



## Optimal Exercise of Employee Stock Options and Securities Arbitrations

By

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We have previously shown that advice to hold shares acquired from the exercise of employee stock options for one year in order to achieve long term capital gains treatment is almost always unsuitable for large, concentrated positions.<sup>2</sup> In this paper, we extend our previous analysis of employee stock options and show that advice to hold unexercised options can be equally unsuitable.

### 1. Introduction

The failed *exercise and hold* investment strategy has spawned widespread litigation and regulatory action.<sup>3</sup> Under the exercise and hold strategy, employees were encouraged to exercise their employee stock options and hold the acquired shares for one year to achieve long term capital gains treatment, often exposing the employee to extraordinarily high levels of concentration risk. In many cases the employees were exposed to leverage risk as well, either because they borrowed to exercise the options or because taxes associated with exercise of the options were to be paid later. As might be expected in light of the high levels of risk, many of these individuals suffered severe economic losses.

Most of these exercise and hold cases involve erroneous tax analysis and sometimes the tax benefits of the strategy were completely illusory. When a genuine tax advantage did exist, it was typically inadequate to justify the extraordinarily high level of risk. In short, the strategy was almost always indefensible. The damages sought have typically been the amount by which the acquired shares declined after the exercise while they were being held to achieve long term

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<sup>2</sup> See Craig McCann and Dengpan Luo "The Suitability of Exercise and Hold," *Securities Arbitration 2002 Handbook*, PLI, available at [www.slcg.com](http://www.slcg.com).

<sup>3</sup> See "Outrage is Rising as Options Turn to Dust" *The New York Times*, March 31, 2002. Also, <http://www.dfi.wa.gov/sd/orders/S-02-030-03-SC001.pdf>.

capital gains treatment – perhaps adjusted for general market declines or for the losses which could not have been avoided by some form of hedging strategy.

While most employee stock option securities arbitrations have focused on the loss in value of acquired shares that were being held for preferential tax treatment, cases involving the loss in value of vested but unexercised options are also being litigated. Unexercised employee stock options sometimes attain great value and these options may represent almost all of the employee’s wealth. Although the employee did not make an out-of-pocket cash payment to acquire the stock options, but instead earned them through labor market transactions, the options are wealth that must be managed with as much care as any other valuable investment assets. Failure to manage investment risk with respect to this option wealth is an error no less egregious than failure to diversify a concentrated stock position.

The issues presented in *un-exercise* and hold cases are similar to the issues involved in exercise and hold cases. Unexercised options can expose the holder to concentration risk and leverage risk. The value of unexercised options rises and falls with the employer’s stock price. If the employer’s stock price drops significantly more than the broad stock market, the loss in stock option value from not exercising vested options and diversifying can be substantial.

The problem faced by an option holder is similar to the problem of an investor holding a concentrated stock position, but with important differences. Employees can exercise options and sell the shares, but generally cannot sell the options. Also, the tax considerations in continuing to hold a stock option are more complex than for the decision to continue to hold shares of stock.

## 2. Exchange Traded Call Options

Employee stock options are similar to exchange traded call options in their main economic features. Call options give investors the right to buy stock at a predetermined price in the future.<sup>4</sup> The difference between the underlying stock’s current price and the strike price of the option is referred to as the *intrinsic value* of the option or, in connection with employee stock

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<sup>4</sup> Most exchange traded call options can be exercised at any time before they expire. Options which can be exercised prior to expiration are called “American” options. Options that can be exercised only at the end of the option term are called “European.” These terms are historical rather than geographically accurate, as both styles of options can be found on both continents.

options, the *bargain element*. For instance, the intrinsic value of an option with a strike price of \$20 when the stock is selling for \$50 is \$30. We can think of intrinsic value as a measure of the profit the option holder would secure if she exercised the option and sold the shares at the price at which the stock is currently trading.

Exchange traded stock options typically sell for more than their intrinsic value. In fact, options which are out of the money, that is options with strike prices greater than the current stock price, sell at positive prices. The difference between the market value of an option and its intrinsic value is the option's *time value*. Unless the option is about to expire, time value is a positive number. This means the price at which the exchange traded option can be sold (intrinsic value plus time value) is greater than the profit that can be secured by exercising the option and selling the stock (intrinsic value alone). Accordingly, it is virtually never optimal to exercise exchange traded options before expiration.<sup>5</sup> If an investor no longer wants to hold the option she can realize more by selling the option than she can by exercising it.

