Willamette Management Associates

Insights

Issue 109

Autumn 2016

Business Valuation, Forensic Analysis, and Financial Opinion Insights

Thought Leadership in the Valuation of Options, Warrants, Grants, and Rights

Willamette Management Associates

$10.00 U.S.

Willamette Management Associates
Thought Leadership

Insights

Insights, the journal of applied microeconomics, is published on a quarterly basis, with periodic special interest issues. *Insights* is distributed to the friends and clients of Willamette Management Associates.

Insights is intended to provide a thought leadership forum for issues related to the Willamette Management Associates business valuation, forensic analysis, and financial opinion services.

Insights is not intended to provide legal, accounting, or taxation advice. Appropriate professional advisers should be consulted with regard to such matters. Due to the wide range of the topics presented herein, the *Insights* discussions are intended to be general in nature. These discussions are not intended to address the specific facts and circumstances of any particular client situation.

The views and opinions presented in *Insights* are those of the individual authors. They are not necessarily the positions of Willamette Management Associates or its employees.

We welcome reader comments, suggestions, and questions. We welcome reader recommendations with regard to topics for future *Insights* issues. In particular, we welcome unsolicited manuscripts from lawyers, accountants, bankers, and other thought leaders of the valuation and forensic services community. Please address your comments or suggestions to the editor.

Annual subscriptions to *Insights* are available at $40. Single copies of current issues are $10. Single copies of back issues are $250. The cumulative collection of the 1991–2014 issues of *Insights* are $2,500. Single reprints of current articles authored by Willamette Management Associates analysts are complimentary. Single reprints of noncurrent articles authored by Willamette Management Associates analysts are available at $100.

Insights Editors and Staff

Editorial Board

Willamette Management Associates

Insights

Issue 109

Autumn 2016

Thought Leadership in the Valuation of Options, Warrants, Grants, and Rights
Editor for This Issue: Robert P. Schweihs

Stock Option Valuation Insights

Valuation Practices and Procedures Insights

Tax Valuation Insights

Intellectual Property Insights

Willamette Management Associates Insights

2016 Recipient of the Apex Literary Award

Forethoughts

This *Insights* issue focuses on the valuation of derivative securities, including stock options, warrants, grants, and rights. Such valuations are often needed with regard to the derivative securities of publicly traded companies as well as of closely held companies.

Such derivative security valuations are often performed for the following purposes:

1. Transaction pricing and structuring—including the final negotiation of transaction participant requirements and the assurance that a proposed transaction is fair to designated transaction participants
2. Financial accounting requirements related to stock-based executive compensation
3. Income tax accounting requirements related to stock-based executive compensation
4. Contract-based ownership transition—including the design and implementation of shareholder buy/sell agreements and other ownership transition agreements
5. Forensic analysis and controversy matters—including shareholder contract disputes, shareholder breach of fiduciary duty claims, marital dissolution disputes, and other contract or tort controversies

In addition to discussions of financial option analyses, this *Insights* issue also presents discussions of real option analyses. Real option analyses are often used by corporate managements—and other investors—to evaluate the implications of financing, investment, and dividend policy decisions.

In particular, this *Insights* issue features discussions regarding stock option valuation practices and procedures related to ESOP-sponsor companies, to family-owned companies involved in a marital estate, and to the income tax reporting of share-based compensation. This *Insights* issue includes both technical discussions of the components of stock option valuation and the practical procedures that analysts may follow in a three-analyst option valuation process. And, this *Insights* issue presents a discussion on the use of real option valuation to justify merger and acquisition pricing decisions and other investment pricing decisions.

Willamette Management Associates analysts are routinely called on to value (and to support the valuation of) stock options and other complex derivative securities for purposes of transaction pricing and structuring, financing collateralization and securitization, tax planning and compliance, financial accounting and public reporting, and forensic analysis and litigation support.

About the Editor

Robert P. Schweihs

Bob Schweihs is a managing director of the firm, and he is resident in our Chicago office.

Bob focuses his practice on complex valuation analyses related to businesses, business ownership interests, intangible assets, and securities (including derivative securities). Bob performs these complex valuation analyses for many purposes, primarily including (1) transaction pricing, structuring, and fairness assessment; (2) taxation planning, compliance, and controversy; and (3) forensic analysis, dispute resolution, and litigation support/expert testimony.

Bob is the author or co-author of numerous textbooks and textbook chapters. His most recent textbook is *Guide to Intangible Asset Valuation*; the revised edition of this text was published by the American Institute of Certified Public Accountants (AICPA) in 2014.

Bob writes and lectures frequently on topics related to valuation, economic damages, and transfer pricing analyses. He has authored dozens of articles published in professional appraisal, accounting, and taxation journals. He presents frequently to legal, accounting, valuation, taxation, and industry conferences.

Bob holds a bachelor of science degree in mechanical engineering from the University of Notre Dame and a master of business administration degree in finance from the University of Chicago Graduate School of Business.

He holds a certified business appraiser (CBA) credential from the Institute of Certified Business Appraisers and an accredited senior appraiser in business valuation (ASA) from the American Society of Appraisers.

Thought Leadership

The Economic Analysis of Real Option Value

Robert P. Schweihs

The discounted cash flow method does not always completely capture the uncertainty of the future financial performance of a business, business ownership interest, or security that is the subject of a valuation analysis. In those instances, when the valuation purpose should take into consideration the owner/operator's ability to influence the future financial performance of the subject investment, then real option valuation (ROV) theory is a powerful analytical tool. ROV analysis is often used by corporate acquirers—and by other investors—who are more interested in the question "what is this investment worth to me?" than they are in the question "what is the market value of this investment?"

Introduction

The current market price of a publicly traded security may be inconsistent with the net present value cash-flow-based intrinsic valuation of that security's price. That is, the intrinsic valuation of the security (based on a discounted cash flow valuation analysis) may simply not support the apparently excessive public stock price of that security.

In such instances, some market analysts have argued that the generally accepted economic theory of business valuation and security analysis is flawed. Such market analysts would observe that the price at which a security changes hands is the best indicator of its market value.

So, when an Internet services company goes public at a stock price that cannot be reasonably explained by the present value of its expected future cash flow, the question arises: what is wrong with generally accepted business valuation and security analysis pricing theory?

Real option value (ROV) theory is a management (or investor) strategic planning tool that may be used to explain the "unreasonable" or "irrational" pricing that is observed in certain situations in the capital markets.

There have always been situations where investors have made investments at prices that cannot be justified by the intrinsic valuation of the subject investment. These investors are admired (particularly if they are successful) as risk takers who invest perhaps on a "hunch."

This discussion considers how ROV theory may explain some of that intuition. This discussion considers how investment risk takers can better handle uncertainty when they have the right—but not the obligation—to take some action in the future.

Discussion of Real Option Value Theory

ROV theory applies option pricing theory more broadly than does the typical application of financial option valuation (i.e., in the valuation of public company or private company stock options, warrants, grants, or rights). ROV theory is often used as an investment strategic tool.

Buyers of businesses or business ownership interests (including equity securities) may use ROV theory to justify their acquisition/investment pricing (or "overpricing") decisions.

The objective of this discussion is to introduce ROV theory and to proffer ROV theory as a possible explanation for certain capital market pricing phenomena.

When acquisition/investment prices cannot be rationally explained, it is not the generally accepted business valuation theory or approaches that should be challenged. The concept that is really under challenge is the definition of economic value. Investors who pay a price greater than intrinsic value—that is, the price that is can rationally be justified by the present value of expected future cash flow—may be paying what valuation analysts define as "investment value" rather than "fair market value."

That is, an "irrational" price may include components of the value that are brought to the subject investment by the particular investor/buyer.

ROV theory has obvious implications to the valuation analyst or the transactional financial adviser:

1. when using empirical transactional pricing evidence as a guideline indicator of investment fair market value,
2. when advising buyers/investors in the development of potential acquisition candidates, and
3. when pricing and structuring proposed acquisition/investment transactions.

ROV theory also has obvious implications to the valuation, transactional fairness, and other investment analysis of:

1. merger and acquisition transaction pricing;
2. initial public offering pricing;
3. capital budget investment decision making;
4. capital market investment decision making; and
5. lost profit analysis and other economic damages analysis related to securities fraud, lack of public disclosure, expropriations and condemnations, and other securities-related litigation claims.

Investment Value versus Fair Market Value

The various forms of the efficient market hypothesis essentially assume the following:

1. All appropriate information is available to investors.
2. Investors use that information when making their investment pricing decisions.

The price that an investor pays for any security investment incorporates the security holder's right to (1) invest, (2) wait, or (3) divest.

These are the "reactive" attributes of most financial instruments, including both publicly traded company and privately held company stock options.

However, ROV theory also involves "proactive" attributes of stock options, with which the security holder actually takes action to increase the value of the option itself.

With regard to virtually any investment decision, investors have the following choices:

1. Invest now
2. Take preliminary steps to invest later
3. Divest now
4. Take preliminary steps to divest later
5. Do nothing

Each investment choice creates a set of economic payoffs linked to further choices at a later time. This is the premise behind the proposition that all management investment, financing, and dividend decisions can be analyzed in terms of option pricing.

As one may expect, the Black-Scholes option pricing model is where ROV theory conceptually begins. Consideration of the Black-Scholes option pricing model helps to explain these otherwise inexplicable "irrational" investment pricing decisions.

There are direct parallels in the economic variables of ROV theory and the six economic variables encompassed in the Black-Scholes option pricing formula. These economic variable parallels are presented in Table 1.

Table 1
Financial Option Pricing Models versus ROV Analyses
Parallels in the Component Economic Variables

Black-Scholes Option Pricing Model Economic Variables	Real Option Valuation Analysis Economic Variables
Time to expiration	Time to expiration
Risk-free interest rate	Risk-free interest rate
Exercise price	Present value of fixed costs
Stock price	Present value of expected cash flow
Uncertainty of stock price movements	Uncertainty of expected cash flow
Dividends	Value lost during decision period

ROV theorists refer to this phenomenon as "flexibility value." This is where the "investment value" standard of value—versus the "fair market value" standard of value—appears to come into play in ROV theory.

Investment value is often defined as "the value to a particular investor based on individual investment requirements and expectations."[1]

ROV theory seems to fit certain situations that are characterized by:

1. high levels of investment research and
2. high levels of investment development, manufacturing, and/or marketing.

For example, an investor may pay today's "irrational" price for the investment—and then the option buyer may use his/her influence to improve the economic value of the subject investment.

Financial Options versus Real Options

For example, as of the Tuesday, August 16, 2016, the stock market closing price of Facebook common stock was priced at $123.30. The publicly traded option (but not the obligation) to buy one share of Facebook common stock before January 20, 2017, for $110.00 per share was priced at $17.50.

In this case, the investor of the financial option on that day would receive a payoff of $13.30. However, that investor, having spent $17.50 on the option, would be "out of pocket" a total of $4.20. That $4.20 is the amount of the premium price charged for the right to wait to exercise the stock purchase option—if and when the Facebook share price increases.

"Real options" are not traded on organized stock market exchanges the way that financial options are. Real options are more analogous to a "valuation premise."

For example, real options may be applicable when valuing oil exploration licenses, mining patent claims, and other rights that are expected to be exercised later—after more information becomes available about the price of that economic right. After buying the license, the license holder can increase the value of that option several ways.

This real option is different from the typical financial option. This is because the holder of the real option can take several actions that influence the value of the security that underlies the subject option.

As a comparison, the holder of the financial option is not in a position to influence the value of the security that underlies the subject option.

In addition, apparently "irrational" acquisition prices may be explained by the application of ROV theory. For example, these irrational prices may relate to investments that are made in social media companies at a significant premium over what the expected net present value of future cash flow would indicate.

Corporate acquirers often expect that post-acquisition economic synergies will develop. Such expected post-acquisition synergies help to rationalize the significant price premium that is paid over the expected net present value of the target company's cash flow.

Some of the recent social media company initial public offerings (IPOs) indicate that enough investors share this expected synergy explanation that this investment value may have become market value. If and when the economic benefits of the expected synergies are not realized, these investors will presumably divest (probably selling at a more rational price than they bought it at).

Real Option Value "Flexibility Value"

ROV theory encompasses both expected net present value plus "flexibility value"—the change in expected net present value over the option's life.

The application of expected net present value sensitivity analysis—with the best-case, worst-case, and most-likely-case scenarios—does not incorporate the variance across different scenarios. Generally accepted sensitivity analysis procedures recognize the uncertainty with regard to economic outcome exists. However, such procedures do not capture the "flexibility value" inherent in the situation.

The "flexibility value" is something that company management can capture. This is how ROV theory can become a management strategic tool—as well as a possible explanation for certain capital market price dislocations.

Reactive flexibility, or the ability to quickly buy or sell an option, is encompassed in the typical financial option's market value.

Proactive flexibility, where the value of an option can be increased while the option is owned by directly affecting the option price before exercising the option, is part of real option value.

Both with financial options and with real options, the investor decides both:

1. whether to invest and
2. when to invest.

However, with real options, the investor also has other decisions. The investor in real options has the ability to directly influence the "levers" that affect the value of the option. In this way, real option holders operate under the investment value pricing premise—more than under the typical market value pricing premise.

As an example, a pharmaceutical company can increase the option value of a new drug product by obtaining a patent on the drug (and thereby affecting the expected life of the drug product's cash flow generation). Or, the pharmaceutical company can increase the value of the drug by increasing marketing expenditures related to the drug's rollout (and thereby affecting the expected revenue component of the drug product's cash flow generation).

These actions by the corporate owner/investor in the drug would also positively affect the value of the equity positions of the other stakeholder/investors in the pharmaceutical company itself.

Going back to the social media company example, let's assume that a certain strategic buyer pays an irrational price for a social medial company controlling (but less than 100 percent) ownership interest in the social media company's equity.

Then, the strategic buyer may use its influence to directly improve the value of its investment in the social media company. This direct influence serves to increase the economic value of the investment for all of the social media company's other stockholder/investors.

Those other company stockholder/investors may realize that increase in the economic value of their ownership interest:

1. when the strategic buyer tenders for the balance of the social media company equity,
2. when another buyer acquires the entire social media company (and buys out both the strategic buyer and the noncontrolling investors), or
3. when some other liquidity event occurs.

The Value of Management on Real Options

This attribute of ROV theory is an indication of the ability of company management to use its skill and/or its operational control to improve the value of an option—before that time at which management has to exercise that option.

Table 2 presents numerous examples of strategies and tactics that company management could employ that may directly affect the economic value of real options.

In order to illustrate the influence that such management actions may have on real option valuation, Table 2 lists such management actions in categories according to the corresponding Black-Scholes financial option pricing model valuation variables.

Management can increase the subject company value by improving the value of the company's real options. For instance, company management can take action to:

- increase expected operating cash inflow,
- decrease expected operating cash outflow,
- increase the uncertainty of expected cash flow,
- extend a business opportunity's expected remaining useful life,
- reduce the value that may be lost while waiting to exercise the real option, and
- increase the risk-free interest rate.

The subject company cash flow can be increased by:

1. increasing the average selling price per unit through increasing the number of units sold or
2. commercializing complementary business opportunities.

The subject company cash outflow can be reduced by:

1. lowering the operating costs per unit through economies of scale or
2. combining either operating or selling, general, and administrative expenses with expenses already being incurred for other business operations.

Greater uncertainty of expected cash flow increases the real option value. In contrast, greater uncertainty would have a negative effect on the expected net present value of cash flow. Therefore, why would a rational company manager encourage uncertainty? Net present value investment analysis assumes the following:

1. That the subject investor is fully invested
2. That the economic value of the company's cash flow simply fluctuates based upon its expected cash flow and its cost of capital

Table 2
The Impact of Management Actions
On the Value of Real Options

Black-Scholes Option Pricing Model Valuation Variables	Management Actions That May Influence Real Option Value
Time to expiration	Extend the duration of the option Maintain any regulatory barriers Signal its ability to exercise Innovate to hold on to a technology lead
Risk-free interest rate	Monitor the impact of changes in the risk-free interest rate
Exercise price	Reduce the present value of fixed costs Leverage economies of scale Leverage economies of scope Leverage economies of learning
Stock price	Increase the expected present value of future cash flow Develop new marketing strategies Develop new alliances with low cost suppliers
Uncertainty of stock price movements	Increase the uncertainty of expected cash flow Extend a business opportunity into related markets Encourage complementary products, product innovations, and product bundling
Dividends	Reduce the value lost by waiting to exercise Create implementation hurdles for competition Lock up key resources

However, when a company manager/investor has bought an option, the manager is not fully invested. The manager can always exercise when the company's value increases, but the manager's exposure to the downside is limited.

As a result, the manager/investor option holder wants to increase uncertainty—and then the manager/investor will either:

1. exercise the option at the maximum value or
2. not exercise the option at all.

Management could implement an option-based strategy that could increase the uncertainty of the investment's expected future cash flow. An example would be:

1. to make a limited strategic investment in a new market (i.e., to make a "bet" on a new market) and then
2. to wait for the company's competition to better define that market.

In a situation where the market potential appears attractive but is undefined, investment by the company's competitors may be encouraged. Then, the manager/investor either (1) exercises at the top (i.e., at the maximum value) or (2) gets out (i.e., doesn't exercise the option) after the new market information is collected.

The option's exercise period can be extended by, for example, relaxing the terms of the company ownership structure, by obtaining an advantageous government license (e.g., a patent) or regulation, and by raising or extending barriers to entry.

Long-term customer contracts, long-term favorable supplier contracts, domination of distribution channels, or the acquisition of other intangible assets can also extend the option's life.

The value lost while waiting to exercise the option is limited when the subject investment is not paying dividends during the option holding period. In financial options, value is lost during the holding period when dividends are paid to the owners of the underlying security but not to owners of the derivative security—that is, the option holder.

The real option holder is economically advantaged when dividends aren't expected to be paid until after the exercise of the option. The structure

of preferred stock instruments held by venture capitalists have characteristics consistent with ROV theory. This is because the preferred stock agreements specifically limit the payment of dividends before the rights conveyed to the preferred stockholders are exercised.

Further, value lost to business competitors can be increased when the early market entrant effectively pays "dividends" by:

1. expanding market share,
2. locking up key customers, or
3. lobbying for regulatory constraints.

While any particular manager/investor cannot increase the risk-free rate, any increase in the risk-free rate negatively affects the expected present value of future cash flow. However, an increase in the risk-free rate positively affects the option value. This is because such a rate increase reduces the present value of the option exercise price.

Sensitivity Analysis of Real Option Value

The issue of where management should devote its attention to real option investments can be explored by the application of a sensitivity analysis. By using the following example, the effect on the option value of a 10 percent increase in each of the six variables indicates where management's attention should be focused.

In our example, an oil company has the opportunity to acquire from the government a five-year license on an oil field exploration. Let's assume that the present value of the expected cash flow generated from the oil field production is $500 million. And, the present value of the cost to develop the oil field is $600 million.

The net present value of the investment opportunity is calculated as follows:

$500 million – $600 million = negative $100 million

Based on this simple net present value analysis, the company obviously would not make this oil field investment.

Under ROV theory, however, the value of uncertainty is recognized. When analyzing the investment as if it were an option, other valuation factors should be considered.

The variability of oil prices, the improvement of field development and exploration methods, the cost of keeping the option active, and the deferred dividend payout all become part of the ROV of the investment.

We can apply the Black-Scholes financial option pricing model to this illustrative oil field investment opportunity, as follows:

$$\text{Call value} = S \times N(d_1) - Ee^{-rt} \times N(d_2)$$

where:

- S = Stock price
- E = Exercise price
- $N()$ = Value of cumulative normal distribution at the time point ()
- d_1 = $[\ln(S/E) + (r + 0.5\sigma^2)t] / \sigma\sqrt{t}$
- d_2 = $d_1 - \sigma\sqrt{t}$
- ln = Natural logarithm
- r = Short-term risk-free rate (continuously compounded)
- t = time to expiration, in years
- e = Base of natural logarithms
- σ = Annual standard deviation of return (usually referred to as volatility)

Using an assumed 30 percent standard deviation around the expected growth rate of the value of operating cash inflow, a $15 million per year investment to keep the option open (i.e., a 3 percent dividend payout during holding period), and a 5 percent risk-free rate, the ROV of the oil field investment is positive $100 million. This ROV is calculated as follows:

$$\{(500e^{-0.03\times5}) \times (0.58)\} - \{(600e^{-0.05\times5}) \times (0.32)\}$$

In the case of the Facebook financial option price situation introduced earlier, the present value of the financial option investment was negative $4.20. And, the investor was paying for the privilege of waiting until more complete information became available.

In this somewhat analogous oil field investment example, the $200 million spread (between negative $100 million and positive $100 million) is the price premium associated with waiting for more complete information.

In ROV theory, the results of a net present value analysis may be misleading. This is because the holder of the real option has the "flexibility" to influence the components of value. Therefore, the ROV begins to bear a resemblance to the investment value premise of value.

Real Option Value Implications for Management

When evaluating the oil field investment as a real option, changes in the life of the lease, the value lost during the holding period, and an increase in the risk-free rate have less effect than the other valuation variables.

If management could influence the variables by, say, 10 percent, the immediately obvious choices would be to increase the expected cash inflow, to reduce the fixed costs, and to increase the level of uncertainty. This conclusion can be reached by quantifying the percentage impact on the estimate ROV valuation as management changes each ROV valuation variable by 10 percent.

This analysis is summarized in Table 3.

Therefore, in this example (as in many situations), it is more important for management to focus on increasing revenue than on decreasing costs. However, even when there are other management activities that appear to be more powerful, management's ability to influence the other variables should not be overlooked.

For example, a significant 10 percent combined return can be achieved by:

1. extending the duration plus
2. limiting the costs to hold the option.

Real Option Value as a Strategic Management Tool

The importance of ROV theory is that it introduces a mechanism to systematically think through the components of an investment's value. ROV theory may provide a means to challenge the premise behind the generally accepted net present value method of investment valuation. This is because, unlike an ROV analysis, the net present value method relies on the fixed, multiyear investment period model at a fixed cost of capital.

Under the fair market value standard of value, the value indication is typically based upon static investment plans. That method may provide one indication of value at a certain point in time. However, that value does not necessarily incorporate the full vision of the owner/operator management.

Using ROV theory, it is possible for management to analyze—and to affect—private investment opportunities more dynamically.

Management can, after consideration of subsequent information, change the course of an investment or even abandon a project after it has been launched. Managers who rely on a static long-term investment projection may find it more difficult to change course quickly.

ROV strategies are distinguished from the net present value methods because they encourage uncertainty and, therefore, risk. Management's outlook shifts from fear of uncertainty to gain from uncertainty. A wider range of possible management actions based upon learning from new information is translated into value.

Information that is not yet available at the time of the investment makes ROV more of a strategic management tool than an investment valuation tool.

ROV theory takes the shackles off of management which is typically motivated to only make incremental investments. For example, under ROV theory, management would not be obligated to use the same low cost of capital appropriate to analyze an incremental investment in the option value

Table 3
Real Option Value Percentage Change

Black-Scholes Option Pricing Model Valuation Variables	Real Option Value Valuation Variables	Option Value % Change Due to a 10% Change in Each Variable
Time to expiration	Time to expiration	6
Risk-free interest rate	Risk-free interest rate	4
Exercise price	Present value of fixed costs	16
Stock price	Present value of expected	26
Uncertainty of stock price movements	Uncertainty of expected cash flow	11
Dividends	Value lost during decision period	4

analysis of a newer, less entrenched investment opportunity.

ROV theory tries to correct the subjective bias toward incremental investment in established projects by justifying an objective bias toward the advantages available from new information. For example, ROV theory may help company management to justify an investment that just keeps the company "in the game."

Multistage investment policies become more attractive when the project is uncertain and expensive to pursue. Management can make simultaneous investments in multiple opportunities. Even though this investment strategy reduces the upside, it also minimizes the downside.

This kind of leverage distinguishes ROV strategies from the more common risk-reduction diversification strategies.

ROV theory provides some financial structure to help management follow the old rule: maximize the opportunity while minimizing the obligation.

The Facebook financial option buyer has protected the right to buy that share even if the price skyrockets, but the option buyer is protected if the price falls below the exercise price.

ROV strategies incorporate the feature of options into real market investments. They discourage the use of static net present value measures for "go/no-go" investment business decisions.

Real Option Value Analysis versus Net Present Value Analysis

ROV theory challenges the validity of net present value investment valuation methodology. According to ROV theory, the net present value methodology does not adequately capture the expected future cash flow and the cost of capital of many investment opportunities.

For the valuation analyst, ROV theory includes elements of investment value as distinguished from fair market value. This is because, to a great extent, ROV theory is based upon the opportunity that the option holder has to influence the value of the option after acquiring it.

ROV theory may provide insights into the traditional interpretation of the alternative levels of value and into the alternative definitions of investment value, fair market value, and fair value.

Implications of Real Option Value Theory

ROV theory has at least three important implications for valuation analysts, for transactional participants, and for investors:

1. Guideline security purchase/business acquisition transactions that are used to estimate market value indications may have been consummated based on ROV theory valuations.
2. In the negotiation and pricing of acquisition or divestiture opportunities, it is appropriate to consider simultaneous, multistage investment analyses—where the buyer can influence the value at a later point in time. This perspective may allow the buyer to compete for the investment opportunity at higher bid prices.
3. The analysis of the pricing and structuring of acquisitive investment transactions may benefit from the consideration of real option variables, thereby:
   a. giving the investors proprietary rights and
   b. escalating financial obligations with expiration dates.

Summary and Conclusion

ROV theory includes a noteworthy departure from the typical net present value investment analysis. This is the power of real options: ROV theory encourages uncertainty and risk. ROV theory changes the way that investment opportunities are valued by—and are influenced by—manager/investors. In summary, ROV theory changes the way in which value is created.

Footnote:

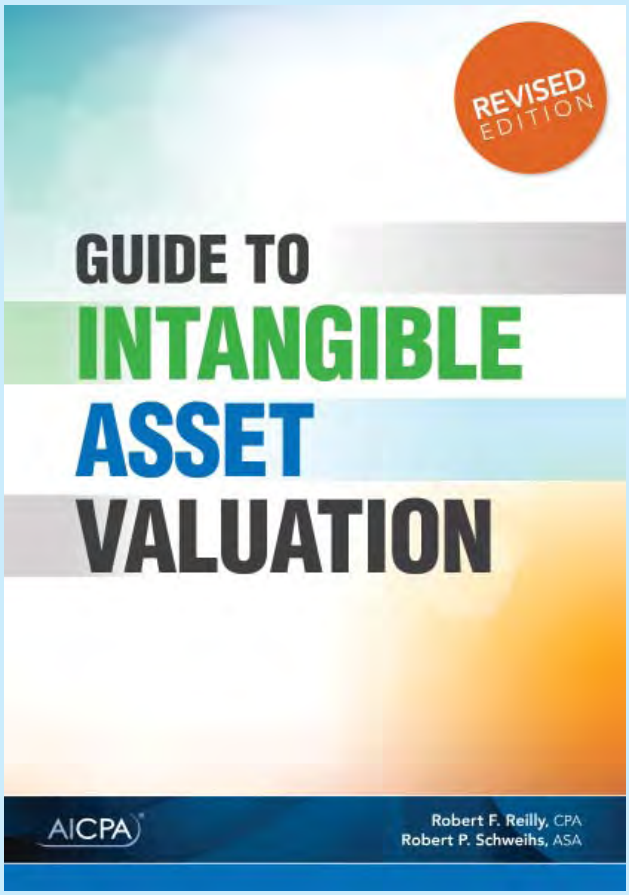
1. International Glossary of Business Valuation Terms (http://bvfls.aicpa.org/Resources/Business+Valuation/Tools+and+Aids/Definitions+and+Terms/International+Glossary+of+Business+Valuation+Terms.htm).

Bob Schweihs is a managing director of the firm and is resident in the Chicago office. Bob can be reached at (773) 399-4320 or at rpschweihs@willamette.com.

We are pleased to announce the 2014 hardback Revised Edition of . . .

Guide to Intangible Asset Valuation

by Robert F. Reilly and Robert P. Schweihs



This 745-page book, originally published in 2013 by the American Institute of Certified Public Accountants, has been improved! The book, now in hardback, explores the disciplines of intangible asset valuation, economic damages, and transfer price analysis. *Guide to Intangible Asset Valuation* examines the economic attributes and the economic influences that create, monetize, and transfer the value of intangible assets.

Robert Reilly and Bob Schweihs, Willamette Management Associates managing directors, discuss such topics as:

- Identifying intangible assets and intellectual property
- Structuring the intangible asset valuation, damages, or transfer price assignment
- Generally accepted valuation approaches, methods, and procedures
- Economic damages due diligence procedures and measurement methods
- Allowable intercompany transfer price analysis methods
- Intangible asset fair value accounting valuation issues
- Valuation of specific types of intangible assets (e.g., intellectual property, contract-related intangible assets, and goodwill)

Illustrative examples are provided throughout the book, and detailed examples are presented for each generally accepted (cost, market, and income) valuation approach.

Who Would Benefit from This Book

- Litigation counsel involved in tort or breach of contract matters
- Intellectual property counsel
- International tax practitioners
- Property tax practitioners
- Auditors and accountants
- Valuation analysts
- Licensing executives
- Multinational corporation executives
- Commercial bankers and investment bankers
- Merger & acquisition professionals
- Bankruptcy professionals
- Judges and arbitrators

Join the Thought Leaders!

Willamette Management Associates is actively recruiting analysts for our offices in Chicago, Atlanta, and Portland. We are seeking qualified candidates at the managing director, manager, and associate levels. For more information, please visit our website at www.willamette.com.

Willamette Management Associates

Guide to Intangible Asset Valuation

Table of Contents

Valuing Derivative Securities and Share-Based Compensation for Marital Dissolution Purposes

Robert P. Schweihs

As an asset of the marital estate, derivative securities and share-based compensation are subject to special consideration. Restricted stock, stock appreciation rights, and employee incentive stock options often require some future event to occur before those security interests vest. And, once vested, those security interests are often subject to restrictions on transferability. Various important dates (employment, grant, vesting, exercise, expiration) affect the value of these securities to the marital estate. Valuation analysts should be aware of the unique characteristics of these securities and of the effect of such characteristics on the value to the marital estate.

Introduction

For purposes of this discussion, derivative securities and share-based compensation considered for marital dissolution purposes include the following:

- Employee incentive stock options
- Restricted shares
- Stock appreciation rights

These financial instruments are provided by employers as a form of compensation to employees. The value of these financial instruments may need to be estimated for many purposes, including in the case of a marital dissolution.

It is necessary for the valuation analyst (analyst) to carefully define the financial instrument that is subject to valuation. In particular, the definition of the financial instrument should include its attributes.

In addition to the number of shares involved, the attributes of the financial instrument are a function of many different dates:

1. The date of employment
2. The date of the grant
3. The conditions of vesting of the financial instrument
4. The exercise date of the financial instrument

Often, these dates may affect how the share-based compensation is treated for certain marital dissolution purposes.

For financial accounting purposes, stock-based compensation is accounted for under Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) topic 718. "How to account for stock-based compensation for financial statement reporting purposes" is a subject that is different from the subject that is covered in this discussion.

However, there are some overlapping concepts. For both financial statement reporting and income tax reporting purposes, the accountant is concerned with:

1. whether, when granted, the stock-based compensation should be classified as equity or as a liability to the company and
2. whether (and when) periodic changes in the value of stock-based compensation generates compensation expense to the company.

While these concerns affect the treatment of share-based compensation for family law purposes, the focus of this discussion is: What factors affect how derivatives and share-based compensation should be valued for family law purposes.

This discussion focuses on how the share-based compensation affects the financial position of the marital estate.

An important issue that distinguishes the valuation of share-based compensation for family law purposes from the valuation of share-based compensation for financial accounting purposes is the fact that share-based compensation is treated:

1. as an asset on the marital estate's balance sheet for equitable distribution purposes and/or
2. as income on the marital estate's income statement for support purposes.

Before we get to this issue, a foundational discussion for the valuation of share-based compensation may be helpful.

First, it may be useful to review the various reasons why share-based compensation value is required. Accordingly, we will review the terminology that will be used in this discussion.

Second, components of derivative securities and share-based compensation will be covered, and the most common valuation models will be summarized.

Situations Requiring Share-Based Compensation Valuation

Some of the situations that may require the valuation of share-based compensation include the following:

1. At the time share-based compensation is designed, granted, exchanged or terminated
2. For company proxy statement disclosure
3. For financial statement footnote disclosure
4. For determination of compensation of executives for SEC disclosure or for income tax purposes
5. For transferring the ownership of the option to a third party
6. For damages suits in which the value of the option is at issue, such as a breach of contract suit between an existing or former executive and the issuing company
7. For the repurchase of an option by the issuing company
8. For the divorce of an executive who holds an option

The analysis of share-based compensation may be different based on the purpose for which the valuation is performed.

Important Terminology

Hedgers and speculators are better able to meet their financial objectives by trading newly created securities with values that are contingent upon the value of other more basic underlying variables.

These securities are known as "derivative securities."

Some derivative securities are traded on public security exchanges. Some are created specifically by a corporate acquirer to meet the particular needs of the holder of the capital of a corporate seller. Others are made available to corporate clients by financial institutions or added to new issues of securities by underwriters.

Derivative securities are being used more commonly by closely held businesses. These securities are used when the business owners plan their estates or create an employee stock ownership plan.

