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Forthcoming in Tax Notes

## The Tax Efficiency of Stock-Based Compensation

Michael S. Knoll\*

Over the last two decades, U.S. corporations have made extensive use of their stock and options thereon to compensate and motivate their employees.<sup>1</sup> Until recently, employee stock options (ESOs) were the rage. In 2000 alone, the companies that comprise the Standard & Poor's (S&P) 500 granted a staggering \$126 billion in ESOs; that is more than the gross domestic product of Ireland (Lavelle).<sup>2</sup> According to some estimates, ESOs now represent as much as 15 percent of outstanding shares (Weedan).<sup>3</sup> Moreover, that number will likely grow. The run rate – the average annual grant of options as a percentage of outstanding shares – has been estimated at around 5 percent (Weedan). ESOs are, thus, an important and growing part of corporate capital structures.<sup>4</sup>

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<sup>1</sup> Their use is especially heavy in the high-tech, financial services and manufacturing industries. According to the Conference Board, as of 1994, 91 percent of manufacturing firms issued ESOs (Austin, Garver & Garver 1998).

<sup>2</sup> ESOs are disproportionately granted to higher paid workers. For chief executive officers in S&P 500 companies, slightly more than half of their 2000 compensation was in the form of ESOs (Murphy).

<sup>3</sup> Strom (2002) reports that for the 1500 largest U.S. companies, options granted, but not exercised, account for more than 14 percent of outstanding common stock. Pearl Meyer estimates that the 200 largest publicly traded companies have reserved shares equal to 10 percent of their outstanding shares for outstanding grants and another 7 percent for future grants (2002). Recent academic studies are roughly in line. For firms that grant options, Core and Gray found that option grants cover 6.9 percent of outstanding shares (2001). Using a wider sample, Eberhart finds that options cover 12 percent of outstanding shares (2001).

<sup>4</sup> Standard & Poor's estimates that expensing options would have reduced the earnings per share (EPS) of the S&P 500 index by 25 percent in 2001 (Borrus & Dwyer).

Defenders of the option culture argue that ESOs, which reward employees when their firms succeed, are responsible for much of the wealth created by the large stock market run-up in the 1990's. They claim that ESOs encourage employees to work harder and with a common purpose.<sup>5</sup> Critics, however, are less sure and employee options have come under heavy attack from investors, commentators and academics.<sup>6</sup> Critics argue that ESOs impose excessive risk on employees<sup>7</sup> and overstate net income.<sup>8</sup>

In the last year or so, the tide has been shifting. In response at least in part to critics, nearly 500 firms, including 113 of the S&P 500, now treat or have announced their intention to treat ESOs as an expense on their income statements (Bear Stearns). In addition, some firms, including General Electric and Microsoft, have begun to replace ESOs with restricted stock (Lohr). Although there are no good numbers on the amount of restricted stock held by employees, its use is rapidly growing (Simon).

Surprisingly, in spite of the importance to employees and employer of stock-based compensation, there has been very little detailed analysis of the question whether ESOs and other stock-based compensation mechanisms are tax efficient. What little serious legal work has been published has concluded that ESOs are tax inefficient (Johnson 1999 and Johnson 2003).<sup>9</sup> Clearly, given the large amount of restricted stock and ESOs outstanding, and thus the substantial tax costs that firms would incur by granting them if they were inefficient, the tax saving or cost from stock-based compensation is an important lacunae in the debate over the wisdom of their

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<sup>5</sup> See Hof (quoting Scott McNealy of Sun Microsystems and Larry Sonsini of Winston, Sonsini).

<sup>6</sup> See Hof.

<sup>7</sup> Most employees are risk averse and would like to hold a diversified portfolio to reduce risk. Because the present value of most employees' future earnings are already connected to their employers' performance, ESOs increase risk by tying the employee's wealth to their employer's performance even more closely.

<sup>8</sup> For financial accounting purposes, ESO-granting firms generally do not treat ESOs as expenses, thereby increasing net income. The financial reporting treatment of ESOs has been and remains a highly contentious issue. See, for example, Borrus & Dwyer (quoting Warren Buffett and Alan Greenspan).

<sup>9</sup> Shortly before publication, I became aware of a recent and thoughtful manuscript, *Is Equity Compensation Tax Advantaged?* by Professor David Walker. Professor Walker has independently produced a sophisticated argument that stock-based compensation is tax efficient. Although there are similarities between my argument and Professor Walker's, there are also substantial differences between the two arguments.

heavy use.<sup>10</sup>

The rest of this paper proceeds as follows. Part I provides a definition of tax efficiency. Part II describes the tax treatment of various forms of stock-based compensation. Parts III and IV describe a methodology for assessing whether a compensation mechanism is tax efficient, and they then apply that methodology to various forms of stock-based compensation. Part V is the conclusion.

## I. Tax Efficiency

What is meant by the claim that stock-based compensation is either tax efficient or tax inefficient? There are at least two senses of tax efficiency.<sup>11</sup> First and most obviously, a compensation mechanism (or any transaction or investment) is tax efficient if it is taxed at least as favorably as it would be taxed under an ideal income tax—the tax system’s benchmark. It is tax inefficient if it is taxed less favorably than under an ideal income tax.

Although this is a reasonable and frequently employed definition of tax efficiency, it is not very useful for assessing the tax cost to employers and employees from stock-based compensation. That is because their choice is among various compensation mechanisms, not between those mechanisms and a theoretical ideal.<sup>12</sup>

The second and more useful sense of the claim is that a compensation mechanism (or any transaction or investment) is tax efficient if it is taxed at least as favorably as all other available alternatives. It is then tax inefficient, if it is taxed less favorably than some other available alternative. That is to say, ESOs, for example, are tax inefficient if from some set of alternative compensation mechanisms, there is at least one other mechanism that is taxed preferentially relative to ESOs. Obviously, in these circumstances, a critical issue is the class of alternatives. Employers and employees have a range of compensation mechanisms available. These include cash (both current and deferred), contributions to pensions, fringe benefits and

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<sup>10</sup> More than 90 percent of those receiving ESOs are everyday employees, but 80 percent of the value goes to senior executives, who typically receive 80 percent of their compensation through options. Borrus & Dwyer. See also Casey (citing an S&P study showing that for 2000 the average compensation for a chief executive of an S&P 500 company was \$14.69 million, 68.8 percent of which came from options).

<sup>11</sup> I limit the discussion of tax efficiency to the income tax (both personal and corporate). A similar inquiry could be made under transfer taxes (the estate and gift taxes), wage taxes or all taxes combined. In addition, I have not taken the alternative minimum tax into account.

<sup>12</sup> This definition is more useful for public policy purposes. It provides insight into whether the tax system under or over taxes such compensation relative to an ideal baseline.

stock-based compensation.