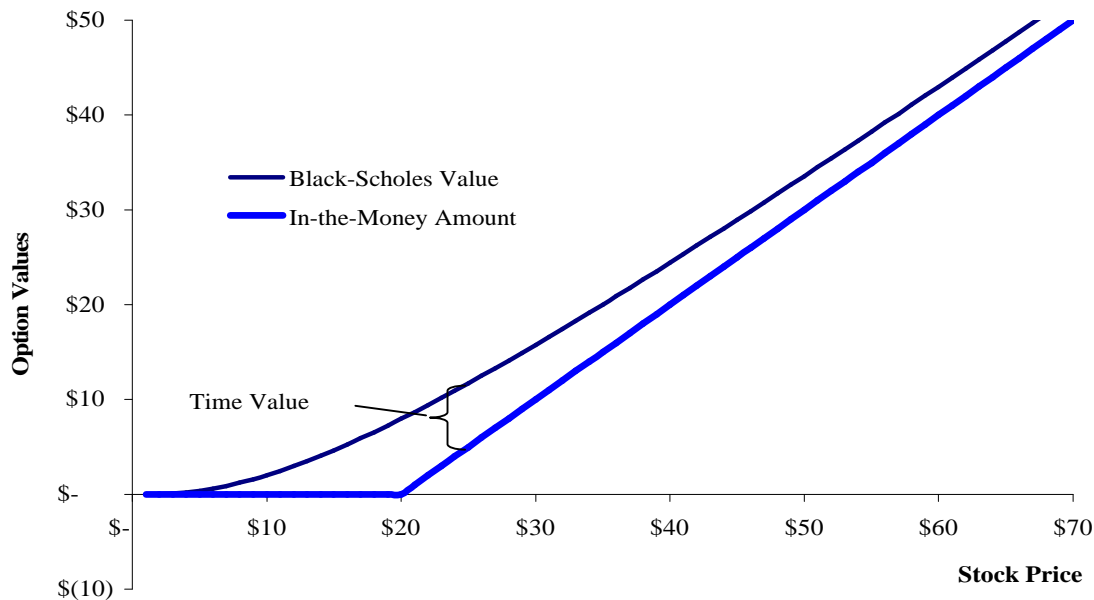
Time value has two components. The option holder can defer paying the strike price into the future. For example, the owner of an option to buy stock currently worth \$50 at any time in the next year for \$20 could exercise the option today paying \$20 or could earn the risk free rate of return for 1 year and then pay \$20. Either way the investor has the stock in one year but the investor who deferred exercise pays \$20 in future dollars rather than \$20 in current dollars. This component of time value is essentially equal to the value of receiving an interest-free loan of the exercise price of the option, adjusted for the probability that the option will in fact be exercised. The time value of an option also reflects the fact that by not exercising the option the investor can avoid having paid \$20 for stock that later – but before expiration – turns out to be worth less than \$20. In other words, the option holder is protected against the loss she would suffer as a shareholder if the stock price is below the exercise price of the option on the expiration date of the option.

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<sup>5</sup> An exception to this general rule occurs when the stock is about to pay a dividend that exceeds the remaining time value of the option. In this situation the optimal strategy is to exercise the option in time to capture the dividend. Normally this situation occurs, if at all, only very close to the expiration date of the option.

Other things equal, an option's time value is lower the more the underlying stock's price rises above the exercise price of the option. See Figure 1. The upper line in the chart is the Black-Scholes value of a stock option with a \$20 strike price for various values of the underlying stock. The lower line is the amount the option is in the money. The distance between these two lines is the time value of the option.<sup>6</sup>

**Figure 1**  
**Black-Scholes Option Values Always Exceed Option's In-the-Money Amount**



### 3. Employee Stock Options

Public companies frequently grant their employees options to buy company stock in the future at a *strike price* equal to the company stock price on the day the options are granted. The options cannot be exercised until they *vest*, usually after three or four years, and expire if they are unexercised after a stated period, which is often ten years.

Employee stock options are worth less than the value they would have as exchange traded options because they can't be sold and must be exercised while the holder is an employee.