In addition, derivative securities are used in making corporate acquisitions and divestitures.

There are publicly traded derivative securities that depend upon stock indices, currencies, futures contracts, and interest rates.

Derivatives can be contingent on almost any variable, from the price of beans to the amount of snow falling at a certain ski resort. There are even options on options, called compound options.

The derivative securities considered in this discussion are options to purchase the stock of either a publicly traded company or a closely held company. In either case, there is no public trading market for the option itself.

Although the financial instruments considered in this discussion are more correctly called warrants in the public markets rather than options, we use the term "options" here. This is because these financial instruments arise most frequently in the familiar context of employee incentive stock options. It is also because contracts conveying such instruments in connection with private placements of capital usually use the term "option" rather than the term "warrant."

Financial instruments called options in the public stock market differ from the options addressed here. Publicly traded options are issued by third parties (so that, at exercise, they are satisfied by already outstanding shares) rather than the company itself. Also, public options are issued for periods of months rather than for periods of years.

The financial analysis of derivative securities has become a specialty area in its own right—complete with its own jargon. The following paragraphs provide an explanation of some of the more common terms.

A "stock option" is a derivative security the value of which is contingent on the price of a stock. An option gives the holder the right to do something—to buy or sell the underlying stock. The holder does not have to exercise this right.

This fact distinguishes options from "forwards" and "futures" where the holder is obligated to buy or sell the underlying asset.

A "call option" gives the holder the right to buy the underlying stock by a certain date for a certain price.

A "put option" gives the holder the right to sell the underlying stock by a certain date for a certain price.

A "stock warrant" is of a longer duration than a stock option and is issued by the company rather than by third parties. The pricing of a warrant must take into consideration the potential dilution effect on earnings.

The "strike price" is the fixed price at which the option is exercisable, sometimes called the "exercise price."

The "expiration date" is the last date for the holder to exercise his right. American options are exercisable any time up to the expiration date while European options can only be exercised on the expiration date itself.

The "value" of an option is the sum of its intrinsic value and its time value.

"Intrinsic value" is the difference between the current price for the underlying stock and its strike price. It is never less than zero.

An American option is worth at least as much as the advantages in price it gives its holder to buy the underlying stock.

If the value of the underlying stock is above the exercise price, the option is referred to as being "in the money. If the value of the underlying stock and the exercise price are equal, the option is referred to as being "at the money." If the value of the underlying stock is less than the exercise price, the option is referred to as being "out of the money."

For options that are at the money or out of the money, the intrinsic value is zero but the option may still have time value.

The time value of a stock option is the present value of the expected difference between the value of the stock at the option's expiration date and the option's intrinsic value on a certain date.

It may be optimal for the holder to wait rather than to immediately capture the intrinsic value (and begin to collect dividends and to vote the shares) in order to benefit from the time value of the option.

Important Dates

The value of share-based compensation is often sensitive to dates. Before valuing any asset for family law purposes, the valuation analyst should understand the appropriate measurement date (or "valuation date"). The date of the marriage, the date of separation, the date of filing for divorce, and the trial date are the alternative valuation dates that the analyst may be concerned with.

The valuation of the share-based financial instrument may also be sensitive to other dates, such as the following:

1. The date of employment of the spouse who has been granted the financial instrument
2. The date of the grant of the financial instrument
3. The date in which the financial instrument vests
4. The exercise date of the financial instrument
5. The expiration date of the option

Employment Date

Stock-based compensation may be awarded, for example, at the time of a promotion. An argument may be made that the stock-based compensation was due, at least in part, to the job performance of the employee prior to the date of the grant of the stock-based award.

How the financial instrument is treated for family law purposes may be affected by whether:

1. the employment date is prior to the date of the marriage and
2. the promotion took place after the date of the marital separation.

Grant Date

The grant date is generally considered to be the date on which an employer and an employee reach a mutual understanding of the key terms and conditions of a share-based payment award. Approval by the shareholders or board of directors may be required.

The grant date for an award of equity instruments is the date that the employee begins to benefit from, or be adversely affected by, subsequent changes in the price of the employer's equity shares.

Vesting Date

For purposes of this discussion, the owner is assumed to have a vested right to the financial instrument when the financial instrument cannot be taken away by any third party. We make this assumption even though the owner may not yet possess the financial instrument.

The vesting date may be conditioned upon a requisite service period or a performance event. Or, the vesting date may be market based.

Requisite Service Period

Most commonly, an explicit service period is stated within the terms of the share-based compensation award.

For example, the employee may be granted the option to acquire 100 shares of the employer company's stock at today's price, with 20 shares vesting on each of the following five anniversary dates of the grant.

An implicit service period is one that is not explicitly stated but inferred from an analysis of the terms and other facts and circumstances involving the grant.

And, the service period may be one that is derived from the application of valuation procedures when the option matures, based on certain market conditions that would be outlined in the share-based compensation award.

Performance Event

The financial instrument may be structured to mature when performance conditions are met.

Examples of such performance conditions could be when the company, division, or department achieves a certain level of sales, or a profit margin, or a reduced error rate.

Market-Based Event

The financial instrument may be structured to mature when a specific marketplace milestone is achieved. An example of such a milestone may be a market share target, the regulatory approval of a particular product, the company target share price is surpassed, or when the company's shares are successfully listed in a public offering.

In some instances, the award may be expressed as a certain dollar amount that will be the basis for the stock price used in the grant of options on the date that the condition is met.

Multiple Service Periods

When multiple service periods exist and the award of the option depends on achieving one *or* the other, the requisite service period is usually the shortest of the possible periods.

When multiple service periods exist and the award of the option depends on achieving one *and* the other condition, the requisite service period is usually the longest of the possible periods.

Complications arise when there is both a service period condition and one or more performance conditions and perhaps a market condition is specified or implied by the terms of the option.

Exercise Date

The exercise date is the first date on which the holder of the financial instrument may put the financial instrument into effect.

In order to comply with Internal Revenue Code Section 409A requirements, the stock option may be exercised by the employee only upon the occurrence of one of the following specified events:[1]

1. A change in ownership control or effective control of the corporation
2. The employee's separation from service
3. Employee disability
4. Employee death
5. The occurrence of an unforeseeable employee emergency
6. A specified fixed date in the future

An unforeseeable emergency may be one of the following:

1. A severe financial hardship resulting from an illness or accident to the employee, employee's spouse, or employee's dependent

2. A loss of the employee's property due to a casualty
3. Another unforeseeable and extraordinary circumstance

Expiration Date

The expiration date is the final date on which the holder of the financial instrument may put the financial instrument into effect. Some options may expire without being exercised.

Restricted Stock

Unregistered shares of stock are not registered for trading—or are restricted from trading—on a stock exchange. Unregistered shares cannot be freely traded in the open market.

When publicly traded companies issue restricted (unregistered) stock, the restricted stock is typically sold at a price discount compared to the price of the (registered) publicly traded stock.

Restricted shares of public corporation stock may not (temporarily) be traded directly on a stock exchange. However, the investor has certainty that, in a relatively short time period, the trading restrictions will lapse.

The shares of stock of a closely held corporation, on the other hand, may never be traded directly on a stock exchange. The prospect of any level of efficient marketability is much lower for closely held company shares than it is for restricted public company shares.

There are a variety of empirical studies regarding the prices of private transactions in restricted securities. These transaction price data can be used for comparison with prices of the same company unrestricted securities eligible for trading on the open market.

The analysis of this body of restricted stock empirical pricing evidence indicates that significant discounts for lack of marketability (DLOM) are usually appropriate with regard to the pricing of restricted stock.

The restricted stock transactions analyzed in the studies covering the 1968 to 1988 period (where the average DLOM was approximately 35 percent) were generally less marketable than the restricted stocks analyzed after 1990 (where the average DLOM ranged between 20 percent and 25 percent).

Stock Appreciation Rights

Stock appreciation rights (SARs) and phantom stock are similar to each other. Both essentially are cash bonus plans, although some plans pay out the benefits in the form of shares.

SARs typically provide the employee with a cash payment based on the increase in the value of a stated number of shares over a specific period of time. Phantom stock provides a cash or stock bonus based on the value of a stated number of shares, to be paid out at the end of a specified period of time.

SARs may not have a specific settlement date; like options, the employees may have flexibility in when to choose to exercise the SAR. Phantom stock may pay dividends; SARs typically would not. Capital gains tax treatment is usually not available for these types of share-based compensation.

Employee Incentive Stock Options

In creating employee stock options, the issuing company will endeavor to set the strike price of the option at the fair market value of the underlying shares. When the strike price is set at fair market value, the intrinsic value of the stock option is zero. And, the only value of the stock option is its time value.

Under these circumstances, the Internal Revenue Service has generally determined that the recipient has no income to report during the year of the stock option issuance.

Income that is eventually derived from the option is determined to be ordinary income to the recipient if the recipient exercises the option to buy the underlying securities and subsequently sells the securities within 12 months.

To qualify for a tax break, the owner must hold the shares for two years after the grant of the incentive stock option (ISO) and for at least one year after its exercise.

Any gain from the time of the grant to the time of the sale is taxed at capital gains rates, which are always lower than ordinary income rates.

Holding the shares for more than 18 months after exercise and before selling the shares puts the owner in the capital gains tax bracket. Planning around the alternative minimum tax is important.

There is an income tax benefit with ordinary nonqualified stock options (NSOs), too. Any appreciation above the option-grant price is taxed as ordinary income, payable at the time of exercise.

When the stock is sold, any subsequent appreciation is taxed as capital gains as long as the shares are held for more than one year. Exercising an NSO early to minimize the ordinary-income-tax hit and to make most of the income a capital gain may also reduce the recipient's total tax expense.

Of course, whether the security owner comes out ahead by exercising early depends on the following factors:

1. How the underlying stock performs during the holding period
2. Dividends
3. Voting rights
4. Other similar factors

To the issuing employer company, the issuance of employee incentive stock options is an event that is reported in the employer financial statements.

Components of Stock Option Values

The typical components of stock option values include the following:

1. *The current price of the underlying stock*
   As the stock price increases, call options become more valuable and put options become less valuable.
2. *The strike price*
   As the strike price decreases, call options become more valuable and put options become less valuable.
3. *The time to expiration*
   The owner of a longer-lived option has more of the exercise opportunities available than the shorter-lived option owner. Put and call options become more valuable as the time to expiration increases.
4. *The volatility of the stock price*
   Volatility is the relative fluctuation of the underlying stock price. Put and call options become more valuable as the stock price volatility increases.
5. *The risk-free interest rate*
   While the investor's carrying cost increases with an increase in the risk-free interest rate, the expected growth rate in the underlying stock price tends to dominate this effect. As the risk-free interest rate increases, the price of call options increases and the price of put options decreases.
6. *The dividends expected during the life of the option*
   The payment of dividends on the underlying stock detracts from an option's value. This is because:
   a. the option holder does not receive the dividends and
   b. the company pays out retained earnings that otherwise might be available for reinvestment.

   These earnings would contribute to the growth in value of the underlying stock.

   Call options are more valuable when expected dividends are zero or small. Put options are more valuable when dividends increase in size.

To value marketable stock options, most valuation models incorporate the following factors:

1. Time to expiration date
2. The risk-free interest rate during the period
3. Estimated dividends
4. Stock price volatility
5. A probability distribution of ending share prices

The Black-Scholes option pricing model effectively treats the time between the current time and the expiration of the options as one time period divided into an infinite number of discrete periods.

The binomial option pricing model, on the other hand, divides the time period between the current

time and the expiration of the options into discrete periods—most often one year.

The binomial model is sometimes used to estimate the effect on the value of employee stock options of factors such as:

1. vesting periods and
2. employee turnover.

Most compensation consultants have endorsed the Black-Scholes option pricing model for purposes of quantifying employer stock option value. Derived to value a fully transferable short-term call on a European-type option for non-dividend-paying instruments, the model has been tweaked, squeezed, and reshaped numerous times.

The Black-Scholes option pricing model has been adapted to conform to nontransferable, long-term American warrants on dividend-paying instruments where:

1. exercise is contingent on employment and
2. the holder cannot be expected to behave like a highly liquid well-diversified investor.

The Black-Scholes Option Pricing Model

In 1973, Fisher Black and Myron Scholes derived what remains as the most widely used and best known theoretical model for the valuation of marketable options. The model is based on the assumption that it is possible to set up a perfectly hedged position consisting of owning the shares of stock and selling a call option on the stock.

Any movement in the price of the underlying stock will be offset by an opposite movement in the option's value, resulting in no risk to the investor.

This perfect hedge is riskless and, therefore, should yield the riskless rate of return. If it does not yield the riskless rate, the option is mispriced, the hedge is not perfect, and the option should be revalued until the hedge yields the riskless rate. Black and Scholes inferred that when the option is correctly priced, the perfect hedge results.

The assumptions underlying the Black-Scholes model are not intuitively pleasing. Nevertheless, it is important for the analyst to be familiar with these option pricing model assumptions.

The Black-Scholes model assumptions are summarized as follows:

1. The short-term interest rate is known and is constant through time.
2. The stock price follows a random walk in continuous time with a rate of variance in proportion to the square of the stock price.
3. The distribution of possible stock prices at the end of any finite interval is lognormal.
4. The variance of the rate of return on the stock is constant.
5. The stock pays no dividends and makes no other distributions.
6. The option can be exercised only at maturity.
7. There are no commissions or other transaction costs in buying or selling the stock or option.
8. It is possible to borrow any fraction of the price of a security to buy it, or to hold it, at the short-term interest rate.
9. A seller who does not own a security (a short seller) will simply accept the price of the security from the buyer and agree to settle with the buyer on some future date by paying him an amount equal to the price of the security on that date. While this short sale is outstanding, the short seller will have the use of, or interest on, the proceeds of the sale.
10. The income tax rate, if any, is identical for all transactions and all market participants.

"Most compensation consultants have endorsed the Black-Scholes option pricing model for purposes of quantifying employer stock option value."

There are many assumptions and computations that need to be made to derive the option value using the Black-Scholes formula.

For example, the model was developed to value European options. Dividends are ignored and when dividends are paid, they are paid at one time and not continuously. Also, fluctuations in the economy preclude rational acceptance of the assumption that investors can borrow or lend at a constant riskless interest rate.

Over the years, much additional empirical research has been conducted, and adjustments have been made to the Black-Scholes option pricing model in order to correct for the original model's limitations.

No universally accepted replacement for the Black-Scholes option pricing model has surfaced. This means that two companies with identical characteristics but different analysts could arrive at different valuations for their stock options. When the valuation methodology is not consistent across competitors, the results will not be widely embraced.

While the Black-Scholes model results for a particular company may seem reasonable, most managers and executives will regard option pricing models as black boxes that can be exchanged for new ones if the results don't square with intuition or earnings objectives.

The empirical research that has been done to improve upon the model is, ultimately, supportive of the Black-Scholes model. Differences between market prices and the Black-Scholes prices have usually been small when compared to transaction costs.

Publicly traded call options need not be exercised in order to realize the profits from an increase in the price of the underlying security, because they can be sold to another investor, who receives the rights associated with the contract.

Executive or employee stock options do not have this advantage. This is because they are usually nonmarketable. However, the basic determinants of the value of traded options are also relevant to the value of any option-type contract.

Employee stock options have the following attributes:

1. Special risks of forfeiture (e.g., termination of employment)
2. Required holding periods (e.g., to take advantage of capital gain treatment)
3. Transferability restrictions (sometimes the employee options at a publicly traded company are options on shares that are not registered for public trading or, in a privately held company are shares subject to a strict buy-sell agreement)
4. Other contingencies that make employee stock options much different from publicly traded options

Black-Scholes model values reflect the value of an option as if there was a market for the option itself. In the case of privately owned companies, an option for which there is no ready market is worth less than an otherwise identical option for which there is a public market.

Some analysts recommend a Monte Carlo simulation process to estimate the value of employee incentive stock options.

Under the Monte Carlo simulation process, a computer could generate a 60-month or 120-month forecast for a company's stock price, assuming certain growth, volatility, and dividend characteristics and then discount back to a present value the amount by which an employee incentive stock option would be in the money upon expiration. This procedure is repeated several thousand times using alternative input variables.

After eliminating the out of the money results, the average valuation is an unbiased estimate of how much the option is really worth.

So-called Monte Carlo simulations are now easier and more reliable to run than imperfect modifications of traditional formulas. They may be more adaptable, understandable, and reliable for particular valuation projects.

Stock Price

Typically, employer corporations issue stock options with a strike price that is equal to the fair market value of the underlying stock on that date. For a publicly traded company, the safe harbor is to use the publicly traded price.

For a privately owned company, there are three safe harbor provisions:[2]

1. The use of a stock fair market value valuation formula
2. A stock valuation by a qualified individual who does not have to be independent of the corporation
3. A stock valuation by an independent third-party appraiser

If a fair market valuation formula is used:

1. the seller must offer to sell the stock to the prospective buyer only at the formula value and
2. the buyer can only sell the stock to the next prospective buyer at the formula value.

A valuation by a nonindependent person is a provision that seems to exist so that a start-up corporation can avoid the cost of an independent appraisal.

A Stock Valuation by an Independent Third-Party Appraiser

The factors to be considered under a reasonable valuation method[3] to set the strike price for a privately owned employer company include the following:

1. The value of the tangible assets and the value of the intangible assets of the corporation
2. The present value of the anticipated future cash flow of the corporation
3. The market value of a stock or equity interest in similar publicly traded corporations or in other entities engaged in a substantially similar trade or business
4. Recent arm's-length transactions involving the sale or transfer of such stock or equity interests

Just as with generally accepted business valuation approaches and methods used for other purposes, the regulations recognize that:

1. the valuation may consider price premiums and price discounts, if appropriate, and
2. business valuations developed for other purposes unrelated to employee compensation may support the reasonableness of the value used for employee compensation purposes.

Volatility

Volatility is an important factor in many option valuation models—usually the most important factor. As volatility increases, the chance that a stock will do very well or very poorly increases. Since the employee owns a call option, he or she would be expected to benefit from price increases but would be protected from the downside risk. This is because the employee has nothing to lose.

One could argue that volatility is not an important factor in the valuation of employee incentive stock options because of their many restrictions. To reiterate, these incentive stock option restrictions are as follows:

1. Employee stock options cannot be sold.
2. Employee stock options cannot be exercised until they vest.
3. The underlying stock may be restricted from sale to third parties.
4. Once the options are exercised, the employee faces a tax incentive to hold the stock for at least one year (ordinary income tax rates apply to the gain if the stock is sold within one year and capital gains tax rates apply thereafter).

While volatility is an important factor in the valuation of publicly traded stock options, its impact on the value of employee stock options is not clear.

The volatility factor is a function of the past variability in the returns on the stock as measured by changes in the stock price. When valuing the options of a privately held employer company, reliable historical prices are typically not available.

Using the price series of a comparable public company to estimate the volatility factor may not be an acceptable proxy.

The options model input should reflect expected future volatility, which may not be accurately represented by measures of historical volatility. The period during which historical volatility is measured should not reflect events affecting the stock price that are not expected to recur in the future.

If the risk of an investment in the company going forward is expected to be significantly different than historical measures of risk, the analyst should consider other methodologies of estimating future risk.

For privately held employer companies, it is not possible to observe historical measures of volatility. The analyst should, therefore, use some other benchmark as a basis for the volatility input. Some analysts use a stock market index that they deem to be comparable to the risk facing the subject company.

Alternatively, the analyst can select a group of publicly traded companies that are deemed to be sufficiently comparable, in effect creating a custom "index" by which to estimate the volatility of the subject employer stock.

Other Complications Regarding Options for Marital Dissolution Purposes

When the valuation analyst adds to the important dates the date of the marriage and the date of the marital dissolution proceeding, the possible controversies emerge.

Depending on the various dates of employment, the components of the option, and the beginning and end of the marriage, the value of the option may need to be disaggregated.

For financial statement reporting, understanding the components of the option is complicated enough. Consideration of the dates of employment and marriage add other dimensions to the analysis in order to measure the value of options for family law purposes.

Parties to the marital dissolution may not agree as to whether the option value is part of the marital estate and, if so, the portion of the value of the option that should be considered to be:

1. the deferral of annual income that is eligible for support or
2. an asset subject to disposition.

Stock options that are designed to vest and become exercisable over a period of time may be considered both compensation for past services and incentive for the employee to continue employment in the future.

Alternatively, let's assume that the employer stock options were granted to the spouse:

1. during the marriage and vested during the marriage,
2. during the marriage and vested after the date of the marital dissolution proceeding,
3. before the marriage and vested during the marriage, or
4. before the marriage and vested after the date of the marital dissolution proceeding.

What portion of the value of the subject employer stock options is marital property versus separate property?

To respond to this issue, many family law courts begin with an understanding of the intrinsic value of the stock options.

Intrinsic Value

One of the first factors to observe in a stock option valuation is the intrinsic value of the option. If an option is in the money (i.e., the prevailing stock price is greater than the exercise price of a vested option) and the option holder is able to exercise the option at the current time, then it is reasonable to assume that the value of the option is equal to the amount by which it is in the money.

However, there is additional value to holding the option and having the right, but not the obligation, to exercise the option in the future. This conclusion is particularly true when there is a significant amount of time before expiration.

For example, let's consider an option with the following features:

1. The stock price is $20.
2. The exercise price is $10.
3. The time to expiration is 5 years.
4. The volatility is 40 percent.

If the risk-free rate is 5 percent, the Black-Scholes model indicates an estimated option value of $13.00, which is $3.00 greater than the $10.00 intrinsic value of the option.

Therefore, a valuation analyst who used the $10.00 intrinsic value as a measure of the value of the option may be significantly underestimating the value of the option.

As the time to expiration decreases, the value of the stock option decreases toward its intrinsic value. Exhibit 1 illustrates how the value of the stock option changes with the time to expiration.

The difference is the time value of the option. There are some advantages and disadvantages of holding the option and not owning the underlying shares as of the valuation date.

The advantages include deploying elsewhere the money that would be used to exercise the shares and avoiding any immediate taxes that might be due upon exercising the option.

The disadvantages include not receiving any dividends that would be awarded on the underlying shares and not being able to vote the underlying shares.

Stock options that were granted and vested during the marriage are usually considered marital property and an asset of the marital estate.

As an asset, the value of the stock options can be considered one of the assets available for distribution. If they can be transferred, then the valuation issues are less complicated.

If the stock options are able to be transferred to the nonemployee spouse, that is the preferred method of distribution because it effects a clean break (without the need for communication or valuation) between the parties.

However, transfer of executive stock options is rarely permitted by the issuing company. In addition, valuation analysts should note that options distributed to the nonemployee spouse may still be:

1. at risk if they lapse upon termination of employment or
2. subject to insider trading rules.

In some circumstances, family law courts will adopt a deferred distribution method under which the court constructs a "trust" that holds the options until their final value is determined. At that time, the proceeds of the stock options are distributed.

One remaining complication associated with vested stock options is the extent to which the annual compensation portion of the option during the period it increased in value should be considered deferred income for spousal support purposes.

Exhibit 1
Comparison of Time to Expiration and Comparison of Volatility to Stock Option Value

Years to Expiration	Volatility					
	25%	30%	35%	40%	45%	50%
1/12	10.04	10.04	1.0.04	10. 04	10.04	10.04
1/6	10.08	10.08	10.08	10. 08	10.08	10.08
1/4	10.12	10.12	10.12	10.12	10.12	10.13
1/2	10.25	10.25	10.25	10.25	10.27	10.28
3/4	10.37	10.37	10.38	10.40	10.43	10.48
1	10.49	10.50	10.52	10.55	10.61	10.69
1 1/2	10.73	10.76	10.81	10.89	10.99	11.13
2	10.97	11.02	11.10	11.22	11.37	11.55
3	11.45	11.54	11.68	11.87	12.09	12.33
4	11.91	12.04	12.22	12.46	12.73	13.02
5	12.34	12.50	12.73	13.00	13.30	13.63

Coverture Factor

There may be no single characterization for whether stock options are awarded for past, present, or future services.

The number of unvested options that should be recognized as part of the marital estate is subject to dispute. The analyst should be aware of some of these issues and consult with legal counsel regarding their resolution for marital dissolution purposes.

To determine how much, if any, of the unvested options constitute marital property, some jurisdictions use a time rule (i.e., a coverture factor).

The following formula illustrates how a typical coverture factor is calculated:

Number of Months from Grant Date to Valuation Date

divided by

Number of Months from Grant Date to Vesting Date

times

Number of Shares to Be Vested (not subject to divestment) on Vesting Date

equals

Number of Units to Be Divided

In some jurisdictions, the number of units to be divided are valued at the intrinsic value on the measurement date and that valuation conclusion is adjusted for personal income taxes.

A sample coverture calculation is presented in Exhibit 2.

Income Taxes

Personal income taxes associated with the ownership of share-based compensation should be considered in the valuation process. The personal income taxes may be at the ordinary income tax rate or they may be at the capital gains tax rate.

Typically, personal income taxes will encumber the value of the share-based compensation. However, in some circumstances, some personal income taxes may already have been incurred and paid.

Presenting the Results

Analysts should ensure that they follow all relevant professional standards and any other relevant standard established by their state's board of accountancy, by other licensing agencies, and by other professional organizations to which the analyst may belong.

Typically, this means that, in addition to meeting competency requirements, avoiding conflicts of

Exhibit 2
Coverture Factor Simplified Example

27.7	Number of Months from Grant Date to Valuation Date
	divided by
60	Number of Months from Grant Date to Vesting Date
	times
70,000	Number of Shares to be Vested
	(i.e., not subject to divestment on the vesting date)
	equals
32,317	Number of Units to be Divided
	times
$23.69	Intrinsic Value minus Exercise Price
	equals
$765,582	Pretax Dollar Value of Marital Estate Portion of the Unvested Shares

interest, and reporting any reservations regarding the scope of the engagement, the valuation report should include significant engagement findings and events.

The valuation opinion report will usually include the following items:

1. A valuation opinion letter summarizing the valuation and the value conclusions
2. Sections summarizing the relevant valuation theory, methodology, procedures, analyses, and conclusions
3. An exhibit section presenting a summary of the quantitative and qualitative valuation analyses
4. A statement of assumptions and limiting conditions
5. The valuation analyst's certification or representation
6. The professional qualifications of the principal analysts

Exhibit 3 on the following page presents a sample list of stock option valuation documents that may be requested from the client.

Summary

Share-based compensation has been an important tool used by employer companies to reduce their immediate compensation costs and to incentivize employees. The treatment of share-based compensation for family law purposes can be quite different from the treatment of share-based compensation for financial statement reporting purposes.

Share-based compensation can come in all sizes and types. The financial instruments addressed in this discussion include restricted stock, SARS, and employee incentive stock options.

Employee incentive stock options are those issued by the employer company on whose stock the option constitutes a call, usually (1) as part of an employee incentive stock option or (2) in conjunction with raising capital for the company.

Most commonly, the strike price for an employee incentive stock option is the fair market value of the underlying share. The most common pricing model used to value stock options is the Black-Scholes option pricing model.

And, the most sensitive factor that affects the value of the option is the volatility of the price of the underlying employer shares.

Often in family law cases, the attributes of the stock option are disaggregated because introducing the date of employment and the date of the marriage into the equation may cause the value of the stock options to be considered in a different light.

Option value, once disaggregated, may influence both the marital estate's balance sheet for distribution purposes and the marital estate's income statement for support purposes.

The danger of rigidity and the resulting unfairness from a blind application of a formulaic approach still exists. No one rule will be responsive to the many different reasons why stock-based compensation is granted.

Notes:

1. Sect. 409A(a)(2)(A).
2. Regs. Sect. 1.409A-1(b)(5)(iv)(B)(2).
3. Regs. Sect. 1.409A-1(b)(5)(iv)(B)(1).

Robert Schweihs is a managing director of the firm and is resident in our Chicago office. Bob can be reached at (773) 399-4320 or at rpschweihs@willamette.com.

Exhibit 3
Employer Stock Option Valuation
Illustrative Document Request Checklist

The following list summarizes many of the documents that may provide the basic information helpful to value and distribute share-based compensation:

1. All employment agreements between the employee spouse and the employer company
2. Dates of promotions and position held by the employee
3. A brief job description of each position held by the employee
4. The salary history of the employee indicating all forms of compensation
5. All short-term or long-term employee incentive plans covering the employee spouse
6. Copy of the stock option plan
7. All company plans, handbooks, and option award letters related to the stock option granted
8. Copies of the employer company financial statements including support for the accounting treatment of the options
9. Copies of prior valuations of the employer company stock options for any purpose
10. Copies of any corporate minutes or proxy statements referencing the award of stock options
11. Copies of any correspondence or internal memorandum which were issued by the employer company at the time of the grant of any stock options
12. A schedule of granted options during the employee's period with the employer company
13. The date of each option granted
14. The number of options granted at each date
15. The exercise price of options granted at each date
16. The expiration date of each set of options granted
17. The date of vesting for each set of options granted
18. The date and number of options exercised
19. The grant date of exercised options
20. An explanation of the extent to which the options will generate personal income tax when they are exercised

Willamette Management Associates

Thought Leadership in
Forensic Analysis and Expert Testimony Services

Lost Profits/ Economic Damages and Valuation Controversy Services

Commercial litigation

- lender liability, breach of contract, fraud and misrepresentation, tortious interference with business opportunity, and similar claims

Intellectual property litigation

- infringement, breach of contract, breach of nondisclosure agreement, breach of joint venture, and similar claims

Business value litigation controversy

- shareholder oppression and dissenting shareholder rights, family law, gift/estate/income tax, condemnation and eminent domain, breach of contract/noncompete/buy-sell agreement, and similar claims

Bankruptcy and insolvency controversy

- solvency/insolvency issues, fraudulent conveyance/preference items, collateral value, voting/liquidation preference, reasonableness of the plan of reorganization

Tax Valuation Controversy Services

Property tax controversy

- taxpayer business (unit value) and intangible asset valuations
- capitalization rate analysis and special purpose property obsolescence analysis

Gift and estate tax controversy

- business enterprise, security, fractional interest, and intangible asset valuations

Income tax controversy

- business enterprise, fractional interest, and intangible asset valuations
- charitable contribution, purchase price allocation, partnership basis, insolvency, change of control, worthless stock, intercompany transfers

Financial Opinion Controversy Services

ESOP formation and other employer stock transactions

- ESOP sponsor company annual stock valuations
- ESOP/ERISA transaction fairness financial adviser expert testimony

Capital market transaction controversy

- fraud and misrepresentation in merger, acquisition, and going private transactions
- fairness, solvency and adequate consideration

Not-for-profit entity transaction

- business/professional practice purchase or sale price, goods or services contracts, and reasonableness of professional/executive compensation
- fairness, fair market value valuation, private inurement, excess benefit, intermediate sanctions, and reasonableness of compensation opinions

For more information, visit our website at www.willamette.com or contact a managing director at our nearest office.

111 S.W. Fifth Avenue
Suite 2150
Portland, OR 97204
503 • 222 • 0577
503 • 222 • 7392 (fax)

8600 W. Bryn Mawr Avenue
Suite 950-N
Chicago, IL 60631
773 • 399 • 4300
773 • 399 • 4310 (fax)

1355 Peachtree Street, NE
Suite 1470
Atlanta, GA 30309
404 • 475 • 2300
404 • 475 • 2310 (fax)

Overview of Stock-Based Executive Compensation Plans for ESOP Sponsor Companies

Kyle J. Wishing

This discussion provides an overview of stock-based executive compensation plans for ESOP sponsor companies. More specifically, this discussion provides (1) a basis for installing stock-based executive compensation plans at ESOP sponsor companies, (2) an introduction to the types of stock-based incentives that are commonly used by ESOP sponsor companies, and (3) an overview of the best practices for implementing a stock-based executive compensation plan for ESOP sponsor companies.

The Role of the ESOP Trustee

The employee stock ownership plan (ESOP) trustee may be asked to review the sponsor company board's proposed executive compensation plan. Corporate governance issues can be compounded for internal ESOP trustees who are also the beneficiaries of the proposed executive compensation plan.

ESOP sponsor companies that have institutional trustees may find it advantageous to ask the ESOP trustee to review the proposed executive compensation plan.

The ESOP trustee, whether internal or institutional, may find it beneficial to engage a compensation consultant to advise on the matter. Ultimately, the ESOP trustee should be aware of his or her responsibility to:

1. represent the ESOP's interest as a shareholder and
2. act solely in the interests of ESOP participants and beneficiaries.

The trustee should consider whether the design of the executive compensation plan creates a "win-win" situation for key executives and for ESOP participants.

An effective sponsor company executive compensation plan should:

1. have measurable goals that contribute to the value of sponsor company stock (i.e., share price growth will offset executive compensation plan dilution),
2. provide aggregate compensation to key executives that is both reasonable and competitive, and
3. promote the long-term retention of sponsor company key executives.

Basis for the Sponsor Company Compensation Plan

The primary purpose of stock-based executive compensation plans is to align the economic interests of management with those of shareholders. Stock-based executive compensation plans benefit the subject sponsor company by helping to motivate, recruit, and retain executives.

However, the decision to implement a stock-based executive compensation plan comes at a cost—equity-based compensation is dilutive to current equity holders.

"Stock-based compensation is a prevalent issue for private companies that are competing for talent with public companies. . . ."

For the executive compensation plan decision makers, the acceptable level of dilution should be estimated based on the expected increase in company value resulting from the efforts of a more incentivized management team.

