricing conditions which will not persist into the future then the exercise experience is guaranteed to change. Exercise history lends precision to this process, but precision here cannot be confused with accuracy.

Lattice Models. Lattice models incorporate these same behaviors but allow you to change the expected behavior as much as needed. As a result, you can wind up with as many as 20 different assumptions instead of six - which can be unwieldy. And it is hard to argue that lattice models enhance the explanatory power of financial statements, as they are difficult to explain in financial disclosures such that the investing public can replicate them or evaluate their reasonableness. Lattice models consider early exercise of call options if it is optimal to exercise before expiration. If early exercise is expected to be optimal, the lattice call will have a higher value than that produced by Black Scholes.

A lattice model assumes the rate of return on a stock can have two possible values at the end of any discrete period. If we look at a one period model, the stock price will be either uS or dS at the end of the period. The stock price movement is represented in Figure 1.

Therefore, the value of a call with one period to expiration is equivalent to the representation shown in Figure 2.

At this point, the lattice model assumes the value of a call should be the expectation, in a risk-neutral world, of the discounted value of the payoff it will receive. As the time to expiration is divided into more intervals, the diagrams shown in Figures 1 and 2 take on a lattice framework. If the time to expiration continues to be divided into smaller intervals with smaller up or down movements, the lattice valuation equation approaches the continuous-time valuation equation of Black Scholes.



Lattice models are very much in vogue right now, because, as mentioned, they are deemed to be "more precise" due to the infinite number of inputs. However, projecting forward risk free rates and volatility and exercise behavior five years hence is difficult to "get right." As such, there is a worthwhile distinction to be made between greater precision and greater accuracy.

For a non-dividend paying company, the use of a lattice model will probably not lead to a material difference in option expense, but can be much more cumbersome to implement. Further, a lattice model will offer no more information to investors or the analysts that follow a given stock, and will be harder for auditors to audit.

However, because lattice models are currently preferred by many, credibility with the investment community, the increasing use of lattice models by other public companies, and the comfort of auditors might be sufficient reasons to make the change to some sort of a lattice model.

Planning for Compliance. For those companies in the process of considering which type of model to employ, we offer this guidance:

1. Review your master option agreement, sample option grants, and your option valuation history thus far.
2. Perform a study of other public companies in your industry to see what they are doing to get an idea of what the "herd mentality" is.
3. Talk to your auditors on the front end about how strongly they feel about which option pricing model you choose.
4. Do a more formal comparison of your option expense using different models to show what is involved in actually using the different models.
5. Work with a qualified business appraiser to discern the pros and cons of which valuation model to choose.
6. Have the appraisal firm develop a model that you can reasonably implement, including the derivation of inputs to the model.
7. If applicable, have the business appraisal firm make a presentation to your Board of Directors to go over your protocol for compliance with SFAS 123R.
8. Choose a business appraisal firm that will be available to answer questions from your auditors with credibility.

Epilogue. Of these considerations to make in designing a protocol to comply with SFAS 123R, a few warrant some additional comment.

Much attention is being spent these days on peer behavior, and, indeed, if seven of the eight companies in your industry are using a lattice model to value their option compensation and your company elects to use Black Scholes, be prepared to defend your decision. Nonetheless, at the AITF meeting, I asked the group (which consisted of 50 other valuation practitioners like me from firms across the U.S.) whether or not observing peer behavior in valuation matters leads to best practices or just herd mentality. The group correctly answered "yes."

Elaborate histories of stock price volatility and exercise behavior are interesting and informative and worthy of consideration, but using them blindly as a proxy for the future is expecting past performance to be indicative of future results. Business appraisers make this mistake commonly. Sometimes the past is the only seemingly objective evidence we have to go on. But valuation is about tomorrow, not yesterday, and what is past should ultimately be treated as such (along with rotary dial telephones, Oldsmobile, and the pooling method of accounting for business combinations).

Don't be afraid to ask for help. Mercer Capital has extensive experience in valuing options using both Black Scholes and lattice models. For more information on our services, please contact me at 800769.0967, or by email at crowm@mercercapital.com. ♦

Buy - Sell Agreements: The Do's and Don'ts

A New Book from Mercer Capital, Coming in the First Quarter of 2006

Mercer Capital has reviewed hundreds of buy-sell and other shareholder agreements, and we want to share our “lessons learned” with you. We do not offer legal opinions or guidance, but instead provide a list of things to watch out for and why they are important. Written for business owners, attorneys, CPAs, insurance providers, as well as other business appraisers, the book also includes case studies from our history of client engagements that powerfully illustrate the consequences of badly-drafted agreements.