<sup>6</sup> The chart is a snapshot of values the option can have at a particular time if we make different assumptions about the stock price at that time, rather than an indication of the values the option can have over a period of time.

Employees forfeit the options if the employees separate from their employers before the options vest or while vested options are underwater. Employees also exercise earlier than would be optimal because of liquidity needs. Models used to value exchange traded options can be easily adapted to value employee stock options. The two most common models for valuing options are the Black-Scholes and the binomial options pricing models.<sup>7</sup> Both can be adapted to deal with the lack of transferability/marketability of employee stock options.

It is not unusual to see employee stock options that are deep in the money after only a small fraction of that ten-year period has elapsed. A deep in the money option is economically similar to owning outright the number of shares that would result from a “sell to cover” strategy, where the employee exercises the option and sells enough shares to cover the exercise price and the tax liability.

Employees who exercise stock options are usually able to sell the shares at the same time or shortly thereafter. Employees who sell the shares receive cash proceeds they can invest in a diversified portfolio. Those who hold most or all of the shares after exercising options (the exercise and hold strategy) are usually exposed to a much higher level of investment risk.

The level of risk depends partly on the *volatility* of the employer’s stock, in other words, its tendency to move up and down rapidly. Equally important is the overall level of diversification in the employee’s portfolio. If someone acquires \$100,000 worth of her company’s stock, we need to know what other investments she holds before we can determine her level of *concentration risk*. If her other assets consist of \$1.9 million worth of stocks in a well diversified portfolio, the company stock represents only 5% of her assets and exposes her to little concentration risk. If she has no other assets, or if her other assets are not well diversified, concentration risk is an important issue that should be addressed promptly.

Other things being equal, investors in general prefer investments that expose them to less risk. As a result, riskier investments generally offer a higher expected rate of return to

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<sup>7</sup> An early discussion of the application of these models to valuing employee stock options can be found in Craig J. McCann, “How (and Why) Companies Should Value Their Employee Stock Options,” *Journal of Applied Corporate Finance*, vol. 7, no. 2 Summer 1994 pp. 91-99. The latest in valuing employee stock options can be found at John Hull and Alan White, “How to Value Employee Stock Options” *Financial Analysts Journal*, January/February 2004, p. 114.

compensate the investor for the added risk. The stock market places no value on risk that can be eliminated through diversification, however. The added risk associated with holding a concentrated position in a single stock is not associated with a higher expected rate of return. In other words, concentration risk is *uncompensated* risk. When an investor fails to diversify, she misses an opportunity to reduce risk without reducing her expected rate of return, or to increase her expected rate of return without increasing risk. Either way, she is leaving money on the table. The elimination of uncompensated risk is one of the most important principles of portfolio management.

Investors who take uncompensated risk, while keeping their overall level of risk within reasonable levels, are likely to have poor investment performance but unlikely to suffer extreme losses. The main problem with both the exercise and hold and the un-exercise and hold strategy is that they often expose investors to an unduly high overall magnitude of investment risk.

There is no accepted formula for determining the appropriate level of investment risk. Two pieces of advice are fairly standard, however. First, as indicated above, stock investments should be broadly diversified. Second, most investors should keep their risk exposure below the level represented by 100% exposure to the stock market by investing in more conservative investments such as investment grade bonds. Based on these principles, it is fair to suggest that the risk level associated with the overall stock market (which is equivalent to a well diversified portfolio invested 100% in stocks) represents a high level of risk.