Stock-based compensation is a prevalent issue for private companies that are competing for talent with public companies, and specifically, for ESOP sponsor companies. ESOP sponsor companies are often hesitant to issue equity to non-ESOP shareholders (i.e., company management).

In terms of attracting talent, a recent compensation survey of corporate financial executives indicated that 89 percent of public company respondents receive some form of stock-based incentive compensation, whereas only 35 percent of private company respondents receive stock-based incentive compensation.[1]

The greater sophistication, complexity, and liquidity of public companies are a few reasons for the disparity in the public company and private company use of stock-based incentives.

In this regard, one benefit that ESOP sponsor companies have over traditional private companies for implementing stock-based compensation plans is that ESOPs are already required to have an established share price from their annual valuation.

Stock-based executive compensation plans can be custom tailored to fit the goals and needs of most ESOP sponsor companies. Effective plans position executives to think like investors—promoting decision making that favors long-term growth.

Types of Compensation Plans

The following list presents some of the common types of stock-based incentive plans offered by ESOP sponsor companies:

- Incentive stock options (ISOs)
- Nonqualified stock options (NSOs)
- Restricted stock
- Phantom stock
- Stock appreciation rights (SARs)

An executive compensation plan may include one or more of the stock-based incentive plans listed above. There are differences in the regulations, payout, accounting, and tax treatment for each of the stock-based incentive plans. Some of the important aspects of each type of plan are discussed below.

Stock Options

ISOs and NSOs are the two primary types of stock options offered for executive compensation purposes.

A few of the common terms relating to stock options are as follows:

- Exercise (or strike) price: The price at which the option holder may purchase the stock
- Spread: The difference between the exercise price and the fair market value of the stock
- Exercise period: The period that an option holder has to exercise his or her option prior to its expiration
- Vesting: The requirement that must be met for the option holder to have the right to exercise the option

Stock options are often issued with exercise prices equal to the current fair market value of the ESOP sponsor company stock (this is referred to as "at-the-money"). If the sponsor company stock appreciates in value, the option is considered to be "in-the-money," and the option holder benefits from exercising the option.

When a stock option is exercised, the employee exchanges the option and pays the amount of cash required to exercise the option for a share of ESOP sponsor company stock.

The ESOP sponsor company may impose certain restrictions on the acquired shares. For example, the sponsor company may restrict the transferability of the acquired shares by imposing a right of first refusal.

Stock options that are granted with exercise prices greater than or equal to the fair market value of the sponsor company stock are not subject to Internal Revenue Code Section 409A.

Section 409A was enacted January 1, 2005, and applies to nonqualified deferred compensation plans. A detailed examination of Section 409A is beyond the scope of this discussion.

Incentive Stock Options

The primary advantage of ISOs is favorable tax treatment for the employee. Gains from an ISO are deferred until the date that the shares are sold and are then taxed at the capital gains tax rate. ISOs are not tax deductible for the sponsor company. ISOs are subject to a number of requirements that are set forth in Section 422.

Income generated from the spread on an ISO is considered a preference item for estimating the employee's alternative minimum tax (AMT). Depending on the employee's tax situation, the ISO may result in an AMT payment when the ISO is exercised.

Nonqualified Stock Options

NSOs are not required to meet any specific tax law requirements and, thus, have greater structuring flexibility than ISOs. Additionally, unlike ISOs, NSOs may be issued to nonemployees.

Employees are taxed at ordinary income tax rates on the spread when the NSO is exercised, and the sponsor company may expense the same amount, lowering its taxable income. Income from an NSO is not considered a preference item for purposes of the AMT.

Restricted Stock

Under a restricted stock plan, an employee is granted shares or allowed to purchase shares at or below fair market value. The shares are generally subject to a substantial risk of forfeiture and transfer restrictions that lapse when certain criteria are met.

These criteria are often based on, but are not limited to, the employee remaining with the company for a specified number of years.

The restricted stock plan will generally specify the types of shareholder rights and privileges (i.e., dividends, voting rights, etc.) that individuals may receive as participants in the restricted stock plan.

For tax purposes, unless a Section 83(b) election is made, the employee pays taxes at ordinary income tax rates when the gain or loss on restricted stock is realized.

Employees may make a Section 83(b) election when they are granted restricted stock. If this election is made, the employee pays ordinary income tax on the bargain element from the restricted stock grant in the taxable year of the grant. Any future change in the value of the shares is then taxed as a capital gain or loss, not as ordinary income.

Making the Section 83(b) election is not without risk. For example, income taxes paid as part of the Section 83(b) election are not refundable to the employee should the restrictions fail to lapse.

The ESOP sponsor company is allowed to take a tax deduction for the amount that the employee is taxed at ordinary income tax rates. Restricted stock is generally exempt from Section 409A.

Synthetic Equity

Two common types of synthetic equity are phantom stock and SARs. These plans allow executives to receive an award based on an increase in the value of sponsor company stock without requiring an actual ownership interest transfer. Synthetic equity plans have a high level of structure flexibility and may be settled in cash or in stock.

Synthetic equity plans are often favorable for S corporation ESOPs. This is because, if they are settled in cash, they do not dilute the ESOP's equity interest in the sponsor company for income tax purposes.

Synthetic equity plans are taxed at ordinary income tax rates for the employee and are tax-deductible for the sponsor company.

"It is generally advisable to have independent members of the ESOP sponsor company board of directors be responsible for establishing the terms and level of executive compensation."

Phantom Stock

Under a phantom stock plan, hypothetical shares of the ESOP sponsor company's stock are allocated to the employee's account. When the vesting requirements are met, the phantom shares in the account may be converted to cash or stock, or a combination of both.

Taxation occurs when distributions are made from the phantom stock account to the ESOP participant.

Phantom stock plans are generally treated as nonqualified deferred compensation plans subject to Section 409A.

Stock Appreciation Rights

In contrast to phantom stock plans, distributions to an employee's account in a SAR plan are based only on the appreciation in the value per share between the grant date and the date of distribution. A SAR plan may allow an employee to choose the timing of distributions from his or her account.

SARs that are granted at fair market value are exempt from Section 409A.

Implementing a Stock-Based Executive Compensation Plan in an ESOP Sponsor Company

The remainder of this discussion focuses on the best practices and potential pitfalls to avoid when structuring and implementing a stock-based executive compensation plan at an ESOP sponsor company.

Conflicts of Interest

The determination of executive compensation is typically the responsibility of the board of directors or a compensation committee selected by the board.

Stock-based compensation plans are a component of the overall executive compensation scheme, and therefore, executive compensation best practices are applicable to stock-based compensation plans. The stock-based compensation plan should be considered in the context of the overall executive compensation scheme.

For ESOP sponsor companies, it is important to consider potential conflicts of interest of board members, particularly members of management that serve on the board, to eliminate self-dealing (or the appearance of self-dealing).

It is generally advisable to have independent members of the ESOP sponsor company board of directors be responsible for establishing the terms and level of executive compensation. It may also be helpful to involve a compensation consultant.

The executive compensation of ESOP sponsor companies is subject to scrutiny by the Internal Revenue Service (Service) and the Department of Labor (DOL). It is also subject to the Employee Retirement Income Securities Act (ERISA) fiduciary requirements.

Relevant Judicial Decisions

There have also been instances where the ESOP or a sponsor company employee has challenged the level of executive compensation.

Two relevant court cases where the reasonableness of the level of executive compensation was challenged are discussed below.

Delta Star, Inc. v. Patton

In *Delta Star, Inc. v. Patton*,[2] Delta Star, Inc., and the Delta Star ESOP sued Andrew W. Patton, the former president of Delta Star, on claims of breach of fiduciary duty.

The Delta Star ESOP was established in 1989 when it acquired a majority interest (98.63 percent) of the Delta Star common stock.

The ESOP trustees consisted of Patton and two other executives. The three trustees were also the only members of the Delta Star board of directors with Patton serving as the chairman and president of Delta Star. Under Patton's direction, the board of directors adopted a Benefit Restoration Plan and a Supplemental Executive Retirement Plan.

From 1989 to 1993, Patton's base salary increased from $201,400 to $301,320, and over this period, Patton received bonuses totaling $2.7 million.

On the other hand, Delta Star's performance suffered over this time frame, with revenue decreasing from over $41 million in 1989 to $27 million in 1994.

The District Court found that:

1. Patton unilaterally established his own compensation without the approval of the board of directors and the ESOP trustees and

2. he actively concealed his compensation from the other board members and trustees.

The District Court found that Patton's compensation was unreasonably high, especially given the financial performance of Delta Star.

The District Court concluded that Patton:

1. breached his fiduciary duty to the ESOP by paying himself an excessive base salary, excess bonuses, and other excessive fringe benefits;
2. failed to recognize the conflict of interest that existed between his duty of loyalty to the ESOP participants and his own financial gain; and
3. violated ERISA statutes prohibiting self-dealing by voting the shares held by the ESOP in favor of his retention as a member of the board of directors, enabling him to pay himself excessive compensation and benefits.

As a result, the District Court ordered Patton to repay more than $3.3 million to Delta Star.

Eckelkamp v. Beste

In Eckelkamp v. Beste,[3] the Sixth Circuit affirmed the District Court grant of summary judgment, rejecting the claim by plaintiffs that key executive compensation was excessive.

Gary Eckelkamp, an employee of Melton Machine and Control Company (Melton) and two former employees, Bradley Hoemann and Ronald Kampmann, brought this action against Melton, its ESOP, and four Melton officers, alleging breach of fiduciary duty claims under ERISA.

In 1986, the ESOP purchased Melton from the founder for $1.4 million. At that time, Melton was transitioning from manufacturing for the bicycle and furniture industries to manufacturing for the automotive industry.

This change brought increased sales, with Melton achieving annual sales of more than $20 million by 2000. From 1985 to 2000, the average annual rate of return on Melton stock was approximately 20 percent.

The average Melton employee earned in excess of $100,000 in direct cash compensation each year, approximately 125 percent greater than the median market rate for similar positions in other companies.

In addition, the average employee with at least one year of service at Melton had ESOP and deferred compensation account totals of approximately $350,000.

The plaintiffs alleged that the defendants violated their fiduciary duties by:

1. overcompensating themselves and
2. failing to obtain accurate annual valuations of Melton stock.

The defendants were responsible for setting employee salaries, including their own. And, the defendants acknowledged that they were compensated at least 56 percent above the median rate for similar positions in comparable companies.

The plaintiffs relied on an expert report that concluded:

1. that the defendants were overcompensated and
2. that annual appraisals consistently undervalued the sponsor company.

The District Court rejected the expert report conclusions, finding that the expert failed to take into account that all Melton employees were paid considerably more than market rates.

In addition, the District Court found that the expert based his analysis on comparisons to executive compensation at companies that were not sufficiently comparable to Melton. For example, none of the "comparable" companies used for comparison had achieved a similar historical revenue growth rate, and some "comparable" companies in the analysis were not even profitable.

In addition, the expert failed to visit the Melton facility, interview its employees, or research the job duties of executives at the comparison companies to ensure that their jobs were actually comparable to those of the defendants.

The expert also did not consider the fact that much of the Melton key executive compensation was paid in the form of bonuses contingent on the performance of the company.

In both of these court cases, the defendants did not make provisions for conflicts of interest in establishing the level of executive compensation. The judicial decisions ultimately differed based on the financial performance of the ESOP sponsor company.

The ESOP sponsor companies could have protected themselves against lawsuits had they followed best practices by:

1. having independent members of the board of directors responsible for setting executive compensation and/or
2. enlisting the services of a compensation consultant to assist in determining reasonable compensation.

Reasonableness of Executive Compensation

There are two primary analyses used to assess the reasonableness of executive compensation:

1. A multifactor analysis
2. The independent investor test

The Internal Revenue Service Job Aid for Valuation Professionals[4] lists 12 factors to be considered by the Service in determining the reasonableness of executive compensation. These 12 factors are as follows:

1. The employee's qualifications
2. The nature, extent, and scope of the employee's duties
3. The employee's background and experience
4. The employee's knowledge of the business
5. The size and complexity of the business
6. The time devoted by the employee to the business
7. The economic conditions generally and locally
8. The character and amount of responsibility of the employee
9. Whether or not the compensation is predetermined based on activities to be performed or not determined until the end of the tax year
10. Amounts paid to the employee in prior years
11. The salary policy of the taxpayer as to all employees
12. The amounts paid by similar size businesses in the same area to equally qualified employees for similar services

Judicial decisions have also provided multifactor outlines for determining reasonable executive compensation.

These relevant judicial decisions include *Mayson Manufacturing v. Commissioner*,[5] which was tried in the Sixth Circuit in 1949 and provides nine factors to be considered for determining reasonable compensation, and *Elliotts, Inc. v. Commissioner*,[6] which was tried in the Ninth Circuit in 1983 and provides five factors to be considered for determining reasonable compensation.

Conversely, in *Exacto Spring Corp. v. Commissioner*,[7] the Seventh Circuit favored an "independent investor" test over the multifactor tests. The independent investor test is based on a stock's return on investment (ROI).

The conclusion was that an investment generating a reasonable ROI would result in a satisfied shareholder that would not object to the level of executive compensation.

Determining the Vesting Schedule

As stated previously, the primary goal of stock-based executive compensation plans is to align the economic interests of key executives with shareholders. The board of directors can accomplish this goal by setting a vesting schedule for the plan.

Generally, units under stock option, restricted stock, phantom stock, and SAR plans are scheduled to vest based on time, performance, or a combination of the two.

Time-based vesting requirements can be used to attract and retain key executives, and the typical vesting period is a ratable schedule of three to five years. In performance-based vesting, specific goals are set in the executive compensation plan documents, and shares vest as performance targets are met.

Performance goals can be based on any measurable criteria. Common performance measures include financial metrics such as earnings before interest, taxes, depreciation, and amortization; cash flow; or stock price targets; or other company, department, or individual goals and objectives.

Sponsor Company Employer Stock Valuation

The addition of any form of stock-based compensation will have a dilutive effect on current equity holders.

The valuation analyst should receive copies of executive compensation plan documents in order to understand how the plan works and ensure that the economic factors of the plan are appropriately reflected in the valuation analysis, whether the analysis is a valuation update for ESOP administrative purposes or as part of a proposed transaction.

A proposed stock-based executive compensation plan that is part of a transaction may affect the share price that a trustee is willing to accept on behalf of ESOP participants.

In any case, the key decision makers should consult with a valuation analyst or a compensation expert in order to understand the valuation effects of adopting a stock-based executive compensation plan.

Valuation analysts often use established econometric or theoretical option pricing models, such as the Black-Scholes model, to estimate the dilution from the stock-based compensation plan. It is common to see a single adjustment to total equity for the amount of the executive compensation plan.

However, there are other methods that may be used to account for the dilution from stock-based compensation plans.

Repurchase Obligation

The potential cash outlays of the stock-based executive compensation plan should be considered when establishing the structure of the plan.

For ESOP sponsor companies, it is appropriate to consider the cash outlays for the executive compensation plan in conjunction with the ESOP repurchase obligation.

S Corporation Considerations

ESOP sponsor companies that are also S corporations should consider the allocation rules in Section 409(p) when allocating equity-based compensation benefits.

In Section 409(p) testing, stock-based compensation is treated as outstanding, deemed-owned shares and may trigger an improper allocation during a nonallocation year by or to a disqualified person.

The rules for Section 409(p) testing are somewhat complex and are outside of the scope of this discussion.

Conclusion

This discussion provided an overview of the benefits and potential pitfalls of stock-based compensation and introduced the various types of stock-based incentives used by ESOP sponsor companies.

An executive compensation plan that is structured appropriately can drive growth of the ESOP sponsor company by (1) incentivizing key executives and (2) aligning the goals of management and shareholders.

Notes:

1. Thomas Thompson and Ken Cameron, *Financial Executive Compensation Survey 2016*, (Morristown, NJ: Financial Executive Research Foundation, 2016).
2. Delta Star, Inc. v. Patton, 76 F.Supp.2d 617 (W.D. Pa. 1999).
3. Eckelkamp v. Beste, 315 F.3d 863 (8th Cir. 2002).
4. "Reasonable Compensation: Job Aid for IRS Valuation Professionals," Internal Revenue Service (October 29, 2014).
5. Mayson Mfg. Co. v. Commissioner, 178 F.2d 115 (6th Cir.1949).
6. Elliotts, Inc. v. Commissioner, 716 F.2d 1241 (9th Cir. 1983).
7. Exacto Spring Corp. v. Commissioner, 196 F.3d 833 (7th Cir.1999).

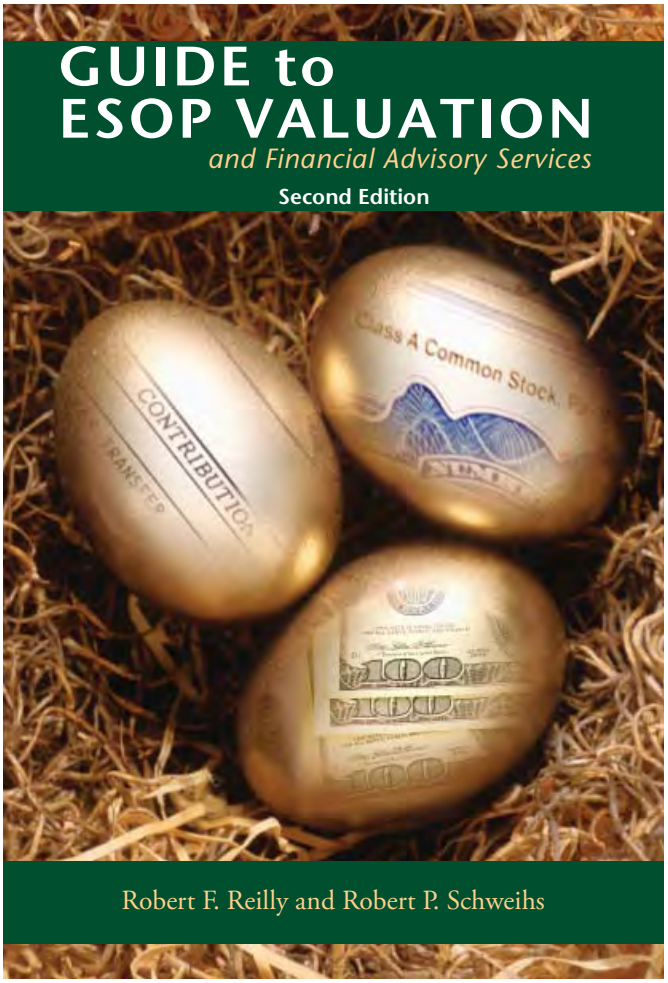
Kyle Wishing is a manager in our Atlanta practice office. Kyle can be reached at (404) 475-2309 or at kjwishing@willamette.com.

Willamette Management Associates

GUIDE TO ESOP VALUATION

and Financial Advisory Services

Second Edition



What's New

This second edition updates and expands the *Guide to ESOP Valuation and Financial Advisory Services,* first published in 2005. The comprehensive, 36-chapter second edition substantially expands the authoritative discussion of current employee stock ownership plan (ESOP) stock valuation and financial advisory services issues. This hard-cover book contains almost 600 pages of narrative, checklists, and sample reports—most of which are new from the first edition.

Practical Applications

This second edition updates the consensus of professional practitioners with regard to the current thinking on ESOP sponsor company stock valuation, transaction structure, acquisition financing, and independent financial adviser issues. The second edition is authored by Robert Reilly and Bob Schweihs, both managing directors of Willamette Management Associates—the thought leader in the business valuation profession. Between them, Reilly and Schweihs have over 70 years of practical experience as ESOP valuation analysts and financial advisers.

This book is available for a limited time for $29.95 (regular price is $59.95) plus shipping. You may order this book at www.willamette.com/book_guide_esop_valuation.html

Willamette Management Associates

thought leadership

www.willamette.com

GUIDE TO ESOP VALUATION

and Financial Advisory Services

Second Edition

Robert F. Reilly and Robert P. Schweihs

Table of Contents

Who Should Buy This "Must-Have" Book

- ESOP independent financial advisers and business appraisers
- ESOP trustees and other plan fiduciaries
- ERISA lawyers and other ESOP professional advisers
- shareholder/executives of ESOP sponsor companies

Willamette Management Associates

Guidance for the Third Analyst in a Three-Analyst Valuation Process

Robert P. Schweihs

Both shareholder contracts and shareholder controversies often call for three valuation analysts to participate in the ownership transition valuation of the subject business, business ownership interest, or security. Private company security buy/sell agreements often use this three-analyst process. And, disputing parties in shareholder oppression, dissenting shareholder appraisal rights, and other breach of fiduciary duty controversies often turn to the three-analyst valuation process in order to resolve their differences. How the three-analyst process works in each situation is determined by either the shareholder (or other) contract or the agreement of the parties. This discussion recommends guidelines both to valuation analysts—and to other process participants—involved in a three-analyst business/security valuation process.

Introduction

In many closely held businesses, the owners want to personally know all of the other shareholders.[1] For the closely held company shares to transfer in an orderly fashion, the owners may insist that all owners subscribe to an ownership agreement, such as a shareholder agreement.

Such an agreement may have a redemption clause which allows for share purchases to be made only by the company or by the other current owners—and only at the price derived from a contractual valuation process.

The valuation provisions in shareholder agreements typically provide for shareholder liquidity by providing:

1. a market for the shares and
2. a mechanism for the purchase of and payment for the shares.

The current shareholders may want to know that the shares will stay in friendly hands in the event of another shareholder's termination of employment, retirement, physical or mental disability, or death.

The shareholder agreement will also typically address the ownership of the shares in case of involuntary transfers due to another shareholder's divorce, bankruptcy, insolvency, or legal disability.

The valuation process can include various adjustments to account for particular attributes or circumstances that the individual shareholders face. For example, the individual shareholder usually does not have the unilateral right to influence or control the management and operations of the subject company.

Therefore, the valuation process can include various adjustments to account for an individual shareholder's lack of ownership control.

Sometimes the prescribed valuation process requires the application of a valuation pricing formula.

To be respected by interested parties (including, for example, the Internal Revenue Service), the valuation pricing formula should be clear, unambiguous, and bear some resemblance to the fair market value of the shares particularly at the time the valuation pricing formula is established.

It may also be important that the valuation pricing formula result in the fair market value of the

shares as of time of the event (occurring sometime in the future) that triggers the application of the formula.

Disadvantages of Relying on a Valuation Pricing Formula

It is unusual for any one formula that was selected at one point in time to consistently provide reasonable and realistic valuations at all other points in time. Dislocations can occur.

Typically, a formula is not very flexible. After all, it's supposed to be "fixed" and unambiguous. A formula may not be flexible enough to take into account changes in, for example, the following factors:

1. The company's prospects
2. Industry in which the company operates
3. Current economic environment
4. Prevailing accounting conventions

If the triggering event occurs when the company is affected by a temporary upturn or downturn, the valuation pricing formula could be viewed to be unfair.

Businesses change due to nonrecurring events such as the introduction of a new product line. Before the introduction of a new product, reported earnings may be abnormally low because they reflect one-time research and development expenses to create the new product and marketing expenses associated with the launch.

After the new product is successfully launched, the early positive earnings may be low. This is because they do not yet reflect the normal, longer-term expected earning power of the new product.

Conversely, the currently reported earnings of the business could be higher than they are expected to be in the future because demand for a significant product has declined or because of a delay in the performance of a significant customer contract.

Industries change when, for example, regulatory restrictions are temporarily added or eliminated. Competitors can make impulsive decisions that have only a short-term impact on the earnings or assets of the subject business.

It is not unusual for a valuation pricing formula to fix the multiple of earnings or the multiple of book value despite any changes in the external economic environment. The economic environment in which the company operates is always changing both locally and nationally.

Events that affect the economic environment that are entirely external to the business can have an important impact on the value of a business. The effect of those external events may not be captured in the typical valuation formula.

"It is unusual for any one formula that was selected at one point in time to consistently provide reasonable and realistic valuations at all other points in time."

Net asset value (or net book value) isn't supposed to be controversial but it often is. Accounting rules can change or the business may adopt an alternative but acceptable accounting convention after the valuation formula was established. This procedure could cause a dislocation to the share value under the valuation formula.

For example, the company may voluntarily or involuntarily change its policy regarding contract revenue recognition, last-in, first-out (LIFO) or first-in, first-out (FIFO) inventory valuation, capital investment capitalization, or categorization of leases as operating or capital.

All parties may not always accept a value derived from a formula (e.g., the Internal Revenue Service may not be required to accept it if it is judged to be a testamentary device). If a transaction takes place for any purpose at a price different from the formula, the integrity of the formula may be jeopardized.

Earnings of the business may be volatile. Some formulas try to accommodate for that volatility by, for instance, using a strait average or a weighted average of the trailing three years of earnings.

In some situations, the formula valuation calculation is made only once per year as of a specific date and the price is supposed to prevail until a new value is calculated the following year. In other situations, the formula valuation calculation is made quarterly or even daily.

The company may not have enough money on hand to be available to redeem the shares at the formula price. The company (or another shareholder, for instance) who has the opportunity or the obligation to redeem the shares may not have the cash available (or the proceeds from a life insurance policy) to satisfy the obligation.

To overcome these disadvantages, rather than relying on a valuation pricing formula, many

"When one or both of the parties is encouraged to take an aggressive position, a third analyst is often required to effectuate a transaction that has been triggered by the provisions of a buy-sell agreement."

shareholder agreements call for a valuation pricing process.

The Valuation Pricing Process

A common valuation pricing process requires the company to establish a price at which it intends to redeem the subject shares. That price may be the result of the application of a valuation pricing formula.

If the shareholder rejects the company's offer price, it is common for the next step in the valuation process to require that each of the parties retain its own valuation analyst.

The valuation process should outline each analyst's assignment. There are several possible assignments, as follows:

1. Each analyst reaches an independent opinion of value and issues an opinion report to his or her client. If the two values are close, say within 10 percent of one another, the average value is the price at which the redemption transaction takes place.
2. The two analysts work together to reach one opinion of value which establishes the transaction price.
3. Without rendering an opinion of value, the two analysts agree on a third analyst to conduct one independent opinion which establishes the transaction price.
4. After rendering opinions that are too far apart (say, beyond 10 percent), the two analysts agree on the name of a third analyst.

The Valuation Target

When the two parties expect the decision maker (the judge) to split the opinions of each of the two parties or weight them somehow, it is more likely that the parties will adopt extreme positions and encourage their analyst to follow their valuation target. We often see that in marital dissolution cases, for example.

However, if the two parties anticipate that the judge will not split the difference but instead will choose only one of the two valuations, then each party will be more likely to encourage a less extreme valuation target. This is the theory behind what is known as baseball arbitration.

But, baseball arbitration only creates the right set of incentives for the parties when both parties would always be better off by submitting a more honest, less biased valuation than a more aggressive one.

Baseball arbitration works well in situations when, after the negotiation, the two parties will continue to have a relationship with each other (as in a labor dispute or when the parties are slicing a whole pie) because the downside of taking an aggressive position that is found to be unsuccessful by one of the parties is great.

Even if an aggressive position was found to be successful, in a marital dissolution for example, the subsequent grudge will impute a cost on the future relationship between the two parties.

Using the marital dissolution situation as an example, the parties are dividing one pie (the collection of marital assets), but they may share responsibility for raising their children, and the cost of causing greater deterioration of the future relationship could be great.

Baseball arbitration may not work well in situations where:

- a party believes that the decision maker is likely to make an error;
- one of the parties can achieve an outsized positive result without the same risk of a downside result (due to having a relatively small ownership percentage or some other kind of financial leverage, for instance); or
- there is no expectation of an ongoing relationship between the parties.

When one or both of the parties is encouraged to take an aggressive position, a third analyst is often required to effectuate a transaction that has been triggered by the provisions of a buy-sell agreement.

The third analyst's assignment is to:

1. select one of the party's opinion or the other (baseball arbitration);
2. develop his or her own independent opinion, which will prevail; or
3. develop his or her own independent opinion, which is averaged with the closer of the

other two opinions of value—this penalizes the outlier valuation target.

The Third Analyst's Assignment

Most shareholder agreements do not completely describe the third analyst's assignment so the components of the third analyst's assignment should be carefully defined, regardless of the written shareholder agreement.

The most obvious reasons for clearly defining the assignment is for all parties to know who is responsible for providing the following:

- Professional services to execute the assignment and to whom that person reports
- Information that is required to execute the engagement and with whom that information may be shared
- Payment for the services and the indemnification of the third analyst.

The third analyst may be engaged to execute any one of several different roles.

In the role of finder of fact, the third analyst reaches a value conclusion based on the evidence provided by the valuation presented by each of the two parties as would a judge.

As mediator, the third analyst's role is to reconcile the opinions of others and to assist the parties is reaching an agreement. The mediator educates the parties and offers options that may resolve the differences.

When the third analyst is engaged to render an independent opinion, the third analyst should make sure the parties are aware of the third analyst's instructions so that the parties to the valuation pricing process will respect the results.

Instructions for the Third Analyst

Many people hold the mistaken notion that there can be only one "value." Instead, those familiar with the valuation profession are aware that there are many factors that influence the value conclusion.

The first influential factor is the applicable definition of value. The purpose of the valuation usually determines the appropriate definition of value.

Identifying and clearly defining the purpose and objective of the business valuation assignment goes a long way towards eliminating many of the problems that occur with the conclusions of business valuation projects.

While it seems simple, and should be simple to understand, failure to clearly define the elements of the valuation assignment at the outset of the business valuation assignment is one of the greatest sources of errors, delays, excess costs, and misunderstandings between client and analyst in a business valuation.

It may seem obvious that the first step is to define the task. However, when asked to participate in finding a solution to a client's problem, the client often does not know how to define the valuation assignment, and communication to agree on and mutually understand the assignment is often an important step.

In fact, valuation assignments that have turned out poorly are often due to a failure to carefully define the assignment at the outset.

The components of a well-defined third analyst (or almost any other business valuation) assignment include the following:

- Objective
- Purpose
- Property subject to value
- Definition and premise of value (contract, state law)
- Applicability of discrete valuation discounts, including key person dependence
- Valuation date
- Valuation approaches and methods
- Work product

In a third analyst process, the objective of the valuation assignment should be made clear and in writing. The typical objective for the third analyst is to provide his or her professional opinion of the value of the shares that are subject to redemption as of the valuation date.

The shares subject to redemption usually represent a noncontrolling, nonmarketable equity interest that is to be redeemed under the terms of the buy-sell agreement.

It is not always appropriate, however, for the third analyst to apply discounts from the pro rata value of the shares to reflect the shareholder's lack of control and lack of marketability.

Different statutory, regulatory, and case precedent standards govern valuations of businesses and business interests under various jurisdictions for diverse purposes. Many business valuations fail to reach a number representing the appropriate definition of value because the analyst failed to match the valuation methods to the purpose for which the assignment was being performed.

The result of a particular valuation can also be inappropriate if the client attempts to use the valuation conclusion for some purpose other than the intended one.

Valuation reports typically contain a set of limiting conditions and one of the typical limiting conditions is as follows:

> This valuation is valid only for the valuation date or dates specified herein and only for the valuation purpose or purposes specified herein. No other purpose is intended or should be inferred.

Much of the litigation involving business valuation arises because the parties have failed to match the valuation methods to the assignment's intended purpose.

The purpose of the valuation encompasses the use to which the valuation exercise is expected to be put. A valuation conclusion prepared for one purpose may not be the appropriate valuation conclusion for another purpose.

The purpose of the valuation often determines the applicable standard of value—that is, the definition of value being sought—and almost always influences it.

The date, or dates, at which the business is being valued is critically important because circumstances can cause values to vary materially from one date to another, and the valuation date directly influences data available for the valuation.

Every day, observers of the public stock markets see sudden and substantial changes in the value of a particular company's stock.

In many court cases, especially those involving tax litigation, significant changes in value over very short time spans have been justified because of changes in relevant circumstances.[2]

Many internal and external factors can cause changes in the value of an interest in a company. Obviously, a sudden change in a company's earnings, especially if unanticipated, can have a substantial effect on value.

Also, the value of a business interest varies with the cost of capital, a factor over which individual businesses have little control. Major events, such as the signing or termination of a major customer contract, can also have a dramatic, immediate impact on value.

In most business valuations, the opinion of value will be based at least partly on other, similar transactions, such as the prices at which stocks in the same or a related industry are trading in the public market relative to their earnings, assets, dividends, or other relevant variables, if such data are available.

It is important to know the valuation date when using guideline companies in the valuation so that the guideline transaction data can be compiled as of the valuation date, or as near to it as is practically possible.

The valuation date is usually the date of the event that triggered the provisions of the buy-sell agreement which is often the date on which the shareholder's employment was terminated.

But there are other events that may have triggered the redemption of the subject equity investment such as oppression of the shareholder or dissent by the shareholder from actions taken by the company management.

Sometimes there is more than one valuation date. For example, in shareholder redemptions, the parties may not stipulate to the trigger date and the value as of more than one date many be needed in order to resolve the dispute.

When the choice of valuation date in such cases is a legal matter, as part of defining the assignment, the third analyst may be asked to consider all the potentially applicable valuation dates and be prepared to address the value as of each date.

Sometimes a court will give an advance ruling on the valuation date to avoid the expense of doing analyses as of dates that the court will not deem relevant.