Most commentators would concede that compensation in the form of nontaxable fringe benefits and contributions to pensions are generally taxed less heavily than stock-based compensation and salary.<sup>13</sup> Employer expenditures on nontaxable fringe benefits, such as health care and life insurance, are immediately deductible by the employer and never taxed to the employee.<sup>14</sup> Employer contributions to pension plans are also immediately deductible, but employees are generally not taxed until the funds are withdrawn.<sup>15</sup> From a joint tax planning perspective, nontaxable fringes and pensions are both taxed substantially better than an ideal income tax, which would allow an immediate deduction by the employer, but would also require an immediate inclusion by the employee.<sup>16</sup>

Because pensions and nontaxable fringe benefits are so attractively taxed, they are subject to tight restrictions, which limit the amount of income that can be shifted to them. Thus, because these limits are binding for many employees, especially the high-level managers who receive the largest option grants, nontaxable fringes and pensions should be excluded from the comparison. That leaves current and deferred cash payments and stock-based compensation plans as the appropriate set for comparison.

## II. Stock-Based Compensation Mechanisms and Their Taxation

Stock-based compensation plans link the covered employees' payments to the company's stock price. There are three classes of stock-based compensation plans: restricted stock, ESOs and stock appreciation rights (SARs).

Companies that grant restricted stock compensate their employees in part with shares. The stock is restricted because the shares are not all vested at the time of the grant. Typically, the shares vest over time and only if the employee is still working for the firm.

ESOs are call options. A call option gives the holder the right, but not the obligation, to acquire the underlying security (here a fixed number of shares of the grantor's stock) for a

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<sup>13</sup> The tax treatment of various forms of stock-based compensation is discussed in Part II.

<sup>14</sup> Internal Revenue Code (IRC) Section 79 (excluding up to \$50,000 of employer provided life insurance from the incomes of employees); Section 106 (excluding employer provided accident and health insurance coverage from the incomes of employees). All statutory cites are to the Internal Revenue Code (IRC) unless otherwise stated.

<sup>15</sup> CITE.

<sup>16</sup> The importance of using a joint tax planning approach is discussed in Part III, *infra*.

specified period at a fixed price. ESOs are typically granted with an expiration date of 5 to 10 years and with an exercise price equal to the price of the underlying stock at the grant date.<sup>17</sup>

SARs provide employees with cash payments equal to the change in the market value of the underlying stock over some period of time. SARs generally do not require employees to repay any amounts to the employer if the stock price falls before the right expires.

In order to understand the economics of the different stock-based compensation schemes, the following notation is helpful. Let  $P$  be the price of the employer's stock at different dates. Let subscript  $g$  denote the date the restricted stock is granted,  $e$  the date the restriction lapses, and  $s$  the date the stock is sold. Thus,  $P_g$  is the price of the stock when the restricted stock is granted;  $P_e$  is the price when the restriction lapses; and  $P_s$  is its price when the employee sells the stock. The same notation with slight modification in interpretation can be used with ESOs and SARs. For ESOs, let subscript  $g$  denote the date the ESO is granted,  $e$  the date it is exercised, and  $s$  the date the stock is sold. Thus,  $P_g$  is both the price of the stock when the option is granted and the exercise price of the option.  $P_e$  is the price of the stock when the option is exercised. Obviously, it only makes sense for the employee to exercise the option if the stock price,  $P_e$ , exceeds the exercise price,  $P_g$ .  $P_s$  is the price of the stock when the employee sells it. Of course, the stock cannot be sold until the option is exercised. For SARs,  $g$  is the date the right is granted and  $e$  is the date a single payment (if any) is made. Thus, with SARs, the employer pays the employee  $P_e - P_g$  at date  $e$  if  $P_e > P_g$  and otherwise nothing.

In order to better understand the operation of the different stock-based compensation mechanisms, a concrete example is given. On January 1, 2001, Xerox grants Xena 1000 shares of restricted stock when Xerox is selling for \$100 a share. The restriction lapses on January 1, 2006 when Xerox is worth \$125 a share. Xena sells all 1000 shares on January 1, 2008 when Xerox's stock price is \$180.

For the grant of ESOs, the series of events is as follows. On January 1, 2001, Xerox grants Xena options on 1000 shares of stock with a per share strike price of \$100 — the stock's market price on January 1, 2001. Xena exercises the options on January 1, 2006 when Xerox is selling for \$125. She sells all of the stock on January 1, 2008, for \$180 a share. Thus,  $P_g$  is \$100,  $P_e$  is \$125 and  $P_s$  is \$180. For the similar SAR, Xerox pays Xena \$25 for each notional share covered by her SARs in 2006.

The cash flows from these transactions are given in Table 1:

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<sup>17</sup> Companies avoid granting in-the-money ESOs because the amount the options are in-the-money must be included by the employee on the grant date.

Table 1–Cash-flows from stock-based compensation mechanisms

Date	January 1, 2001	January 1, 2006	January 1, 2008
Stock Price	P <sub>g</sub> = \$100	P <sub>e</sub> = \$125	P <sub>s</sub> = \$180
Restricted Stock			
Employee	0	0	180,000
Employer	0	0	0
Employee Stock Options			
Employee	0	-100,000	180,000
Employer	0	100,000	0
Shared Appreciation Rights			
Employee	0	25,000	0
Employer	0	-25,000	0

Table 1 uses the convention that cash inflows are positive and cash outflows are negative. The employer's \$100,000 cash inflow on January 1, 2006 with an ESO arises because the employee pays the employer \$100,000 [= \$100/share x 1000 shares] when she exercises the options.

In order to describe the tax consequences of the different stock-based compensation mechanisms, some additional notation is necessary. Let the employer's corporate tax rate be  $t_c$ , with an additional subscript to denote the tax rate at a specific date, such as the date of grant, exercise or sale. Let the employee's personal income tax rate be  $t_p$ , with an additional subscript to denote the tax rate at a specific date. Although corporations pay tax on capital gains at ordinary income rates, individuals enjoy a preferential rate for (long-term) capital gains (IRC Section 1(h)). Denote the ratio of the individual capital gains tax rate to the individual ordinary income tax rate by  $g$ .<sup>18</sup>

Consider first the tax treatment of restricted stock. Restricted stock is not taxed when it

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<sup>18</sup> Prior to the 2001 tax reforms, the ordinary income tax rate was nearly 40 percent and the maximum tax rate on long-term capital gains was 20 percent. Thus,  $g$  was roughly .5. The 2001 tax reforms call for the maximum personal tax rate to drop to 35 percent in 2006. Thus,  $g$  would have been roughly .56. The reform provided that the rate was to drop in 3 stages. The 2003 tax reforms accelerated the ordinary income tax reductions to January 1, 2003, and it reduced the capital gains tax rate to 15 percent. Thus,  $g$  is roughly 43 percent.

is granted, but only when the restriction lapses.<sup>19</sup> At that point, the employee takes into income at ordinary tax rates the value of the stock received and the employer deducts that amount as compensation expense. Thus, in the example, there is no deduction or inclusion until 2006, when Xerox deducts \$125,000 and Xena includes that amount in ordinary income. Assuming both Xerox and Xena are taxed at 35 percent, Xerox would receive a deduction worth \$43,750 and Xena would pay \$43,750 in tax. In 2008, when Xena sells her stock, she reports a \$55,000 capital gain and pays \$8250 in tax.<sup>20</sup>

The tax treatment of SARs is also simple. The employer deducts any payment on a SAR when made. Thus, in the example, Xerox would deduct \$25,000 in 2006. If Xerox's marginal corporate tax rate in 2006 is 35 percent, Xerox would receive a deduction worth \$8,750. The holder of a SAR is taxed at ordinary income rates on any payment. Thus, Xena would report \$25,000 in ordinary income from the SARs in 2006. If Xena's marginal tax rate in 2008 is 35 percent, she would pay \$8750 in tax.