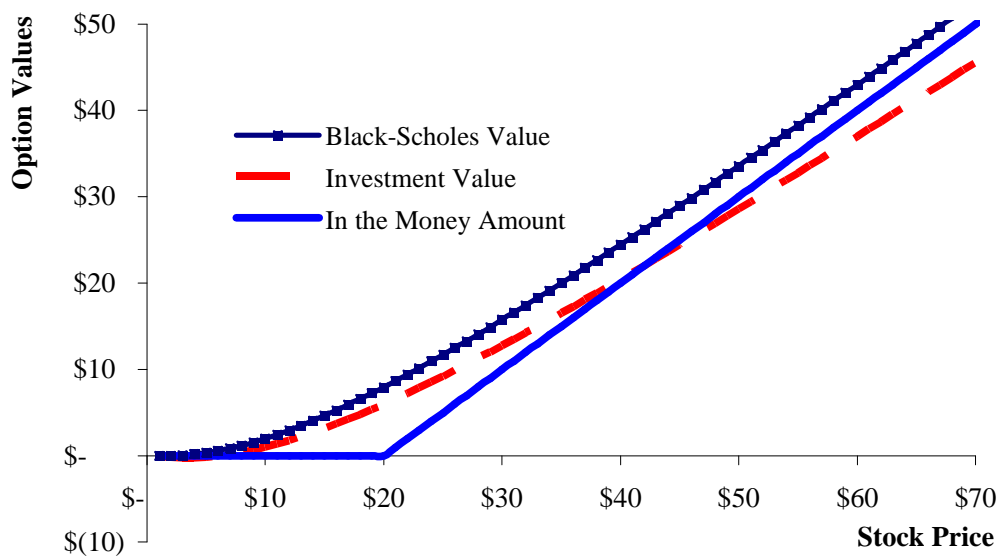
Seen in this light, the benefits of diversification become obvious. An employee holding deep in the money options typically has a substantial amount of wealth in the form of a leveraged investment in a concentrated position that exposes her to an unsuitable level of risk. If she could, the correct course of action would clearly be to sell the option for its full value and use the net proceeds to make more suitable investments. That course of action is generally not available for employee stock options, so the employee must consider an alternative. By exercising the option and selling the stock, the employee can eliminate the uncompensated risk associated with the concentrated position, often at a cost that is smaller than the cost of hedging that loss for a single year (e.g. the purchase price of put options for that period).

The cost of diversification is the abandonment of the option’s remaining time value. If the employee stock option is deep in the money, the cost of abandoning the remaining time value of the option is relatively small, even if the option will not expire for several more years. Unless the employee holds other investable wealth large enough to diversify away much of the risk inherent in the option, the benefit of liquidating the option and reinvesting the proceeds is far greater than the cost of abandoning the time value of the option.

#### 4. Optimal Exercise

Optimal exercise balances the benefits of diversification against the destruction in remaining option value. The tradeoff is pictured in Figure 2. The line labeled “Investment Value” is the Black-Scholes value of the option reduced by a penalty for the lack of diversification. The option’s Investment Value is its value to the employee as a continuing investment. If the Investment Value is less than the Intrinsic Value the option should be exercised. If the Investment Value is greater than the Intrinsic Value (i.e. the net proceeds which can be realized from exercising the option) the option should be held unexercised.

**Figure 2**  
**Optimal Exercise As A Function of Current Stock Prices**



If the options are a small part of the employee's wealth – wealth that is itself well diversified – the Investment Value will be quite close to the Black-Scholes value and early exercise will seldom be optimal. On the other hand, if the options are a significant fraction of the employee's wealth, the Investment Value line can move below the amount the option is in the money. In other words, the value of the option as a continuing investment is less than the profit that can be secured by exercising the option and selling the shares. When this happens, the employee should exercise the options.<sup>8</sup>

At one extreme then, if an option is deep in the money and represents a significant fraction of the employee's wealth, the option should be exercised early and the acquired shares sold. At the other extreme, options which are at or near-the-money and with considerable time left to expiration should not be exercised since the option value significantly exceeds the value of the diversified portfolio which can be purchased with the net benefit from exercising the option. At some intermediate stock price, prudent investors are indifferent between exercising the NQSOs and holding the unexercised options. The precise determination of this threshold price is beyond the scope of this paper as most *un-exercise* and hold cases will involve options which were left unexercised even though they were deep in the money and represented a large fraction of the employee's wealth.

## 5. Taxes

Early exercise of stock options has an additional cost because the employee must pay the income tax associated with the exercise and this payment could have been deferred by delaying the exercise. The benefit is much smaller though than commonly believed, and far too small to justify exposure to extraordinarily high levels of risk.

Tax deferral is often described as a benefit equivalent to receiving an interest-free loan. Yet careful analysis of the tax consequences faced by an option holder reveals that deferral in

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<sup>8</sup> Employees' wealth, fully considered, often includes a lot of risk associated with their employer or their employers' industries. While some senior executives may have significant investment portfolios we find that rank and file employees with substantial wealth as a result of employee stock options typically have few other investments. If employees exercise options on margin and hold the acquired shares and/or generate future tax liabilities, their employers' stock can often be more than 100% of the employees' net invested assets. For present purposes we consider only thickly traded securities and employee stock options but could also include as wealth thinly traded assets like real estate and illiquid assets such as human capital.



this situation is not equivalent to an interest-free loan. We can illustrate this point with a simplified example where the option is so deep in the money that the exercise price is effectively equal to zero. We use an assumed income tax rate (combined federal and state) of 40%. If the employee exercises the stock option for \$100,000 worth of stock now, she will pay \$40,000 in tax and secure only \$60,000 of investable proceeds. Is she better off postponing the exercise of the option, so that she has the full \$100,000 working for her?