Some of the most important sources of guidance as to the applicable standard and premises of value for the given situation are the following:

- Statutory law (state and federal)
- Case law (cases decided under the controlling statutory or common law)
- Administrative regulations (e.g., Internal Revenue Service revenue rulings)[3]
- Company documents (e.g., articles of incorporation or partnership, bylaws, meeting minutes, agreements)
- Contracts between the parties (e.g., buy-sell agreements, arbitration agreements)
- Precedent established by prior transactions
- Directives issued by the court (in some litigated cases where the standards or premises are not clear, the analyst may take the initiative to seek direction from the court regarding the relevant definition of value)
- Discussions with an attorney involved in the valuation matter or experienced in similar matters
- Legal case documents (e.g., complaint, response, and so forth)
- The analyst's experience and judgment

In certain situations, the third analyst's assignment may be limited to analyzing only a certain valuation method or only one component of the dispute between the parties.

For instance, the controversial matter that separates the parties may be the proper normalization adjustments to make when arriving at a component of the valuation pricing formula such as EBITDA[4] or book value.

It is also important that the form of the third analyst's work product be understood. The form of the work product ranges from an oral opinion of value to a simple letter to a full narrative opinion report including all supporting data and documentation.

Communication

For the valuation process to be respected, it's important for the third analyst's instructions regarding communication be understood.

The third analyst should be instructed regarding the confidentiality of the documents being produced, whether the parties will be producing documents separately, whether documents produced by one party are to be shared with the other party, whether either party is permitted to communicate orally or by electronic means with the third analyst outside of the presence of the other party, how will any required in-person site visits be attended, and the dissemination of the third analyst's work product.

Unlike the delivery of work product in the typical valuation assignment, in the case of the third analyst valuation process, the work product is usually not issued as an incomplete document that is subject to discussion.

The benefit of issuing incomplete work product for discussion purposes in the typical valuation assignment is to allow the audience to provide advice regarding the accuracy of the information upon which the analysis depends and to achieve a reasonable understanding of the analysis.

Instead, the work product of the third analyst is a complete, final opinion that is not subject to discussion.

There is no universally acceptable final work product format for the third analyst. The work product may be a full narrative opinion report prepared in a format consistent with that proscribed under (1) the Uniform Standards for Professional Appraisal Practice or (2) another set of agreed-upon business valuations standards.

The work product may be nothing more than a simple statement of conclusions. Or, the work product could follow any other format to which the client agrees.

The third analyst is entitled to indemnification. A typical indemnification provision states that the parties agree to indemnify and hold the third analyst harmless from, and will defend the third analyst

against costs or liabilities of any nature whatsoever which result from, claims against the third analyst where such claims arise out of any use of the results of the third analyst's work on this engagement.

The third analyst will provide independent valuation assistance only. The third analyst will not provide legal, accounting, or taxation advice.

The parties may want to develop some reasonable expectations regarding the timetable for the start and completion of the project and any important intermediate events.

Who will be responsible for paying the third analyst's fees and expenses should be clear. It is usually a good practice to reach an understanding and to establish reasonable expectations regarding the amount of the fees and expenses that will be incurred in performing the assignment as defined.

Typically there is no work required from the third analyst after rendering the final opinion. Therefore, the third analyst should expect to be paid before rendering that opinion.

Conclusion

The third analyst assignment may seem to be simple, but it is important for the parties who are engaging the third analyst to recognize the following:

1. The parties who are engaging the third analyst are already involved in a controversy.
2. Valuation problems are inherently controversial.
3. Value conclusions are usually not based on absolutely settled data and professional judgment is a prerequisite to solving the valuation problem.
4. The third analyst is taking directions and is not the director of the project.
5. Clients don't want the third analyst's fees to include a premium to account for the risk of valuation malpractice litigation.
6. For the indemnified third analyst, the scope of the valuation assignment can be narrowly focused on the controversial valuation issues.
7. For the unindemnified third analyst, the scope of the valuation assignment includes the time required to continuously challenge the integrity of the instructions given to other professionals, instructions given by other professionals, advice rendered by other professionals, and information provided by the client and other professionals.

   Analysts should refuse to accept third analyst assignments unless the parties provide adequate indemnification.
8. For the parties, the possibility that valuation malpractice may be alleged is disruptive to the entire professional team.
9. For both the plaintiff and the defendant in litigation alleging valuation malpractice, it is complicated, expensive, and there is a low probability of a satisfactory award.

Of course, parties to the third analyst valuation process do not want to be involved in subsequent litigation and neither does the third analyst. When the assignment is to provide the best, unbiased opinion, the third analyst should be indemnified from future litigation. The analyst doesn't control many of the circumstances that surround the resolution to the valuation controversy.

When both parties to the third analyst assignment provide indemnification, it does not mean that:

1. the third analyst is not independent,
2. the strength of the third analyst's opinion is weakened,
3. the third analyst's opinion is tainted, or
4. the third analyst will not stand behind and defend the opinion.

Notes:

1. For convenience only, "shares" is used in this discussion to refer to the equity that is subject to a legal agreement to which the equity owners are committed. The equity may be shares in a corporation or units in a partnership or units limited liability company.
2. See, for example, Morris M. Messing, 48 T.C. 502 (1967), *acq*. 1968-1 C.B. 2. Even though the company made a public offering at over $36 shortly after a gift of stock, the court upheld a value of $13 for gift tax purposes as of the date of the gift.
3. Note that administrative rulings do not have the force of law, but represent the position of the agency administering the law as to their interpretation of the law and rules for applying it.
4. Earnings before interest, taxes, depreciation, and amortization.

Robert Schweihs is a managing director of the firm and is resident in our Chicago office. Bob can be reached at (773) 399-4320 or at rpschweihs@willamette.com.

Willamette Management Associates

Business Valuation Services

- *Business enterprise valuations*
- *Debt or equity security analyses and valuations*
- *Intangible asset valuations*
- *Intellectual property valuations*
- *Income-producing and special purpose property appraisals*

Forensic Analysis Services

- *Economic damages and lost profits calculations*
- *Reasonableness of executive compensation analyses*
- *Tangible/intangible property intercompany transfer pricing*
- *Forensic analysis and expert testimony*
- *Intellectual property infringement/royalty rate analyses*

Financial Opinion Services

- *Fairness opinions*
- *Solvency/insolvency opinions*
- *Fair market valuation opinions*
- *Fraud and corporate governance opinions*
- *ESOP valuation and adequate consideration opinions*

Thought Leadership

Founded in the 1960s, Willamette Management Associates provides thought leadership in business valuation, forensic analysis, and financial opinion services. Our clients range from family-owned companies to Fortune 500 corporations. We provide business valuations, forensic analyses, and financial opinions related to transaction pricing and structuring, tax planning and compliance, and litigation support and dispute resolution.

Thought Leadership in Business Valuation Services

Our business, security, and property valuation services relate to: ESOP employer stock purchase or sale; the purchase or sale of a business; purchase price or sale price allocation; federal income, gift, and estate tax; state and local property tax; bankruptcy and reorganization; refinancing and restructuring; intellectual property transfer; intergenerational wealth transfer; like-kind exchange; and fair value accounting and financial reporting.

Thought Leadership in Forensic Analysis Services

Our forensic analysis services include: reasonableness of shareholder/executive compensation, intellectual property transfer price, forensic accounting and fraud investigation, commercial litigation, economic damages and lost profits, intellectual property infringement, eminent domain and condemnation, shareholder oppression/dissenting shareholder appraisal rights actions, and breach of contract or noncompete agreement claims.

Thought Leadership in Financial Opinion Services

Our financial opinion services include: fairness opinions for mergers and acquisitions; solvency and fraudulent conveyance opinions for highly leveraged, dividend distribution, or financing transactions; fair market valuations regarding the corporate governance of transaction, financing, reorganization, and intercompany transfers; and excess benefit/private inurement opinions for not-for-profit entity transactions.

For More Information

For more information, visit our website at www.willamette.com or contact a managing director at our nearest office.

111 S.W. Fifth Avenue
Suite 2150
Portland, OR 97204
503 • 222 • 0577
503 • 222 • 7392 (fax)

8600 W. Bryn Mawr Avenue
Suite 950-N
Chicago, IL 60631
773 • 399 • 4300
773 • 399 • 4310 (fax)

1355 Peachtree Street, NE
Suite 1470
Atlanta, GA 30309
404 • 475 • 2300
404 • 475 • 2310 (fax)

Measuring Equity Volatility for Closely Held Company Securities

Patrick O. Van Dyke and Benjamin H. Groya

Valuation analysts may use option pricing models to estimate the fair market value of stock options. This discussion focuses on the implied volatility estimate within the Black-Scholes-Merton (BSM) option pricing model. Specifically, this discussion (1) highlights the procedures that valuation analysts may use to estimate implied volatility, (2) observes the impact that implied volatility has on stock options for closely held companies, and (3) addresses factors that can change that implied volatility.

Introduction

There are many nonmarketable stock options issued by companies with shares that are publicly traded. Incentive stock options issued to employees is one example.

The fair market value of the stock options may be needed for any one of a variety reasons, including the following:

1. Dispute resolution
2. Gift and estate tax
3. Transactions
4. Financial accounting requirements

The measure of volatility has an important impact on the fair market value of those derivative securities.

The fair market value of a stock option takes into consideration the relationship between:

1. the observable price of the underlying security and
2. the rights associated with the stock option.

Volatility is a measurement of the risk of owning the security. Volatility measures the magnitude of spread, both positive and negative, in observable historic stock prices during a given period of time.

Higher volatility means that the value of the security underlying the derivative is expected to fall within a wider range of values in the future when the rights under the derivative may be executed.

Higher volatility means that the price of the security can change dramatically over time in either direction. A lower volatility means that a security's value does not fluctuate dramatically but, instead, the security's value is expected to change within a narrow range.

When all else is equal, a derivative on a security for which investors expect highly volatile trading prices is more valuable than a derivative on a security with low expected volatility.

Many types of options to buy a security (a call option) or to sell a security (a put option), along with the underlying security itself, trade on organized exchanges such as the Nasdaq or the New York Stock Exchange.

To decide whether the observable trading price of the option is favorable or not, investors can compute the prices of an option by applying an options pricing model such as the Black-Scholes-Merton (BSM) option pricing model.

When the stock options are issued by a closely held company, the analysis is even more complicated. This discussion summarizes some of the factors that analysts should consider when estimating the

volatility factor to be used to estimate the fair market value of derivative securities issued by closely held companies.

The Black-Scholes-Merton Option Pricing Model

The BSM option pricing model is commonly applied by valuation analysts to estimate the fair market value of stock options for closely held companies.

The BSM is composed of five factors:

1. Time to expiration
2. Option exercise price
3. Risk-free rate
4. Current price of the underlying security
5. The implied volatility

In this discussion, we assume that the appropriate inputs for all of the factors are known, including the price of the closely held firm's stock. The focus of this discussion is on implied volatility.

Stock price volatility can be historical (i.e., based on past price fluctuations) or implied (i.e., the market's expectation of the volatility of the stock price in the future). Implied volatility helps capture the amount of excess or deficit value of an option compared to the theoretical price output.

In other words, implied volatility helps to find the difference in theoretical value and the value assigned in the market of a stock option. Implied volatility is calculated by including all of the other inputs: stock price, strike price, risk-free rate, days to expiration, and the market price of the option.

Then, the analyst solves for the isolated variable of implied volatility. The implied volatility component of the BSM is a forward-looking variable and is readily accessible for publicly traded companies. It is noteworthy that this form of measured volatility is not certain.

Although it is based on historical performance, being a forward-looking measure, it must be considered a proxy and not an absolute parameter. Due to the infrequent trading activity of closely held companies, implied volatility is unavailable.

There are existing procedures that can assist valuation analysts in solving for the implied volatility of a closely held stock option. However, these procedures should be used in accordance with the changing circumstances presented in each case.

One procedure used by analysts when estimating implied volatility of a closely held business stock is analyzing the volatility of guideline publicly traded companies (GPTCs).

There are three procedures that are often used when analyzing GPTCs:

1. Review and analyze the volatility that each GPTC reports in its SEC Form 10-K.
2. Calculate the historical volatility of the stock prices for the GPTC.
3. Analyze the implied volatility in the GPTC stock options.

GPTC search criteria should be as comparable to the subject interest as possible. If comparable GPTCs are identified, the estimated implied volatility for the subject interest should be reasonable.

There are factors that increase the volatility of closely held stock, and there are factors that decrease the volatility of closely held stock. Closely held stocks are typically smaller and do not have the same access to capital as their GPTC counterparts.

Feasible access to capital encourages funding for new company projects, ultimately leading to increased profitability when utilized effectively.

Generally, smaller companies have fewer operating locations, resulting in a smaller geographic footprint. These factors are typically associated with a higher cost of equity for closely held companies, because of the increased risks a smaller, non-publicly-traded company experiences when compared to GPTCs.

Furthermore, a greater cost of equity generally is characterized by greater volatility of returns,[1] demonstrating the effect of uncertainty among shareholders.

There are factors that can lessen the stock volatility of a closely held company relative to GPTCs. Closely held stock may not be influenced to the same degree by the macroeconomic forces that can change the stock prices of the GPTCs.

For example, a closely held company may not have as much of a geographic footprint when compared to the GPTCs. Now consider a change in monetary policy in a foreign country where the closely held business *does not* operate, but the GPTCs *do* operate.

In this example, the foreign central bank employs an expansionary plan for the economy. One of the by-products of an expansionary policy is a decrease in interest rates.

A decrease in interest rates makes an economy less attractive to investors because of the lack of return investors can earn on domestic bonds.

As a result, foreign investors pull their money out of that country in search of higher returns. As direct investment in the foreign country decreases, the value of the country's currency decreases.

A decrease in the foreign currency in countries in which the GPTCs operate would affect the GPTC stock price. This is because the decrease in foreign currency value would relatively increase the GPTCs price for inputs for the goods it produces in that country.

The closely held company remains relatively unaffected by this macroeconomic change because it does not operate within the foreign country's boundaries and is not subject to the increased price of inputs.

Since GPTCs are often subject to frequent trading and macroeconomic changes due to their interconnectedness to the economy, investors may require a higher return.

Closely held companies may not be as connected to the macroeconomic environment; in this case, investors may not require a higher return to compensate for their level of risk.

Exhibit 1 further illustrates how a change in macroeconomic events can affect the stock prices of GPTCs—in this case, the United Kingdom vote to leave the European Union (EU) on June 24, 2016.

Exhibit 1 compares the closing prices and daily percent change from the Dow Jones Industrial Average (DJIA) and a selected group of financial services stocks: Wells-Fargo & Company (WFC); Citigroup, Inc. (C); U.S. Bancorp (USB); Bank of New York Mellon (BK); and SunTrust Banks (STI).

The EU referendum affected many companies. However, the financial services industry was heavily influenced. In the United States, a low federal funds rate and low government bond interest rates have affected the ability for banks to improve their profitability from their net interest spread in recent years. Therefore, these financial institutions have invested elsewhere in the markets.

As a result of the referendum, many financial institutions will be forced to terminate and relocate thousands of jobs to adhere to new regulations. This type of example would increase the stock price volatility of GPTCs relative to a smaller, non-publicly-traded company.

In this case, a valuation analyst may need to decrease the implied volatility estimate of the closely held stock option.

Macroeconomic events do not always bear as much influence on closely held business stock. When purchasing a closely held stock, there may be adjustments leading up to the purchase price.

However, these adjustments result from the subject interest's historical performance, not solely based on economic news events. This suggests that the stock price of closely held businesses should be less volatile than their GPTC counterparts.

continued on page 72

Exhibit 1
Daily Index Value Change

	Dow Jones Industrial Average		Financial Services Companies (WFC, C, USB, BK, STI)	
Date (2016)	Closing Price [a]	Daily Change (percent) [a]	Average Closing Price [b]	Average Daily Change (percent) [b]
June 22	17,780.83	-0.3	42.66	-0.1
June 23	18,011.07	+1.3	43.87	+2.9
June 24	17,400.75	-3.4	40.88	-6.9
June 27	17,140.24	-1.5	39.18	-4.2

[a] Source: Yahoo Finance.
[b] Calculated by authors – average of WFC, C, USB, BK, and STI. Individual closing prices and percentages from Yahoo Finance.

Insights Wins the APEX 2016 Publication of Excellence Awards Competition

Introduction

We are proud to announce that the quarterly business valuation journal *Insights*, published by Willamette Management Associates, received a publication excellence award in the 2016 APEX Award of Excellence competition.

This is the seventh year in a row that the thought leadership in *Insights* has been recognized with an Apex Award of Publication Excellence.

APEX Awards for Publication Excellence

The APEX Awards for Publication Excellence are presented based on an annual competition for writers, editors, publication staffs, and business and nonprofit organization communicators. International in scope, the APEX competition recognizes outstanding publications ranging from institutional newsletters and magazines to corporate annual reports, brochures, and websites.

There were nearly 1,900 entries in the APEX 28th annual awards program. *Insights* was a winner in the Magazine & Journal Print category of the 2016 annual APEX award of excellence competition.

"We are honored to receive the APEX Publication of Excellence Award for our quarterly business valuation journal *Insights*," said firm managing director Robert Reilly. "This is the seventh year in a row that we have received the APEX recognition for publication excellence in the Magazine & Journal Print category. This award motivates us to continue to provide thought leadership in a journal that focuses on the business valuation, forensic analysis, and financial opinion disciplines."

Each quarterly issue of *Insights* presents current thought leadership related to one or more of our firm's financial advisory services disciplines. These professional disciplines include economic damages measurement and lost profits analysis, business and security valuation, intangible asset and intellectual property analysis, intercompany transfer price analysis, bankruptcy and reorganization analysis, forensic accounting and expert testimony, and corporate transaction opinion services.

Each quarterly *Insights* issue typically includes about 8 to 10 discussions. In each 96-page issue, about half of the *Insights* discussions are written by Willamette Management Associates authors. And, about half of the *Insights* discussions in each issue are authored by lawyers, bankers, accountants, or academics who are not associated with Willamette Management Associates.

About Willamette Management Associates

Founded in 1969, Willamette Management Associates provides thought leadership in its business valuation, forensic analysis, and financial opinion services. Our clients range from substantial family-owned companies to Fortune 500 corporations. And, our clients also include financial institutions, the accounting and audit profession, the legal community, and government and regulatory agencies.

Best Practices

A Closer Look at Volatility in Stock Option Valuations

Fady F. Bebawy

Volatility is considered by many valuation analysts to be an important input in performing stock option valuations. Estimating volatility can be complex. This is because the analysis involves perspectives that at the same time (1) may result in different or conflicting indications and (2) may be interrelated and overlapping. This discussion summarizes three perspectives the analyst may consider in estimating volatility and presents insights and guidelines that may aid the analyst through the analysis.

Introduction

The value of a stock option, regardless of the valuation methodology that is applied, is most sensitive to the analyst's estimate of the range of the expected trading price of the underlying stock. In stock option valuation models, the range of the expected trading price of the underlying stock is called its volatility.

A stock option is more valuable when there is a wide range of expected trading prices for the underlying stock (holding all other variables constant). A stock option is less valuable when there is a narrow range of expected stock trading prices.

This is reasonable because the holder of a call option has the right, but not the obligation, to buy the underlying stock at a price that has already been fixed (the strike price). When the underlying stock might trade within a wide range in the future (before the expiration date of the option), the call option holder has more reason to expect to be able to sell the underlying stock (after exercising the option) at a premium above the strike price.

There is no one generally accepted method to estimate the volatility of the expected trading price of the stock that underlies a stock option.

The factors that analysts consider when estimating volatility for stock option valuation purposes are the subject of this discussion.

To illustrate the sensitivity of a stock option's value to these factors, we will consider whether economic damages have been incurred by an employee when the employer unilaterally reduced the expiration date of the employee's stock options in a hypothetical example.

The valuation analyst may consider several perspectives when estimating volatility as an input in valuing a stock option.

Different perspectives for estimating volatility may sometimes result in widely disparate volatility indications. A small change in the volatility assumption often results in a significant change in the stock option value.

The selection of the best perspective is seldom a simple one. In order to determine the best perspective, the analyst should consider taking several perspectives and then examining each of the perspective results. The selected volatility should be (1) supportable, (2) consistent with the purpose of the valuation assignment, and (3) explainable and understandable.

We discuss three perspectives to consider in estimating volatility as an input in valuing stock options. These three perspectives are as follows:

1. Historical volatility versus implied volatility
2. Time horizon over which volatility is measured

3. The changes in volatility during different periods of time in the past

The interrelationships of these perspectives and their overlapping combinations add to the complexity of the volatility selection.

A Brief Review of Stock Option Valuation Methodology

While the focus of this discussion is on volatility and its impact on the value of stock options, we will also review the inputs into the Black-Scholes-Merton ("BSM") model and indicate how changes to each input affects the stock option value.

The inputs into the BSM model are the (1) current stock price, (2) strike price, (3) term to expiration, (4) risk-free rate, (5) dividend yield, and (6) volatility.

Holding all other inputs constant, the value of a stock option will:

1. Increase with an increase in the current stock price
2. Decrease with an increase in the strike price
3. Increase with an increase in the term to expiration
4. Increase with an increase in the risk-free rate
5. Decrease with an increase in the dividend yield
6. Increase with an increase in the volatility

Historical Volatility versus Implied Volatility

Volatility is commonly measured in two primary ways.

The first way is by examining historical stock prices. Historical volatility is, as the name suggests, backward-looking and examines the changes in the observable stock price. When the analysis relies on historical, observable stock prices it means that this is the best estimate of future stock prices. Historical volatility is a statistical measure of the dispersion of returns for a given stock. It is the relative rate at which the price of a stock moves up or down. It is measured by calculating the standard deviation of changes in the price of a stock.

The second way to measure volatility is by examining implied volatility.

This involves examining the stock price volatility that is "implied" by an observable stock option's trading price and solving for the volatility that is implied by the trading price of that option compared to the trading price of the underlying stock.

While historical volatility is backward-looking, implied volatility is forward-looking. It is the market's expectation of the future volatility of the stock.

While historical volatility can be calculated directly, implied volatility cannot. Instead, implied volatility of a stock may only be calculated indirectly by examining the observable trading price of an option on that underlying stock.

Generally, option traders evaluate stock options and execute their trades based on implied volatility and not on the actual stock option premium price. "Traders often quote the implied volatility of an option rather than its price. This is convenient because the implied volatility tends to be less variable than the option price."

Implied volatility is calculated by entering all the inputs into the BSM model except for volatility and then solving for the volatility that makes the stock option price generated from the BSM model equal to the actual trading price of the stock option.

The implied volatility for a particular company's stock calculated this way is often different from the volatility calculated by relying on the historical trading price of the underlying shares.

If implied volatility is lower than historical volatility, then an investor may consider the observed stock option trading price to be a good investment. In other words, if the higher historical volatility is applied in the BSM model, then the resulting stock option price will be higher than the observable option trading price and the observable option trading price would appear to be undervalued. Similarly, if implied volatility is higher than historical volatility, this stock option price resulting from the BSM model will be lower than the observable option trading price which may make an investment in that stock option appear to be less attractive.

Analysts typically rely on historical volatility when valuing stock options. Since implied volatility captures the market's expectations for future volatility and, since valuations using options are typically forward-looking, it may be reasonable to consider the implied volatility assumptions in the valuation analysis.

"Implied volatilities can be used to monitor the market's opinion about the volatility of a particular stock. Whereas historical volatilities are "backward looking," implied volatilities are "forward looking."

It is therefore not surprising that predictions of a stock's future volatility based on implied volatilities tend to be slightly better than those based on historical volatilities."

Let's consider an example to see how historical volatility differs from implied volatility and determine whether there are any meaningful value implications related to the difference.

We examined an option of a hypothetical publicly traded company, ABC Company (ABC). An executive of ABC is granted an option to buy 100,000 shares of ABC with a strike price of $38. On July 1, 2016, ABC notified the executive that the exercise period for the option was going to be reduced by one year from an expiration date in 1.5 years, to a shorter expiration date of 0.5 years. The executive wants to understand how the value of his option has changed and whether the shortened expiration has damaged him economically. The details of the stock option and the BSM model inputs are presented in Exhibit 1.

Historical Volatility

We first examine the impact of a shorter expiration period by applying the BSM model after selecting volatility based on the historical changes in the observable publicly traded stock price.

Based on the inputs in Exhibit 1, we calculate the value of the option with the original expiration term by applying the BSM model relying on historical volatility assumptions for an option with a remaining term of 1.5 years.

Next, we calculate the value of the option with the shorter expiration term based on historical volatility for an option with remaining term of 0.5 years. The difference in the two indications of value is an indication of the economic damages suffered by the executive that is caused by the expiration term being reduced by one year. The results of these calculations are presented in Exhibit 2a.

This analysis indicates that the value of the executive's option declined by approximately $287,000 when the term was reduced by one year (and the volatility increased by 10 percentage points).

Performing a sensitivity analysis based on the changes in historical volatility illustrates just how sensitive the value is to changes in the volatility of the original option contract and the shortened option contract. This is presented in Exhibit 2b.

The sensitivity table presented in Exhibit 2b illustrates the decrease in the value of the option due to a combination of a reduction in its expiration period and an increase in the historical volatility assumption.

The values with a horizontal box around them are based on the historical volatility assumptions of 50 percent (the historical volatility for an option with 1.5 years remaining) and 60 percent (the historical volatility for an option with 0.5 years remaining).

Similarly, the values with a vertical box around them are based on historical volatility assumptions of 60 percent (the historical volatility of the shortened options contract) and 50 percent (the historical volatility of the original options contract).

If the historical volatility of the shortened option is unchanged from the historical volatility of the original option, the difference in the value of the options contracts would increase from approximately $287,000 to approximately $394,000. On the other hand, if the historical volatility of the original option is the same as the historical volatility of the shortened option, the difference in the value of the option contract increases from $287,000 to $466,000. In other words, as volatility increases (the historical volatility of the original option of 50 percent increases to the historical volatility of the shortened option of 60 percent), the value of the original option increases such that the difference is greater.

Based on this example, the economic damages suffered by the executive as a result of ABC's action to shorten the executive's stock options was approximately $287,000. This represents a loss of 37.5 percent of the value of the executive's current,

Exhibit 1
Stock Option Valuation & Volatility Considerations
Valuation Variable Inputs as of July 1, 2016

Stock Price $	Strike Price $	In the Money $	Number of Shares	Intrinsic Value $
40.00	38.00	2.00	100,000	200,000

Long-Term Target Price	$ 50.00	Implied Expected Growth	25%

	Shortened	Original	Change
Stock Price	$ 40.00	$ 40.00	
Risk-Free Rate	0.3%	0.4%	-0.1%
Historical Volatility	60%	50%	10%
Implied Volatility	90%	80%	10%
Implied Volatility Change	30%	30%	0%

Exhibit 2a
Stock Option Valuation & Volatility Considerations
Black Scholes-Merton Option Pricing Model—Historical Volatility

	Shortened	Original
Strike price	$ 38.00	$ 38.00
Stock price	$ 40.00	$ 40.00
Assumptions - Black-Scholes-Merton Option Pricing Model:		
Expiration date	1/1/2017	1/1/2018
Valuation date	7/1/2016	7/1/2016
Term (in years)	0.5	1.5
Risk-free rate	0.3%	0.4%
Estimated expected volatility (in %)	60%	50%
Variance (in %)	36%	25%
Call option value	$ 7.65	$ 10.52
Number of Shares	100,000	100,000
Option Value ($)	765,180	1,051,907
Change in Option Value ($)		**286,727**

shortened options. Recall that this value is based on a spread of historical volatility of 10 percentage points—that is, the shortened option historical volatility of 60 percent minus the original option historical volatility of 24 percent.

Using the sensitivity analysis presented in Exhibit 2b, we can see the effect of the same 10 percentage point spread at increasing historical volatility levels. These are presented in red in the sensitivity analysis. For example, the decrease in value between the original option and the shortened option of $359,000 is based on an original option historical volatility assumption of 60 percent and a shortened option historical volatility assumption of 70 percent (i.e., a spread of 10 percentage points). This decrease in value represents a loss of 46.9 percent of the shortened option value by reducing the remaining term of the option.

Exhibit 2c presents the results of examining the same 10 percentage point spread at increasing historical volatility levels.

As is evident in Exhibit 2c, as historical volatility levels increase, keeping the same 10 percentage point spread in volatility, the economic damage increases and becomes more material as a percentage of the option value of the shortened option contract.

Implied Volatility

Next, we examine the impact on shortening the executive's option contract using the BSM model and relying on implied volatility assumptions. Stock options on ABC shares are publicly traded.

Based on the inputs in Exhibit 1, we calculate the value of the original option and the option with the shorter remaining term using the BSM model and implied volatility assumptions. We then calculate the difference in value—that is, the damage the executive would suffer if the remaining term of the option is shortened by one year. This is presented in Exhibit 3a.

Exhibit 2b
Stock Option Valuation & Volatility Considerations
Sensitivity Analysis—Historical Volatility

		Volatility - Original Contract										
		5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Volatility - Shortened Contract	10%	2,547	79,300	258,723	443,301	627,458	809,522	988,517	1,163,701	1,334,445	1,500,202	1,660,493
	20%	(93,565)	(16,811)	162,612	347,189	531,347	713,410	892,406	1,067,590	1,238,334	1,404,091	1,564,381
	30%	(198,531)	(121,778)	57,646	242,223	426,380	608,444	787,440	962,623	1,133,367	1,299,124	1,459,415
	40%	(305,533)	(228,779)	(49,356)	135,221	319,379	501,442	680,438	855,622	1,026,366	1,192,122	1,352,413
	50%	(412,981)	(336,228)	(156,805)	27,773	211,930	393,994	572,989	748,173	918,917	1,084,674	1,244,965
	60%	(520,248)	(443,495)	(264,071)	(79,494)	104,663	**286,727**	465,723	640,906	811,651	977,407	1,137,698
	70%	(626,987)	(550,234)	(370,810)	(186,233)	(2,076)	179,988	358,983	534,167	704,911	870,668	1,030,959
	80%	(732,963)	(656,210)	(476,787)	(292,209)	(108,052)	74,012	253,007	428,191	598,935	764,692	924,983
	90%	(837,991)	(761,238)	(581,815)	(397,238)	(213,080)	(31,016)	147,979	323,163	493,907	659,664	819,955
	100%	(941,915)	(865,162)	(685,738)	(501,161)	(317,004)	(134,940)	44,056	219,240	389,984	555,740	716,031

Exhibit 2c
Stock Option Valuation & Volatility Considerations
Decrease in Value at Historical Volatility Spreads

Option Historical Volatility			Decrease in Value	
				% of Shortened
Shortened	Original	Spread	$	Contract
60%	50%	10%	286,727	37.5%
70%	60%	10%	358,983	46.9%
80%	70%	10%	428,191	56.0%
90%	80%	10%	493,907	64.5%
100%	90%	10%	555,740	72.6%

This analysis indicates that the value of the executive's options declined by approximately $494,000 by shortening the term by one year and increasing the volatility by 30 percentage points. Based on this particular example, implied volatility is greater the closer the option is to its expiration date.

Performing a sensitivity analysis based on the changes in implied volatility illustrates just how sensitive the change in value is for changes in the implied volatility of (1) the original option contract and (2) the option with the shorter remaining term. This is presented in Exhibit 3b.

The sensitivity table presented in Exhibit 3b illustrates the increase in the value of the option by reducing the remaining term based on a range of implied volatility assumptions. As discussed in the historical volatility section, the values with a horizontal box around them are based on implied volatility assumptions from 80 percent to 90 percent. Similarly, the values with a vertical box around them are based on implied volatility assumptions from 90 percent to 80 percent.

Similar to the historical volatility discussion, we note that if the implied volatility of the option with the shorter term is unchanged from the implied volatility of the original option, the value of the difference in options contracts increases from $494,000 to $599,000.

On the other hand, if the implied volatility of the original option is the same as the implied volatility of the option with the shorter term, the value of the difference in options contracts increases even more—from $494,000 to $660,000.

We see the same trend in the implied volatility analysis as we did in the historical volatility analysis—as volatility increases (the original option implied volatility of 80 percent increases to the implied volatility of 90 percent for the option with the shorter remaining term), the value of the original option increases such that the difference between the two options is greater.

Based on this example, the economic damages suffered by the executive as a result of ABC's action to reduce the remaining term of the executive's stock options was approximately $494,000. This represents a loss of 45.6 percent of the value of the executive's current, shortened options. Recall that this value is based on a spread of implied volatility of 10 percentage points, that is, the implied volatility of 90 percent for the option with the shorter term minus the original option implied volatility of 80 percent.