To be notified of the publication date and qualify for the special pre-publication discount, email Barbara Price at priceb@mercercapital.com. Please type “Buy - Sell” in the subject line, and be sure to provide your name and address in the message.

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Title	Description	Investment	Release Date
Valuing Shareholder Cash Flows: Quantifying Marketability Discounts	<i>Quantifying Marketability Discounts</i> has been updated and is now offered as an e-book. Titled <i>Verifying Shareholder Cash Flows: Quantifying Marketability Discounts - 2005 E-Book</i> , this edition provides a brand new chapter which discusses each of the five assumptions of the QMDM in depth. As a bonus, when you purchase the e-book, you will also receive the <i>QMDM Companion</i> , the latest edition of the Quantitative Marketability Discount Model in spreadsheet format. We plan to continually add content to this e-book, and as a purchaser, you will receive this content <i>free-of-charge</i> when it becomes available.	\$95.00	<i>Currently Available</i>
Valuing Financial Institutions	We are responding to requests to put this book back into print and we are doing so as an e-book	\$65.00	<i>Currently Available</i>
Valuation for Impairment Testing	The first SFAS 142 valuation resource for CFOs and auditors. Also available in printed form at www.mercercapital.com	\$45.00	<i>Currently Available</i>
Are S Corporations Worth More Than C Corporations?	An e-booklet that adds to the S Corp vs. C Corp. debate	Complimentary	<i>Currently Available</i>

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MERCER CAPITAL ON THE ROAD

September 30, 2005

“The Integrated Theory of Business Valuation”

8th Annual Conference of the Arizona Society of CPAs
Phoenix, Arizona

Z. Christopher Mercer, ASA, CFA

October 18, 2005

“Mergers & Acquisition Overview”
Financial Executives International

Memphis Chapter
Memphis, Tennessee

**Timothy R. Lee, ASA and
Nicholas J. Heinz**

November 13, 2005

“Allocating Enterprise Value to Various Classes of Equity”

FCG Conference
Las Vegas, Nevada

Travis W. Harms, CFA, CPA/ABV

The professionals of Mercer Capital have a great deal of experience speaking to industry and professional groups across the nation on topics such as:

- The Integrated Theory of Business Valuation
- Is Your Business Ready for Sale?™
- Purchase Price Allocation
- Valuation of Employee Stock Options
- Litigation Support and Expert Testimony
- Valuation of Privately Held Businesses, Partnerships, or LLCs
- Financial Institution Valuation
- ESOP Valuation

To book a Mercer Capital professional as a speaker at your next conference or CLE/CPE meeting, please contact Barbara Walters Price at priceb@mercercapital.com.

A GENTLE PLUG FOR OUR FIRM

MERCER CAPITAL is a business valuation and investment banking firm serving a national and international clientele. Our reputation for excellence is based on an ability to solve complex financial problems expeditiously. We convert over 20 years of experience, including thousands of assignments, into solutions for the issues of today.

Mercer Capital provides a broad range of independent valuation and financial advisory services, including:

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- Valuation for Corporate Tax Matters
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- Corporate Litigation Support
- Purchase Price Allocations
- Valuation of Employee Options
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- Valuation of Intangible Assets
- Fairness Opinions

MERCER CAPITAL ADVISORS is the investment banking division of Mercer Capital and specializes in providing merger and acquisition services to sellers or buyers of private businesses or public companies divesting divisions and subsidiaries. In addition, Mercer Capital Advisors assists clients in industry consolidations, roll ups, and refinancings.

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Mercer Capital's Complimentary Teleseminar Series

Is Your Business Ready for Sale?™

Presented by Z. Christopher Mercer, ASA, CFA

November 2, 2005

December 14, 2005

January 18, 2006

Noon - 1:30pm (Central Standard Time)

Noon - 1:30pm (Central Standard Time)

Noon - 1:30pm (Central Standard Time)

or purchase the teleseminar series on CD for only \$99

"Is your business ready for sale?" is a question that might seem to have a simple answer: "yes" or "no." But the answer truly has many nuances. There are many aspects of readiness for sale, some of which are more important than others. But *any* aspect of a business that is not "ready for sale" can create issues, slow down the process of an actual sale *when desired*, and cause prospective buyers to write smaller checks - none of which are attractive results.

If your business is not ready for sale, you are leaving in place costly impediments to orderly transfers, opportunity costs of unknown and potentially huge proportions, and the comfort and satisfaction of a job well done - in taking care of your business, your customers, your employees, and your family.

It is time to take control of your future. Do not let another day pass without paying attention to **your most important asset - your business** (or your client's business if you are a business adviser).

