# Valuing Stock Options in the Marital Context: Speculate, Agree, or Wait and See?

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An issue that often confronts courts wrestling with the distribution of marital property upon divorce is how to deal with stock options held by one of the parties as a benefit of employment. While many jurisdictions hold that such options are marital property because they are compensation for work performed by the employee spouse during the marriage, such options are not transferable to the non-employee spouse. No in-kind distribution is therefore possible, but no jurisdiction has definitively stated how such options are to be valued for the purpose of a cash buy-out of the non-employee spouse's share. The pursuit of finality in divorce proceedings militates in favor of the use of one of three methods discussed below to place a value on stock options held by an employee-spouse; however, given the speculative nature of determining such a value, the best course might be to wait until the options are actually exercised before their value is fixed and the buy-out is accomplished.

## I. Stock Options as Marital Property

In Pennsylvania, the Supreme Court has held that stock options are a form of deferred compensation intended to induce a quality employee to remain loyal to the employer; stock options are thus analogous to pension benefits and are considered marital property.[1] Similarly, in New Jersey, the Supreme Court has held that even stock options awarded after the filing of a divorce are subject to equitable distribution because options are granted in recognition of the contribution the employee has made to the employer in the past.[2] One of the earliest, and perhaps the most

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[1] Fisher v. Fisher, 769 A.2d 1165 (Pa. 2001).
[2] Pascale v. Pascale, 660 A.2d 485 (N.J. 1995).

widely cited case regarding the treatment of stock options in divorce actions is *In re Marriage of Hug*,[3] where the court held that stock options are a form of deferred compensation for present services that attract and retain employees, thus they are community property.

Some courts recognize that stock options cannot be traded, but nevertheless, like common stock, represent marital property.[4] Although they have no "fair market" value, stock options may be viewed as an economic resource to be equitably distributed.[5] Even where a court finds that it is unfair to distribute the value of stock options that have no quantifiable value, the court may retain jurisdiction of a divorce case until such time as the employee spouse's stock options are actually exercised and actual value is determined.[6] Finally, a court may treat stock options not as property, but as income to be considered when determining a payor's support obligation.[7]

## II. Valuation Methods

Once a court determines that an employee spouse's stock options are subject to the claims of the other spouse, the much thornier question becomes how to place a value on the options. The simplest method is the use of the "intrinsic value."

### A. *Intrinsic Value*

The intrinsic value is determined by subtracting the exercise price of the stock option, and any associated financing costs, from the current market value of the stock.[8] This method of valuation is quite easy to calculate: for example, assume that the employee spouse works for PPG Industries, and that she was granted the option to purchase 1,000 shares of PPG stock at an exercise price of $55 per share. Further assume that at the date of distribution of the marital assets, PPG stock is selling at $60 per share, and that the parties' broker charges $25 for every

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[3]   154 Cal. App. 3d 780, 201 Cal. Rptr. 676 (Cal. Ct. App. 1984).

[4]   Richardson v. Richardson, 659 S.W.2d 510 (Ark. 1983).

[5]   Green v. Green, 494 A.2d 721 (Md. Ct. Spec. App. 1985).

[6]   *In re* Marriage of Moody, 457 N.E.2d 1023 (Ill. App. Ct. 1983).

[7]   Murray v. Murray, 716 N.E.2d 288 (Ohio Ct. App. 1999), *discretionary appeal denied*, 716 N.E.2d 288 (Ohio 1999).

[8]   *Fisher,* 769 A.2d at 1171.

purchase or sale transaction. The intrinsic value of the stock is thus $60 - $55 = $5 per share; for 1,000 shares, the value is $5,000, less the $25 transaction fee that would be applied in the event of a sale, which gives total value of $4,975. The intrinsic value method's boon of simplicity, however, is also its bane: because key variables are ignored, the method is too speculative.[9] The employee receiving the stock options might die or have his employment terminated before the options vest or are exercised.[10] The possibility also exists that the employer might terminate the program.[11] Moreover, the intrinsic value method makes no allowance for volatility in the stock market or in the individual stock, market interest rates, or the time period during which the options may be exercised. Finally, the intrinsic value method makes no allowance for risk.[12] If the non-employee spouse retains the options and the other spouse is compensated with the requisite "intrinsic value," he or she might ultimately receive a windfall, or be unfairly awarded an asset worth far less than what was supposed by the court.