Exhibit 3a
Stock Option Valuation & Volatility Considerations
Black Scholes-Merton Option Pricing Model—Implied Volatility

	Shortened	Original
Strike price	$ 38.00	$ 38.00
Stock price	$ 40.00	$ 40.00
Assumptions - Black-Scholes-Merton Option Pricing Model:		
Expiration date	1/1/2017	1/1/2018
Valuation date	7/1/2016	7/1/2016
Term (in years)	0.5	1.5
Risk-free rate	0.3%	0.4%
Estimated expected volatility (in %)	90%	80%
Variance (in %)	81%	64%
Call option value	$ 10.83	$ 15.77
Number of Shares	100,000	100,000
Option Value ($)	1,082,924	1,576,831
Change in Option Value ($)		**493,907**

Exhibit 3b
Stock Option Valuation & Volatility Considerations
Sensitivity Analysis—Implied Volatility

Volatility - Shortened Contract	Volatility - Original Contract										
	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	2,547	79,300	258,723	443,301	627,458	809,522	988,517	1,163,701	1,334,445	1,500,202	1,660,493
20%	(93,565)	(16,811)	162,612	347,189	531,347	713,410	892,406	1,067,590	1,238,334	1,404,091	1,564,381
30%	(198,531)	(121,778)	57,646	242,223	426,380	608,444	787,440	962,623	1,133,367	1,299,124	1,459,415
40%	(305,533)	(228,779)	(49,356)	135,221	319,379	501,442	680,438	855,622	1,026,366	1,192,122	1,352,413
50%	(412,981)	(336,228)	(156,805)	27,773	211,930	393,994	572,989	748,173	918,917	1,084,674	1,244,965
60%	(520,248)	(443,495)	(264,071)	(79,494)	104,663	286,727	465,723	640,906	811,651	977,407	1,137,698
70%	(626,987)	(550,234)	(370,810)	(186,233)	(2,076)	179,988	358,983	534,167	704,911	870,668	1,030,959
80%	(732,963)	(656,210)	(476,787)	(292,209)	(108,052)	74,012	253,007	428,191	598,935	764,692	924,983
90%	(837,991)	(761,238)	(581,815)	(397,238)	(213,080)	(31,016)	147,979	323,163	**493,907**	659,664	819,955
100%	(941,915)	(865,162)	(685,738)	(501,161)	(317,004)	(134,940)	44,056	219,240	389,984	555,740	716,031

Using the sensitivity analysis presented in Exhibit 3b, we can examine a similar percentage point spread of 10 percent at increasing implied volatility levels. These are presented in red in the sensitivity analysis. For example, the $556,000 decrease in value between the original option and the option with the shorter remaining term is based on an original option implied volatility assumption of 90 percent and an implied volatility assumption of 100 percent (i.e., a spread of 10 percentage points) for the option with the shorter remaining term. This decrease in value represents a loss of 51.3 percent of the value of the executive's current, shortened options.

Exhibit 3c presents the results of examining the same 10 percentage point spread at the increased historical volatility level just discussed.

As is evident in Exhibit 3c, as implied volatility levels increase, keeping the same 10 point spread, the damage increases and becomes more material as a percentage of the option value of the original option contract.

Summary of Historical Volatility Versus Implied Volatility

This example illustrates that there is a material difference from an economic perspective (and in the case of a litigation, from an economic damages perspective) if the analyst expands the valuation analysis to a consideration of implied volatility from the conventional use of historical volatility.

Exhibit 4 presents a summary of the differences between the historical volatility analysis compared to the implied volatility analysis when examining the impact of ABC reducing the remaining term of the executive's option.

As presented in Exhibit 4, this example illustrates that a stock option analysis relying on implied volatility results in economic damages of more than 70 percent of a stock option analysis relying on historical volatility.

Recalling that if implied volatility is greater than historical volatility, the actual option trading price is higher than what it would be if the historical volatility is used in the BSM model to calculate the option trading price. Does this mean that the actual option trading price implied by the implied volatility is correct or incorrect? Put differently, does this mean that the higher implied volatility of the option is correct and the lower historical volatility of the stock price is incorrect as it relates to the time horizon to the expiration of the option? Or, is the current higher implied volatility of the option incorrect or is the lower historical volatility of the stock price correct as it relates to the time horizon to the expiration of the option?

In order to answer this question and select the correct volatility measure, the analyst should carefully examine historical and implied volatility in the context of the facts and circumstances of the company and its market outlook.

The valuation analyst should also keep in mind that implied volatility is forward-looking rather than backward-looking. Thus, the volatility implied from actual option prices includes the market's current outlook of future expectations for the value of the

Exhibit 3c
Stock Option Valuation & Volatility Considerations
Decrease in Value at Implied Volatility Spreads

Option Implied Volatility			Decrease in Value	
Shortened	Original	Spread	$	% of Shortened Contract
90%	80%	10%	493,907	45.6%
100%	90%	10%	555,740	51.3%

Exhibit 4
Stock Option Valuation & Volatility Considerations
Summary of Historical Volatility versus Implied Volatility at July 1, 2016

	Volatility		Stock Price		Change in Option Value
	Shortened Contract	Original Contract	$	Reference	$
Historical Volatility	60%	50%	40.00	Exhibit 2a	286,727
Implied Volatility	90%	80%	40.00	Exhibit 3a	493,907
Change	30%	30%			207,180
Percentage Change					**72%**

Source: As indicated above, Bloomberg, and Willamet Management Associates.

stock. However, while the price of the stock already reflects the market's future expectations, this is not reflected completely in the stock's historical volatility measure. This is because historical volatility relies on many data points over a certain period of time. One day's stock price change, though high, will not change today's six-month, daily historical volatility very much from yesterday's six-month, daily historical volatility.

Therefore, today's six-month, daily historical volatility does not fully reflect the impact of today's stock price change. Implied volatility, on the other hand, does fully reflect the impact of today's stock price change and the change in the market's outlook about future stock performance.

For this reason, the valuation analyst may generally consider implied volatility as a better measure of volatility than historical volatility. However, an examination of both is the recommended best practice before selecting a final volatility estimate.

Implied volatility may be considered a leading and concurrent indicator of volatility, while historical volatility may be considered a lagging indicator of volatility.

There are, however, other perspectives that the valuation analyst should consider. These perspectives—time horizon and valuation changes—are discussed next.

Time Horizon

The time horizon selected is an important factor in estimating volatility. As mentioned above, different perspectives that the analyst may adopt may often result in widely disparate volatility conclusions.

Historical volatility may be measured in frequencies on a daily, weekly, and even monthly basis. In addition, historical volatility is measured by examining the stock prices over any time period.

For example, the analyst can examine historical volatility by analyzing daily prices during the prior (1) one month period, (2) three month period, (3) one year period, (4) multi-year period, or (5) any other unique period of time. Similarly, historical volatility may be examined by analyzing the price at the end of each week during the same time periods. In some instances, only month-end prices are analyzed.

As the duration between observations increases, fewer data points will be available to calculate the volatility. This may result in a lower level of reliability on this data. The analyst must weigh the potential benefits of selecting longer observation frequencies to calculate volatility against the effect that this might have on reliability due to the fewer data points.

Using the historical volatility measure is limited in instances where there are not enough data points to provide a statistically meaningful measure of volatility. This problem does not exist when considering implied volatility. As such, relying on implied volatility in those instances may provide a better and more reliable measure of volatility.

Implied volatility is measured by examining stock options that will expire in the future. Unlike historical volatility time horizons, which offer much greater flexibility in selecting the time horizon, implied volatility time horizons are limited to (1) the number of stock options issued and outstanding at a particular time and (2) the expirations of those options.

Stock option prices for a specific expiration date are different based on their strike price because their intrinsic values are different. Theoretically, however, the implied volatility of options expiring on the same date should be the same regardless of their strike prices. In other words, while their actual option prices are not the same, because of their different strike prices, their implied volatility should, theoretically, be the same. If they are not the same, this may add an additional layer of complexity in selecting the appropriate options at a given expiration date.

Stock options that have the same expiration date but have different implied volatilities should be analyzed to determine whether the magnitude of the differences is material. Then, the valuation analyst may select the implied volatility of one particular stock option at a particular strike price or some or all of the stock options expiring on that same day.

Changes in Volatility

Volatility changes over time. For any one specific procedure that the analyst applies to examine volatility at a particular date, when that same procedure is applied at a different date, it may yield a different volatility conclusion. This is true for historical volatility as well as implied volatility.

If the volatility, whether measured historically or implied, does not change over different dates, this may give support for a particular current volatility estimate.

For example, assuming implied volatility today for a three-month option is 50 percent, if the analyst examines the same three-month option at various intervals in the past (three months ago, six months ago, nine months ago, one year ago) and finds the same 50 percent volatility, this fact pattern lends considerable support for today's 50 percent volatility indication.

The analyst may consider changes in volatility over time in performing these procedures to estimate volatility. Depending on the purpose of the valuation and the scope of the assignment, the change in volatility over time may call for further analysis before reaching the conclusion of the option value.

Continuing with our example, let's look to see how things change for the same company at a different time horizon and different volatilities. In this part of the example, the executive of ABC holds the same options at the same strike price and at the same expiration, but in this example the valuation date is January 1, 2016, and the expiration is now 2.0 years. If ABC reduces the executive's option expiration period by one year, how would the value of his options change and would the shorter expiration period in this instance have damaged him economically?

The details of the stock option and the BSM model inputs for this scenario are presented in Exhibit 5.

We will perform the same analysis as in the previous discussion for the new earlier valuation date of January 1, 2016.

Historical Volatility

Based on the inputs in Exhibit 5, we calculate the value of the original option and the option with the shorter remaining term using the BSM model and historical volatility assumptions. We then calculate the difference in value, that is, the value that the executive would be giving up if the term of the option is shortened by one year. This is presented in Exhibit 6a.

This analysis indicates that the value of the executive's option declined by approximately $48,000 by shortening the term by one year and leaving the volatility relatively unchanged.

Performing a sensitivity analysis based on the changes in historical volatility illustrates just how sensitive the change in value is for changes in the historical volatility of the original option contract and the shortened option contract. This is presented in Exhibit 6b.

The sensitivity table presented in Exhibit 6b illustrates the decrease in the value of the option due to a combination of a reduction in its expiration period and an increase in the historical volatility assumption. Recall that we noted in our earlier discussion that if the historical volatility of the option with the shorter remaining term is unchanged from the historical volatility of the original option, the difference in the value of the options contracts would increase in this particular case. Conversely, if the historical volatility of the original option increases, the difference in the value of the options contracts also increases.

Based on this example, the economic damages suffered by the executive as a result of ABC's action to reduce the remaining term of the executive's stock option was approximately $48,000. This represents a loss of 4.8 percent of the value of the executive's current, shortened option. In this scenario, this value is based on a 10 percentage point spread in historical volatility.

Using the sensitivity analysis presented in Exhibit 6b, we can examine the same 10 percentage point spread at increasing historical volatility levels. These are presented in red in the sensitivity analysis.

Exhibit 5
Stock Option Valuation & Volatility Considerations
Valuation Variable Inputs as of January 1, 2016

Stock Price $	Strike Price $	In the Money $	Number of Shares	Intrinsic Value $
44.00	38.00	6.00	100,000	600,000

Long-Term Target Price	$ 49.00	Implied Expected Growth	11.4%

	1/1/2017	1/1/2018	Change
Stock Price	$ 44.00	$ 44.00	
Risk-Free Rate	0.4%	0.5%	-0.1%
Historical Volatility	40%	30%	10%
Implied Volatility	60%	50%	10%
Implied Volatility Change	20%	20%	0%

Exhibit 6a
Stock Option Valuation & Volatility Considerations
Black Scholes-Merton Option Pricing Model—Historical Volatility

	Shortened	Original
Strike price	$ 38.00	$ 38.00
Stock price	$ 44.00	$ 44.00
Assumptions - Black-Scholes-Merton Option Pricing Model:		
Expiration date	1/1/2017	1/1/2018
Valuation date	1/1/2016	1/1/2016
Term (in years)	1	2
Risk-free rate	0.4%	0.5%
Estimated expected volatility (in %)	40%	30%
Variance (in %)	16%	9%
Call option value	$ 10.01	$ 10.49
Number of Shares	100,000	100,000
Option Value ($)	1,001,020	1,049,258
Change in Option Value ($)		**48,238**

Exhibit 6b
Stock Option Valuation & Volatility Considerations
Sensitivity Analysis—Historical Volatility

Volatility - Shortened Contract	Volatility - Original Contract: 5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	12,069	49,294	218,397	422,346	633,734	845,209	1,053,586	1,256,998	1,454,142	1,644,030	1,825,885
20%	(82,330)	(45,105)	123,998	327,947	539,335	750,811	959,188	1,162,599	1,359,743	1,549,631	1,731,487
30%	(216,164)	(178,939)	(9,836)	194,114	405,501	616,977	825,354	1,028,765	1,225,909	1,415,797	1,597,653
40%	(362,040)	(324,815)	(155,711)	**48,238**	259,625	471,101	679,478	882,889	1,080,033	1,269,921	1,451,777
50%	(512,014)	(474,788)	(305,685)	(101,736)	109,652	321,127	529,504	732,916	930,060	1,119,948	1,301,803
60%	(662,947)	(625,722)	(456,619)	(252,670)	(41,282)	170,193	378,570	581,982	779,126	969,014	1,150,869
70%	(813,248)	(776,023)	(606,920)	(402,971)	(191,583)	19,892	228,269	431,681	628,825	818,713	1,000,569
80%	(961,942)	(924,717)	(755,614)	(551,665)	(340,277)	(128,802)	79,576	282,987	480,131	670,019	851,875
90%	(1,108,349)	(1,071,124)	(902,021)	(698,072)	(486,684)	(275,209)	(66,832)	136,580	333,724	523,612	705,467
100%	(1,251,952)	(1,214,726)	(1,045,623)	(841,674)	(630,286)	(418,811)	(210,434)	(7,022)	190,122	380,010	561,865

For example, the decrease in value between the original option and the option with the shorter remaining term of $110,000 is based on an original option historical volatility assumption and a shorter-term option historical volatility assumption of 10 percentage points. This decrease in value represents a loss of 11.0 percent of the value of the executive's current, shortened options.

Exhibit 6c presents the results of examining the same 10 percentage point spread at increasing historical volatility levels.

As is evident in Exhibit 6c, as historical volatility levels increase, keeping the same 10 percentage point spread, the decrease in value (from the original option to the shortened option) increases and becomes more material as a percentage of the option value of the shortened option contract.

Implied Volatility

Based on the inputs in Exhibit 5, we calculate the value of the original options and the shorter-term options using the BSM model and implied volatility assumptions. We then calculate the difference in value, that is, the value the executive would be giving up if the remaining term of the option is shortened by one year. This is presented in Exhibit 7a.

Exhibit 6c
Stock Option Valuation & Volatility Considerations
Decrease in Value at Historical Volatility Spreads

Option Historical Volatility			Decrease in Value	
Shortened	Original	Spread	$	% of Shortened Contract
40%	30%	10%	48,238	4.8%
50%	40%	10%	109,652	11.0%
60%	50%	10%	170,193	17.0%
70%	60%	10%	228,269	22.8%
80%	70%	10%	282,987	28.3%
90%	80%	10%	333,724	33.3%
100%	90%	10%	380,010	38.0%

This analysis indicates that the value of the executive's options declined by approximately $170,000 by shortening the term by one year and increasing the volatility by approximately 10 percentage points.

Performing a sensitivity analysis based on the changes in implied volatility illustrates just how sensitive the change in value is for changes in the implied volatility of the original option and the shorter-term option. This is presented in Exhibit 7b.

The sensitivity table presented in Exhibit 7b illustrates the increase in the value of the option by reducing the term of its expiration based on a range of implied volatility assumptions. As discussed in the historical volatility section, the values with a horizontal box around them are based on implied volatility assumptions from 50 percent to 60 percent. Similarly, the values with a vertical box around them are based on implied volatility assumptions from 60 percent to 50 percent.

Similar to the earlier discussions of sensitivity analyses, as illustrated in Exhibit 7b, if the implied volatility of the shorter-term option is unchanged from the implied volatility of the original option, the value of the difference in options contracts increases materially from $170,000 to $322,000.

Moreover, if the implied volatility of the original option is the same as the implied volatility of the shorter-term option, the difference in the value of the options increases even more—from $170,000 to $379,000.

Based on this example, the economic damages the executive suffered as a result of ABC's action to reduce the term of the executive's stock options was approximately $170,000. This represents a loss of 13.1 percent of the value of the executive's current options with a shorter expiration period.

Exhibit 7a
Stock Option Valuation & Volatility Considerations
Black Scholes-Merton Option Pricing Model—Implied Volatility

	Shortened		Original
Strike price	$ 38.00		$ 38.00
Stock price	$ 44.00		$ 44.00
Assumptions - Black-Scholes-Merton Option Pricing Model:			
Expiration date	1/1/2017		1/1/2018
Valuation date	1/1/2016		1/1/2016
Term (in years)	1		2
Risk-free rate	0.4%		0.5%
Estimated expected volatility (in %)	60%		50%
Variance (in %)	36%		25%
Call option value	$ 13.03		$ 14.74
Number of Shares	100,000		100,000
Option Value ($)	1,303,186		1,473,606
Total Change in Option Value ($)			**170,420**

Exhibit 7b
Stock Option Valuation & Volatility Considerations
Sensitivity Analysis—Implied Volatility

Volatility - Shortened Contract	Volatility - Original Contract										
	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	12,072	49,439	218,887	423,154	634,836	846,584	1,055,211	1,258,846	1,456,186	1,646,242	1,828,234
20%	(82,581)	(45,214)	124,234	328,500	540,183	751,931	960,557	1,164,193	1,361,533	1,551,588	1,733,581
30%	(216,659)	(179,293)	(9,845)	194,422	406,104	617,852	826,479	1,030,114	1,227,455	1,417,510	1,599,503
40%	(362,764)	(325,397)	(155,949)	48,318	260,000	471,748	680,375	884,010	1,081,350	1,271,406	1,453,398
50%	(512,953)	(475,587)	(306,139)	(101,872)	109,810	321,558	530,185	733,820	931,161	1,121,216	1,303,209
60%	(664,092)	(626,725)	(457,277)	(253,011)	(41,329)	**170,420**	379,046	582,681	780,022	970,077	1,152,070
70%	(814,587)	(777,220)	(607,772)	(403,505)	(191,823)	19,925	228,552	432,187	629,527	819,582	1,001,575
80%	(963,462)	(926,096)	(756,648)	(552,381)	(340,699)	(128,951)	79,676	283,311	480,652	670,707	852,700
90%	(1,110,039)	(1,072,672)	(903,224)	(698,958)	(487,275)	(275,527)	(66,901)	136,734	334,075	524,130	706,123
100%	(1,253,797)	(1,216,430)	(1,046,982)	(842,716)	(631,034)	(419,285)	(210,659)	(7,024)	190,317	380,372	562,365

Exhibit 7c
Stock Option Valuation & Volatility Considerations
Decrease in Value at Implied Volatility Spreads

Option Implied Volatility			Decrease in Value	
				% of Shortened
Shortened	Original	Spread	$	Contract
60%	50%	10%	170,420	13.1%
70%	60%	10%	228,552	17.5%
80%	70%	10%	283,311	21.7%
90%	80%	10%	334,075	25.6%
100%	90%	10%	380,372	29.2%

Recall that this value is based on a spread of historical volatility of 10 percentage points—that is, the shorter-term option implied volatility of 60 percent minus the original option implied volatility of 50 percent.

Using the sensitivity analysis presented in Exhibit 7b, we can examine a similar 10 percentage point spread in implied volatility levels. These are presented in red in the sensitivity analysis.

For example, the decrease in value between the original option and the shorter-term option of $229,000 is based on an original option implied volatility assumption of 70 percent and a shorter-term option historical volatility assumption of 60 percent (i.e., a spread of 10 percentage points). This decrease in value represents a loss of 17.5 percent of the value of the executive's original options.

Exhibit 7c presents the results of examining the same 10 point spread in implied volatility levels.

As is evident in Exhibit 7c, as implied volatility levels increase, keeping the same 10 point spread, the damage increases and becomes more material as a percentage of the current, shortened option value.

Summary of Historical Volatility Versus Implied Volatility

Similar to the previous example as of July 1, 2016, this example also illustrates that, as of January 1, 2016, there is a material difference from an economic perspective (and in the case of a litigation, from an economic damages perspective) if the analyst expands the valuation analysis beyond the conventional use of historical volatility to considering implied volatility.

Exhibit 8 presents a summary of the differences between the historical volatility analysis compared to the implied volatility analysis when examining the impact of ABC reducing the remaining term of the executive's option.

As presented in Exhibit 8, this example illustrates that a stock option analysis using implied volatility results in economic damages of greater than two and a half times that of a stock option analysis using historical volatility.

This analysis as of January 1, 2016, allowed us to examine the same option analysis of ABC stock as of an earlier point in time, according to the second perspective related to time horizon. Since the historical volatility and implied volatility were different as of the January 1, 2016, analysis, this also allows us to examine the same option analysis of ABC stock having differing volatilities.

As presented in Exhibit 9, the shorter time horizon resulted in more than twice the economic damages by relying on implied volatility. A similar analysis can be performed for historical volatility. The valuation analyst should assess which volatility measure is the most reliable and supportable.

This example illustrates the three perspectives in estimating volatility:

1. Implied volatility
2. Time horizon
3. Change in volatility over time

All of these perspectives affect the valuation of stock options.

Exhibit 8
Stock Option Valuation & Volatility Considerations
Summary of Historical Volatility versus Implied Volatility
at January 1, 2016

	Volatility		Stock		Change in
	Shortened Contract	Original Contract	Price $	Reference	Option Value $
Historical Volatility	40%	30%	44.00	Exhibit 6a	48,238
Implied Volatility	60%	50%	44.00	Exhibit 7a	170,420
Change	20%	20%			122,182
Percentage Change					**253%**

Source: As indicated above, Bloomberg, and Willamet Management Associates.

Other Considerations

Another financial metric that the valuation analyst may consider in determining the proper volatility assumption when valuing stock

options is third-party analysts' consensus estimates of the long-term target stock price for a particular company. Since this is a forward-looking metric, it only applies to implied volatility and not to historical volatility.

Our example above illustrates that this metric does change over different points in time, as presented in Exhibits 1 and 5 above. While the long-term target price estimate is not an input in the BSM model, it is a data point that is considered by both the investment community and the valuation community in assessing the value of stock options vis-à-vis its current stock price.

Exhibit 9
Stock Option Valuation & Volatility Considerations
Impact of Time Horizon on Option Value Changes Using Implied Volatility

Volatility	Valuation Date	Time Horizon Shortened	Time Horizon Original	Reference	Change in Option Value $
Implied	July 1, 2016	0.5	1.5	Exhibit 3a	493,907
Implied	January 1, 2016	1.0	2.0	Exhibit 7a	170,420
Increase in Economic Damages					323,488
Percentage Change					**190%**

Source: As indicated above, Bloomberg, and Willamet Management Associates.

This long-term target price estimate metric is also important in assessing the impact of a company reducing the remaining term of an executive's stock option. As the long-term target stock price increases, a shorter-term stock option would preclude the executive from enjoying the increase in the anticipated intrinsic value and the increase in the actual option value of the stock option.

Understanding the long-term target stock price estimate also aids the executive in deciding what action to take in exercising the stock option at the date the shorter term option expires.

When exercising stock options, the executive's stock options in our example, and the holder of a stock option in general, has three alternatives:

1. Take a full position in the stock—exercise the option and hold the stock
2. Take a partial position in the stock—exercise the option and sell enough stock to cover the tax liability related to exercising the option
3. Cash out (take a zero position in the stock)—exercise the option and sell all the stock

Taking a Full Position in the Stock of a Stock Option

Taking a full position in the underlying stock of a stock option is the first alternative the holder of a stock option may take at or prior to the expiration date. This involves exercising the option, paying the strike price of the option for the shares of stock, and paying the taxes on the intrinsic value (the extent to which the option is in-the-money) of the option at the exercise date.

The holder of a stock option would select this alternative if the executive believes the stock price will increase in the future, thereby enjoying further profits in excess of the intrinsic value achieved through exercising the option.

However, even if the holder of the option believes the stock price will increase in the future, the executive may not be able to select this alternative. This is because the option holder may not have enough money to pay the strike price and the taxes. This might be the case especially with very large positions in stock options.

In the case of our example with the executive of ABC, the cash required to exercise and take a position in the stock is $3.8 million ($38 strike price * 100,000 shares). At a stock price of $42, the tax liability of exercising the option at a 40 percent tax rate is $160,000 ([$42 stock price minus $38 strike price] * 100,000 shares * 40 percent). Therefore, the executive would have to pay a total of $3.96 million in order to take a full position in the stock of ABC.

In this case (taking a full position in the stock upon exercising ABC stock options), the executive would have zero economic damages of exercising early at the shorter-term expiration date. This is because, upon exercise, the executive now owns the underlying stock and would, therefore, enjoy any increase in the stock price. In other words, exercising early and taking a full position versus exercising later and taking a full position would not change the executive's economic position compared to the original expiration date.

Taking a Partial Position in the Stock of a Stock Option

Taking a partial position in the underlying stock of a stock option is the second alternative available to

the holder of a stock option at or prior to the expiration date. There are many partial positions a stock option holder may take.

Let's consider the alternative where the stock option holder wishes to take the largest position the executive can in the stock while not paying any money—that is, undergoing a cashless exercise of the stock option. This alternative is a favorite among many stock option holders for the following reasons:

1. It does not require any cash outlay to exercise the option.
2. It does not provide any cash to the stock option holder upon exercise.
3. Most importantly, it allows the stock option holder to hold the maximum number of shares of the stock as possible, given the first two constraints.

In effect, this alternative is truly a cashless exercise. That is, the stock option holder exercising the stock option neither receives cash nor pays cash.

Executing this alternative involves exercising the stock option and then selling only those number of shares required to pay for (1) exercising the stock option (the strike price multiplied by the number of shares) and (2) the taxes (current stock price minus strike price multiplied by the tax rate).

In the case of our example with the ABC executive, if the stock price increases over the next six months, the economic damages would be limited to the lost value for the number of shares the executive sold in order to satisfy the cash requirements (both for acquiring the stock at the strike price and paying the tax liability for the intrinsic value) for exercising the stock options. There would be no damages associated with the stock the executive received because the executive would enjoy any stock price increase over the subsequent six months just like the original option.

In general, the economic damages related to the lost value for the number of shares the executive sold in order to satisfy the cash requirements for exercising the stock options would typically only be considered "damages" if the executive did not have any cash at the shortened expiration date in order to exercise the option and take a full position in the stock and the executive was, therefore, forced to sell the stock.

If the executive did have the cash to exercise the option and take a full position in the stock, an argument may be made that there would not be any economic damages suffered by the executive related to being forced to accept the shorter-term option.

Cashing Out—Taking a Zero Position in the Stock of a Stock Option

Finally, cashing out by taking a zero position in the underlying stock is the third alternative available to the holder of a stock option at or prior to the expiration date.

In this alternative, the option holder simply exercises the option, sells all the underlying stock, pays for both acquiring the stock at the strike price and paying the tax liability for the intrinsic value, and receives the remaining cash proceeds.

In the case of the ABC executive, since the stock option holder has exercised the stock options and sold all of the underlying stock, the economic damages, if the stock price increases over the subsequent six months from the shortened expiration date, is the maximum among the three alternatives discussed here.

However, to the extent that the second alternative is easily available to the executive (i.e., performing a cashless exercise and taking a position in the stock), then there may be a duty to mitigate his damages. Therefore, the economic damages that may be available to the executive may be limited to what is included under the second alternative.

Summary and Conclusion

We discussed several perspectives that a stock option analyst should consider when estimating volatility. Estimating volatility involves an examination of (1) historical volatility versus implied volatility, (2) the appropriate time horizon over which volatility should be measured, and (3) the changes in volatility over different periods of time in the past.

Performing a comprehensive analysis of volatility is important because (1) the valuation of stock options may be very sensitive to even small changes in volatility and (2) different perspectives to estimate volatility may result in materially different conclusions.

The following points summarize important insights regarding the above discussion of stock option volatility considerations:

1. As volatility increases, the value of a stock option, holding all other variables constant, also increases.
2. Historical volatility may be measured in multiple frequencies and over multiple time periods. Each frequency and time period used to measure volatility may result in disparate volatility indications. Therefore, care must be exercised in considering these multiple

methods of measuring historical volatility and the selected method.

3. Implied volatility time periods are more limited than historical volatility.
4. Implied volatility for stock options of a particular company expiring at a specific expiration date should, theoretically, be the same. If they are not, the analyst should exercise care in investigating the reasons for the differences, the magnitude of the differences, and selecting the appropriate implied volatility measure.
5. Examining volatility, both historical and implied, using the same parameters at different points in the past is an important perspective in testing the valuation analyst's selected volatility. If the volatility measures at different points in the past are consistent with the current volatility measure, this may provide reasonable support for the selected volatility.
6. In the ABC executive's stock option example, (a) shortening the expiration of a stock option increases the volatility and decreases the stock option value and (b) doing so at a valuation date that is closer to the expiration date increase the volatility more and decreases the value more.
7. Implied volatility is forward-looking and therefore captures the future expectations of the market and the company. Because of this feature of implied volatility, which historical volatility does not have, the valuation analyst may consider implied volatility preferred to historical. At a minimum, the analyst should consider implied volatility along with historical volatility in selecting a volatility measure for valuing a stock option.
8. Another benefit of implied volatility over historical volatility is that the speed and the magnitude of a company's current and expected performance may be reflected in the volatility measure. Implied volatility is affected by company news daily. On the other hand, even a large change in the stock price of the company will not result is a commensurate change in the company's historical volatility. Consequently, the analyst may generally consider implied volatility as a better measure of volatility than historical volatility. However, an examination of both is the recommended best practice before selecting a final volatility estimate.
9. The analysts' consensus estimates of the long-term target stock price for a particular company provides meaningful information about the company's outlook. This financial metric is only captured in implied volatility.
10. Implied volatility may be considered a leading and concurrent indicator of volatility, while historical volatility may be considered a lagging indicator of volatility.
11. Estimating the volatility measure is an important input, if not the most important input, in performing stock option valuations, or, for that matter, any other type of valuation that requires a volatility input.

As described above, estimating volatility can be very complex. An analysis of volatility should (1) be comprehensive, (2) include an examination of the three perspectives discussed in this article, (3) consider the important understandings and insights discussed in this article, (4) be conducted in the context of the facts and circumstances of a particular company and the market in which it competes, (5) consider the characteristics and requirements of the specific purpose of the valuation, and (6) be reasonable, explainable, and supportable.

Notes:

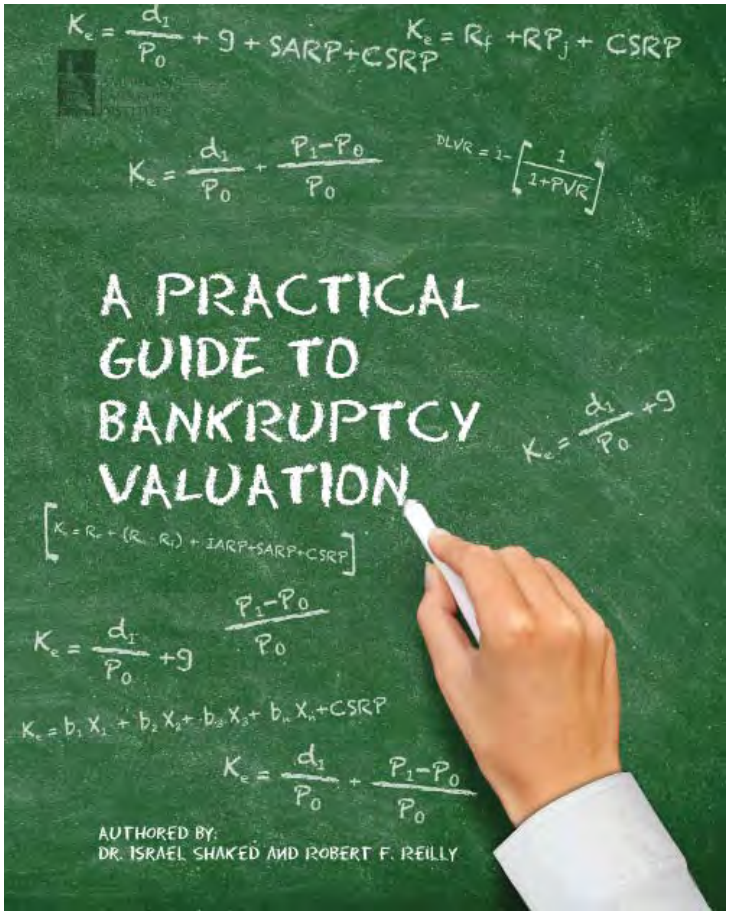
1. John C. Hull, *Fundamentals of Futures and Options Markets*, 9th ed. (New York: Pearson, 2016), 308.
2. Ibid.
3. This means that when the historical volatility of the shortened option remains the same as (unchanged from) the historical volatility of the original option of 50 percent, how does the change in the option values between the shortened option and the original option behave? Is it greater, unchanged, or less? This same analysis is repeated in subsequent scenarios in this article.
4. The assumption implicit in this article is that the stock option is an American-style option in which the vested stock option may be exercised any time before or at the date of expiration. European-style options may only be exercised on the expiration date of the option. Because of the flexibility in the exercise date, the value of an American-style option is usually greater than the value of European-style options.

Fady Bebawy is a vice president of our firm and is resident in our Chicago office. Fady can be reached at (773) 399-4323 or at ffbebawy@willamette.com.

Just Released . . .

A PRACTICAL GUIDE TO BANKRUPTCY VALUATION

A Practical Guide to Bankruptcy Valuation provides practical guidance on the valuation of a business, business ownership interest, security, or intangible asset within a bankruptcy context.



Published by the American Bankruptcy Institute in 2013, *A Practical Guide to Bankruptcy Valuation* contains a wealth of information on how solvency and capital adequacy analyses, debtor-in-possession financing, fraudulent conveyance and preference claims, restructuring of debtor securities, sale of bankruptcy estate assets, plans of reorganization, bankruptcy taxation issues and fresh-start accounting issues, among others, are factored into properly valuing a bankrupt company.