Consider what happens if she holds the option long enough for the stock price to double. The amount she can realize by exercising the option at that point is \$200,000, but the tax is \$80,000. She has net proceeds of \$120,000, which is the same amount she would have if she exercised the option earlier and obtained the same investment performance (a 100% increase) from investment of the \$60,000 proceeds. In other words, if we assume that the return to a diversified investment is the same as to the single stock, she did not keep the entire \$100,000 working for her; 40% of that amount was working for the government, even though the tax would not be due until she exercised the option.

In our example above, postponing the exercise of the option permits her to secure \$120,000 after payment of all income tax. If she exercised the option earlier and achieved the same pre-tax investment performance, she would potentially owe tax on the \$60,000 of growth in the value of her investment during the period after the exercise of the stock option. Postponing the exercise of the stock option produces a tax benefit equivalent to the opportunity to invest the net after-tax proceeds tax-free. This is true for both nonqualified stock options and incentive stock options (“ISOs”); the difference is in the amount of after-tax proceeds (due to potential tax benefits from ISOs) rather than the nature of the benefit of deferring the exercise of the option.

Tax-free investing over a long period of time, as in a Roth IRA, can significantly enhance the owner’s wealth. Yet the difference in rates of return is not great enough to justify the extraordinary level of risk associated with a heavy concentration in a single stock. In a taxable investment account, it is generally possible to postpone indefinitely income tax on much of the growth in the form of unrealized capital gains. Realized gains may be offset with realized losses, and gains that are not offset are subject to a low rate of tax if the assets have been held more than

a year.<sup>9</sup> Capital gains on assets held at death escape income taxation altogether. The low effective rate of tax on investment earnings diminishes the value of an opportunity to invest tax free.

Using crude but realistic estimates, we might assign a pre-tax expected return of 10% to stock investments in general and assume an effective federal income tax rate of 15% on investment income produced by stock investments. In this case, the performance benefit of the deep-in-the-money stock option over a diversified investment that performs the same as the stock underlying the option would be the difference between 10% and 8.5%, the after-tax return of the two investments. Compounded over many years, a difference of this magnitude would be of significant benefit to an investor. Yet the magnitude of the advantage in expected return is not nearly great enough to justify the risk associated with a concentrated position. Investors routinely give up as much as 400 basis points of expected return in exchange for the much smaller risk reduction associated with moving investments out of stocks and into bonds. They can much more easily afford to give up 150 basis points of expected return to achieve a far greater reduction in risk as they move from a concentrated stock position to a diversified portfolio.

## **6. Taxes and the Exercise and Hold Strategy Revisited**

Individuals who hold shares after exercising employee stock options are often highly concentrated in the employer's stock. Apart from these shares, they may have additional exposure through unexercised options or stock held in other accounts, including retirement accounts.<sup>10</sup> Even without such additional exposure, the level of risk they experience may be more than double the risk of the overall stock market. This risk may be further magnified by leverage if the individual borrowed to exercise the option or has an unpaid tax obligation as a result of the option exercise. These numbers translate into the potential for huge losses. An investment in the overall stock market would rarely lose more than 30% of its value in a single

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<sup>9</sup> Qualified dividend income is now also subject to the lower rates that apply to long-term capital gains.

<sup>10</sup> While we do not address the issue here, it is worth noting that employees have further indirect exposure to stock risk as a result of working for the company, because events adversely affecting the company's stock may also adversely affect the company's compensation arrangements or decisions to reduce workforce size.

year. Many individuals using the exercise and hold strategy for large stock option profits have lost 60% of their wealth in a year, with even greater losses not uncommon.

These losses spring from a strategy that entails extraordinarily high risk without promising higher than average investment returns. Ignoring taxes, the strategy is plainly unwise from an investment point of view. The question then is whether tax considerations provided a justification for the strategy.