## B. *Discount to Present Value*

In this case, simplicity rarely equates with accuracy; thus the intrinsic value method is not adequate to value stock options for the purposes of distribution between divorcing parties.[13] Some of the deficiencies of the intrinsic value method are addressed by the discount to present value method, whereby the option is first assigned an intrinsic value, and then the court applies discounts to determine the present value.[14] The discounts applied would account for items such as taxes due on sale, lack of marketability or risk of forfeiture.[15] There are, in fact, a myriad of discounts that could be applied, including future interest and the probability that the employee will die or retire before qualifying

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[9]   *Id.* at 1167.

[10]   *Id.*

[11]   Chammah v. Chammah, 1997 WL 414404 (Conn. Super. Ct. 1997).

[12]   Wendt v. Wendt, 1998 WL 161165 (Conn. Super. Ct. 1998), *aff'd,* 757 A.2d 1225 (Conn. App. Ct. 2000), *cert. denied*, 763 A.2d 1044 (Conn. 2000).

[13]   *Fisher*, 769 A.2d at 1171; *Wendt,* 1998 WL 161165.

[14]   *Fisher,* 769 A.2d at 1171–72 (Newman, J., concurring).

[15]   *Id., citing Evans v. Snyder,* 603 N.Y.S.2d 740 (N.Y. App. Div. 1993).

for benefits.[16]  The discount to present value method is exemplified by those court decisions where pensions are similarly valued; in Pennsylvania, such valuation is performed by: 1) calculating a benefit assuming the employee spouse was age 65 at divorce, 2) determining the life expectancy and thus the number of months of benefits, 3) choosing an appropriate discount rate, 4) finding the value of the annuity at age 65, 5) discounting for mortality, disability and termination, and 6) discounting for lack of vesting.[17]

While the discount to present value method appears to be on more sound footing than the intrinsic value approach, similar problems as those associated with the intrinsic value method obtain.  In effect, applying the discount to present value method compounds the speculation involved in calculating value.  The court must guess as to taxes due on sale, which will depend in large part on when the options are exercised.  The court must also pick a discount rate for lack of marketability, forfeiture, risk of non-vesting, and mortality.  Essentially, the court is still guessing how long the recipient employee will remain employed, whether all options will vest, and what discount rate is appropriate.  Moreover, as with the intrinsic value method, no allowance is made for the key factor of volatility of the underlying stock.

## C. *The Black-Scholes Method*[18]

In contrast, a more sophisticated method to determine the exact value of a particular stock option, one which accounts for volatility, is the Black-Scholes model.[19]  The Black-Scholes model is a complex formula that considers 1) the volatility of stock prices, 2) dividends, 3) the exercise price of the stock, and 4) the current market value of the stock by using a logarithmic formula.[20]  A number of Black-Scholes formulae exist,[21] and other applications may include "1) the share price today, 2) the exercise price, 3) the time to maturity, 4) the risk-free interest

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[16]    Bloomer v. Bloomer, 267 N.W.2d 235 (Wis. 1978).

[17]    DeMasi v. DeMasi*, 530 A.2d 871 (Pa. Super Ct. 1987).

[18]    *See* Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 J. Pol. Econ. 637 (1973).

[19]    *Wendt,* 1998 WL 161165

[20]    *Id.*

[21]    *Chammah,* 1997 WL 414404.

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rate, 5) the probability that the option will be exercised, and 6) the volatility of the share price (measured by its standard deviation)."[22] The complexity of the factors considered in the model, especially those involving probabilities and a measure of volatility, in addition to the requirement that the user manipulate a logarithmic formula, do not facilitate ease of use. Quite to the contrary, Black-Scholes "appears to a layman to be one of the most complicated formulas ever devised by mankind. It is hardly useful for a court to consider with a simple calculator on the bench. It would require expert computation."[23] Although commercial programs are available to compute the outcome of the Black-Scholes calculation, the model is best manipulated by an expert evaluator.[24] As explained by the Connecticut Superior Court in *Wendt v. Wendt*, the Black-Scholes model arose out of the search by traders for a formula that would take the guesswork out of buy/sell decisions.[25] In the early 1970's Fischer Black and Myron S. Scholes, working with Robert C. Merton, developed a formula that addressed the relevant variables.[26] The model was published in 1973, at the same time the business of trading stock options was created, a business made possible by the existence of the model.[27] In 1997, Scholes and Merton were awarded the Nobel Prize in Economics for their work on the formula; the Nobel Prize Committee noted that the formula's use became widespread at a rate previously unseen, and that thousands of traders use the formula every day.[28]

