

One of the most difficult questions you can face with stock compensation is when to exercise your nonqualified stock options (NQSOs). If the stock price goes up afterwards, you think you made a mistake by exercising too soon. If it goes down, your timing confirms the genius in you.

You need a decision-making process that removes guesswork and emotions. Otherwise, you're likely to exercise much too soon after vesting or wait to exercise all your options at the end of the term.

What I analyze below are "in the money" NQSOs (i.e., the market price is higher than your exercise price). In addition, the decision under analysis is whether to hold the options or to exercise them and immediately sell the stock to obtain the cash proceeds. An alternative is to exercise the options and hold some or all of the stock without selling it, which will be the focus of a future article.

Any stock option analysis should be done as part of a financial plan that determines your asset mix, total company stock holdings, risk tolerance, tax situation, and financial goals. These elements are crucial in determining the recommended course of action.

First Factor To Consider: Your Concentration Of Net Worth In Company Stock

Often executives have not only a large number of outstanding stock option grants but also additional company stock in 401(k) plans, restricted stock, and stock purchased on the open market or from an ESPP. As a result, company executives too often have a dangerously high percentage of their net worth (as well as compensation) tied up in employer stock. We become concerned when employer stock and options exceed 15% of total financial assets (excluding home, cars, collectibles, etc.).

When you have this high concentration, it is often difficult to diversify to get below this 15% benchmark. Often the restricted stock cannot be sold or is not yet vested and the options have not realized their potential. However, the first step of diversification may be to sell employer stock in your company tax-deferred plans (e.g., a 401(k) plan). If further reduction is necessary, you may consider selling available unrestricted stock (or [give appreciated stock to charity](#) in lieu of cash), or exercise and sell deep in-the-money options. Experts generally do not recommend exercising and selling stock options whose potential has not been substantially realized. This is because these stock options have the greatest leverage and should be the last thing used for divestment (see a [related article](#) by another financial advisor).

Your decision-making should remove guesswork and emotions to avoid exercising too soon or too late.

Experts avoid exercising and selling NQSOs before their full potential has been realized. Because options have the greatest leverage in your portfolio, they should be the last thing you diversify.

Second Factor: Time Value Remaining On Options

What makes an employee stock option so valuable and potentially very profitable is its "option" part. You can buy your company's stock at a fixed price for the full term regardless of how much the market price of your stock has jumped (e.g., \$25 pre-tax value when market price is \$60 and the exercise price stays at \$35), but the remaining time you have left to exercise the option represents potential additional gains because the price may go up. This right to wait to buy the stock has value. Although you cannot cash in on this time value today, it remains useful in developing your exercise strategy.

Valuation Models

The Black-Scholes Model (BSM) of valuing options is considered one of the most important concepts in modern financial theory. It was developed to determine the "theoretical" full value of an exchange-traded option. While certain

assumptions within the original BSM do not perfectly fit employee stock options, subsequent "add-ons" make the results much closer to reflecting typical employee stock option terms (we use the BSM with add-ons but will still call it BSM in this article).

Moreover, most companies use a variation of the BSM when they calculate the cost of issuing stock options to their employees for financial-reporting purposes. You can get some inputs for your own analysis from your company's annual report. Look at the financial-statement footnote that describes the valuation methodology and assumptions the company uses.

While some companies instead apply a lattice model, such as binomial, these are not yet used for financial planning (see a related FAQ that compares the Black-Scholes and binomial models). Other than a straight linear approach to modeling (e.g., stock price goes up 10% per year for four years), which can be the easiest for stock plan participants to understand, financial planners also use Monte Carlo simulations.

Black-Scholes Approach To Time Value

In general terms, the formula is:

$$\text{Black-Scholes option value} = \text{in-the-money value of option} + \text{time value remaining on option}$$

By computing the Black-Scholes value of your options, we are able to estimate the remaining time value of your options.

$$\text{Time value remaining on option} = \text{Black-Scholes option value} - \text{in-the-money value of option}$$

Without going into mind-numbing detail as to the inputs into the formulas, four key elements determine the outcome for the time value:

- 1. The expiration date of the option
- 2. The strike price of the option
- 3. The volatility of the stock (how narrowly or widely the price fluctuates)
- 4. The risk-free rate of return (e.g., current interest rate on appropriate government securities)

The remaining time value of the option is key in determining when to exercise. The lower the remaining time value, the more desirable it is to exercise. For example, deep in-the-money options (i.e., big spread between exercise and market prices) with a low remaining time value are a good candidate for selling and diversifying if you are heavily concentrated in company stock.