The tax treatment of SARs is equivalent to the tax treatment of deferred compensation. If Xena entered into an employment contract with Xerox in 2000 that provided that Xerox would pay Xena \$25,000 in 2006, then Xerox would have a \$25,000 deduction and Xena would have \$25,000 ordinary income in 2006.

The tax treatment of ESOs is more complicated than those of restricted stock and SARs. That is because not all ESOs are taxed the same. For tax purposes, there are two types of ESOs: nonqualified stock options (NQOs) and incentive stock options (ISOs), sometimes called qualified stock options.<sup>21</sup> Although neither type of ESO generates income or a deduction when granted, thereafter their tax treatments differ. Starting with the NQO, when the employee

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<sup>19</sup> IRC Section 83.

<sup>20</sup> The employee may elect to include the stock in income at the time of the grant. IRC Section 83(b). In that case, the employer is entitled to an immediate deduction. IRC Section 83(h). From a joint tax planning perspective such an election is unattractive when the employer and employee face the same tax rate because it increases their total taxes by the employees capital gain tax on the appreciation that occurs before the restriction lapses.

<sup>21</sup> There are several requirements an ESO must meet to qualify as an ISO. These requirements, which are set out in IRC Section 422(b), include the following: the options must be exercised within 10 years of their grant; they must be nontransferable except by death; the employee must remain with the employer; at least two years must lapse between the grant date and the employee's sale of the stock; and at least one year must lapse between the exercise date and the sale of the stock. If any of these requirements are not met, the ESO is taxed as a NQO. In addition, ISO grants are limited. IRC Section 422(d) sets a \$100,000 annual limit on the aggregate value of the stock that any one person can acquire by exercising ISOs. Options exercised beyond this limit are taxed as NQOs.



exercises the option and acquires the stock, the employer deducts the excess of the market price of the stock over the exercise price ( $P_e - P_g$ ) as compensation expense and the employee takes this amount into ordinary income. When the employee sells the stock, she has capital gain (or loss) of the excess (shortfall) of the price of the stock when it is sold over the price the stock was selling for when she acquired it ( $P_s - P_e$ ). There are no tax consequences to the employer upon sale. Thus, in the example, Xerox would deduct \$25,000 in 2006 and Xena would have \$25,000 of ordinary income in that same year. In 2008, Xena would have \$55,000 capital gain.

The tax treatment of ISOs is simpler than that of NQOs. ISOs never generate deductions for employers. For the employee, income is not taxed until the stock is sold, at which time the difference between the sale price and the exercise price is taxed as capital gain ( $P_s - P_g$ ). Thus, with ISOs, Xerox would never receive a deduction and Xena would pay tax at long-term capital gains rates on \$80,000 in 2008.

Table 2 describes the tax consequences to Xena and Xerox of the different stock-based compensation mechanisms (using current top bracket tax rates).

Table 2–Tax treatment of stock-based compensation to employees and employers (per share<sup>22</sup>)

Date	January 1, 2001	January 1, 2006	January 1, 2008
Stock Price	Pg = \$100	Pe = \$125	Ps = \$180
Restricted Stock			
Employee	0	-43,750=-125,000x.35	-8250=-55,000x.15
Employer	0	43,750=125,000x.35	0
Incentive Stock Options (ISOs)			
Employee	0	0	-12,000 =-80,000 x .15
Employer	0	0	0
Nonqualified Options (NQOs)			
Employee	0	-8,750 =-25,000 x .35	-8250=-55,000 x .15
Employer	0	8,750 = 25,000 x .35	0
Shared Appreciation Rights (SARs)			
Employee	0	-8,750=-25,000 x .35	0
Employer	0	8,750 = 25,000 x .35	0

Because tax payments are cash outflows and reductions in tax are cash inflows, the employee's (nonzero) entries are negative and the employer's are positive.

More generally, the tax related cash flows from stock-based compensation per share of stock covered are described in Table 3.

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<sup>22</sup> For restricted stock grants, these amounts are for each explicit share granted; for NQOs and SARs, the amounts are for each embedded share.

Table 3–Tax treatment of stock-based compensation to employees and employers per share of stock covered

Date	Grant (g)	Lapse or Exercise (e)	Stock Sold (s)
Stock Price	$P_g$	$P_e$	$P_s$
Restricted Stock			
Employee	0	$-t_{pe} \times P_e$	$-gt_{ps} \times (P_s - P_e)$
Employer	0	$-t_{pc} \times P_e$	
Incentive Stock Options			
Employee	0	0	$-gt_{ps} \times (P_s - P_g)$
Employer	0	0	0
Nonqualified Options			
Employee	0	$-t_{pe} \times (P_e - P_g)$	$-gt_{ps} \times (P_s - P_e)$
Employer	0	$t_{pc} \times (P_e - P_g)$	0
Shared Appreciation Rights			
Employee	0	$-t_{ps} \times (P_e - P_g)$	0
Employer	0	$t_{pc} \times (P_e - P_g)$	0

### III. The Tax Efficiency of Various Forms of Stock-Based Compensation Compared to One Another

This and the next Part are the heart of this paper. In this Part, I assess the tax efficiency of various forms of stock-based compensation relative to one another. Specifically, in this Part, I respond to what little analysis there has been of the issue. That analysis purports to show that NQOs are tax inefficient (and perhaps very costly) when compared to SARs. In contrast, I show that NQOs are as efficient as SARs, although ISOs are generally less efficient than both.

After undercutting the leading argument that stock-based compensation is tax inefficient, I then assess in the next Part the tax efficiency of stock-based compensation by comparing it to additional cash. In that Part, I also estimate the tax costs and benefits of stock-based compensation relative to cash compensation under different assumptions about the investment the stock displaces. I show that for a wide range of reasonable assumptions, there can be a substantial net tax benefit from stock compensation.

Compensation consultants often encourage firms to issue NQOs because it allows them to deduct their equity. However, such simple advice looks at only the employer's half of the transaction because it ignores the employees' inclusion. Whether a compensation mechanism is tax efficient or not should be determined from a joint contracting perspective rather than the employer's or employee's perspective alone (Scholes et al.).