A key strength of the Black-Scholes model is the fact that it accounts for volatility, as shown in the following analogy.[29] Assume that the stock price of an employee spouse's company, like the weather in a spring month, has shown large fluctuations in the past. If one were to make a bet that the temperature in May will hit 65 degrees at some point during the month, despite a current temperature on the day the bet is made of 35 degrees, it

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[22]  Dearlove v. Genzyme Transgenics Corp., 2004 WL 3053701, *8 (Pa.Com.Pl. 2004).

[23]  *Wendt,* 1998 WL 161165 at * 195.

[24]  *See Wendt*, 1998 WL 161165.

[25]  *Id.*

[26]  *Id.*

[27]  *Id.* at * 195–96.

[28]  *Id.* at * 196.

[29]  Analogy provided by Richard F. Brabender, Esquire.

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would be a good bet; the same cannot be said for the month of January. Likewise, it is a good bet that the value of the employee spouse's company's stock will increase, considering the fact that its price has fluctuated in the past; the same cannot be said for static stocks. It is a safe bet that the value of stock options for a volatile stock will increase in price, especially as the time to the date of exercise increases. No prudent party would rely on an option value that did not consider volatility, because that value would ignore the near certainty of changing prices on the stock market and the effect this would have on the options in question.[30]

In addition to reflecting market volatility, the efficacy of the Black-Scholes method is shown by the fact that it is now the most widely accepted method of calculating the value of stock options.[31] State courts have referred to it as "the leading option pricing model,"[32] or the model that is "regularly" used.[33] Federal courts have also approved the Black-Scholes model. The District Court for the Southern District of New York noted expert opinion that the model "has been: a) subject to testing and found reliable; b) received favorable commentary; and c) widely used by [securities] traders."[34] The court held that the Black-Scholes model meets the test for reliability under Federal Rule of Evidence 702.[35] Likewise, the Unites States Tax Court has held that Black-Scholes is a credible stock option valuation method, and

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[30] For a discussion of the application of the Black-Scholes formula and the fact that the value of a stock option calculated using Black-Scholes necessarily exceeds the exercise price of the option, *see* Ryan J. Foreman, *Employee Stock Options in Personal Bankruptcy: Assets or Earnings?*, 72 U. Chi. L. Rev. 1367, 1387 – 88 (2005), *citing* Richard A. Brealey and Stewart C. Myers, *Principles of Corporate Finance*, 606 – 08 (McGraw-Hill 6th ed. 2000).

[31] Comrie v. Enterasys Networks, Inc., 837 A.2d 1, 18, n.87 (Del. Ch. 2003).

[32] *In re* Coleman Co., Inc. S'holders Litig., 750 A.2d 1202, 1208, n.13 (Del. Ch. 1999).

[33] *In re* Marriage of Robinson and Thiel, 35 P.3d 89 (Ariz. Ct. App. 1 2001).

[34] R.A. Mackie & Co. v. Petrocorp Inc., 329 F. Supp. 2d 477, 513 (S.D.N.Y. 2004).

[35] *Id.* at 514; *see also* Custom Chrome, Inc. v. Comm'r, 217 F.3d 1117 (9th Cir. 2000); Mathias v. Jacobs, 238 F. Supp. 2d 556 (S.D.N.Y. 2002).

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that generally accepted accounting principles support its use.[36] The Internal Revenue Service has also ratified the Black-Scholes model.[37]  Finally, journal authors have referred to the model as the one typically used to value stock options.[38]

It is no surprise that the Black-Scholes model is a preferred method of valuation of stock options in light of the fact that it has been documented to have an accuracy factor within six percent.[39] However, it must be said that no jurisdiction, nor the IRS, has adopted the Black-Scholes method as the exclusive valuation method, and other valuation methods are often used.[40]  Also, some state cases reject the model.[41]  One court has stated that the model assumes the options in question are publicly traded, overstates value because it does not take into account the cost-reducing effect of early exercise, and does not make allowances for the effect of volatility on publicly-traded versus restricted stock options.[42]  Some tax court cases have likewise rejected the model.[43]