One can make three broad generalizations about the remaining time value of the option:

- 1. The time value decreases as the expiration date approaches.
- 2. The time value decreases as the in-the-money amount increases.
- 3. The time value increases as the stock volatility increases.

Case Study

Tom is a 58-year-old executive at a major corporation. His net-worth statement:

Cash	\$50,000
Brokerage account	\$950,000
401(k) plan (not company stock)	\$1,200,000
Stock options (in-the-money value)	\$1,165,000

Total net worth	\$3,365,000
------------------------	--------------------

From this statement you can see that Tom has 35% of his net worth in company stock options in addition to his salary. His concentration in company stock is high relative to his other investments. Tom is bullish on his company's future, and he has not exercised any of his options beyond those that were close to expiration. He feels strongly that the stock will continue to go up even though it has been rather volatile over the past several years.

Analysis of his vested stock options produces the following information:

Stock price	Strike price	# of shares	Exp.	In-the-money value (pre-tax)	Time value left (TV)	Black-Scholes value (BSV)	TV/BSV or "Insight Ratio"*
\$60	\$22	10,000	4/1/08	\$380,000	\$20,863	\$400,863	5.20%
\$60	\$24	11,000	4/1/09	\$286,000	\$34,083	\$430,083	7.92%
\$60	\$49	10,000	4/1/10	\$110,000	\$115,877	\$225,877	51.30%
\$60	\$58	14,000	4/1/11	\$28,000	\$251,993	\$279,993	90.00%
\$60	\$47	11,000	4/1/12	\$143,000	\$153,651	\$296,651	51.80%
\$60	\$48	9,000	4/1/13	\$108,000	\$143,377	\$251,377	57.04%
\$60	\$62	11,000	4/1/14	\$0	\$258,526	\$258,526	100.00%
Totals				\$1,165,000	\$978,371	\$2,143,371	

*The Insight Ratio is a registered trademark of Net Worth Strategies Inc. (Bend, OR) and is calculated by using its professional stock option analysis software, StockOpter Insight. For more information, visit www.networthstrategies.com.

Looking at the last column, or "Insight Ratio," you can see how much time value is remaining on each option grant as a percentage of its Black-Scholes value. For example, the option grant with the \$49 exercise price expiring on 4-1-2010 has 51.30% of its time value yet to be realized. This ratio is very helpful when making decisions about which grant to exercise and when because it shows how much of the Black-Scholes value is left. In general, the grant with the lowest Insight Ratio is the one to exercise first.

From the above information, Tom sees the wisdom of diversifying his portfolio because of his high concentration in company stock options. The first two grants on the list with the biggest spread show that, according to the estimated inputs in the model, the Black-Scholes value of the options has been almost fully realized, which is why their Insight Ratio percentage is low. Therefore, these are prime candidates for exercise and reinvestment in a broadly diversified portfolio.


The more time you have before major expenses such as retirement or tuition, the longer you can wait before taking action on your NQSOs.

No Single Rule For Everyone

If you are like many optionholders, you may ask: "At what Insight Ratio level should I exercise my options?" Unfortunately, you have no single rule to follow. Upcoming cash-flow needs are a good indicator of your planning horizon and risk profile. The more time you have before you need to fund major expenses such as retirement or college tuition, the longer you can wait before taking action on your stock options. However, by understanding and measuring the time value unique to each of your option grants, you can make a well-informed judgment about how to manage your personal goals in the context of your tolerance for risk and your other financial goals.

Samuel Swisher is a tax lawyer and financial advisor with the financial-planning firm of [Vantage Financial Partners Limited](#) in Arlington Heights, IL. As a former corporate executive, he specializes in financial planning for executives using the Executive AdVantage program developed by his firm, with a specialty in stock options. This article was published solely for its content and quality. Neither the author nor his firm compensated us in exchange for its publication.

People who read this article also read:

- ▶ [How To Diversify Your Company Stock Holdings While Leveraging The Wealth In Your Stock Options](#) 
- ▶ [Stockbrokers' Secrets \(Part 1\): What I Tell My Best Clients About Stock Option Strategy](#)
- ▶ [Ten Financial Planning Rules Everyone With Stock Options Needs To Know](#)

The content is provided as an educational resource. myStockOptions.com shall not be liable for any errors or delays in the content, or any actions taken in reliance thereon.

Copyright © 2000-2006 myStockPlan.com, Inc. Patent pending.

myStockOptions.com is a federally registered trademark. Please do not copy or excerpt this information without the express permission of [myStockOptions.com](#). Contact editors@mystockoptions.com for licensing information.