If a compensation mechanism is attractively taxed from the employer's perspective, but not from the employee's, then the parties can reduce their combined taxes by substituting another mechanism. The parties can then split the benefit, reducing the employer's after-tax compensation expense and increasing the employee's after-tax pay. A firm that chooses a tax inefficient mechanism (even one that is attractively taxed to the employer) will likely find itself paying higher compensation costs and thus at a competitive disadvantage.

According to the definition developed in Part I, a compensation mechanism is tax inefficient if it is taxed less favorably than some other available mechanism. It is efficient if it is taxed at least as favorably as the alternatives. The comparison must be among "available" alternatives. Specifically, compensation mechanisms that are attractively taxed, but are limited or restricted in such ways that they are not "available" alternatives for paying additional compensation should be excluded. Accordingly, the requirement that an alternative be "available" excludes pensions and fringes, which are tightly restricted and so usually are not "available" at the margin. This leaves only cash compensation as an alternative to stock-based compensation.

Commentators have written very little on the tax efficiency of stock-based compensation from a joint contracting perspective. I am aware of only two such discussions. Both compare NQOs to SARs and both argue that NQOs are tax inefficient in comparison.

#### A. The Tax Efficiency of NQOs Compared with SARs

The authors of *TAXES AND BUSINESS STRATEGY* (Scholes & Wolfson 1992, pages 190-91; Scholes et al. 2002, pages 201-02) claim that ESOs are generally taxed less favorably than SARs because the appreciation that occurs between exercise of the option and sale is taxed with ESOs, but not with SARs. To illustrate their claim, the authors compare an NQO to a SAR that calls for a single payment not on the date the option is exercised, but instead on the date the stock is sold (s).

To see this consider a SAR that calls for a payment on the same date that the employee sells the stock. Thus, in the example, Xerox pays Xena \$80,000 in 2008, which Xerox takes as a deduction and Xena reports as ordinary income. The SAR transaction, then, generates no net income or tax to Xerox and Xena because Xena's income is fully offset by Xerox's deduction.<sup>23</sup>

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<sup>23</sup> The claim that the ESO transaction generates no net tax assumes Xerox and Xena both pay tax at 35 percent.

In contrast, the ESO transaction generates \$55,000 of net taxable income — Xena’s income in 2008, which is not offset by any deduction. The net tax due would be \$8250, which is paid by Xena in 2008.<sup>24</sup>

The above comparison, however, is not apposite. The additional tax with NQOs arises because the grantor of a SAR is assumed to have an obligation until the sale of the stock in 2008, whereas the grantor of a NQO is assumed to have no obligation after 2006. In other words, the tax consequences are different because the transactions are different. If, however, the transaction with SARs is revised to equate the economics of the two transactions, the tax consequences would be the same, as demonstrated above.<sup>25</sup>

Professor Calvin Johnson (1999), who calls ESOs the most expensive form of compensation, has taken the above argument one step further. In effect, he claims that the above comparison is appropriate because if the corporate employer issues an ESO that is exercised, it must ultimately redeem that stock for cash, which generates no deduction, but gives the holder capital gain. In contrast, if the employer grants SARs, it will never issue additional shares, and so it will never have to redeem them, thereby producing no gain that is not offset by a deduction.

The gap in Professor Johnson’s provocative argument is that he does not compare otherwise identical firms. The firms granting ESOs will have additional cash equal to the exercise price of their options. That cash has to be invested somewhere. Professor Johnson does not explicitly say how the additional cash is invested, but his analysis implicitly assumes that it is being used to expand the business. That is not an appropriate comparison because it does not isolate the effect of using ESOs rather than SARs to compensate employees. Instead, Professor Johnson is lumping together the decision to use ESOs (a compensation decision) with a decision to increase the firm’s investment (an investment decision) by expanding its equity capital (a capital structure decision). In other words, he is comparing a firm using SARs to a larger firm with additional equity that uses ESOs. That is not an apples-to-apples comparison.

In effect, Professor Johnson’s analysis assumes that all of the firm’s investment and capital structure decisions are fixed except for the choice of compensation mechanism, which is assumed to determine the firm’s aggregate level of investment and its outstanding equity. His argument, thus, ignores the adjustments to capital structure that a change in the compensation mechanism are likely to bring about. Comparing the SAR to the NQO, the corporate employer’s cash flows and capital structure are the same at the exercise date if it buys on the open market the shares that it must tender to its employees.<sup>26</sup> In that case, there are no additional shares that it

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<sup>24</sup> Xena would pay \$8750 in tax in 2006 that would offset Xerox’s \$8750 savings.

<sup>25</sup> Scholes et al. recognize this, but still describe ESOs as tax inefficient.

<sup>26</sup> In terms of Table 1, the ESO-granting employer spends \$125,000 at exercise to buy the stock on the open market. That would give it a cash outflow of \$25,000, which is equivalent to

must ultimately redeem with ESOs that it does not have to redeem with SARs. Alternatively, if the firm fulfills its obligation to provide shares to option holders by releasing shares held in its treasury, then the cash flow and capital structure are the same if the corporation that issued SARs issued additional shares to replace the cash it spent.<sup>27</sup> Similarly, if the ESO-granting firm reduces its dividends or share redemptions by an amount equal to the sum of the cash the ESO-granting firm receives upon exercise plus the cash it pays out on the SARs, the cash flows and capital structure would again be identical.<sup>28</sup> In all of these scenarios (which isolate the compensation decision) by holding the level of investment and capital structure constant, the choice of tax-based compensation mechanism does not affect the size of the firm and so there is no tax detriment from NQOs that SARs avoid.<sup>29</sup> Thus, after allowing for adjustments, there is no tax benefit from SARs over NQOs. It therefore follows that compared to SARs, NQOs are tax efficient. Hence, commentators are incorrect in claiming that ESOs are tax inefficient relative to SARs.<sup>30</sup>

## B. The Tax Inefficiency of ISOs Compared to NQOs and SARs

Although NQOs are as tax efficient as SARs, ISOs generally are not. This can easily be seen in Table 3, which describes the tax treatments of the different forms of ESOs. Compared to the same number of NQOs, the ISO defers the employee's gain accruing between the grant and the exercise of the option and converts that gain from ordinary income to capital gain. The ISO also eliminates the employer's deduction with the NQO of the gain that occurs between grant and exercise of the option. Because the parties nontax cash flows with ISOs and NQOs are identical, the more tax-efficient ESO is the one where the parties pay the lower combined tax. From a pure

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that of the SAR-granting firm. The two firms would also have the same capital structure.

<sup>27</sup> In terms of Table 1, the SAR-granting firm sells 1000 shares for \$125,000 when it makes the \$25,000 SAR payment. It will then have a \$100,000 cash inflow just as the ESO-granting firm. The two firms would also have the same capital structure.