Interspersed with helpful charts and illustrative examples, the book describes the generally accepted approaches for valuing the assets and securities of a financially troubled business. Based on the authors' combined 75 years of experience in the valuation field, *A Practical Guide to Bankruptcy Valuation* lays a solid foundation for those seeking a better understanding of valuation within the bankruptcy context.

This book is available for $115 plus shipping at www.willamette.com/book_bankruptcy.html.

Willamette Management Associates
thought leadership
www.willamette.com

A PRACTICAL GUIDE TO BANKRUPTCY VALUATION

Dr. Israel Shaked and Robert F. Reilly

Table of Contents

Willamette Management Associates

Valuing Stock Options in Compliance with Section 409A

Reid Chanon

Internal Revenue Code Section 409A provides the income tax provisions related to deferred compensation—including employee stock options. Section 409A does not prescribe a universal methodology to value employee stock options. However, many analysts apply option pricing models—such as the Black-Scholes option pricing model ("Black-Scholes") or a binomial model—to value employee stock options. This discussion provides (1) a summary of Section 409A and (2) an overview of common option pricing models.

Introduction

Internal Revenue Code Section 409A applies to the compensation that is earned by an employee in one year but is paid in a future year, such as a nonqualified deferred compensation plan.

A nonqualified deferred compensation plan is an arrangement between an employer and an employee to pay the employee compensation in the future.

Such arrangements include the following:

1. Nonqualified retirement plans
2. Elective deferrals of compensation
3. Severance and separation programs
4. Post-employment payments provided for in an employment agreement
5. Equity incentive programs, such as stock options

According to Section 409A, every time a corporation issues a stock option to an employee, there should be a valuation of the corporation's common stock. However, Section 409A does not provide a universally accepted valuation method to value employee stock options.

For this reason, it is up to the employer and its advisers to elect a practical valuation method, or application, to estimate the fair market value of the employee stock options.

Therefore, it is common for analysts to apply an option pricing model to value employee stock options. This is because option pricing models allow analysts to assign probabilistic assumptions to analyze contingent events.

The value of employee stock options is contingent on the economic circumstances that will exist in the future when the employee has the right to receive the shares.

Section 409A Overview

Section 409A requires that all compensation deferred for the taxable year and all preceding taxable years be included in gross income for the taxable year unless there is a substantial risk of forfeiture.

Section 409A applies to all deferred compensation that an employee earns for the taxable year and imposes severe tax penalties on noncompliant deferred compensation arrangements.

In order to avoid noncompliant arrangements, company managements and their analysts should understand how to establish (1) the value of the shares that underlie the option and (2) the exercise price for the stock option.

Noncompliant arrangements may include the following:

1. Stock options and stock appreciation rights that are granted with an exercise price below fair market value at the time of grant

2. Stock options or stock appreciation rights that are not affiliated with the common stock of the company the employee works for or its parent company
3. Rights that are added later to further defer the stock option or stock appreciation rights[1]

According to Section 409A, stock options and stock appreciation rights that are noncompliant may result in significant unfavorable tax consequences for the employee and the employer.

For example, the nonqualified deferred compensation in question will be fully taxable as soon as the employee has a vested right to receive it. In addition, a tax penalty of 20 percent may be applied.[2]

Valuing Public and Private Corporation Stock

To avoid unfavorable tax consequences under Section 409A, the exercise price of the stock option must not be less than the fair market value of the underlying stock as of the date of the grant.

The following valuation guidelines are appropriate for both public and private corporation stock.

Determining Fair Market Value of Public Company Stock

The fair market value of stock that is actively traded on an organized securities market may be based upon:

1. the most recent sale price before the grant,
2. the closing price on the trading day before the grant,
3. the arithmetic mean of the high and low prices on the trading day before or the trading day of the grant, or
4. another reasonable basis using actual transactions in the stock as reported by the market.[3]

Determining the Fair Market Value of Private Company Stock

The fair market value as of the date of the grant of stock that is not traded on a reputable securities market is to be established by reasonable application of a recognized valuation method.

A reasonable valuation method may include one or more of the following considerations:

1. The value of tangible and intangible assets of the company less its liabilities (an asset-based approach valuation analysis)
2. The present value of expected future cash-cash flow of the company (an income approach valuation analysis)
3. Recent arm's-length transactions involving the sale or transfer of the subject stock (a market approach valuation analysis)
4. The market value of stock or equity interest in similar companies (a market approach valuation analysis), based on:
   a. observable trading prices on an reputable securities market or
   b. an amount paid in a recent arm's-length private transaction
5. A method that is regularly used for other purposes that have a material economic effect on the company, its stockholders, or its creditors (which may include relevant factors such as ownership control price premiums or discounts for lack of marketability)[4]

A valuation method is not considered to be reasonable if:

1. it fails to reflect important information that is known or knowable as of the grant date that may materially affect the value of the corporation's stock such as:
   a. the resolution of material litigation or
   b. the issuance of a patent, or
2. the valuation date was more than 12 months prior to the date for which the valuation is being used.[5]

Valuation Safe Harbors for Private Company Stock

The Internal Revenue Service (the "Service") may rebut this presumption by showing that the concluded value of company stock was "grossly unreasonable" by the improper use of the valuation method.[6]

A private company's use of a valuation method is presumed to be reasonable under the following three safe harbor provisions.

Safe Harbor I

The fair market value of the private company stock is estimated by a qualified independent appraiser that has:

"Stock options in the public market differ from a stock option issued by a closely held company because they are issued by a third party rather than the public company itself."

1. met educational and experience requirements or
2. a professional designation recognized by the Secretary of Treasury.

Such requirements must be met 12 months prior to the date for which the valuation of employee stock options is being used.

Safe Harbor II

The fair market value is based on a formula (e.g., multiple of book value or multiple of earnings or a combination of both) that is regularly used for other purposes that have a material economic effect on the company, its stockholders, or its creditors.

Safe Harbor III

The fair market value is estimated by a qualified individual who is not independent of the company. However, this safe harbor provision usually applies only to illiquid stock of a start-up company.

An Employee Stock Option Is a Derivative Security

An employee stock option is a derivative security whose value is contingent on the price of the company stock. A stock option gives the holder the right, but not the obligation, to acquire stock in a company within a specific time period.

In addition, a stock option typically includes an exercise price and a stated expiration date. Unlike futures and forward contracts, options do not have an obligation where final purchases are required.

The following discussion presents a brief description of other common derivatives.

1. A forward contract is an agreement between one party to buy, and the other to sell, an asset at a predetermined price. The price at which the exchange occurs is set at the time of the initial contracting.

   If the value of the asset decreases between the time the contract is entered into and the time it is executed, then the seller has a gain and the buyer has a loss.[7]

2. A futures contract is fundamentally a forward contract. But, future contracts differ from forward contracts in that futures:[8]
   a. are standardized and traded on organized exchanges whereas the terms of a forward contract can be privately negotiated,
   b. are highly regulated compared to forwards, and
   c. are backed by the clearinghouse.
3. A swap is equivalent to a series of forward contracts. A swap is simply defined as an agreement between one party to pay the floating rate of interest on a determined amount of principle, and the counterparty agrees to pay a fixed rate of interest in return.[9]
4. A credit derivative is a contract that provides protection for the lender against default by the borrower.

Stock options in the public market differ from a stock option issued by a closely held company because they are issued by a third party rather than the public company itself.

A "call option" gives its holder the right, but not the obligation, to buy the underlying asset at a predetermined price within a specific time period.

A "put option" gives its holder the right, but not the obligation, to sell the underlying asset at a predetermined price within a specific time period.

The "strike price" is the stated price per share for which underlying stock may be purchased or sold by the option holder upon exercise of the option contract. In other words, the "strike price" represents the exercise price specified in the option contract.

An "expiration date" is the last day for the holder to exercise their right.

An "American option" allows the owner to exercise the option at any time before or at expiration.

A "European option" can be exercised only on the expiration date. Thus, an "American option" has more flexibility than the "European option," so it is worth at least as much and typically more.

If the value of the underlying asset is greater than the exercise price, the option is referred to as being "in the money." Being "in the money" provides a positive payoff if the option is exercised. Conversely, if the value of the underlying asset is below the exercise price, the option is referred to as being "out of the money."

If the value of the underlying asset equals the strike price, then the option is referred to as being "at the money." Thus, the amount that is in the money or the difference between the current price of the underlying asset that is above its strike price is referred to as its "intrinsic value" of the option, and zero otherwise.

The difference between the price of an option and its intrinsic value is referred to as being the "time value" of the option on a certain date.

A "stock warrant" is of a longer duration than a stock option and is issued by the company rather than by third parties. The pricing of a warrant must take into consideration the potential dilution effect on earnings.

Factors Involved with Valuing Stock Options

Many option pricing models incorporate the following six factors:

1. *The current price of the underlying asset*.
   Call options increase in value when the price of the underlying asset appreciates relative to the strike price. Conversely, put options increase in value when the price of the underlying asset depreciates relative to the strike price.

2. *The strike price*.
   A call option is in the money when the strike price is below the price of the underlying asset. Conversely, a put option is in the money when the strike price is above the price of the underlying asset.

3. *The time to expiration*.
   A call or put option is more valuable when the time to expiration is longer and are less valuable as their time to expiration decreases.

4. *The volatility of the underlying asset*.
   Volatility is the annualized standard deviation of returns.[10] A high standard deviation in the pricing of the underlying asset increases the probability that it will be higher than the strike price on the expiration date. Put and call options become more valuable as the volatility of the pricing of the underlying asset increases.

5. *The risk-free rate*.
   As the risk-free rate increases, call options become more valuable and put options become less valuable.

6. *The effect of expected dividends on the underlying asset*.
   In general, an option holder is not entitled to receive the dividend that is paid to the holder of the underlying asset.

   When an investor holds an underlying asset on the ex-dividend date, the underlying asset will usually depreciate in value by the amount of dividends paid per share.

   This is primarily because of the company's retained earnings that could have been reinvested into the company are now being paid out as a dividend—usually as a cash or a stock dividend—to the shareholder, which theoretically should reflect an overall decrease in the company's market cap.

   As a result, call options are usually more valuable when dividends are zero or minimal.

   Conversely, after the ex-dividend has been declared, put options are typically more valuable.

Important Dates

Employee stock option values are usually sensitive to various dates. Therefore, an analyst should understand the following types of dates when valuing stock options:

Grant Date

The grant date is the date when a company issues stock options to the employee. In other words, it is the date when the company and the employee agree to the terms of the employee stock options.

Vesting Period

The vesting period is a restricted time period during which the employee does not yet own the stock options. Cliff vesting is when an employee owns the stock options at an agreed upon date.

Equal annual vesting is when an employee receives an annual right to own a fixed percentage of their stock options.

Similarly, variable annual vesting is when an employee receives an annual right to own their stock option based on a formula.

Exercise Date

The exercise date is the date on which an employee may exercise his or her stock options. Under Section 409A, an employees can only exercise their

"Many analysts consider using option pricing models such as the Black-Scholes model or a binomial model to value employee stock options."

stock options under the following circumstances:

1. An employee separates from service
2. Employee disability
3. Employee death
4. An agreed upon future date
5. A change in control of the business
6. The occurrence of an unforeseeable emergency[11]

Expiration Date

The expiration date is the last day an employee's options may be exercised and is provided in the terms of the contract.

Option Pricing Models

Section 409A does not prescribe a universal methodology to value employee stock options. Many analysts consider using option pricing models such as the Black-Scholes model or a binomial model to value employee stock options.

The Black-Scholes model effectively treats the time between the current time and the expiration of the options as one time period divided into an infinite number of discrete periods.

The binomial option pricing model, on the other hand, divides the time period between the current time and the expiration of the options into discrete periods—most often one year.

The binomial model is sometimes used to estimate the effect on the value of employee stock options of factors such as the following:

1. Vesting periods
2. Employee turnover
3. Blackout periods
4. Change in risk-free rates
5. Volatility

The following discussion gives a brief overview of the Black-Scholes model and the binomial models.

Black-Scholes Option Pricing Model

In 1973, Fisher Black and Myron Scholes developed an option pricing model for the valuation of publicly traded options on non-dividend-paying stocks.

The model was derived from Robert Brown's "Brownian Motion model," which describes the random movements of microscopic particles suspended in a liquid or a gas.

The Black-Scholes model is primarily based on the assumption that an investor could create a perfectly hedged position to eliminate risk by buying an option and selling the underlying stock.

Therefore, any movement in price would be offset by a position in the option and the underlying stock. The value of the call option is equal to the present value, discounted at the risk-free rate, of the expected net proceeds received after closing the hedge at the option's expiration date.[12]

Thus, an option is priced correctly when the perfect hedge yields the risk-free rate.

Some of the other assumptions underlying the Black-Scholes model include the following:

1. There are no commissions or other transaction costs in buying or selling the stock or the option.
2. The short-term risk-free interest rate is known and is constant through time.
3. Trading is continuous through time following a geometric Brownian motion.
4. The underlying stock pays no dividends and makes no other distributions.
5. There is unrestricted access to credit, and the securities are perfectly divisible. However, it is possible to borrow any fraction of the price of a security to buy, or to hold it, at the short-term risk-free rate.
6. The stock price follows a random walk with a log normal distribution.
7. The volatility of the stock is constant over the life of the option.
8. The option can be exercised only at maturity.
9. A seller who does not own a security (a short seller) will simply accept a future date by paying for an amount equal to the price of the security on that date. While this short sale is outstanding, the short seller will have the use of, or interest on, the proceeds of the sale.
10. The tax rate, if any, is identical for all transactions and all market participants.[13]

The Black-Scholes formulas for the prices at time 0 of a European call option on a non-dividend-paying stock and a European put option on a non-dividend-paying stock are as follows:[14]

$$Call\ Value = S_0 \times N(d_1) - Ke^{-rT} \times N(d_2)$$

and

$$Put\ Value = Ke^{-rT} \times N(-d2) - S_0 \times N(-d_1)$$

where:

$$d_1 = \frac{\ln(S_0 / K)+(r + 0.5\sigma^2)T}{\sigma\sqrt{T}}$$

$$d_2 = \frac{\ln(S_0 / K)+(r - 0.5\sigma^2)T}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T}$$

The function $N(x)$ is the cumulative probability distribution function for a standardized normal distribution.[15]

In other words, it is the probability that a variable with a standard normal distribution, φ (0, 1), will be less than x.[16]

S_0 is the stock price at time zero, K is the strike price, e is the base of natural logarithms, ln is the natural logarithm, r is the continuously compounded risk-free rate, σ is the stock price volatility, and T is the time to maturity of the option.[17]

There are many assumptions and computations that need to be made to derive the option value using the Black-Scholes formula. In the model (1) dividends are ignored and (2) fluctuations in the geopolitical and macroeconomic environment preclude coherent acceptance of the assumption that investors can borrow or lend at a constant risk free rate.

Robert Merton added an additional computation to account for dividends in the Black-Scholes model (referred to herein as the "BSM model").

The BSM model essentially assumes that dividends are paid continuously over the life of the option as a percentage of the underlying stock price.

Pseudo-American Call Option Model

Unlike the Black-Scholes model, which only values European options on non-dividend-paying stocks, the pseudo-American call option model values American options or employee stock options that can be exercised anytime during the life of the option.

The pseudo-American call option model was developed by Fisher Black and is essentially a modified Black-Scholes model. Fisher Black's model values an option for the possibility of early exercise. This is simply done by valuing an option to each ex-dividend day and choosing the maximum of the estimated call values.[18]

Dividends are adjusted for both the exercise price and the stock price. The procedures in the method are as follows:

1. Compute the adjusted market price of the stock by deducting the present value, using the risk-free rate, of the future dividends payable during the remaining life of the option.
2. For each pseudo-option assumed to expire on a dividend date, deduct from the exercise price of the option the dividend payable on the dividend date and the present value, using the risk-free rate, of all the remaining dividends to be paid after the dividend date during the term of the option.
3. Using the Black-Scholes model, compute the value of the actual option as well, using the adjusted market price and the unadjusted exercise price.
4. The value of the American option is the European option with the highest value.[19]

Some analysts prefer to use the pseudo-American call option model to determine if early exercise of an American call option has value. If it does, then the investor would use a different model to determine the American call option's price, such as a binomial model.

Binomial Model

In 1978, John C. Cox, Stephen Ross, and Mark Rubinstein published a paper entitled "Option Pricing: A Simplified Approach."

The binomial model discussed in this paper contains the Black-Scholes option pricing formula. It is considered as a practical application for valuing special cases of American options, such as employee stock options.

The binomial model separates the price movement in the underlying stock into time intervals, or steps. It is based on the probability that the share price of the common stock can only move to one of two possible prices in the following time period.

The probability of moving these prices or "nodes" should total 100 percent.[20] The amount of up or down movement in the underlying stock price is determined by its volatility and the option's time

to expiration. The possible movements at each step forms a binomial tree or "lattice."

Given the stock price lattice, the method then calculates the individual option at each node of the stock price lattice.[21] The value of the option is the present value of all the individual option and ex-dividend date values at each node of the lattice, weighted by its probability of occurrence.[22]

The binomial model formulas for the prices at time 0 of a American call option on a dividend-paying stock are the following:[23]

$$C = \text{Max}\left((P \times C_u + (1 - P) \times C_d) \times e^{(-r(t/step))}, S - E\right)$$

$$P = \frac{e^{(i-div)(\frac{t}{step})} - D}{U - D}$$

$$U = e^{\sigma\sqrt{t/step}}$$

$$D = \frac{1}{U}$$

where:

C =	Call price at current step
P =	Probability of upward movement in the succeeding step
$(1 - P)$ =	Probability of downward movement in the succeeding step
C_u =	Value of call after upward movement in the succeeding step
C_d =	Value of call after downward movement in the succeeding step
e =	Base of natural logarithms
r =	Continuously compounded risk-free rate
t =	Time to expiration in years
$step$ =	Number of steps or time periods
S =	Stock price at the same step
E =	Exercise price at the same step
i =	Annualized and continuously compounded risk-free interest rate for the same time as the remaining life of the option
div =	Dividend yield
U =	Upward movement during a step
D =	Downward movement during a step
σ =	Stock price volatility[24]

The option may be exercised if the difference between the stock price and the exercise price, at the same step, is greater than the value of the succeeding step, otherwise the option is held to the next step.

There are many assumptions and computations that need to be made to derive the option value using either the Black-Scholes or the binomial models. Analysts need to consider the assumptions of the option pricing model when deciding on which model to use to value specific stock options.

For example, time to expiration, early exercise of the option, dividends, volatility, and the economic environment should be considered when valuing employee stock options.

It is noteworthy that there is no universally accepted model for an option pricing valuation. Thus, two analysts valuing the same company may arrive at different valuations for their stock options. However, when the valuation methodology is consistent across analysts, the results may be closer to one another.

Publicly traded call options do not need to be exercised to realize profits from the underlying stock. This is because the option can be sold to another investor who receives the rights associated with the option contract.

Deferred compensation plans that include stock options do not have this advantage. This is primarily because they are usually nonmarketable. However, the assumptions to value publicly traded options are relevant to most employee stock option contracts.

The Black-Scholes Model versus the Binomial Model

Whether Black-Scholes or binomial, both of these models come from the probabilistic assumptions about the financial world. Both models are derived from the Wiener process or Brownian motion where the underlying stock follows continuous paths in a stochastic process with stationary independent normally distributed increments.

In fact, the binomial model converges with the Black-Scholes model as the number of steps increase in the binomial model. Therefore, the binomial model provides discrete approximations to the continuous process of the Black-Scholes model.

As a result, a European option or an employee stock option can be valued with either model.

For example, let's assume the following scenario:

Asset Price	$30.00
Strike Price	$30.00
Years to Maturity	4
Risk-Free Rate	2.25%

Dividend Yield	2%
Volatility	30%
Number of Shares	5,000

Applying these assumptions in the Black-Scholes model, we arrive at a value of $6.58 per share, and conclude a fair market value of the 5,000 options of $32,906.

For illustration purposes, we use five steps for our binomial model. Exhibit 1 presents a stock price of $30 and will move up or down based on the 30 percent volatility.

As a result, we arrive at a value of $7.07 per share, and conclude a fair market value of the options of $35,338.

SUMMARY

There is no universally accepted analytical method for valuing stock options under Section 409A. The most often used option pricing methods were summarized in this discussion.

In the employee stock option price is derived by applying one of the safe harbor methods, the valuation burden of proof will shift to the Service to determine that the valuation method or its application was "grossly unreasonable."

Employee stock options are issued by an employer who provides the terms. For the employee stock option to have no tax consequence to the employee on the date of the grant, the strike price for the employee stock options is typically equal to or higher than the fair market value of the stock.

Exhibit 1
The Binomial Model
Illustrative Example

Input Values:

Current Stock Price	30	S
Exercise Price	30	E
Divdend Rate	2%	Div_Rate
Dividend	0	Divdend
Present Value of Expected Dividend	$0.00	PV_Dividend
Option Life in Years	4	t
Annuual Risk-Free Rate	2.25%	i
Volatility	30%	Std_dev
Number of Steps	5	Step

Calculated Values:

Current Stock Prices less Dividend S Adjustment	$30.00	= S - PV_Dividend
Up Movement U	1.308	= Exp(Std_dev)^(SQRT(t/Step))
Down Movement D	0.765	= 1/U
Risk Neutral Up Movement Probability P	0.437	= (EXP((i-Div_Rate)*(t/Step))-d)/(U-d)
Risk Neutral Down Movement Probability (1-P)	0.563	= 1-P

Stock Price Lattice:

X/Y	0	1	2	3	4	5
0	30.00	39.23	51.31	67.10	87.75	114.76
1		22.94	30.00	39.23	51.31	67.10
2			17.54	22.94	30.00	39.23
3				13.41	17.54	22.94
4					10.26	13.41
5						7.84

Call Option Price Lattice:

X/Y	0	1	2	3	4	5
0	7.07	12.74	22.19	37.10	57.75	84.76
1		2.90	5.81	11.34	21.31	37.10
2			0.73	1.70	3.96	9.23
3						
4						
5						

Source: Shannon P. Pratt, *Valuing a Business*, 5th ed. (New York: McGraw-Hill, 2008).

The Black-Scholes model is commonly used in practice when valuing employee stock options.

However, one may argue that the binomial model may be more practical to value employee stock options. This is because an analyst can include assumptions such as early exercise, blackout periods, employee turnover, and vesting provisions in the model.

Notes:

1. "A Question and Answer Guide to Code Section 409A" found at http://www.sandw.com/assets/html-documents/CLIENT_ADV._-_A_Question_and_Answer_Guide_409A_(B0778012).PDF
2. Ibid.
3. "Income Tax Regulation Including Proposed Regulations §1.301-1–§1.483-4" (Winter 2016), 33,815.
4. Ibid.
5. Ibid.
6. Ibid.
7. Robert W. Kolb, *Futures, Options, and Swaps,* 4th ed. (London, U.K.: Pearson Prentice Hall, 2003), 3.
8. Ibid.
9. Ibid., 5.
10. Paul Wilmott, *Frequently Asked Questions in Quantitative Finance,* 2d ed. (London, U.K.: John Wiley & Sons, 2009), 162.
11. "A Question and Answer Guide to Code Section 409A" found at http://www.sandw.com/assets/html-documents/CLIENT_ADV._-_A_Question_and_Answer_Guide_409A_(B0778012).pdf.
12. Shannon P. Pratt, *Valuing a Business*, 5th ed. (New York: McGraw-Hill, 2008), 589.
13. Ibid., 589–590.
14. John C. Hull, *Options, Futures, and Other Derivatives*, 7th ed. (Upper Saddle River, NJ: Pearson Education, 2009), 291.
15. Ibid.
16. Ibid.
17. Ibid., 291–292.
18. http://people.stern.nyu.edu/adamodar/pdfiles/valn2ed/ch5.pdf, 18.
19. Pratt, *Valuing a Business,* 593.
20. Ibid., 597.
21. Ibid.
22. Ibid.
23. Ibid., 600.
24. Ibid.

Reid Chanon is an associate in our Chicago practice office. He can be reached at (773) 399-4339 or at rlchanon@willamette.com.

Measuring Equity Volatility for Closely Held Company Securities

Continued from page 46

Fundamentally, estimating stock option volatility for a closely held business is subjective. A higher required return for closely held businesses compared with GPTCs commonly reinforces a higher level of implied volatility.

"A higher required return for closely held businesses compared with GPTCs commonly reinforces a higher level of implied volatility."

However, lower volatility tends to materialize when additional factors, which have a lesser impact on closely held companies, are introduced.

Once the valuation analyst determines an acceptable GPTC estimate for implied volatility, the analyst applies the estimate in the BSM for the closely held business stock option.

However, given the fundamental differences between GPTCs and closely held businesses, the analyst should apply professional judgment when considering the final implied volatility estimate.

An analyst may consider the closely held company geographic footprint in the market it serves, the reactiveness to macroeconomic news events, and access to capital compared to the GPTCs.

This is by no means an exhaustive list—many other factors may change the implied volatility estimate. The analyst should be aware of these potential influential factors and apply them on a case by case basis.

Essentially, when selecting a closely held implied volatility estimate, valuation analysts apply professional judgment in relying on GPTC implied volatility data.

Note:

1. Aaron M. Rotkowski, "Estimating Stock Price Volatility in the Black-Scholes-Merton Model," *The Value Examiner* (November/December 2011).

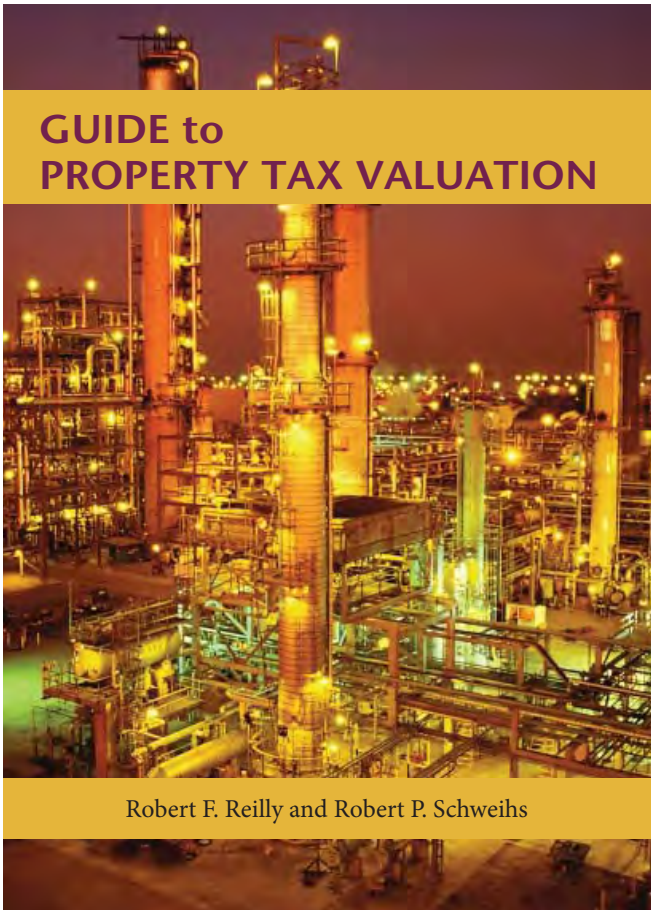
Patrick Van Dyke and Benjamin Groya are associates in our Chicago practice office. Patrick can be reached at (773) 399-4338 or at povandyke@willamette.com. Ben can be reached at (773) 399-4312 or at bhgroya@willamette.com.

Order Your Copy Today . . .

Willamette Management Associates

GUIDE TO PROPERTY TAX VALUATION

The *Guide to Property Tax Valuation* presents practical advice to solve specific ad valorem tax valuation problems. This book explores (and, when possible, resolves) the practical ad valorem tax issues facing corporate taxpayers, valuation analysts, state and local tax lawyers, and state and local tax administrators. This book summarizes the consensus of the current thinking of ad valorem tax valuation practitioners.



What some professional experts are saying about this book:

"This book is the most authoritative text dedicated to property tax valuation principles that I have ever reviewed in my 30 plus years of property tax practice. It is a comprehensive analysis addressing valuation issues important to attorneys, appraisers and property tax professionals. Every property tax practitioner's reference library should have a copy."

Edward Kliewer III
Fulbright & Jaworski L.L.P.

"The *Guide to Property Tax Valuation* fills a current void within the literary property tax arena. This comprehensive text brings clarity to many of the important property tax issues facing executives today."

Thomas W. Randle, CMI
Director, North Central Region Practice Leader
Thomson Reuters, Thomson Property Tax Services

This book is available for a limited time for only $29.95 (US) plus shipping. Table of contents and order information may be found at www.willamette.com/book_guide_property_tax_valuation.html

Willamette Management Associates
thought leadership
www.willamette.com

Intellectual Property Valuation, Damages, and Transfer Price Analyses

Robert F. Reilly, CPA

The analyst should be aware of the context in which the analysis is prepared. For example, most intellectual property valuation standards require that the analyst define certain conditions under which the analysis is relevant. These conditions include the use of the analysis and the intended users, the intellectual property being analyzed, the standard of value and the premise of value, and the effective date of the analysis. In a different context, many of these conditions can be different and those differences may render the conclusions of the analysis irrelevant. In a different context, the report describing the analysis conclusion may be considered irrelevant. This is because that report doesn't explain the analytical approaches within the appropriate context. This discussion considers different types of intellectual property, different contexts for analyzing intellectual property, and different intellectual property valuation, damages, and transfer price methods.

Introduction

This discussion summarizes the various types of intellectual property and the primary reasons why owner/operators may need to analyze their intellectual property. This discussion describes the generally accepted intellectual property valuation, damages, and transfer price methods. Finally, this discussion presents an illustrative example of a trademark valuation, a patent economic damages analysis, and a trademark intercompany transfer price analysis.

Types of Intellectual Property

There are four (and only four) types of intellectual property:

- Patents
- Trademarks
- Copyrights
- Trade secrets

Patents, trademarks, and copyrights are created under, and protected by, federal statutes. Trade secrets are created under, and protected by, state statutes. Most states have either completely adopted—or have adopted the essence of—the Uniform Trade Secret Act within their state statutes.

For valuation, damages, or transfer price analyses, the four intellectual property categories are sometimes expanded to include associated or contributory intangible assets. The patents category may include patent applications, the technology and designs encompassed in the patent, and the engineering drawings and other technical documentation that accompanies the patent or patent application.

The trademarks category may include trademarks (both registered and unregistered), trade names, service marks, service names, trade dress, product labeling that includes trademarks, institutional advertising (including signage), and promotional materials that include trademarks.

The copyrights category may include both registered and unregistered copyrights on publications,

manuscripts, white papers, musical compositions, plays, manuals, films, computer source code, blueprints, technical drawings, and other forms of documentation.

For most purposes, the trade secrets category includes any information or procedure that (1) the owner/operator keeps secret and (2) provides some economic benefit to the owner/operator.

Such trade secrets may include the following:

- Computer software source code
- Employee manuals and procedures
- Computer system user manuals and procedures
- Company operating manuals and procedures
- Chemical formulas
- Food and beverage recipes
- Product designs
- Engineering drawings and technical documentation
- Plant or process schematics
- Financial statements
- Employee files and records
- Customer files and records
- Vendor files and records
- Contracts and agreements

An owner/operator may own two or more related intellectual properties. For example, the same product can have a utility patent and a design patent. The same product can have a patent and a trademark. The same software can hold a copyright and be a trade secret. The same procedure manuals can hold a copyright and be a trade secret. The same drawings and schematics can be included within a patent, have a copyright, and be a trade secret.

Because the owner/operator can own more than one intellectual property, the analyst may be asked to assign values for the individual intellectual property for fair value accounting, income tax accounting, property tax accounting, and other purposes.

In disputes related to infringement or breach of contract, two or more intellectual property assets may be damaged by the wrongful action. In that case, the analyst may be asked to assign or allocate the damages amount among the affected intellectual property.

The damages analysis should consider each of the affected intellectual properties. And, the damages analysis should not double count the amount of damages by assigning the same damages to two or more intellectual properties.

Within a multinational corporation, different business units in different jurisdictions can own different intellectual property. For example, a product design could benefit from a utility or design patent in county alpha, the product could be manufactured with a trade secret in county beta, and a trademark could be assigned to the final product in county gamma. Such a multinational corporation may retain the analyst to determine the intercompany transfer price for each intellectual property application.

"[T]he damages analysis should not double count the amount of damages by assigning the same damages to two or more intellectual properties."