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[36]   Menard, Inc. v. Comm'r, 2004 WL 2066599 (U.S. Tax Ct. 2004), *citing* Statement of Financial Accounting Standards No. 123; *see also* Leema Enter., Inc., v. Comm'r, 1999 WL 34819 (U.S.Tax Ct. 1999), *aff'd sub nom,* Keeler v. Comm'r, 243 F.3d 1212 (10th Cir. 2001); Estate of Mellinger v. Comm'r, 112 T.C. 26 (U.S.Tax Ct. 1999); Hospital Corp. of America v. Comm'r, 1996 WL 740741 (U.S.Tax Ct. 1996); Berry Petroleum Co. v. Comm'r, 104 T.C. 584 (U.S. Tax Ct. 1995), *aff'd sub nom,* Berry Petroleum Co. and Subsidiaries v. Comm'r, 142 F.3d 442 (9th Cir. 1998).

[37]   I.R.S. Rev. Proc. 2003-68 (2003); I.R.S. Rev. Proc. 98-34 (1998).

[38]   *Equitable Distribution of Stock Options,* 17 Equitable Distribution J. 85 (Aug. 2000), *citing* Brian J. Hall, *What You Need to Know About Stock Options,* Harv. Bus. Rev. (Mar./Apr. 2000).

[39]   *See* Michael J. Mard & Jorge M. Cestero, *Stock Options in Divorce: Assets or Income?*, 74 Fla. B.J. 62 (2000), *citing* Shannon P. Pratt, *Valuing a Business: The Analysis and Appraisal of Closely Held Companies*, Business One Irwin (1989).

[40]   *See, e.g.,* Fountain v. Fountain, 559 S.E.2d 25 (N.C. Ct. App. 2002) (noting that multiple valid methods exist to determine the value of stock options).

[41]   *See In re* 3COM Corp., 1999 WL 1009210, *4, n.17 (Del. Ch. 1999) ("This Court has consistently taken a rather jaundiced view of [Black-Scholes] valuations and their reliability.").

[42]   Lewis v. Vogelstein, 699 A.2d 327, 332 (Del. Ch. 1997).

[43]   *See, e.g.,* Lewis G. Hutchens Non-Marital Trust v. Comm'r, 1993 WL 522147 (U.S. Tax Ct. 1993), *citing* Snyder v. Comm'r, 93 T.C. 529 (1989) (Black-Scholes is not appropriate because no way exists to determine the period of time the stock will be held).

While the Nebraska Supreme Court has approved the use of the Black-Scholes model to value an employee spouse's stock options,[44] many states specifically reject the model in the context of divorce litigation.[45] Other courts have held that the model is applicable to commercial, but not divorce, litigation.[46] Some commentators agree that Black-Scholes should not be used in divorce litigation.[47]

The problem with Black-Scholes is that it is applicable to a marketplace of buyers and sellers of stock options; however, in the marital setting, the options at issue are often not vested, and in any case they are not transferable; thus no market exists. In *In re Marriage of Moody*,[48] the Illinois Appellate Court found it impossible to value the stock options at issue before they were exercised, regardless of which method might be applied.[49] The fact that the options could not be transferred meant the only way to earn a profit on them was to exercise them, requiring a capital expenditure that the employee might not be able to make; given unfavorable circumstances, there is a possibility that stock options will never be exercised.[50] In *Wendt*, the court elaborated:

> The Black-Scholes model makes a number of assumptions that are not relevant to placing a value on nonvested stock options in a marital setting: 1) the value of the option has nothing to do with expectancies about the future price of the underlying stock (a purchaser of an option would not buy that option merely because of a belief that the price of the stock will rise), 2) there must be a known market for the asset, and 3) there must be prior history of the trading price for both the underlying stock and the option being evaluated. In a marital setting dealing with employer issued unvested stock options the following comments are appropriate as to those three assumptions: 1) the value of the option to the employee is primarily that his efforts as a

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44    Davidson v. Davidson, 578 N.W.2d 848 (Neb. 1998).

45    *See* Chammah, 1997 WL 414404; Murray, 716 N.E.2d 288.

46    *In re* Marriage of Robinson and Thiel, 35 P.3d 89.

47    *See* Celia Guzaldo Gamrath, *New Options at Divorce: Legislation Treats Stock Options as Marital Property*, 90 Ill. B.J. 139 (2002); David S. Rosettenstein, *The ALI Proposals and the Distribution of Stock Options and Restricted Stock on Divorce: The Risks of Theory Meet the Theory of Risk*, 8 Wm. & Mary J. Women & L. 243 (2001).