<sup>28</sup> In terms of Table 1, the SAR-granting firm reduces its dividends and redemptions by \$125,000 when it makes the \$25,000 SAR payment. It will then have a \$100,000 cash inflow just as the ESO-granting firm. The two firms would also have the same capital structure.

<sup>29</sup> In contrast, Professor Johnson does not isolate the effect of the compensation decision because he examines a scenario where the firm's compensation decision determines its level of investment and capital structure. Only in that case is there a tax cost from using ESOs. However, because the decision how to pay the cost of the exercise of in-the-money options is within the control of the granting firm, the granting of such options is tax efficient because there are tax efficient strategies available to the employer.

<sup>30</sup> The two advantages from using NQOs over SARs described next also apply if NQOs are compared to other forms of compensation, such as current and deferred cash.

tax perspective, NQOs are preferred to ISOs if the value of the deduction to the corporation is greater than the cost to the employee of accelerating and recharacterizing the appreciation between the gain and exercise date.<sup>31</sup> For companies with a zero or very low effective marginal tax rate, ISOs are a tax efficient method of providing compensation. That is because there is little or no cost to the employer of deferring and converting the employee's income into capital gain. If the employer and employee are taxed at the same rate, then the ISO is tax inefficient unless the effective capital gains tax rate is zero. Only if the employer's effective marginal tax rate is low will ISOs be tax efficient relative to SARs and NQOs. Thus, given that the top statutory personal and corporate tax rates are both 35 percent, ISOs are unlikely to be tax efficient for corporations currently paying tax (or that expect to be paying tax soon).<sup>32</sup>

#### IV. The Tax Efficiency of Stock-Based Compensation Compared with Fixed Compensation

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<sup>31</sup> Using the convention that an asterisk (\*) indicates the present value at the date of exercise of \$1 in tax at the sale date, the choice between NQOs and ISOs can be written as:

$$\begin{array}{ccc}
 < & & > \\
 NQOTaxes = ISO Taxes & \text{as} & t_{ce} = t_{pe} - gt_{ps}^* \\
 > & & <
 \end{array}$$

The above equation just formalizes the intuition in the text. A similar equation is provided by Scholes et al.

<sup>32</sup> The discussion above has assumed that the effective marginal tax rates paid by employers and employees are constant over time. When effective tax rates vary, ESOs become more tax efficient. That is because there are option elements to NQOs and ISOs that SARs cannot match. With NQOs, it is possible to generate joint benefits by exercising the options either when personal tax rates are low or corporate tax rates are high (Huddart 1998). This option obviously does not exist with SARs because their terms are set in advance. Another option element with ESOs is that it is possible to recharacterize an ISO as an NQO if the employee sells the stock within one year of exercising the option. (It is not possible to recharacterize an NQO into an ISO). This ability to recharacterize is very attractive when the corporation's effective marginal tax rate is initially very low or zero because of past or current losses and the parties do not know whether that firm's tax rate will return to the statutory rate when the option is exercised. By initially issuing an ISO, the parties can receive ISO treatment if the corporation remains untaxed, but switch to NQO treatment if it is taxed at the statutory rate. Such disqualification of ISOs have been used by Microsoft and others to generate tax benefits that they have shared with their employees. An employee can convert ISOs into NQOs by selling the stock within 1 year of exercising the option.

In Part III, I responded to the argument that NQOs are tax inefficient compared with SARs. In doing so, I rebutted the current tax-based argument against stock-based compensation. However, undercutting the argument on which commentators base their claim that stock-based compensation is tax inefficient does not establish that such compensation is tax efficient, nor does it provide a method for estimating the magnitude of the resulting net joint tax saving or cost. It is to those tasks that I now turn.

I have argued above that pensions and fringe benefits are generally not viable alternatives to stock-based compensation because of the dollar caps on pensions and the limitations on excludable fringe benefits. That leaves only additional cash payments as a viable alternative to stock-based compensation. In this Part, I develop a method for measuring the net tax cost or benefit from stock-based compensation relative to cash. I then apply that method first to restricted stock and then to NQOs and SARs. I show that for a wide range of reasonable assumptions stock-based compensation is tax efficient.

The analysis in this Part is different and more complicated than that in the last Part. In this Part, the comparison is not between ESOs and SARs, two compensation mechanisms with similar economics and tax consequences, but between stock-based compensation (which includes restricted stock, ESOs and SARs) and cash. The economics of stock-based and cash compensation differ. In addition, the tax treatment of stock-based compensation is not equivalent to what would occur if the firm entered into a similar transaction (or series of transactions) with outside parties. Moreover, in comparison to cash, there is no general answer to the question whether stock-based compensation is or is not tax efficient. The reason why there is no general answer is because the tax consequences of substituting stock-based compensation for cash depend on what the taxpayer would have done with the cash. Accordingly, the answer will differ not only across employers, but also across employees of the same employer.

The analysis in the first section of this Part is first for restricted stock (compared to cash). Those results are then applied in the second section to NQOs and SARs (compared to cash).

#### A. Restricted Stock

In order to compare the tax treatments of restricted stock and cash, it is necessary to isolate the firm's decision how to compensate its employees from its investment and capital structure decisions. The firm that grants restricted stock has more cash to invest and more equity



outstanding than the firm that pays additional cash.<sup>33</sup> These last two effects must be eliminated in order to isolate the decision how compensation is paid so that the tax consequences of that decision can be ascertained. Accordingly, throughout this section I compare a firm paying stock-based compensation to a hypothetical identical firm that pays additional salary in cash and raises that cash by issuing stock.<sup>34</sup> (Alternatively, I could assume that the firm that pays stock-based compensation uses the additional cash to retire stock.)<sup>35</sup>

Relative to the firm that pays cash compensation, the firm that grants restricted stock will lose a deduction at the grant date and receive a deduction when the restriction lapses.<sup>36</sup> The employee will lose her inclusion at the grant date and replace it with one at the lapse date. She would also include any income on the invested cash when recognized. Thus, comparing cash and restricted stock compensation, the latter defers the employer's deduction and the employee's inclusion.<sup>37</sup> Restricted stock also permits the employer to deduct appreciation from the grant date

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<sup>33</sup> In terms of the example, the market value of the restricted stock at the grant date is \$100,000 [=1000 shares x \$100/share]. The cash flows to employer and employee from paying an additional \$100,000 cash compensation on January 1, 2001 are given below:

Date	January 1, 2001	January 1, 2006	January 1, 2008
Employee	\$100,000	0	0
Employer	-\$100,000	0	0

<sup>34</sup> In terms of Table 1, the firm that pays \$100,000 additional cash compensation on January 1, 2001, also issues 1000 shares at \$100/share on that date. The stock issuance raises \$100,000, which yields a net cash flow of zero, which is what the firm that pays stock-based compensation has on that date.