Reasons to Analyze Intellectual Property

Analysts may be asked to perform intellectual property valuations for the following reasons:

1. Financial accounting: fair value acquisition accounting and intangible asset impairment testing
2. Income tax accounting: value of a contribution from an owner to a company or of a distribution from a company to an owner, a charitable contribution, abandonment deduction, taxpayer solvency or insolvency analysis, or the purchase price allocation in a taxable acquisition
3. Property tax accounting: for intangible assets that are either subject to property tax or exempt from property tax
4. Bankruptcy: post-bankruptcy fresh start accounting, value of debt collateral, reasonably equivalent value of assets transferred into or out of the bankruptcy estate, fairness of the price of a bankruptcy estate asset sale, and debtor solvency or insolvency analysis
5. Fairness of transaction price: between any two arm's-length parties, between a parent corporation and a less-than-wholly-owned subsidiary, and between a for-profit entity and a not-for-profit entity

Analysts may be asked to measure intellectual property economic damages for the following reasons:

1. Tort disputes: infringement claims, breach of a duty claims, and interference with business opportunity claims

2. Breach of contract disputes: breach of a use license, development agreement, commercialization agreement, confidentiality agreement, or other license or contract
3. Expropriation and eminent domain claims: where the intellectual property is taken by some government agency or regulatory authority
4. Partnership or joint venture disputes: regarding an intellectual property holding company or a joint venture development or commercialization entity

Analysts may be asked to determine an arm's-length price (ALP) for the following reasons:

1. International taxpayer intercompany transfer: transfer price for the use of an intangible property between multinational controlled entities of a single taxpayer in compliance with Internal Revenue Code Section 482
2. Domestic intercompany transfer: transfer price for the use of an intangible property between the multistate controlled entities of a single domestic taxpayer
3. Intercompany transfer within a consolidated entity: intercompany transfer price for an intellectual property use between a wholly owned subsidiary and a less-than-wholly-owned subsidiary
4. Transfer between third party entities: fairness of a use license ALP (or royalty rate) between independent third parties or fair market value price for a use license between a for-profit entity and a not-for-profit entity

Valuation Methods

All of the generally accepted valuation approaches are applicable to intellectual property. Cost approach methods are particularly applicable to a contributory (sometimes called backroom) intellectual property. Market approach methods are applicable to an intellectual property that is (or could be) licensed. And, income approach methods are applicable to an intellectual property that produces a measurable amount of operating income for the owner/operator.

The cost approach may be applicable to the valuation of trade secret proprietary information and of copyrights on internal use software. For example, the cost approach may be used to value procedure manuals, training manuals, technical documentation and drawings, internal use training films, confidential books and records, confidential customer or supplier files, or the source code for internal use computer software.

For such intellectual property, it may be difficult for the analyst to assemble comparable uncontrolled transaction (CUT) sale or license data or to identify property-specific income measures.

The market approach may be applicable to the valuation of patents, trademarks, and certain copyrights. For such intellectual property, the asset owner/developer may license the use of the intellectual property to a third-party operator. The various forms of royalty payments from the licensee to the licensor (for example, royalty as a percent of revenue, as a percent of income, or on a per unit basis) may be used to estimate the intellectual property value.

The income approach may be applicable to the valuation of patented or unpatented (trade secret) processes or technologies. The income approach may also be applicable to the valuation of certain trademarks and copyrights.

For example, this approach may be applicable if the patented product or process (or the trade secret product formulation in process) allows the owner to generate increased revenue or experience decreased costs. This income measure may occur when the owner/operator experiences increased unit sales or increased unit selling prices due to the proprietary feature. Alternatively, it may occur if the owner/operator experiences decreased operating expenses or decreased other expenses due to a property process.

The income approach may be used in the valuation of copyrights related to books, plays, musical compositions, or films and film libraries. This is because the analyst can often identify a measurable stream of income associated with the commercialization of the copyrighted work.

Damages Methods

The determination of the appropriate damages methods in an intellectual property dispute is often a legal decision. The analyst should consult with legal counsel as to the judicially allowable damages methods with respect to the intellectual property type, the damages claim type, and the particular jurisdiction.

With regard to trademarks, the damages methods typically include the following:

1. Lost profits
2. Reasonable royalty rate
3. Cost to cure (or decrease in trademark value)
4. Statutory damages

In order to measure lost profits, the analyst may apply the before and after method, the yardstick method, or the projections method. Each of these methods compares the owner/operator's income to some measure of income that the owner/operator would have earned but for the damages event. The damages event could be a breach of contract, a tort, or some other wrongful action.

In some cases, a statutorily determined damages amount may be available to the trademark owner. The analyst should consult with counsel regarding the application and measurement of such statutory damages.

The reasonable royalty rate is often based on third-party CUT license agreements. The royalty rate could also be estimated based on a profit split method or a residual property split method.

The cost to cure is often based on the comparison of a before-damages event value to an after-damages event value. That analysis often includes an opportunity cost component (that is, the owner/operator's lost income during the intellectual property restoration [cure] period).

With regard to patents, the damages methods typically include the following:

1. Lost profits
2. Reasonable royalty
3. Cost to cure (or decrease in patent value)

These methods are often applied in a manner consistent with the trademark damages methods.

With regard to copyrights, the damages methods typically include the following:

1. Lost profits
2. Reasonable royalty rate
3. Cost to cure (or decrease in copyright value)
4. Unjust enrichment
5. Statutory damages

The application of the first three damages methods is consistent with the trademark and patent methods. Unjust enrichment typically has two components. The first component relates to the revenue generated by the damaging party that uses the copyright in any way. The second component relates to the variable costs to generate that measure of revenue. The damaging party's revenue (using the copyright) minus the damaging party's variable costs equals the unjust enrichment.

"The unjust enrichment damages method involves the damaging party's disgorgement of any and all 'ill-gotten gains' related to the damages event."

Unjust enrichment is calculated for each time period during the damages period. As with other damages measures, prejudgment interest is often added to the actual unjust enrichment in order to conclude the amount of the legal claim. The unjust enrichment damages method involves the damaging party's disgorgement of any and all "ill-gotten gains" related to the damages event.

Other damages measures are based on various economics and accounting concepts. The unjust enrichment damages measurement is based on a legal concept: the disgorgement of profits earned from the wrongful activity. The analyst should confirm with counsel that the unjust enrichment method is legally permissible in the instant circumstances.

Specific statutory damages may also apply to certain wrongful actions related to copyrights. The analyst should consult with counsel regarding the application of such statutory damages amounts in any particular situation.

With regard to trade secrets, the damages methods typically include the following:

1. Lost profits
2. Reasonable royalty
3. Cost to cure (or decrease in trade secret value)
4. Unjust enrichment

All of the "but for" damages measurements described here are available to the trade secret owner/operator. To apply these lost profits measurements, the damaged party is usually both the owner and operator of the trade secret because these methods measure the profits that the trade secret owner would have earned but for the wrongful action.

In applying such an analysis, the owner either operates the exact trade secret or a similar trade

"Analysts should recognize that it is very difficult to obtain data regarding CUT trade secret licenses."

secret. Therefore, the analyst can use alternative benchmarks of the owner's financial performance to measure the owner's damages. Those alternative benchmarks in the "but for" world include the following:

1. The owner's actual financial performance before and after the damages event
2. The owner's projection of financial performance without the damages event
3. An industry, economic, or other yardstick measurement of the owner's financial performance in the "but for" world

If the owner never operated (that is, commercialized) the trade secret, then it may be difficult for the analyst to assemble the information needed to perform a lost profits analysis. Such instances occur when the trade secret owner (1) licensed out the trade secret use to a third-party operator or (2) subcontracted with a third-party provider to supply the trade secret goods or services. In these instances, the analyst may have to apply a damages method other than the lost profits methods.

Even if the owner never outbound licenses the trade secret use to a third-party operator, the analyst often can use the reasonable royalty rate method. The analyst may conclude a reasonable royalty rate based on the following:

1. The owner's other inbound or outbound license agreements
2. CUT licenses
3. A profit split analysis of the trade secret operator's operations
4. A residual profit split analysis of the trade secret operator's operations
5. A fair rate of return on the trade secret value (often estimated using a cost approach method)

Analysts should recognize that it is very difficult to obtain data regarding CUT trade secret licenses. Other intellectual property owners often outbound license their patents, trademarks, and copyrights.

Trade secret owners rarely outbound license their trade secrets so that they remain secret. Intellectual property license agreements generally include confidentiality provisions. Nonetheless, the outbound trade secret license involves the owner sharing the secret with the operator. Accordingly, there are fewer trade secret CUT data than there are copyright, patent, or trademark CUT data.

As with the lost profits methods, it may be more difficult to apply the cost to cure method to a trade secret owner than to a trade secret owner/operator.

The cost to cure damages method typically involves some comparison of the (1) intellectual property value before the damages event and (2) the intellectual property value after the damages event. It is challenging to estimate the value (before or after) of the trade secret to the owner. This is because the owner (compared to the owner/operator) only generates nonoperating license income. In contrast, the owner/operator generates all forms of income (both license income and operating income) associated with the trade secret. The analyst should include all of the trade secret income generation in the cost to cure or decrease in value damages analysis.

An unjust enrichment damages method is often used in cases in which the trade secret owner is not also the trade secret operator. In such instances, it may be straightforward to identify the damages event. It is also relatively straightforward to identify the damaging party's variable revenue, variable costs, and unjust enrichment related to the damages event.

The legal theory behind the unjust enrichment method is also straightforward: the damaging party should disgorge all of its ill-gotten gains associated with the wrongful action.

An unjust enrichment analysis is based more on legal principles than on economics or accounting principles. Therefore, the analyst should confirm with counsel that an unjust enrichment legal remedy is available to the trade secret owner in the subject jurisdiction.

Transfer Price Methods

This discussion focuses primarily on the intangible property intercompany transfer price analysis for federal income tax purposes. Section 482 deals with the allocation of income and deductions among taxpayers. Section 482 applies to the transfer of intangible property between controlled entities within a common corporation. Specifically, Section 482 applies to the transfer of intangible property between two (or more) controlled entities and between two (or more) countries.

Section 482 applies to a domestic parent corporation when a domestic subsidiary develops an intangible property and transfers the use of that

intangible property to a foreign subsidiary. In that case, the foreign subsidiary has to pay an arm's-length royalty (or other type of transfer price) to the domestic subsidiary for the use of the domestic company's intangible property. This type of transfer price represents foreign income being recognized by the domestic company.

Section 482 also applies to a foreign parent corporation when the foreign subsidiary develops an intangible property and transfers the use of that intangible property to the domestic subsidiary. In that case, the domestic subsidiary has to pay an arm's-length royalty (or other type of transfer price) to the foreign subsidiary for the use of the foreign company's intangible property. This type of transfer price represents a deduction being recognized by the domestic company.

The Section 482 regulations provide that all such intercompany transfer prices should be based on the arm's-length standard.

Regulation 1.482-1(b)(1) relates to any intercompany transfer: "the standard to be applied in every case is that of a taxpayer dealing at arm's length with an uncontrolled taxpayer. A controlled transaction meets the arm's length standard if the results of the transaction are consistent with the results that would have been realized if uncontrolled taxpayers had engaged in the same transaction under the same circumstances (arm's length result)."

Regulation 1.482-1(b)(2) explains that there are specific ALP methods related to the intercompany transfers of tangible property and intangible property: "Sections 1.1482-2 through 1.1482-6 provide specific methods to be used to evaluate whether transactions between or among members of the controlled group satisfy the arm's length standard, and if they do not, to determine the arm's length result."

With regard to the allowable methods, the regulations require that the analyst select and apply a single best method. This procedure is called the best method rule. Regulation 1.482(c)(1) puts forth that "the arm's-length result of a controlled transaction must be determined under the method that, under the facts and circumstances, provides the most reliable measure of the arm's length result."

Regulation 1.482(c)(2) provides the criteria for the analyst's selection of the single best method for measuring the ALP. The regulation indicates that "data based on the results of transactions between unrelated parties provides the most objective basis for determining whether the results of a controlled transaction are at arm's length." The criteria to select the best method are as follows:

1. Comparability. The analyst should consider the comparability between the controlled transaction or taxpayer and the uncontrolled transaction or taxpayer.
2. Data and assumptions. The analyst should consider the completeness and accuracy of the underlying data, the reliability of the assumptions, and the sensitivity of the results to possible deficiencies in the data and assumptions.
3. Confirmation of the results by another method. "If the best method rule does not clearly indicate which method should be selected, an additional factor that may be taken into account in selecting a method is whether any of the competing methods produce results that are consistent with the results obtained from the appropriate application of another method" (See Regulation 1.482(c)(2)(iii)).

Regulation 1.482(d) discusses the comparability between the controlled and the uncontrolled taxpayer or transaction:

> [F]or this purpose, the comparability of transactions and circumstances must be evaluated considering all factors that could affect prices or profits in arm's length dealings (comparability factors). . . . Such factors include the following:
>
> (i) functions,
>
> (ii) contractual terms,
>
> (iii) risks,
>
> (iv) economic conditions, and
>
> (v) property or services.

Regulation 1.482-3 describes the allowable methods for calculating the tangible property intercompany transfer price. These methods are beyond the scope of this discussion. Nonetheless, the analyst should be aware of these allowable tangible property intercompany transfer price methods:

1. The comparable uncontrolled price method (see Regulation 1.482-3(b))
2. The resale price method (see Regulation 1.482-3(c))
3. The cost plus method (see Regulation 1.482-3(d))
4. The comparable profits method (see Regulation 1.482-5)
5. The profit split method (see Regulation 1.482-6)

6. Unspecified (other) methods (see Regulation 1.482-3(e))

Regulation 1.482-4 describes the allowable methods for calculating the intangible property intercompany transfer price. Regulation 1.482-4 is titled "Methods to determine taxable income in connection with a transfer of intangible property." Nonetheless, the regulations do not specifically define the term "intangible property." However, Regulation 1.482-4(b) is titled "Definition of intangible." This regulation defines the term "intangible" as follows:

> For purposes of section 482, an intangible is an asset that comprises any of the following items and has substantial value independent of the services of any individual—
>
> (1) Patents, inventions, formulae, processes, designs, patterns, or know-how;
>
> (2) Copyrights and literary, musical, or artistic compositions;
>
> (3) Trademarks, trade names, or brand names;
>
> (4) Franchises, licenses, or contracts;
>
> (5) Methods, programs, systems, procedures, campaigns, surveys, studies, forecasts, estimates, customer lists, or technical data; and
>
> (6) Other similar items. For purposes of section 482, an item is considered similar to those listed in paragraph (b)(1) through (5) of this section if it derives its value not from its physical attributes but from its intellectual content or other intangible properties.

Regulation 1.482-4(c) describes the CUT method. The CUT method is based on the selection and analysis of the arm's-length sales or licenses of similar intangible property. As stated in Regulation 1.482-4(c)(1)

> (t)he comparable uncontrolled transaction method evaluates whether the amount charged for a controlled transfer of intangible property was arm's length by reference to the amount charged in a comparable uncontrolled transaction.

Regulation 1.482-4(c)(2) describes the comparability and reliability considerations related to the application of the CUT method. Reliability looks at whether the uncontrolled transaction involves the transfer of the same intangible property under the same, or substantially the same, circumstances as in the controlled transaction.

The regulation also states that the degree of comparability of the controlled transaction and the selected uncontrolled transactions is based on a set of comparability factors. These comparability factors include:

1. The comparability of the intangible property:
   - Are the CUT intangible assets and the taxpayer intangible asset used in connection with similar products or processes within the same general industry or market?
   - Do the CUT intangible assets and the taxpayer intangible asset have the same profit potential?
2. The comparability of the transfer circumstances:
   - Are the terms of the transfer (for example, exploitation rights, exclusivity, use restrictions, and geography restrictions) similar?
   - Is the stage of development (between the CUT intangible property and the taxpayer intangible property) similar?
   - Are the rights to receive intangible property updates, modifications, and revisions similar?
   - Is there a similar degree of uniqueness, including legal protection (between the CUT intangible assets and the taxpayer intangible property)?
   - Is the duration of the license or other agreement similar?
   - Are the product liability or other economic risks similar?
   - Is the existence of ongoing business relationships (if any) between the transferor and the transferee similar?
   - Are the functions performed by the transferor and the transferee similar?

Regulation 1.482-4(a)(1) describes the CUT method by providing illustrative examples of the selection, adjustment, and application of CUT intangible property license agreements and royalty rate data.

Regulation 1.482-5 describes and illustrates the application of the comparable profits method. When used in other (non-Section 482) contexts, this transfer price method is sometimes called the com-

parable profit margin method. Whatever title the analyst uses, the methodology is the same:

1. The analyst selects uncontrolled companies (in the Section 482 case, uncontrolled taxpayers) that can be compared to the subject taxpayer. These uncontrolled companies either operate or don't operate (depending on which side of the taxpayer intercompany transfer is tested) a similar intangible asset to the taxpayer's intangible asset.
2. The analyst selects the appropriate profit level indicator (PLI) to use as the intercompany transfer price test metric. The common PLIs are listed in the regulation as follows:
   - Rate of return on the amount of capital employed (that is, a measure of return on investment).
   - Various profit margin financial ratios, including the ratio of operating profit margin to sales and the ratio of gross profit margin to sales (that is, measures of profit margin). The regulation also allows for other PLIs.
3. The analyst selects the tested party within the taxpayer intangible property transferor. The tested party can be either the transferor of the taxpayer intangible property or the transferee of the taxpayer intangible property. The selection of the tested party is based on which party has the most reliable data and requires the least amount of adjustments.
4. The appropriate intercompany transfer price is the price that brings the tested party's PLI (either a return on investment or a profit margin on sales) in line with the selected uncontrolled companies' PLIs.

When selecting the uncontrolled comparable companies, the analyst should consider the comparability and reliability factors described above. In particular, the analyst should consider the functional, risk, and resource comparability of the selected comparable companies compared to the taxpayer tested party.

Regulation 1.482-6 describes the profit split method for measuring the appropriate intercompany transfer price:

> The profit split method evaluates whether the allocation of the combined operating profit or loss attributable to one or more controlled transactions is arm's length by reference to the relative value of each controlled taxpayer's contribution to that combined operating profit or loss. The combined operating profit or loss must be derived from the most narrowly identifiable business activity of the controlled taxpayers for which data is available that includes the controlled transactions (relevant business activity).

To allocate the taxpayer's profit under the profit split method (that is, to determine the appropriate profit split percentage), the analyst may use one of two allowable profit allocation methods: the comparability profit split method or the residual profit split method.

The comparable profit split method compares the division (or split) of operating profits among the controlled taxpayer entities to the division (or split) of operating profits among the selected uncontrolled companies engaged in similar activities under similar circumstances.

The comparable profit split method may not be used if the combined operating profit (as a percentage of the combined assets) of the uncontrolled comparable companies varies significantly from the operating profit earned by the controlled taxpayer entities.

In the residual profit split method, first, the analyst identifies and applies a fair rate of return to the taxpayer's routine (also called contributory) tangible assets and intangible assets. Second, the analyst provides a market-based rate of return on the taxpayer's routine tangible and intangible assets.

The regulation looks at the contribution that these routine (or contributory) assets make to the uncontrolled taxpayer business. Therefore, the regulation uses the term "routine contributions."

Routine contributions are contributions of the same or a similar kind to those made by uncontrolled companies involved in similar business activities for which it is possible to identify market returns. They ordinarily include contributions of tangible property, services, and intangible property that are owned by uncontrolled companies engaged in similar activities.

The analyst performs a functional analysis to identify these contributions according to the functions performed, the risks assumed, and the resources employed by each of the controlled taxpayer entities. Market returns for the routine contributions are determined by reference to the returns achieved by uncontrolled companies engaged in similar activities.

Finally, an unspecified method (as described in Regulation 1.482-4(d)) for determining the intangible property intercompany transfer price is any method not described as an allowable method in the regulations. Such a method should meet the comparability and reliability criteria described above and should be the best method to measure the ALP of the intercompany transfer of the taxpayer intangible property.

Trademark Valuation Illustrative Example

In this illustrative example, the analyst is asked to estimate the fair market value of the Upsilon Company (Upsilon) trademarks and trade names as of January 1, 2014. Upsilon is a regional telecommunications company that provides land-line local and long distance telephone service, cellular telephone service, internet provider service, and data transfer services.

Upsilon is assessed for state ad valorem property tax purposes based on the unit valuation principle. That is, the entire assemblage of Upsilon tangible assets and intangible assets is valued as a single operating unit.

In the state in which Upsilon operates, identifiable intangible assets are exempt from property taxation. Therefore, Upsilon management has to report the value of the company's trademarks (and other identifiable intangible assets). Management then subtracts the value of the company's intangible assets from the Upsilon total unit (or business enterprise) value in order to conclude the value of the company's tangible assets (real estate and tangible personal property) that are subject to property taxation.

The valuation objective is to estimate the fair market value of the Upsilon trademarks and trade names. The valuation purpose is to assist management with its ad valorem property tax compliance as of the January 1, 2014, assessment date.

Upsilon Trademarks Overview

Upsilon owns over 200 U.S. trademarks (the "subject trademarks"). The subject trademarks are registered and used in connection with Upsilon services and promoted to Upsilon customers or potential customers. The most important trademarks are the Upsilon trademark and the U trademark, as they constitute the Upsilon principle brand marks and, combined, compose the corporate logo. These marks are used extensively across all of the Upsilon product lines and throughout the country, including inside and outside of the company buildings, on the company website, and on the company's consumer advertising.

Upsilon conducts extensive advertising in a variety of media including television, radio, print, and online. The Upsilon name appears on service vehicles, buildings, and employee uniforms. In addition, Upsilon sponsors a variety of professional and collegiate-level sports.

Intellectual Property Valuation Analysis

The analyst considered all three generally accepted valuation approaches. Based on the quantity and quality of available data, the analyst selected the market approach—and the relief from royalty method—to estimate the fair market value of the subject trademarks.

The relief from royalty method is based on the principle that the intellectual property owner would be willing to pay a reasonable royalty rate to license the intellectual property if that owner did not already own the property.

License royalty rates are estimated from the analysis of market-derived empirical data with respect to arm's-length licenses of guideline intellectual property assets.

The analyst considered the following royalty rate scenarios:

1. Royalty income that is earned—or could be earned—by the owner of the intellectual property (such as trademarks) by licensing the intellectual property to an independent party
2. Hypothetical royalty expense that is not paid to an independent third party licensor because the owner (a) in fact owns the intellectual property or the right to use the intellectual property and (b) does not have to license the intellectual property from a third-party licensor

This second analytical scenario is the basis for the analyst's relief from royalty method analysis.

The avoided royalty expense measured in the relief from royalty method analyses may take many forms, such as (1) total royalty dollar payments per period, (2) royalty rate as a percentage of revenue, (3) royalty rate as a percentage of profits, (4) royalty dollar amount per unit sold, and (5) royalty dollar amount per unit allocated.

Upsilon (as the intellectual property operator) does not have to pay itself (as the intellectual property owner) a license fee for the right to use the subject trademarks. Therefore, the analyst calculated the hypothetical royalty expense that would be paid if Upsilon had to license the subject trademarks from a third-party licensor. The analyst based this avoided royalty expense on a percentage of Upsilon revenue from the subject trademarks.

Royalty rates in the telecommunications industry vary depending on a variety of factors, including the popularity of the trademark and the amount of revenue attributable to each trademark.

The analyst gathered publicly available data related to arm's-length royalty or license agreements and selected eight CUT trademark license agreements, which are summarized in Exhibit 1.

The analyst converted the actual arm's-length royalty or license payments to a common-size royalty rate based on a percentage of revenue. This estimated fair royalty rate is multiplied by the projected Upsilon revenue to estimate the royalty expense avoided by reason of owning rather than licensing the subject trademarks.

The analyst tax-affected this avoided royalty expense in order to estimate the after-tax benefit associated with the avoided royalty payments.

The tax-affected avoided royalty expense is projected for a discrete projection period and then capitalized in the terminal year, discounting the avoided royalty expense to present value based on the Upsilon weighted average cost of capital. The analyst applies the yield capitalization method.

One of the eight CUTs is a license agreement between Upsilon, as the licensor, and Unical Enterprises, Inc. (Unical), as the licensee. This license agreement is for the use of various Upsilon trademarks in the telecommunications industry. The royalty rate that is actually being paid by Unical to Upsilon for the use of the subject trademarks ranged between 2.1 percent and 2.2 percent.

In applying an appropriate royalty rate to calculate the avoided royalty expense on the subject trademarks, the analyst also considered telecommunication industry norms and the subject trademarks' brand awareness.

Exhibit 1
Upsilon Company
Trademarks and Trade Names
Market Approach—Relief from Royalty Method
CUT Trademark Licenses

Trademark Licensor	Trademark Licensee	CUT Trademark License Description	License Term (Years)	License Start Year	License Royalty Rate Range Low	License Royalty Rate Range High	Upfront/ Other Fee
Southwestern Bell Telephone	Telco Group	This license calls for a compensation fee or "royalty" for the exclusive right to the name, reputation, and public image of the licensor telephone company. The licensee recognizes the franchise-like benefits realized as a result of its relationship with the licensor.	10	2012	5.0%	5.0%	NA
Cable and Wireless PLC	Hong Kong Telecommunications, Ltd.	In a third-party transaction, Cable and Wireless entered into an exclusive agreement with a Hong Kong telephone company for the use of its trademarks (in particular, use of the telecommunication name and logo in connection with international business) on relevant products and services	10	2010	8.0%	8.0%	NA
AT&T Corp.	KIRI Inc.	Licensor grants to the licensee an exclusive, nontransferable, non-sub-licensable license to use the licensed marks (AT&T and globe design logo) solely in connection with the marketing, advertising, promotion, and provision of the licensed services (such as telecommunication and internet services) in the licensed territory.	10	2011	2.5%	4.0%	$2.5 million minimum guarantee
Nextel	Nextel Partners	A partnership or alliance between a U.S. parent company and a publicly owned spin-off company includes an exclusive agreement for rights to use the Nextel brand name. The licensee owns its own spectrum and provides services as Nextel.	10	2009	0.5%	1.0%	0
France Telecom (Orange Brand Services Limited, UK)	PTK Centertel	PTK Centertel is rebranding its name from Idea to Orange. Idea, which now holds 32.2 percent of the market, will change its name and logo (trademark). PTK Centertel will pay the France Telecom a royalty for exclusive use of the Orange name.	10	2011	1.6%	1.6%	NA
Upsilon Company	Unical Enterprises, Inc.	An exclusive, limited nontransferable, revocable right to use the following trademarks: Techline, Easytouch, Favorite, Class Favorite, Classic Favorite Plus, Phototouch, Choice, Competitor, Competitor Plus, Roommate, Plaza, Favorite Plus, Easyreach, Big Button, EZ Button, Cleartech, favorite Messenger II, Digimate, Mountain Bell. Nonexclusive, limited, nontransferable revocable right to use the following trademarks: B Office, Bell symbol, Bell mark, Northwestern Bell.	10	2012	2.1%	2.2%	NA
Virgin Enterprises Limited	NTL Inc.	The licensee entered into an exclusive trademark license agreement under which it is entitled to use certain Virgin trademarks within the United Kingdom and Ireland. The agreement was entered into on the same date and is an exclusive license covering a number of aspects of the consumer business, including the provision of communications services (such as internet, television, fixed line telephony, and upon the acquisition of Virgin Mobile, mobile telephony), the acquisition of branding sports, movie and other premium television content, and the branding and sale of certain communications equipment related to the Licensee consumer businesses.	10	2010	0.3%	0.3%	£8.5 million minimum annual royalty
Sprint Communications	Virgin Mobile USA, Inc.	Sprint Communications grants to Virgin Mobile USA the exclusive right to use the Sprint name and logo in the United States, US Virgin Islands and Puerto Rico for mobile voice and data services and related services, such as voicemail and messaging, subject to certain limitations.	10	2011	0.3%	0.3%	NA

High Royalty Rates	8% of revenue
Low Royalty Rates	0.3% of revenue
Mean Royalty Rates	2.5% of revenue
Median Royalty Rates	1.9% of revenue

Selected Trademark License Royalty Rate	2% of revenue

The factors that positively influence the value of the subject trademarks are as follows:

1. The consistency and broad use of the trademarks
2. The positive connotation and reputation associated with the trademarks by customers and potential customers
3. The association with a quality service
4. The Upsilon profitability compared to the telecommunications industry average profitability
5. The numerous means by which the subject trademarks are promoted

Based on the qualitative assessment of the attributes of the subject trademarks and the consideration of the CUT trademark licenses, the analyst selected a royalty rate of 2 percent.

The analyst calculated the discrete period projection of avoided royalty expense by multiplying projected operating revenue for 2014–2017 by the selected royalty rate of 2 percent.

Next, the analyst subtracted the discrete period trademark licensee's maintenance expense. This is the expense related to maintaining, refreshing, promoting, and protecting the trademark that would be necessary to allow Upsilon to use the subject trademarks for a 20-year remaining useful life (RUL) post 2017. This projection of the licensee's expected intellectual property maintenance and protection expense was provided by Upsilon management.

Next, the analyst tax-affected the avoided net royalty expense to estimate the after-tax avoided royalty expense to Upsilon.

The analyst discounted this after-tax net avoided royalty expense to a present value at an appropriate discount rate.

The analyst calculated the projected 2018 avoided net royalty expense by multiplying the 2017 projected after-tax avoided net royalty expense by one plus the expected long-term growth rate (of negative one percent). This avoided net royalty expense incorporates the licensee's trademark maintenance and protection expense. The analyst assumed a 20-year RUL after 2017.

The analyst capitalized the projected 2018 avoided net royalty expense by an appropriate direct capitalization rate (for a 20-year RUL) to estimate the trademark terminal value. Then, the analyst discounted the trademark terminal value to a present value at an appropriate discount rate.

Upsilon Trademarks Value Conclusion

As presented in Exhibit 2, adding the present value of the discrete period avoided net royalty expense to the present value of the terminal period avoided net royalty expense results in an indicated fair market value of the subject trademarks, as of January 1, 2014, of $840 million (rounded).

Patent Damages Illustrative Example

In this illustrative example, the analyst is asked to measure the amount of damages related to a patent infringement claim.

Alpha Company ("Alpha") manufactures and sells the product Beta. Alpha holds a utility patent on Beta. Gamma Company ("Gamma") manufactures and sells the product Delta. Alpha management claims that the Delta product infringes on the Beta patent. Legal counsel for Alpha retained the analyst to measure the amount of damages suffered by Alpha as a result of the infringement of the Beta patent.

Based on the quantity and quality of available data, the analyst selected lost profits as the appropriate measure of economic damages. Also, the analyst selected the projections method to measure the lost profits. The analyst selected the projections method because Alpha management had prepared a long-term financial plan for the Beta product prior to the patent infringement damages event.

Damages Analysis

In this simple example, let's assume that the patent infringement starts on January 1, 2010. After Gamma is contacted by Alpha's counsel, the patent infringement concludes on December 31, 2013. Therefore, the patent infringement period is 2010 through 2013.

To keep this illustrative example simple, let's assume that there is no residual damages affect on the Beta product after the 2013 conclusion of the infringement period. And, let's assume that Alpha did everything it could to mitigate the damages during the infringement period.

In this example, Alpha management had prepared a long-term financial plan encompassing the Beta product line. That long-term plan was prepared before the inception of the infringement period.

The analyst prepared the damages analysis in 2014, after the conclusion of the infringement period. Therefore, all of the Alpha's actual results of

Exhibit 2
Upsilon Company
Trademarks and Trade Names
Market Approach—Relief from Royalty Method
Valuation Summary
As of January 1, 2014

Discrete Projection Period Avoided Royalty Expense:	Projected Calendar Year 2014 $000	2015 $000	2016 $000	2017 $000
Projected Revenue [a]	9,037,000	8,891,000	8,807,000	8,752,000
Arm's-Length Trademark License Royalty Rate [b]	2%	2%	2%	2%
Projected Gross Avoided Trademark License Royalty Expense	180,740	177,020	176,140	175,040
Less: Trademark License Expense [c]	13,740	13,540	13,380	13,300
Projected Pretax Avoided Trademark License Net Royalty Expense	167,000	164,380	162,760	161,740
Less: Projected Income Tax Rate	41%	41%	41%	41%
Projected After-Tax Avoided Trademark Net Royalty Expense	98,530	96,925	96,208	95,427
Discounting Periods [d]	0.5000	1.5000	2.5000	3.5000
Present Value Factor @ 11% [e]	0.9492	0.8551	0.7704	0.6940
Present Value of Avoided Trademark Net Royalty Expense (rounded)	94,000	83,000	74,000	66,000

Terminal Period Avoided Royalty Expense:	
Fiscal 2018 Normalized Avoided Net Royalty Expense [f]	$ 94,482
Direct Capitalization Rate [g]	12.5%
Terminal Value	755,856
Present Value Factor @ 11%	0.694
Present Value of Terminal Period Avoided Trademark Net Royalty Expense (rounded)	$ 525,000

Valuation Summary:	
Present Value of Discrete Period Avoided Net Royalty Expense	$ 317,000
Present Value of Terminal Period Avoided Net Royalty Expense	525,000
Indicated Fair Market Value of Upsilon Trademarks and Trade Names (rounded)	$ 840,000

Footnotes:
[a] Based on management projections.
[b] Based on an analysis of CUT trademark license agreements.
[c] Projected license expense related to maintaining, promoting, and protecting the subject trademarks into perpetuity.
[d] Calculated as if royalty expense is paid at mid-year.
[e] Based on the Upsilon WACC.
[f] Based on the 2017 projected after-tax avoided trademark royalty expense and the expected long-term growth rate of -1 percent.
[g] Calculated as the present value of an annuity factor for an 11% WACC and a 20-year RUL.

operations, including the total impact of the alleged patent infringement, were available to the analyst.

Damages Conclusion

With this information, the analyst prepared the lost profits analysis presented in Exhibit 3. This damages analysis indicates that Alpha suffered total lost profits of $1,665,000 during the infringement period.

