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A Fountain Run Dry

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Introduction. The North Carolina Court of Appeals missed a golden opportunity to bring North Carolina case law in line with modern reality with its recent ruling in *Fountain v. Fountain*, COA01-14 (N.C. App., Feb. 5, 2002). One of the issues in *Fountain* concerned the valuation of stock options in equitable distribution. The husband in *Fountain* held call options on 480,000 shares of publicly-traded stock. Under the Black-Scholes model, the options had a value of approximately $1.6 million while under the intrinsic value method the options had a value of approximately $60,000. The trial court ruled and the appellate court upheld that the intrinsic value method was "an acceptable method for reasonably approximating the value of stock options" and the options were therefore valued at the lower value for the marital estate. Unfortunately, this ruling is not a reflection of how options are valued and traded in the real world.


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A Brief Refresher. Remember that a call option gives the holder the right to purchase a share of stock at a pre-determined price. For example, if a call option has a strike price of $95 per share and the stock currently trades at $100 per share in the market, the holder could exercise the call option, purchasing the stock at the strike price of $95. The holder could then sell the stock in the market for $100, netting a $5 profit. Conversely, if the stock was trading at $90 per share in the market, the holder of the call would not exercise the option as that would result in a purchase at $95 per share and a sale at $90 per share, or a $5 loss. In the first hypothetical, we say that the "intrinsic value" of the option is $5 (calculated as $100 minus $95). In the second hypothetical, we say that the option has no "intrinsic value" or is "underwater."

Time Value is Key. The problem with the recent *Fountain* ruling is that it only considers one component of option valuation – namely, intrinsic value. There is another equally if not more important component of option valuation that the Court failed to recognize: the time value of options. Whereas the intrinsic value of an option is a simple calculation of the strike price less the market price, the time value of an option quantifies the fact that there is still time left in the option period and the stock may at some point during that period exceed the strike price. For example, in the *Fountain* case, the options, although having a relatively small intrinsic value at the date of separation, were for a ten year period and had a little under seven years left to run as of the date of separation. This factor translated into a significant time value of the options, a value that is unfortunately ignored by the intrinsic value method.

Wide Acceptance of Black-Scholes. The quantification of the combined intrinsic value and time value of stock options is very complicated to calculate, however, investment professionals have been successfully using the Black-Scholes model for 30 years in accurately calculating option value. On every business day, real world buyers and sellers trade stock options on exchanges using the Black-

Scholes model. In fact, the Black-Scholes model has achieved wide acceptance not only within the investment community but also by the SEC, the IRS, and the FASB (Financial Accounting Standards Board). A discussion of the Black-Scholes model is too complex for this article, however, readers may go to our website at www.businessvalue.com, click on "Valuation Articles," and look under "Stock Option Valuation" to see a more detailed explanation of the Black-Scholes model. Although no option model is perfect, the Black-Scholes is a far more accurate measure of option valuation than the intrinsic value method perpetuated by trial courts and the North Carolina Court of Appeals.

Consider the Following. If reading about Black-Scholes makes your eyes glaze over, you are normal. Without getting into the complexities of Black-Scholes, consider the following three simple illustrations as to why the intrinsic value method is an inaccurate and inferior method of option valuation.

1. The Real World. Every day, *The Wall Street Journal* lists a portion of the option trading occurring in the market. A recent issue of the *Journal* indicated that on June 25, 2002, an IBM call option with a strike price of $75 per share and an expiration date in August of 2002 had traded at a price of $2.25 per option. This means a willing buyer bought and a willing seller sold these options in the market that day at a price of $2.25 per option. On the surface, this may not seem remarkable, however, one key fact I neglected to mention is that the publicly-traded stock price of IBM on June 25, 2002, was $68.60 per share. Given the strike price of $75 per share on the August options, this means the options had a negative intrinsic value of $6.40 (calculated as $75 minus $68.60). In other words, on June 25, 2002, a holder of this option would not have exercised the option in the market as that would have entitled him to buy the IBM stock at $75 per share and then sell it at $68.60 per share, realizing a $6.40 loss per share. Despite the fact that these options actually traded in the market at $2.25, under the intrinsic value method allowed by the North Carolina Court of Appeals in *Fountain*, these IBM options would have no value in an equitable distribution matter.

This suggests that the justices on the North Carolina Court of Appeals, had they owned these August 2002 options on IBM, would have been giving them away on the floor of the stock exchange as they would believe these options to be worthless (due to their negative intrinsic value). Imagine the surprise and delight of the option traders on the floor who graciously accepted these donated options from the justices, only to turn around and re-sell them in the market at their fair market value of $2.25 per option.

Some of you reading this will object that the IBM options above are freely transferable while most stock options that are the subject of equitable distribution cases are restricted only to the holder of the option and the transfer of those options makes them void. That may be true, however, it doesn't close the issue. Aren't other non-transferable assets (such as pensions and retirement plans) also valued and divided as a part of the marital estate? Furthermore, under the recent *Hamby* decision by the North Carolina Court of Appeals, the transferability of an asset now apparently has no bearing on its value. In *Hamby*, the husband's insurance agency (which both sides agreed was not transferable to any other party), was nonetheless found to have value to the husband and was therefore able to be valued and divided as part of the marital estate. Frankly, I don't know whether the *Hamby* logic is right or wrong. I do know that *Hamby* creates significant confusion and uncertainty among business appraisers as concerns the proper standard of value to apply in equitable distribution matters. Fair market value contemplates the ability to freely transfer an interest in property. A *Hamby* standard of value does not require such an ability to transfer. This is an unsettled issue in North Carolina that needs immediate resolution from the courts or the legislature, however, this issue does not affect the original point made in this illustration: the fact that the intrinsic value method does not mirror what takes place in the real world of option trading and option pricing.