<sup>35</sup> In terms of Table 1, the firm that pays stock-based compensation retires 1000 shares at \$100/share for a cash outflow of \$100,000 on January 1, 2001. That is the same cash outflow that the firm paying cash compensation has on that date.

<sup>36</sup> I assume throughout the discussion that the employer can deduct both stock-based and cash compensation. If the cash compensation would not be deductible by virtue of IRC Section 162(m), which restricts public companies from deducting compensation in excess of \$1 million, then stock-based compensation is more attractive than the results below suggest.

<sup>37</sup> This assumes that tax rates are constant over time, which has not been true since January 1, 2001. Using the current 35 percent personal tax rate, the tax consequences of a \$100,000 cash payment from the employer to the employee are given by the following table:

Date	January 1, 2001	January 1, 2006	January 1, 2008
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to the lapse date and taxes the employee on this increase at her ordinary tax rate. In addition, the employee who is paid with restricted stock escapes tax on the income foregone on the investment she never made because she received stock instead of more cash.

Under the assumption that the employee's and employer's tax rates are the same, there is neither a joint tax benefit nor a cost from deferring tax on the value of the restricted stock granted.<sup>38</sup> The benefit to the employee from deferral exactly offsets the detriment to the employer. There can however be a joint effect from the appreciation that occurs between the grant date and the lapse date. Companies that compensate employees with restricted stock are effectively issuing tax deductible equity to their employees.<sup>39</sup> The income on the equity is deductible because the employer can deduct the appreciation in the stock from the grant date to the exercise date. The cost of this deduction is that the employee pays tax on this income at her ordinary income tax rate. For employers at the top statutory rate, the benefit is the employer's deduction at 35 percent<sup>40</sup> on the appreciation of the stock from the grant date to the exercise

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Employee	-\$35,000	0	0
Employer	\$35,000	0	0

More generally, the tax consequences of cash compensation of  $P_g$  on the grant date is given by the following table:

Date	Grant (g)	Exercise (e)	Stock Sold (s)
Stock Price	$P_g$	$P_e$	$P_s$
Employee	$-t_{pg} \times P_g$	0	0
Employer	$t_{cg} \times P_g$	0	0

<sup>38</sup> If the parties' tax rates differed, there would be a joint net tax consequence to the parties from deferring tax on the value of the grant. If we denote the value of the restricted stock grant by  $P_g$ , then the tax benefit from deferral is  $[(t_{pg} - t_{pe*}) - (t_{cg} - t_{ce*})] \times P_g$ , where the asterisk (\*) represents the present value at the grant date of tax paid at the exercise date. Assuming constant tax rates over time, there is a joint net cost from deferral if the employer's tax rate exceeds the employee's, and conversely.

<sup>39</sup> If the stock depreciates, the depreciation reduces the employer's deduction. There is no capital loss that might not be usable if it cannot offset capital gain.

<sup>40</sup> The assumption that a corporate issuer in the 35 percent tax bracket pays tax at a marginal tax rate of 35 percent implicitly assumes that the corporation is not sheltering some portion of its income at the margin through tax shelters. If it is using tax shelters to reduce its marginal tax rate, the joint benefits (costs) are smaller (larger) than described in the text.

date.<sup>41</sup> For employees, the gross cost is the taxation of this income at the employee's ordinary income tax rate. For employees in the highest tax bracket, this cost is 35 percent.<sup>42</sup> The net cost to the employee is the difference between the gross cost [35 percent] and the tax saved on the investment displaced by the grant.<sup>43</sup> Therefore, the parties' joint net cost from substituting restricted stock for cash is the tax that would have been paid on the displaced investment.<sup>44</sup> Obviously, this joint net cost depends on how the employee adjusts her portfolio in response to the stock-based compensation grant.<sup>45</sup>

## 1. Offsets holdings of employer stock

The simplest scenario to analyze is if the grant induces the employee to reduce her holdings of the company's stock by the same amount. Under this assumption, the employee's gross cost is reduced by whatever tax she would have paid on the shares she would have otherwise held. That, of course, depends on how she would have held the shares and for how long.

### a. Offsets holdings on personal account

For example, if the employee reduces the shares in her personal account, their sale would have produced long-term capital gain (currently taxed at a 15 percent maximum rate) if held for longer than one year. Thus, if the employee would have sold those shares on the same date as her restricted stock vests, the displaced stock would have been taxed at the same time at 15 percent.<sup>46</sup> In this case, the net tax benefit from using restricted stock is 15 percent—the difference between

<sup>41</sup> Thus, the employer's tax benefit can be written as  $t_{ce} \times (P_e - P_g)$ .

Because the decision to grant restricted stock must be made before the stock price at lapse and sale are known, expectations about future prices inform the decision. Over time, stock prices tend to rise so that the following relationship holds for expected stock prices:  $P_s > P_e > P_g$ .

<sup>42</sup> Thus, the employee's gross cost can be written as  $t_{pe} \times (P_e - P_g)$ .

<sup>43</sup> Thus, the net cost to the employee can be written as  $(t_{pe} - gt_{pe}) \times (P_e - P_g)$ .

<sup>44</sup> More generally, the formula for the net benefit can be written as  $(t_{ce} - t_{pe} + t_{ps*}) \times (P_e - P_g)$ , where  $t_{ps*}$  is the present value as of the lapse date of the tax paid at the sale date.

<sup>45</sup> Thus, the employee's net cost can be written as  $(t_{pe} - t_{pa*}) \times (P_e - P_g)$ , where  $t_{pa*}$  is the present value of the tax on the alternative asset that is displaced. Therefore, the formula for the net benefit is  $(t_{ce} - t_{pe} + t_{pa*}) \times (P_e - P_g)$ .

<sup>46</sup> The 15 percent marginal tax rate on the displaced investment assumes that any loss on the stock can be used to offset capital gains. If the loss cannot be used immediately (because of the limitation in Section 1211(b)), then the effective marginal tax rate is higher than 15 percent.

the 35 percent benefit to the employer from issuing stock-based compensation and the net 20 percent cost to the employee from the compensation.<sup>47</sup>

Of course, the shares held by the employee that are displaced by the grant might not have been sold at the lapse date. If they would have been sold sooner, the tax benefit is greater; if latter, the benefit is smaller. In the extreme, the stock would be held until death when the step up in basis occurs.<sup>48</sup> If this were to happen, then at current tax rates the employer's 35 percent net benefit offsets the employee's 35 percent net cost and so there would be no net tax consequences.<sup>49</sup>

b. Offsets holding in a qualified account

Alternatively, if the shares would have been held in a qualified account (such as an individual retirement account (IRA)), the employee is never taxed on the appreciation.<sup>50</sup> Accordingly, the employee's net cost of 35 percent exactly offsets the employer's 35 percent net gain. Under these circumstances, the joint net tax benefit from the restricted stock grant is

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<sup>47</sup> Professor David Walker (2004) examines the case where a grant of restricted stock displaces employee stock that would have been sold on the lapse date. He concludes that there will generally be a joint net tax saving if the employer uses the cash saved by the stock grant to buy back shares. He then goes on to argue that if the employer uses the proceeds differently, such as to expand its business or invest in the securities of other firms, there will be a joint net tax cost from the grant. Professor Walker also surveys the empirical literature that looks at where companies invest their cash savings from stock-based compensation and finds no clear answers. One of the principal differences between this paper and Professor Walker's incisive analysis is that he looks at different possible responses by the firm assuming the employee invests in the firm's stock on personal account, whereas I look at different possible responses by the employee assuming the employer buys back shares. Professor Walker also considers a range of possible tax rates for the employer and employee, whereas my discussion in the text is just for employers and employees taxed at 35 percent.