Of course, in determining the total damages claim, the analyst may also consider the income tax consequences of a $1,665,000 lost profits judicial award. That is, such a judicial award would represent taxable income to Alpha. Therefore, the damages claim may also include the income tax liability associated with the lost profits award. In addition, the analyst would consider the calculation of prejudgment interest on the amount of lost profits for each time period up to the date of the judicial award.

Trademark Transfer Price Analysis Illustrative Example

The analyst is retained to determine an intercompany transfer price for the controlled transfer of

Exhibit 3
Alpha Company
Beta Patent Infringement Claim
Illustrative Damages Analysis
Lost Profits Damages Analysis Using the Projections Method

FYE December 31 for Each Year	Damages Analysis Variable	Before the Patent Infringement Period 2007	2008	2009	During the Patent Infringement Period 2010	2011	2012	2013
Actual (With the Patent Infringement) Operating Results								
Number of Beta Product Units Sold (000)	A	70	80	90	100	50	55	60
Price Per Beta Product Unit ($)	B	10	10	10	10	8	8	8
Total Beta Product Line Revenue ($000)	C=A×B	700	700	700	1,000	400	440	480
Variable Cost Per Beta Unit ($)	D	4	4	4	4	5	5	5
Total Beta Product Line Variable Costs ($000)	E=A×B	280	320	360	400	250	275	300
Beta Product Line Contribution Margin ($000)	F=C–E	420	480	540	600	150	165	180
Projected (Without the Patent Infringement) Operating Results								
Number of Beta Product Units Sold (000)	G				100	110	120	130
Price Per Beta Product Unit ($)	H				10	10	10	10
Total Beta Product Line Revenue ($000)	I=G×H				1,000	1,100	1,200	1,300
Variable Cost Per Beta Unit (4)	J				4	4	4	4
Total Beta Product Line Variable Costs ($000)	K=G×J				400	440	480	520
Beta Product Line Contribution Margin ($000)	L=I–K				600	660	720	780
Lost Profits Due to the Alleged Patent Infringement ($000)	M=L–F				0	510	555	600
Total Lost Profits Suffered by Alpha Company (before calculation of prejudgment interest)	$1,665,000							

intellectual property between the domestic and foreign subsidiaries of a domestic multinational corporation. The transfer price analysis is performed to assist the taxpayer Omicron, Inc. ("Omicron") with its compliance with Section 482 for federal income tax purposes.

Purpose and Objective of the Analysis

The analysis objective is to estimate the ALP, as of December 2, 2013 (the "analysis date"), for the following intercompany transfer transactions between Omicron and certain Omicron wholly owned subsidiaries:

1. The license of the Omicron trademark (the "subject trademark") by Omicron to Omicron of Europe BV (OE)
2. The license of the subject trademark by Omicron to Omicron of Canada, Ltd. (OC)
3. The license of the subject trademark by Omicron to Omicron of UK, Ltd. (OUK)

The analysis purpose is to assist Omicron management in determining an intercompany transfer price in compliance with Section 482 and the associated regulations.

Section 482 Regulations

The purpose of Regulation 1.482 is to ensure that taxpayers clearly reflect the income attributable to controlled transactions. The standard to be applied in every case is that of a taxpayer dealing at arm's length with an uncontrolled taxpayer. A controlled transaction meets the arm's-length standard if the results of the controlled transaction are consistent with the results that would have been realized if uncontrolled taxpayers had engaged in the same transaction under the same circumstances.

This ALP analysis relates to intercompany transactions between Omicron and certain of its international subsidiaries. For these intercompany transactions, the Omicron international subsidiaries intend to pay Omicron an ALP for a use license related to the subject trademark.

Regulation 1.482 stipulates that ALP considerations for intercompany transactions should be determined using the best method rule. The best method rule states that "the arm's-length result of a controlled transaction must be determined under the method that, under the facts and circumstances, provides the most reliable measure of an arm's-length result" (see Regulation 1.482-1(c)).

The analyst applied the best method rule to estimate an ALP for the transactions between Omicron and its international subsidiaries.

Section 482 states that the governing principle in determining the allocation of taxable income between related parties is the arm's-length standard. This standard states that the price for a transaction between related parties should be the same as if unrelated taxpayers had engaged in the same transaction under the same or similar circumstances. The determination of whether a transaction produces an arm's-length result is made by reference to results of comparable transactions under comparable circumstances.

Section 482 is applied by comparing the related-party transaction to a similar transaction between unrelated parties. The arm's-length standard and the comparability test give Section 482 a market orientation that requires the examination of both the facts and circumstances relevant to the related transaction and the facts and circumstances relevant to unrelated transactions used to test the related transaction.

The comparison between related transactions and comparable transactions is performed on actual financial results over a similar period. The similarity of the related transactions to the comparable transactions in one period does not indicate that this similarity holds in other periods. Periodic comparability tests are typically performed to confirm that the related transactions correctly reflect the economic and business realities of a given set of transactions.

The Section 482 regulations state that the "standard to be applied in every case is that of a taxpayer dealing at arm's length with an uncontrolled taxpayer" (Regulation 1.482-1(b)(1)). The regulations emphasize that it is more than just the ALPs that should be consistent with the uncontrolled transaction. The arm's-length results should also be consistent.

The regulations also allow for an arm's-length range that the results should fall within. If the actual financial results of the taxpayer fall within the arm's-length range, which is derived from applying the same pricing method to two or more uncontrolled transactions that have a similar level of comparability and reliability, then no adjustment will be made to the income or deductions of that taxpayer.

The arm's-length range consists of the results of all of the uncontrolled comparables that meet the following conditions:

1. The information on the controlled transaction and the uncontrolled comparables is sufficiently complete that it is likely that all material differences have been identified.
2. Each such difference has a definite and reasonably ascertainable effect on price or profit.
3. An adjustment is made by the analyst to eliminate the effect of each such difference.

If there are no uncontrolled comparables that meet these conditions, then the arm's-length range is derived from the results of all the uncontrolled comparables that achieve a similar level of comparability and reliability. In such cases, the reliability of the ALP analysis should be increased, where it is possible to do so.

This reliability is accomplished by adjusting the indicated range through the application of a valid statistical method to the results of all of the selected uncontrolled comparables.

The reliability of the ALP analysis is increased when statistical methods are used to establish a range of results in which the limits of the range will be determined such that there is a 75 percent probability of a result falling above the lower end of the range and a 75 percent probability of a result falling below the upper end of the range.

The interquartile range ordinarily provides an acceptable measure of this ALP range. The interquartile range is the range from the 25th percentile to the 75th percentile of the results derived from the uncontrolled comparables.

Selecting the Best Method

In selecting the best method, the analyst followed the guidance provided by the regulations. The best method is defined as the method that produces the most reliable measure of an arm's-length result for the subject transactions, considering all of the relevant facts and circumstances with regard to each transaction.

The analyst considered two primary factors in order to determine the best method. The first factor was the degree of comparability between the subject transaction and the CUTs. The five considerations to determine the degree of comparability are as follows:

- Functions performed
- Contractual terms
- Risks borne
- Economic conditions
- Nature of the property or services

The second factor was the quality of the data and the assumptions used in the ALP analysis. There are several considerations to assess the quality of the data and the assumptions. The analyst considered each of these factors:

- Completeness and accuracy of the data
- Reliability of assumptions
- Sensitivity of the results to deficiencies in data and assumptions

The analyst assessed each of the relevant methods to determine which is most reliable in consideration of the fact pattern and the availability and reliability of the data. Based on these factors, the analyst selected the CUT method to estimate the Omicron trademark ALP.

Subject Trademarks Overview

The Omicron name was created in October 1960 for a millwork plant in Portland Falls, Oregon. Before

1960, the Omicron trademark had already been in use for a number of years by the Omicron family. Omicron holds approximately 250 registered trademarks; approximately 100 issued patents, utility models, and design registrations; and approximately 65 pending patent applications.

Omicron sells doors under a variety of trademarks throughout Europe. The company holds the first or second market position for doors in Germany, the United Kingdom, Denmark, Sweden, Norway, Switzerland, France, Spain, and Finland, which together accounted for 90 percent of European sales in 2013.

Omicron holds a leading position in the window market in Canada and the United Kingdom. Brand strength is particularly important in the global window industry. The company manufactures and sells its windows exclusively under the Omicron brand in the United States, Canada, and the United Kingdom.

In Canada, Omicron is the largest manufacturer of residential windows and a leading manufacturer of doors. Products in Canada have been marketed exclusively under the Omicron brand since 2005. In 2002, the company sold its products under the Omicron brand and also under another local brand. Omicron is the only full-line door and window manufacturer in North America.

Omicron sells its products directly to customers around the world through the company's marketing and branding initiatives. The marketing initiatives focus on increasing awareness of the Omicron brand. Omicron promotes its brand and products using print and television advertising and professional athletic sponsorships.

According to the company's corporate counsel, the Omicron brand is registered as a community trademark, which is a trademark registered in each member state of the European Union where Omicron has operations.

The Omicron trademark has limited registration outside of the United States. Although Omicron has been operating since 1960, the Omicron brand has a relatively short operating history outside of the United States.

Application of the CUT Method

The trademark license agreements between Omicron and its international subsidiaries are referred to as the "subject transactions." Omicron owns the subject trademark. Omicron plans to license the subject trademark to its international subsidiaries.

The analyst assembled comparable license agreements that grant a licensee the right to sell branded products within a designated territory.

The subject transfers are effective on or near the analysis date, and the transfers may be applied retroactively to the beginning of the 2013 calendar year. The analyst considered this factor in the selection of the CUT licenses. For the purposes of estimating a royalty rate, the analyst selected CUTs that were effective in the year approximating the analysis date (that is, calendar year 2013).

Identification of CUTs

The analyst identified CUT license agreements by searching the following sources:

1. RoyaltySource royalty rate database
2. ktMINE royalty rates and records database
3. U.S. Securities and Exchange Commission filings of companies that are classified in standard industry classification (SIC) code 2430 (millwork, veneer, plywood, and structural wood) and SIC code 5030 (lumber and other construction materials)

Exhibit 4 summarizes relevant information about the selected CUTs.

The analyst considered the following factors regarding the selected CUTs:

- All of the CUTs were still in effect in 2013. All of the CUTs were executed between 2008 and 2012.
- All of the CUTs involved companies that manufactured durable goods. None of the CUTs involved a window or door manufacturer.
- ARI is primarily a service company. ARI licensed the "Century 21" trademark for home improvement products sold and installed by ARI. Although it was primarily a service company, ARI manufactured home remodeling products sold under the Century 21 trademark.
- The Century21 license agreement contained a minimum royalty payment. The Speed-Lok license agreement required annual contributions to the licensor company for advertising, and there was not sufficient detail regarding the other two CUTs to determine if the licensee agreed to make payments to the licensor in addition to the agreed upon royalties. All else being equal, these net sales guarantees generally allow for a lower net sales royalty rate. The subject transactions are not subject to minimum net sales guarantees, and the Omicron subsidiaries are not required to pay Omicron for advertising costs.

Exhibit 4
Omicron, Inc.
Information from the Selected Trademark CUTs

Licensee:	American Remodeling, Inc. (ARI)	Jore Corporation (Jore)	Ranco, Inc. (Ranco)	Morris Material Handling, Inc. (MMH)
License:	"Century 21" trademark	"Speed-Lok" trademark	"Coleman" trademark in conjunction with the term "Sheltra"	"P&H" and "Magnetorque" trade names, trademarks, and service marks
Products:	Siding and related products, guttering, windows and related products, kitchen cabinet refacing and related products, kitchen and bath products, doors, and other similar products	Drilling and driving products	Smoke alarms, carbon monoxide detectors, heat detectors, flammable gas detectors, and indoor air quality monitors	Original industrial cranes, hoists, winches, and other related types of industrial "through-the-air" material handling equipment
Product Distribution:	Sells remodeling services and related products (and not products) to homeowners	Sells to global residential and commercial appliance manufacturers and wholesalers and distributors of HVACR controls and services	Sells to power tool manufacturers and retailers	Sells to global residential and commercial appliance manufacturers and wholesalers and distributors of HVACR controls and services
Term:	20 years (originated 10/17/08)	5 years with five one-year renewals (originated 12/27/11)	15 years (originated 3/24/10)	7 years and 15 years, depending on the product (originated in 2010)
Exclusivity:	Exclusive in territory	Exclusive in territory	Exclusive	Exclusive
Territoriality:	United States, Canada, and Mexico	North America	World	World
Royalty Rate:	Greater of $11 million per year or 3% of revenue, with the minimum royalty payment increasing to an estimated amount of $40 million by the end of the 20-year term of the license agreement	3% royalty	5% royalty	0.75% royalty on the products sold by the licensee
Others:	Licensee will make minimum contributions to an advertising fund in the amount of $10 million per year	$500,000 minimum royalty	NA	NA
Profit Potential:	The licensee parent company reported a $14.7 million operating loss in fiscal 2007; no post-license financial statements available; company became bankrupt in 2009	Jore Corporation reported a net loss in fiscal 2010; in fiscal 2011, the company reported an operating profit margin of 17.2%	The Ranco financial statements are NA; Coleman reported operating profit margin of 4.1% the year the licensing agreement was enacted	Morris Material Handling, Inc., operating profit margin was 8.4% in fiscal 2010
Source:	RoyaltySource Intellectual Property Database; AMRE, Inc., Form 8-K dated 10/17/07; AMRE, Inc. Form 8-K dated 1/20/09; and AMRE, Inc., 10-K405 dated 3/12/12	RoyaltySource Intellectual Property Database & Jore Corporation Form 10-K/A dated 4/7/12	RoyaltySource Intellectual Property Database; The Coleman Company, Inc., Form 10-K405 dated 3/24/10	RoyaltySource Intellectual Property Database; Morris Material Handling, Inc., Form 10-K dated 1/29/11

Note: These data are hypothetical and are presented for illustrative example purposes only.

- The royalty rate specified in the P&H and Magnatorque license agreement was based on a percent of the licensee's total sales (and not only the sales related to the licensed products). All else being equal, this formula allows for a lower net sales royalty rate. The ALP for the license of the subject trademark will be based on a percent of sales of products sold with the subject trademark (and not the respective company's total sales).
- Several of the CUTs provide for licensee exclusivity in multicountry territories. All else being equal, the exclusivity of a larger territory allows for a higher net sales royalty rate. The subject transactions allow for the nonexclusive right to promote or sell merchandise in a single territory. However, the subject companies operated in large and well-developed markets.
- The operating profit margin of the licensee during the year of the CUT was negative for the ARI parent company and Jore and positive for MMH. Financial statements were unavailable for Ranco. However, Coleman, the licensor in the transaction with Ranco, reported an operating profit margin of 4.1 percent. MMH reported an operating profit margin of 8.4 percent in its fiscal 2013. The normalized 2011 operating profit margin from OC, OE, and OUK was 8.8 percent, negative 0.9 percent, and 5.9 percent, respectively. A higher profit margin implies a higher net sales royalty rate, all other factors being equal.

The CUT net sales royalty rates ranged from 0.75 percent to 5.0 percent. The P&H and Magnatorque CUT had a 0.75 percent net sales royalty rate; the Century21 CUT and Speed-Lok CUT each had a 3 percent net sales royalty rate; and the Coleman and Sheltra CUT had a 5 percent net sales royalty rate.

The P&H and Magnatorque CUT was adjusted (down) because the royalty rate was based on total MMH product sales and not only the product sales affected by the licensed trademark. However, the royalty rate on this transaction was adjusted (up) since the licensee was granted worldwide exclusivity.

The Century21 CUT and Speed-Lok CUT was adjusted (down) because the license included compensation in addition to the royalty rate.

The Coleman and Sheltra CUT net sales royalty rate of 5 percent was for world exclusivity. This royalty rate may have been less than 5 percent if the licensee territory were smaller.

Based on the selected CUT data, the analyst estimated a reasonable range of royalty rates at one percent to four percent of licensed product licenses sales where the licensee territory is a regional area (and not worldwide). This royalty rate range may need to be adjusted up or down based on the products, profit, and contract terms of the subject transactions.

To select a net sales royalty rate for the right to use the subject trademark, the analyst considered the following five factors:

1. The outlook for the window and door industry
2. The fundamental position of each subject company
3. The historical financial results of each subject company
4. A functional analysis of the subject trademark
5. The license agreement terms of the subject transactions

Transfer Price Conclusion

Based on the CUT method, the analyst concluded that an ALP (or the trademark royalty rate) for the right to use the subject trademark in Canada, as a percent of sales, is

2.5 percent.

The selected royalty rate for OC is at the higher end of the rate range indicated by the CUTs. The analyst reached this conclusion based primarily on the following:

1. The factors previously identified
2. The subject trademark being the only trademark used by OC in Canada
3. Marketing and promotion costs being borne by OC
4. The OC profitability compared to the licensees in the CUTs
5. The market share of the subject trademark in the OC territory. OC holds a leading position in the window end market in Canada. In Canada, OC is the largest provider of residential windows.
6. The subject trademark being first used exclusively in Canada in 2005 for the sale of products of windows and doors
7. OC operating in an industry and economy that has withstood the industry and

economic downturn better than other regions of the world. Canada has fared better than other industrialized countries in the economic crisis. As of January 2013, Canada recovered all jobs lost in the recession and created additional jobs. In addition, it is expected that the window and door industry in Canada will outpace the overall economy in 2013.

Based on the CUT method, the analyst concluded that an ALP (or the trademark royalty rate) for the right to use the subject trademark in Europe, as a percent of sales, is

1.5 percent.

The selected royalty rate for OE is below the lower end of the rate range indicated by the CUTs. The analyst reached this conclusion based primarily on the following:

1. The factors previously identified
2. OE using several other prominent brands in its window and door business besides the subject trademark
3. Marketing and promotion costs being borne by OE
4. OE reporting operating losses during the last three fiscal years. According to management, OE targets increased profitability after restructuring
5. The market share of the subject trademark in the OE territory. OE sells its products under other prominent brands, which may compete with the Omicron brand.
6. The subject trademark not being used in all of the markets in Europe that OE competes in
7. OE operating in an industry and economy that has experienced a greater adverse impact from the industry and economic downturn than other regions of the world. Unemployment in the Euro Zone increased more than in other European countries. In addition, the windows market in Poland is the only other European market besides Germany to expand since 2008.

Based on the CUT method, the analyst concluded that an ALP (or the trademark royalty rate) for the right to use the subject trademark in the United Kingdom, as a percent of sales, is

1.5 percent.

The selected royalty rate is at the lower end of the rate range indicated by the CUTs. The analyst reached this conclusion based primarily on the following:

1. The factors previously identified
2. OUK using the subject trademark exclusively to market the Omicron products of doors and windows
3. Marketing and promotion costs being borne by OUK
4. OUK reporting operating losses during the last five fiscal years. According to management, the OUK operations experience some inefficiencies due to high labor costs and excess working capital investments.
5. The market share of the subject trademark in the OUK territory. OUK has 41 percent market share in doors and 15 percent market share in windows in the United Kingdom. OUK holds the first or second market position for doors and holds a leading position in the window end market.
6. The fact that the United Kingdom—the OUK market—expects annual real GDP growth of 1.8 percent over the 2013–2020 period. However, according to the Scotiabank Group Global Forecast Update, a weaker economic recovery was expected in 2013 and 2014 in the United Kingdom, amid aggressive fiscal consolidation, slow export growth, and higher household debt levels.

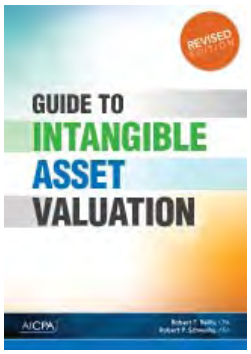
Summary

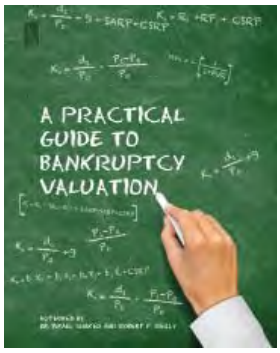
This discussion described and illustrated intellectual property valuation, damages, and transfer price analyses. This discussion summarized the various types of intellectual property. This discussion explained the primary reasons to analyze intellectual property, including valuation, damages, and transfer price reasons.

This discussion explained the principal intellectual property valuation methods, damages methods, and intercompany transfer price methods. Finally, this discussion presented an illustrative example of a trademark valuation, a patent damages analysis, and a trademark transfer price analysis.

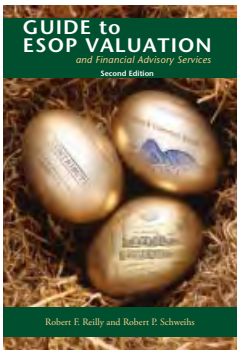
Robert Reilly is a managing director of the firm and is resident in our Chicago office. Robert can be reached at (773) 399-4318 or at rfreilly@willamette.com.

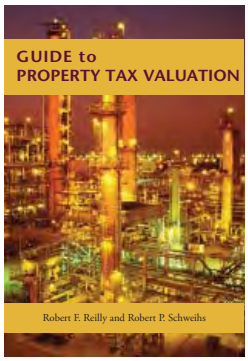
Valuation Textbooks Authored by Robert Reilly and Robert Schweihs

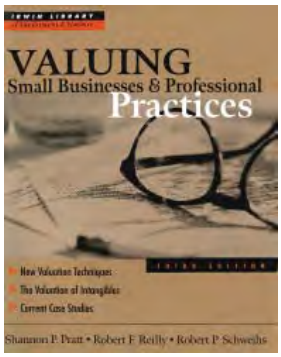


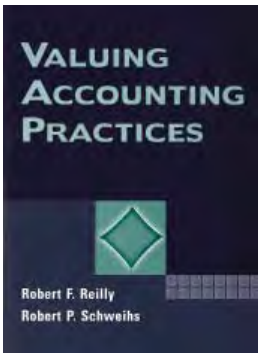


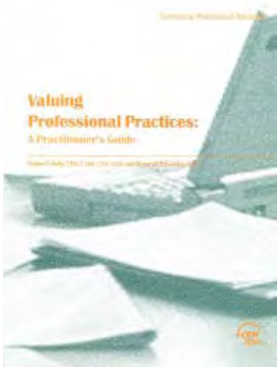
*

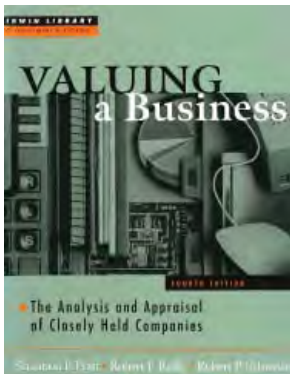




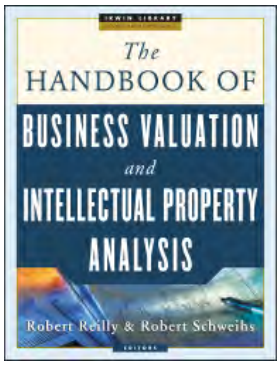




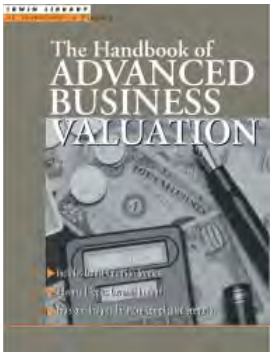




**



***



***

* Authored by Robert Reilly and Israel Shaked, Ph.D.
** Authored with Shannon Pratt
*** Edited by Robert Reilly and Robert Schweihs

Willamette Management Associates

On Our Web Site

We have recently redesigned and updated our website to make it mobile-friendly. Please visit us at ***www.willamette.com*** *to view* Insights *issues, read articles and presentations from our professional staff, and learn about the variety of valuation, forensic analysis, and financial advisory services we offer.*

Recent Articles and Presentations

Robert Schweihs, a managing director of our firm, delivered a presentation to the Kentucky Society of CPAs Business Valuation and Litigation Conference, which was held on August 12, 2016, in Louisville, Kentucky. The title of Bob's presentation was "Intangible Asset Valuations for Controversy Purposes."

Bob discussed various types of intangible asset analyses. He reviewed the generally accepted intangible asset valuation approaches and methods. Bob explored the differences between a business valuation and an intangible asset valuation. Finally, he discussed intangible asset damages measurement methods and considerations.

Aaron Rotkowski, a vice president of our firm and the leader of our property tax valuation practice, delivered a presentation to the Institute for Professionals in Taxation Northwest Regional Property Tax Seminar, which was held on August 4, 2016, in Hillsboro, Oregon. The title of Aaron's presentation was "Income Approach Issues in Valuations Prepared for Property Tax Purposes."

Aaron discussed issues related to the valuation of intangible assets using the income approach. These issues include estimating a supportable long-term growth rate, assessing the reasonableness of market data in the income approach, assessing the reasonableness of normalized depreciation expense and capital expenditures, and the internal consistency of assumptions.

Aaron Rotkowski also co-delivered a presentation to the 46th Annual Taxation Conference: Appraisal for Ad Valorem Taxation of Communications, Energy and Transportation Properties, which was held in Wichita July 24-28, 2016. Aaron's co-presenter was Michael Mangan, Esq., of Tonkon Torp. The topic of this presentation was "Economic Obsolescence and Market Value."

Aaron and Michael focused their presentation on the consideration of economic obsolescence within the cost approach to unit valuation for ad valorem taxation purposes. Topics included factors that contribute to economic obsolescence, appropriate methods for the estimation of economic obsolescence, and proper application of the obsolescence quantification methods. They examined the effect of economic obsolescence on the valuation of businesses for ad valorem taxation purposes.

Robert F. Reilly, a managing director of our firm, also co-delivered a presentation to the 46th Annual Taxation Conference: Appraisal for Ad Valorem Taxation of Communications, Energy and Transportation Properties. Robert's co-presenter was Keith Fuqua of Colonial Pipeline Company.

Robert and Keith presented an overview of the process of developing a unit valuation capitalization rate study. They examined the procedures involved in such a study. Such procedures include consideration of the objective of the valuation analysis, development of the appropriate capital structure, development of the cost of debt rate, development of the cost of equity rate, and arriving at the final capitalization rate conclusion.

www.willamette.com

Communiqué

In Print

Robert Reilly, firm managing director, authored an article that appeared in the August 2016 issue of *The Practical Lawyer*. The title of Robert's article was "Bankruptcy-Related Intellectual Property Valuations."

Robert Reilly authored an article that appeared in the Summer 2016 issue of *The Practical Tax Lawyer*. The title of Robert's article was "Bankruptcy-Related Intellectual Property Valuations."

Robert Reilly had two articles that appeared in the Winter 2016 issue of *Insights* reprinted in a presentation at the Florida Bar Wealth Conference in April 2016. Those two articles were "Distinguishing Personal Goodwill from Entity Goodwill in the Valuation of a Closely Held Corporation" and "Closely Held Business Goodwill Valuation Approaches and Methods."

Robert Reilly authored an article that appeared in the May/June 2016 issue of *Construction Accounting and Taxation*. The title of that article was "Measuring the Discount for Lack of Marketability for a Construction Company Valuation."

Robert Reilly also authored a chapter that appeared in the fourth edition of *BVR/AHLA Guide to Healthcare Industry Finance and Valuation,* which was published in August 2016. The title of Robert's chapter is "Valuation Issues Affecting Tax-Exempt Healthcare Organizations."

Robert Reilly also authored an article that appeared in the National Association of Certified Valuators and Analysts (NACVA) online publication at quickreadbuzz.com. The article appeared on June 8, 2016, and was titled "The Cost to Obtain Liquidity: Studies in the Closely Held Company Valuation (Part II of II)." Part I of that article appeared on May 26, 2016, and was titled "Measuring the DLOM for a Closely Held Company Controlling Interest (Part 1 of 2)."

Robert Reilly also authored an article that appeared in NACVA's quickreadbuzz.com on July 21, 2016. The title of Robert's article was "Discounts for Lack of Marketability: Consideration for Closely Held Securities—DLOM Theoretical Models, Part II of II. Part I of that article appeared on July 14, 2016.

Robert Reilly also authored an article that appeared in the June/July 2016 issue of *Financial Valuation and Litigation Expert*. The title of Robert's article was "Intellectual Property Market Approach Valuation Methods in Bankruptcy Controversies."

Robert Reilly also authored an article that appeared in the June 2016 issue of *Transaction Advisors*. The title of Robert's article was "Discount for Lack of Marketability for Closely Held Company Securities."

Robert Reilly also authored an article that appeared in the May/June 2016 issue of *Valuation Strategies*. The title of Robert's article was The Market Approach to Valuing Intangible Assets."

In Person

Bob Schweihs, firm managing director, will deliver two presentations at the annual American Society of Appraisers Advanced Business Valuation Conference. The conference will be held September 12-14, 2016, in Boca Raton, Florida. Bob's topics are "Patent Litigation" and "When an Option Is Not an Option."

Robert Reilly will deliver a one-hour webinar for the NACVA on November 7, 2016. The title of Robert's webinar is "The Valuation of Businesses, Securities, and Intangible Assets for Bankruptcy Purposes."

Robert Reilly will also present a one-hour webinar for NACVA on November 11, 2016. The title of Robert's webinar is "The Application of the Cost Approach to Value Intangible Assets."

Robert Reilly will deliver a presentation at the NACVA Financial Forensics and Expert Witness Conference to be held in Chicago on November 14-16, 2016. The title of Robert's presentation is "Valuation of Distressed Businesses and the Plan of Reorganization."

Bob Schweihs delivered a presentation at the Kentucky Society of Certified Public Accountants Business Valuation and Litigation conference on August 12, 2016. The title of Bob's presentation was "Intangible Asset Valuations (including in Dispute Settings)."

Kevin Zanni, Chicago office director, delivered a webinar for NACVA on August 11, 2016. The title of Kevin's webinar was "A Step-By-Step Guide to Applying a Quantitative Method to Support the Discount for Lack of Marketability Selection."

Insights Archives

❑ Summer 2016
Thought Leadership in Property Tax Valuation Issues

❑ Summer 2015
Focus on Reasonable Compensation in Eminent Domain and Expropriation Controversies

❑ Summer 2014
Focus on Forensic Analysis and Litigation Services

❑ Spring 2016
Focus on Intellectual Property

❑ Spring 2015
Focus on Corporate Transaction Advisory Services

❑ Spring 2014
Focus on Property Tax Intangible Asset Valuation Analyses

❑ Winter 2016
Focus on Gift Tax, Estate Tax, and Generation-Skipping Transfer Tax Valuation

❑ Winter 2015
Focus on Intercompany Transfer Price and Other Income Tax Insights

❑ Winter 2014
Focus on Bankruptcy and Reorganization Financial Advisory Services

❑ Autumn 2015
Focus on Dissenting Shareholder Appraisal Rights and Shareholder Oppression Litigation

❑ Autumn 2014
Focus on Gift, Estate, and Generation-Skipping Tax Issues

❑ Autumn 2013
Focus on Gift and Estate Taxation

Please send me the items checked above.

Name: _____

Company name: _____

Address: _____

City/State/Zip: _____

Telephone/E-mail: _____

Fax this form to Charlene Blalock at (503) 222-7392 or e-mail to cmblalock@willamette.com. Please allow at least a week for delivery.

Willamette Management Associates
111 S.W. Fifth Avenue, Suite 2150
Portland, Oregon 97204-3624

PRINTED WITH SOY INK

PRESORTED STANDARD
U.S. POSTAGE PAID
PORTLAND OR
PERMIT NO. 431

CHANGE SERVICE REQUESTED

PLEASE LET US KNOW . . .

if you wish to be deleted from our mailing list for this publication . . .

. . . OR . . .

if you have colleagues who you think should be added to our mailing list . . .

BY FAX (503) 222-7392
OR BY E-MAIL
sespiegel@willamette.com

Willamette Management Associates
thought leadership

Willamette Management Associates provides thought leadership in business valuation, forensic analysis, and financial opinion services. Our professional services include: business and intangible asset valuation, intellectual property valuation and royalty rate analysis, intercompany transfer price analysis, forensic analysis and expert testimony, transaction fairness opinions and solvency opinions, reasonableness of compensation analysis, lost profits and economic damages analysis, economic event analysis, M&A financial adviser and due diligence services, and ESOP financial adviser and adequate consideration opinions.

We provide thought leadership in valuation, forensic analysis, and financial opinion services for purposes of merger/acquisition transaction pricing and structuring, taxation planning and compliance, transaction financing, forensic analysis and expert testimony, bankruptcy and reorganization, management information and strategic planning, corporate governance and regulatory compliance, and ESOP transactions and ERISA compliance.

Our industrial and commercial clients range from substantial family-owned companies to Fortune 500 multinational corporations. We also serve financial institutions and financial intermediaries, governmental and regulatory agencies, fiduciaries and financial advisers, accountants and auditors, and the legal profession.

Willamette Management Associates analysts apply their experience, creativity, and responsiveness to each client engagement. And, our analysts are committed to providing thought leadership—by delivering the highest level of client service in every engagement.

Chicago Office
8600 West Bryn Mawr Avenue
Suite 950-N
Chicago, IL 60631
(773) 399-4300
(773) 399-4310 (FAX)

Portland Office
111 S.W. Fifth Avenue
Suite 2150
Portland, OR 97204
(503) 222-0577
(503) 222-7392 (FAX)

Atlanta Office
1355 Peachtree Street, N.E.
Suite 1470
Atlanta, GA 30309
(404) 475-2300
(404) 475-2310 (FAX)