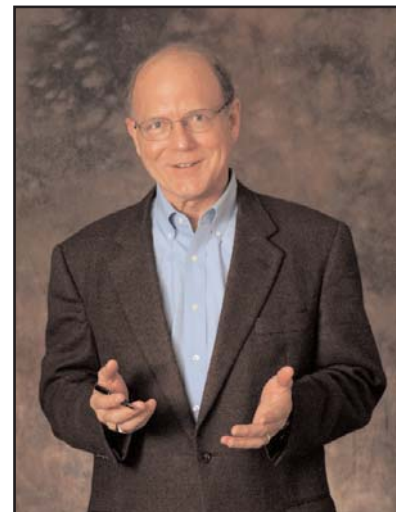
What is the focus of this teleseminar series? This teleseminar series will focus on **value - understanding, building, and realizing** the value of and in your or your client's business.

Will the content of each session be different? **Each of the three sessions will address a different set of topics important to business owners and their advisers.** Attending just one session will mean that you hear only one-third of the total content.

What this teleseminar series IS. This teleseminar series IS **an unabashed effort to convince you to begin the process of getting your business ready for sale** - so that when you are ready - or an unexpected and extravagant offer comes along - you and your company are ready.

What this teleseminar series is NOT. This teleseminar series is NOT a come-on to try to convince you to sell your business now.

Who should attend? If you are a business owner or a professional adviser to businesses, you should not miss this opportunity to share in the knowledge learned from working with thousands of clients representing hundreds of industries. Chris Mercer has taken this knowledge and encapsulated it to a few hard truths about value and what business owners and their advisers must be focused on every day.



Z. Christopher Mercer, ASA, CFA

A Personal Note from Chris

I have enjoyed looking at the world from the perspective of one who values businesses for many years now. That perspective has evolved into one causing me to examine much of what I see and hear based on implications related to value - and values - as both pertain to businesses, projects, strategies or whatever. Through this teleseminar series, I want to speak directly to the needs of business owners and their advisers. You can't work with business owners for over twenty years without learning a thing or two. I will be honored to share what I've learned with you.

Registration information on page 11 of this newsletter.

What specifics will be covered in this teleseminar series? This teleseminar series will address the topics listed below, and more!

The business transfer matrix - it's not a matter of *if*, but *when*

Why you should be ready at all times to sell your business

Why being "ready for sale" is advantageous to most of your employees *and* shareholders

Fair market value vs. the real world

The "Grapes" of value

Value = Profit x Multiple. Right?

Why it's important to understand the levels of value

The length of time it takes to build value

The 60-50 rule

How to identify the *ideal* time to sell your business

How to view your business as an investment - probably the most valuable investment you own

Types of buyers and types of sellers and why it matters

What happens to a business when the owner gets tired

6 different ways to look at your business

Is your business providing the liquidity you and other shareholders need?

What if the business is ready but the owner isn't?

What if the owner is ready but the business isn't?

Understanding how the market values a business

Why it doesn't matter what you (the business owner) think the value of your business is

An overview of recent multiples

Why private equity ain't what it used to be

Who can a business owner turn to for guidance?

The difference between "transferable value" and "value to you"

How to put all the pieces together

Spreadsheet analysis for business that can dramatically enhance your knowledge of readiness for sale

Everyone knows about IPOs but the candidates are few. Are you ready for a PIO (no, that's not a typo)?

Why and when you should pay dividends (or make distributions)

Why reinvestment (not paying dividends) should be a conscious decision

So you're not ready to sell your business - alternatives to sell a part of it now and the rest later

Three lessons about business I'll never forget

What is the role of the business appraiser (or business appraisals) in getting your business ready for sale?

The high cost of complacency

Does being an S corporation make your business more valuable?

Who are the possible or likely buyers of your business

Where your business stands on the "value food chain"

Readiness is an attitude and a process and not an event

Is this just more theory? No. We'll share numerous true stories of business owners who operated their business in a "ready for sale" mode and reaped the benefits. We'll also share stories of business owners who essentially had their heads in the sand and missed once-in-a-lifetime opportunities! **Business owners will learn from the successes and mistakes of others.**

And, if you are a professional adviser to businesses, we'll be providing actionable information you can use to communicate with your clients in these important and sometimes delicate conversations. **If your clients don't see you as a trusted adviser now, after this teleseminar series, they will.**

Qualifications of the speaker. **Chris Mercer has been valuing businesses for more than 25 years.** During those years, he has consulted with hundreds of companies and financial institutions about business planning and business strategy. He has also been an advisor to numerous boards, and have served on the boards of several private companies and one public company. **And, given his wealth of experience acting as a sell-side M&A adviser for numerous companies and financial institutions, he knows when a business is ready for sale — or not.** He'll be sharing this wealth of knowledge with the registrants.