<sup>48</sup> IRC Section 1014(a).

<sup>49</sup> More generally, the date on which the offsetting stock would have been sold might not be the lapse date. It could have been sold earlier or later. In this case, the net benefit formula becomes  $(t_{ce} - t_{pe} + gt_{p*}) \times (P_e - P_{g'})$ , where  $gt_{p*}$  is the present value at the lapse date of capital gains taxes incurred at the date the alternative asset is sold. The lower bound is  $(t_{ce} - t_{pe}) \times (P_e - P_{g'})$ , which is the formula with no offset.

<sup>50</sup> Although the employee pays tax at her ordinary rate on the securities she withdraws from a qualified account, this cost is offset by the deduction she receives when she deposits money or securities into the account. For constant tax rates, the deduction and inclusion are equivalent to exempting the appreciation from tax. CITES.

identically zero.<sup>51</sup>

## 2. Offsets other holdings

The analysis of the joint net tax benefit or cost from granting restricted stock is more complicated if the grant does not cause the employee to reduce her holdings of the firm's common stock by one share for each restricted share granted. That is because securities can bear different amounts of implicit taxes. Accordingly, if a grant of restricted stock causes the employee to reduce her holdings of other investments, then in addition to the employee's cost as described above, there should be added (or subtracted) the difference between the implicit taxes on the restricted shares granted to the employee over the implicit taxes on the replaced investment.<sup>52</sup> It, thus, follows that if the granted stock and the displaced asset bear the same implicit tax, the results are as above. If the restricted stock bears more than the displaced asset, the net benefit is smaller, and conversely.<sup>53</sup>

This exercise is made difficult by the lack of success financial economists have had so far in measuring implicit taxes on common stock (see Scholes et al). Accordingly, to get some idea of the range of results, I assume that the implicit tax rate on the employer's stock and on the alternative investment foregone range between zero and the personal statutory tax rate on investments in corporate equities.<sup>54</sup>

The 2003 federal income tax reforms reduced the long-term capital gains tax rate on most equities to 15 percent and the tax rate on qualified dividends to 15 percent. Thus, ignoring the possibility of individual investors paying tax at 35 percent on short term capital gains and

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<sup>51</sup> In this case, the net benefit formula becomes  $(t_{ce} - t_{pe}) \times (P_e - P_g)$ .

<sup>52</sup> Thus, the equation for the joint net benefit from using restricted stock can be written as:  $(t_c - t_p - t_{pa} - (t_i - t_{ia})) \times (P_e - P_g)$ , where  $t_i$  is the implicit tax on the employer's stock and  $t_{ia}$  is the implicit tax on the alternative investment. The equation for the joint net benefit assumes that the risk-adjusted expected appreciation on the company's stock and the displaced asset are equal. That assumption is an assumption about the efficiency of the stock market.

<sup>53</sup> The tax efficiency of any particular grant of stock-based compensation will depend upon the implicit taxes borne by the employer's stock, the investment displaced, and how the latter is held.

<sup>54</sup> The idea is that in equilibrium the sum of the implicit and explicit personal tax rates is the same across assets for tax efficient investors. If the explicit tax rate is lower, then the implicit tax rate increases to maintain equilibrium. I also assume that employees holding restricted stock are not the marginal investor. Of course, the portfolios of many investors are not tax efficient and there are good reasons, such as portfolio diversification, for having at least some tax inefficiency.

corporate investors paying tax at 35 percent on both long- and short-term capital gains, the difference in explicit taxes across equity investments is no larger than 15 percent. I thus assume the implicit tax rate on the restricted stock and on the displaced investment are both between 0 and 15 percent.<sup>55</sup>

a. Offsets holdings on personal account

When the displaced asset has the same implicit tax as the restricted stock grant, the lower bound on the net joint tax benefit from restricted stock is zero. This lower bound is reduced by its maximum amount – the personal tax rate on equities – when the employer’s stock bears no explicit tax to the marginal investor, only implicit tax. In that case, the employee pays both explicit and implicit taxes at 15 percent on the restricted stock. Accordingly, the joint net tax cost from restricted stock can be as high as 15 percent.

The upper bound on the joint net tax benefit when there is no difference in implicit taxes is 20 percent. This upper bound is increased by the personal tax rate on equities [15 percent] – when the employer’s stock bears no implicit tax and the displaced stock bears implicit tax of 15 percent. Accordingly, the maximum joint net benefit is 35 percent at current tax rates.<sup>56</sup>

b. Offsets holdings on qualified account

The logic is the same for investments held in qualified accounts as it was for investments on personal account. The lower bound is reduced by the personal tax rate on equities and the upper bound is increased by it. Thus, at current tax rates, the parties joint net tax cost can be as large as 15 percent and the joint net benefit can be as large as 15 percent.<sup>57 58</sup>

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<sup>55</sup> The numerical example implicitly assume that the displaced asset is stock and not some other investment, such as debt or a partnership interest. If the displaced asset is not stock and if stock bears implicit taxes relative to other assets, then the lower bound might be lower because of the additional implicit taxes borne by the restricted stock.

<sup>56</sup> If we assume that the sum of the implicit and explicit personal tax rates is the same across assets for tax efficient investors, then the upper bound on the joint net tax benefit for such investors is 20 percent, but the lower bound is a joint net tax cost of 15 percent.

<sup>57</sup> These values come from subtracting and adding to the net tax benefit when the grant displaces the employer’s stock on qualified account [0] the personal tax rate on equities of 15 percent.

<sup>58</sup> If we assume that the displaced alternative investment bears no implicit tax (which would be the tax-efficient — although possibly not the economically-efficient — stock to hold in a qualified account), then the lower bound is unchanged [15 percent], but the upper bound is what it is when the grant offsets an investment in employer’s stock on qualified account [0

### 3. Offsets consumption

Of course, the grant of restricted stock might not cause the employee to reduce her investment holdings, but instead cause her to reduce her current consumption. Since current consumption does not produce a return that is subject to tax, there is neither an explicit nor an implicit tax on the displaced consumption. Accordingly, the joint net tax cost from a grant of restricted stock equals the implicit tax on the restricted stock.<sup>59</sup> Thus, the joint net tax cost from granting restricted stock would be between 0 and 15 percent.<sup>60</sup>

### 4. Summary

The results described above are summarized in Table 4.<sup>61</sup> That table gives the joint net tax benefits (and costs) from using restricted stock. The calculations are made for corporate employers and employees in the top statutory tax brackets.<sup>62</sup>

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percent].