48    Moody, 457 N.E.2d 1023.

49    *Id.* at 1026.

50    *Id.* at 1026-27. *See, e.g.*, Menard, 2004 WL 2066599 (it is proper to apply a reasonable discount to the Black-Scholes value to account for the likelihood a corporate CEO will never exercise a portion of his stock options).

high executive will increase the price of the underlying stock, or less personally, the longer the employee remains with the corporation, the higher the value of the underlying stock. Both the employee and spouse, therefore, value the unvested stock options based on expectations that the future price of the underlying stock will rise; 2) there is no market for unvested stock options; and 3) unvested stock options issued to high executives are almost always nontransferable, and since there is no market for similar unvested stock options, there can be no history of the trading price of these unvested stock options.[51]

## III. Conclusion

Although the Black-Scholes model is the most theoretically sound method of valuing stock options in an open market, neither Black-Scholes, the intrinsic value method, nor the discount to present value method can eliminate uncertainty. Using any of these approaches, a court must engage in speculation as to the true value the stock options granted to a divorcing spouse will ultimately realize. Keeping this in mind, divorcing parties might do well to pick one expert and one valuation method, and reach an agreement as to the value of stock options. Such an agreement would reduce the expenses of both parties, decrease the amount of hearing time needed, and also provide a measure of finality. Ultimately, the value of the stock might turn out to be larger, or smaller, than that agreed upon, and therefore one party will have made a better bargain than the other; however, this is true regardless of the method used and the time and expense spent on dueling experts.

If parties are adamant that a court develop as accurate a distribution scheme as possible, a court might retain jurisdiction over an action until such time as all of the stock options at issue are exercised.[52] Waiting until stock options are exercised before distributing them keeps a case open longer, but assures accuracy.[53] Although litigation could be delayed indefinitely, it must be noted that finality is often deferred in any event where ongo-

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[51] Wendt, 1998 WL 161165 at * 196.

[52] *See* Moody, 457 N.E.2d 1023 (trial court to retain jurisdiction until such time as the options were exercised and, in its discretion, allocate an appropriate share of the profits to each spouse).

[53] Fisher, 769 A.2d 1165.

ing issues persist such as support and alimony that are subject to modification.

Courts and litigants might argue that to avoid undue financial dependency between the parties and allow them to go on with their lives, courts should choose an appropriate valuation method and award the value of stock options at the time of distribution of the other assets.[54] Even recognizing that parties may remain tied to each other because of ongoing child support and alimony matters, it may be best to limit as much as possible the need for parties to return to court.[55] Moreover, retaining jurisdiction may be imprudent because the employee spouse might, purely out of spite, forgo profits and decline to exercise options when they vest. Alternatively, he or she might decline to exercise stock options in a reckless endeavor to realize unrealistically high profits.[56]

However, these fears assume, likely unjustifiably so, that parties will act out of spite, and not in their own best interests, even after much time has passed and their wounds have had time to heal. If one party strongly desires finality and the ability to move on with his or her life, it remains the case that he or she can speed the resolution of the litigation by coming to agreement regarding the value of stock options. As for the vindictive spouse, the Pennsylvania Supreme Court has noted that while

> [u]nreasonable or spiteful spouses are not altogether unknown to trial courts charged with adjudicating the multifarious issues arising under the divorce code . . . [the non-employee spouse] will be able, so long as options acquired during her marriage may yet be exercised, to petition the court if she has evidence that [the employee spouse] has violated the . . . policy of effectuating economic justice between parties who are divorced.[57]

Additionally, if the employee spouse allows options to expire without being exercised though they would have realized a profit, the trial court remains competent to render an equitable decision to rectify the situation.[58]

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54    Fisher, 769 A.2d at 1170–71 (Newman, J., concurring).

55    Chammah, 1997 WL 414404 at *6 (a court should uncertainty and reject "reserved jurisdiction").

56    Fisher, 769 A.2d at 1170 (Newman, J., concurring).

57    *Id.*

58    *Id.* at 1170 n.5.

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    Considering the speculative nature of valuing stock options, where parties cannot agree on value, it is perhaps best that a court distribute them correctly, rather than quickly, by adopting a wait and see attitude.