How much does it cost? There is no such thing as a free lunch, but if you dial into the sessions, our teleseminars are **complimentary!** The only cost you incur is the cost of the phone call. The value of the information you'll receive, however, will be priceless.

If your schedule doesn't permit you to join us on November 2, December 14, and January 18, you can purchase recordings of the individual sessions for only \$49 each, or you can purchase the entire teleseminar series on CD for only \$99. The CDs will be mailed to you shortly after each teleseminar. (See **Registration Information** below)

Don't Think It Can Happen To You? A True Story ...

He stared into his morning cup of coffee trying to fathom how he could have walked away from \$25 million.

That's the story of an owner/operator of a manufacturing company located in a small southern town. The business had been in the family for three generations. In the late 1980s, it had revenues of about \$30 million per year with a hefty 20% pre-tax margin. The industry was a niche industry and highly competitive so growth was hard to come by but the family ran the business exceptionally well. So well that they were able to increase market share and sales while generating excellent margins. At this point, the company was worth about \$35 million or 6x pre-tax earnings. It was a prime time to sell, but the family enjoyed not only the income from the business but the social status of owning this business which was so important to the community.

Fast forward to the late 1990s. The general business climate was excellent, the economy was in the midst of a length expansion, and the acquisition market was dynamic. The stock market was booming and interest rates continued to decline. Revenues at the business were \$28 million and the pre-tax margins were still in the range of 20%. However, potential trouble was brewing. Domestic competitors were moving their operations off-shore. Yet, there were still numerous potential acquirers for the business and the company was worth a multiple between 5x and 6x pre-tax earnings – or about \$30 million. Still, the family was comfortable and complacent. They could never imagine that this business that had been such a part of their family and their community for so long could ever go away.

It is early 2005 and revenues are approximately \$20 million and pre-tax margins have slipped to 12% and the downward trend appears to show no signs of stopping. The company is now worth about \$10 million, lay-offs have become the norm, and there are no buyers in sight.

The owner/operator now spends many mornings staring into his coffee before he faces another day at work – looking back with regret. He knows he should have sold and knows now that the same opportunity likely won't come his way again.

Sign-Up Bonus #1

For signing up for this teleseminar series, you will receive a **special pre-publication notice and discount off the purchase price of Chris Mercer's soon-to-be-published book** entitled (not so strangely) "Is Your Business Ready for Sale?"™

You will also be eligible for discounts on future teleseminar series and products from those series!

Sign-Up Bonus #2

You will receive a **complimentary E-Booklet** containing over fifteen recent articles dealing directly with the issues that will be addressed in this teleseminar series.

- Determining the Value of Your Business: Art or Science?
- Private Initial Offerings (PIOs), IPOs or "Back Door IPOs"
- The TR Factor — Business Planning or Not?
- Six Ways to Look at Your Business
- Get Rid of That Crazy Stuff on Your Balance Sheet
- "Tiredness" and Business Value
- Your Buy-Sell Agreement: Ticking Time-Bomb or Reasonable Resolution?
- Investors Paying Attention to Dividends?
- Cash is Good, Right?
- Too Much Cash?
- Why Do Private Businesses Retain Earnings?
- Sprint Nextel and Nextel Partners — What is Fair Market Value?
- Nextel Partners' Put to Sprint Nextel Advances
- Nextel Partners Hires an Appraiser
- Sprint Nextel Provides Valuation Lessons for Appraisers
- A Wally Lowenbaum Story

These articles were originally published as posts on Chris Mercer's blog, [Mercer on Value](#).

Sign-Up Bonus #3

Complimentary sign-up for notification of new posts to Chris Mercer's blog, [Mercer on Value](#). Many of the posts on this blog deal directly with the issues we are addressing in this teleseminar series.

Is Your Business Ready for Sale?™

Teleseminar Registration Information

Register Today for this **complimentary teleseminar series** and/or purchase the entire series on CD using our secure ordering system at www.mercercapital.com/readyforsale.html.

If you are unable to attend the teleseminars or wish to have the information available to you at any time, you can purchase the teleseminar series on CD for only \$99. Shortly after each teleseminar, a CD will be mailed to you.

If you would like to send copies of this teleseminar series on CD to clients and/or friends, contact Barbara Walters Price at priceb@mercercapital.com for information on volume discounts.

You will receive a confirmation after your order. And, if attending the teleseminars, you will receive dial-in instructions several days before the scheduled teleseminar. Also, handout material will be e-mailed to you directly prior to the teleseminars.

And don't forget the **three sign-up bonuses** available with any registration and/or order.

Also, remember that each of the three sessions will address a different set of topics important to business owners and their advisers. Attending just one of the sessions means that you will only hear one-third of the content.

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