Others of you will object that the IBM options above are of a short-term nature (two months) while most of the stock options in equitable distribution cases are for multi-year periods. That, too, is a reasonable objection as one of the criticisms of the Black-Scholes model is that it may

not be as accurate in valuing longer-term options. This does not mean, however, that Black-Scholes is inaccurate in measuring the value of longer-term options. Nor does it mean that the intrinsic value method is more accurate that Black-Scholes in the valuation of longer-term options. By failing to consider the critical aspect of the time value of options, the intrinsic value method leaves out a key aspect of the equation. This is a far greater error than any slight discrepancy the Black-Scholes model may have in valuing longer-term options.

2. Common Sense. If the above real-world scenario does not have you convinced, assume the following scenario: You own options on one million shares of IBM. Your strike price on the options is $69 per share. As noted above, IBM is trading in the market at $68.60 per share. Therefore, as of today, your options are "underwater." That is, you would not exercise your options today as that would result in your purchasing one million shares of IBM at $69 per share and then turning around and selling the one million shares at $68.60 per share. That would guarantee you a $400,000 loss ($68.60 sale price minus $69 purchase price, times one million shares). Using the intrinsic value method, your options are therefore worth zero.

But suppose your option period is for 10 years and today is day one of that period. That means, if at any time over the next 10 years the stock price of IBM goes over $69, your options will be "in the money," guaranteeing you a profit. For example, if the stock price of IBM goes to $75 next week, you could exercise your options, paying $69 per share for IBM stock and then selling those shares in the market at $75 per share, guaranteeing yourself a $6 million profit ($75 sale price minus $69 purchase price, times one million shares).

Now ask yourself this question: Are your options really worth nothing on day one of the 10-year option period (when the stock price was $68.60)? If something is worth nothing to me, I usually throw it away. Would you throw away your options on day one because they were underwater? If you are the North Carolina Court of Appeals and believe that the intrinsic value method is the appropriate method for valuing stock options you apparently would. Well, for the Court of Appeals and anyone else out there who wants to get rid of similar "worthless" stock options: feel free to mail those options to me and I'll be glad to take them off your hands.

3. Market Influences. Finally, consider what actually happened with the options in *Fountain*. According to the company's form 10-K filed with the SEC, these options were issued in 1995 at strike prices ranging from $3.94 to $4.67. The options were for a ten year period, expiring in 2005. The company's stock price was in the $3 to $5 range during 1995, however, it rose to as high as $16 in February of 1997. In fact, the stock traded as high as $9 per share the week before the date of separation before tremendous selling volume drove the stock down to $4.75 as of the date of separation. Prior to the week before the date of separation in 1998, the average 1998 daily trading volume of the stock was about 13,400 shares. In the week leading up to the date of separation, the average daily trading volume was about 70,600 shares, including days of 150,900 and 125,400 shares on the day before and the day of separation.

Under the intrinsic value method, with every $1 decline in the stock price, the value of the options dropped $480,000. Therefore, in the one week before the date of separation, the value of the options under the intrinsic method fell by $2,040,000 (calculated as $9 per share less $4.75 per share times 480,000 options). Or, looked at another way, one week before the date of separation, the value of the options under the intrinsic value method was about $2.1 million. One week later, on the date of separation, the value of the options under the intrinsic value method was about $60,000. This represents a 97% decline in value.

This drastic a decline would likely not have occurred under the Black-Scholes model. Although the intrinsic value is one component considered under the Black-Scholes model, as noted above, the time value component can be an equally, if not more important component. One of the variables that goes into to the calculation of the time value component of the Black-Scholes model is the underlying volatility of the stock. Without going into great detail, a more volatile stock translates into a greater value for the option (all else being equal). Therefore, the significant drop in the company's stock price the week before the date of separation (an

indication of high volatility) may have had an dampening impact on the decline in value of the options under Black-Scholes. It certainly would not have resulted in the 97% drop in value recorded under the intrinsic value method.

Conclusion. In all fairness, trial court judges and the justices on the North Carolina Court of Appeals have a very difficult job. They must hear cases covering every conceivable topic and it is unrealistic to expect them to be up-to-date on modern financial valuation techniques. In *Fountain*, the Court of Appeals did not find error with the trial court's use of the intrinsic value method because the Appellate Court "has not adopted any approach for valuing stock options" and "the trial court's valuation method will be accepted by this Court if it is a sound valuation method, based on competent evidence, and is consistent with section 50-21(b) [of the North Carolina General Statutes]." It is our hope that this and other similar articles will educate practitioners and judges as to what "sound valuation methods" are as concerns stock options. We hope trial courts and the Court of Appeals will join the rest of the world in adopting the Black-Scholes model as the sole method of option valuation and lay to rest such flat-earth techniques as the intrinsic value method. The intrinsic value method does not reflect the reality of actual financial markets and does not comport with common sense. Its continued use in the courts is resulting in inaccurate valuations and unfair settlements. Only under the Black-Scholes model (or some similar model) is the time value component of options considered and an accurate estimate of value reached. ♦

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