The tax treatment of NQSOs is simple. An employee who receives NQSOs does not recognize any income until the options are exercised. When the options are exercised, the difference between the value of the shares acquired and the exercise cost is taxed as ordinary income and the tax basis for the acquired shares is set to the current value of the acquired shares. As a result, the employee can sell the shares without incurring any additional tax cost, using the proceeds to eliminate any leverage incurred in the exercise of the option and make investments that do not entail high levels of uncompensated risk. Apart from transaction costs, which are usually trivial in relation to the benefit of risk reduction, there is no reason for the employee to hold shares after exercising a nonqualified stock option.

Perversely, some financial advisors have recommended that employees exercise NQSOs early and hold the acquired shares for one year to convert more of the anticipated increase in the stock value from intrinsic value at the time of the exercise which will be taxed at current income tax rates into capital gains which will be taxed at the lower, long term capital gains rates. This strategy not only unnecessarily exposes the employee to uncompensated risk, it destroys significant option value as the options are exercised prematurely.

In contrast with NQSOs, incentive stock options provide the potential for a genuine tax advantage if shares are held after exercise of the option. If the employee holds shares long enough to satisfy a special holding period (usually one year<sup>11</sup>), the option profit is converted from ordinary income, taxed at rates up to 35%, to long-term capital gain, taxed at a maximum rate of 15%. This rate conversion can significantly boost the after-tax expected return from

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<sup>11</sup> The employee must also hold shares until at least two years after the date the option was granted. This requirement is moot in the usual situation where the employee exercises the option more than a year after the grant date.

holding the shares for the required period. The strategy of holding at least some of the shares is not so clearly flawed that it should be rejected out of hand. Yet many employees have suffered severe losses as they pursued this strategy to excess. The errors that led to these financial disasters stemmed from a failure to appreciate the lofty risk levels and, here again, faulty tax analysis.

Cases involving the exercise and hold strategy for ISOs often involve even more risk than NQSO cases. The reason is that there is no income tax withholding upon exercise of an ISO, even though tax liability under the alternative minimum tax (AMT) can be substantial. Employees who exercise NQSOs often sell enough shares to cover the income tax withholding. If they borrow to cover the withholding, they are likely to encounter a margin call. The forced sale may come as an unwelcome surprise, but may prevent an even greater disaster as the stock continues to decline. Employees who exercise ISOs can postpone the tax payment until the following April. They do not have to sell shares to meet a withholding requirement, so they may decide to hold all the shares. Once the AMT liability from exercising the option becomes fixed, this unpaid tax represents hidden leverage. There will not be a margin call when the stock price declines. As a result, employees have been known to hold shares until the value fell below the amount needed to pay the tax liability, exposing the employees' other assets to the tender mercies of IRS collection agents. Advisors assisting these employees should have alerted the employees to the excessive level of risk and urged them to sell some or all of the shares.

These losses are all the more lamentable because they are based in part on faulty tax analysis. When the bargain element of an incentive stock option is large relative to other income, the tax benefit of holding stock extends to only a portion of the shares. An employee who holds additional shares incurs greater risk without the possibility of an increased tax benefit. Under the tax rates in effect before 2001, many employees could have sold as many as 40% of the shares obtained upon exercise of an ISO immediately upon exercise of the option without forgoing any tax savings.<sup>12</sup> In addition, many of these employees (and their advisors) overlooked an opportunity to reduce their tax exposure through a disqualifying disposition late in

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<sup>12</sup> Under current (2004) tax rates, the tax benefit of *exercise and hold* may extend to only 35% of the shares acquired upon exercise of an ISO.

the year of exercise.<sup>13</sup> In short, even assuming it made sense to take whatever risk was necessary to attain the maximum tax benefit available from the exercise and hold strategy, these employees took *far more* risk, without any possibility of attaining additional tax benefits.

## 7. Conclusion

Employees holding highly appreciated stock options are exposed to extraordinarily high levels of investment risk except when they also hold enough other investable assets to provide adequate diversification. Inevitably, many of those who were exposed to these high levels of risk suffered grievous losses. The strategy of holding deep in the money stock options leading to these losses was not justified by stock option economics or the benefit of tax deferral.

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<sup>13</sup> AMT liability does not become fixed until December 31 of the year of exercise.