<sup>59</sup> In addition, there would be a psychic cost to the employee from consuming less and investing more. That cost however is not a tax cost.

<sup>60</sup> If all common stock, including common stock that paid all income currently to shareholders, bore implicit tax, then the implicit tax borne by all common stock relative to other [benchmark] assets should be added to the joint net tax cost.

<sup>61</sup> The reported values in Table 4 are for each share of restricted stock. The benefit (or cost) is a percentage of the expected income from the restricted stock between the grant date and the date the restriction lapses.

<sup>62</sup> The formulae in the footnotes can be used to calculate the net tax benefits for other assumptions about tax rates.

Table 4 – Net tax benefit (cost) from using stock-based compensation (percent)

Offsets holdings of employer stock	
On personal account <sup>63</sup>	0 – 20
On qualified account	0
Offsets other holdings	
On personal account <sup>64</sup>	(15) – 35 <sup>65</sup>
On qualified account <sup>66</sup>	(15) – 15 <sup>67</sup>
Offsets consumption	(15) – 0

## B. NQOs and SARs

Option theory teaches that call options are equivalent to levered stock. That is to say, an investor who holds a call can synthesize that position by borrowing and buying the underlying security. In other words, a held call on stock is equivalent to buying that stock on margin. Because ESOs and SARs are examples of call options, they are equivalent to levered stock. Thus, a firm that has granted ESOs or SARs has in effect loaned money to its employees that they use along with some foregone salary to buy stock from their employer.

Accordingly, the capital structure of a firm that is providing stock-based compensation

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<sup>63</sup> The lower bound assumes that no tax will ever be paid on the alternative investment in the employer's stock. The upper bound assumes that tax at the maximum long-term capital gains rate will be paid on the same date for restricted stock and for the stock held on personal account.

<sup>64</sup> The lower bound assumes that no tax will ever be paid on the alternative investment in the employer's stock; the upper bound assumes that tax at the maximum long-term capital gains rate will be paid on the same date for restricted stock and for the stock held on personal account. The lower bound also assumes that the tax on the investment being displaced is all explicit tax; the upper bound also assumes the tax is all implicit.

<sup>65</sup> The upper bound is 20 percent (the corporate tax rate) if the total tax on the alternative asset is constrained to be no more than the personal tax rate on equities –15 percent

<sup>66</sup> The lower bound assumes that the tax on the investment being displaced is all explicit tax; the upper bound assumes the tax is all implicit.

<sup>67</sup> The upper bound is 0 if the total tax on the alternative asset is constrained to be no more than the personal tax rate on equities –15 percent.



will differ from that of an otherwise identical firm that is providing fixed compensation with the same present value.<sup>68</sup> The former has in effect issued additional shares and lent money to its employees who have received grants of stock-based compensation, which would reduce the risk of its shares. Thus, in order to keep the investment, capital structure (and risk) of the two firms the same, the firm granting stock-based compensation can adjust its capital structure by repurchasing equity and increasing its borrowing (or equivalently, decreasing its cash holdings). Alternatively, the firm paying fixed compensation can adjust its capital structure by issuing equity and decreasing its borrowing (or increasing its cash holding). That one or the other firm make the adjustment is necessary in order to isolate the method used to pay compensation and separate it from the decision to increase or decrease investment and change the firm's capital structure.<sup>69</sup> There are, therefore, two potential sources of tax consequences from the use of stock-based compensation. The first is from the substitution of embedded debt for outstanding debt and the second is from the substitution of embedded equity for outstanding equity.<sup>70</sup>

The following discussion is for NQOs (and thus equivalently SARs), but not for ISOs. According to *BUSINESS WEEK*, eighty percent of the value of ESOs goes to senior executives (Borrus & Dwyer 2002). Because these options are almost all NQOs, NQOs are of principal interest in determining the tax efficiency of options.

#### 1. Substitution of embedded debt for outstanding debt

First, companies that are issuing NQOs and SARs are in effect lending to their employees. The interest on this embedded loan is deductible by the employer and includible by the employee when it is paid (which is the date of exercise on an ESO or payment on a SAR). Thus, compared with an explicit loan, there is deferral of the employer's inclusion and employee's deduction on the interest on the loan embedded in the option.<sup>71</sup> If the employer and the employee's effective marginal tax rates are equal, the deferral is a wash.<sup>72</sup> Thus, because the top bracket corporate and personal tax rates are both 35 percent, there is neither a cost nor a benefit from the debt portion of a stock option grant. Accordingly, the tax consequences from

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<sup>68</sup> The text implicitly assumes that the ESOs are as valuable as tradeable options with the same terms.

<sup>69</sup> That is what Professor Johnson did not do.

<sup>70</sup> This method follows McDonald 2001.

<sup>71</sup> The benefit measured as of the exercise date can be written as  $t_{ps^*} - t_{cs^*}$ , where the asterisk in the subscript indicates the present value measured as of the exercise date.

<sup>72</sup> If the employee's effective marginal tax rate exceeds the employer's (which would have occurred if both were paying tax at the statutory maximums before 2003), deferral would produce a joint tax increase.

using ESOs are the consequences from substituting embedded equity for equity issued to outside investors.

## 2. Substitution of embedded equity for outstanding equity

Second, companies that grant stock-based compensation in the form of NQOs and SARs are effectively issuing tax deductible equity to their employees. However, the economic consequences of substituting embedded equity for issued equity were discussed in detail in the section on restricted stock. Accordingly, because there are no net tax consequences from the substitution of embedded debt for issued debt, the results for restricted stock also apply to NQOs and SARs. The one caution is that these results are not per option but are rather per embedded share.<sup>73</sup>

## V. Conclusion

ESOs and other forms of stock-based compensation represent a large and growing share of the capital structures of many corporations (Pearl Meyer). Their intensive and widespread use is also controversial. Proponents argue that stock-based compensation increases productivity by better aligning managers' and employees' interests with shareholders' interests. Critics are skeptical of the claim of increased productivity. They also argue that stock-based compensation hurts employees because it hampers portfolio diversification. In either case, a largely overlooked piece of the puzzle are the tax consequences of stock-based compensation, the subject of this paper. What little has been written argues that ESOs are costly – perhaps very costly.

This paper contributes to that debate in several ways. First, it defines tax efficiency and describes a methodology for assessing whether compensation mechanisms are efficient.

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<sup>73</sup> My analysis differs from that provided by Professor Robert McDonald in his thoughtful manuscript on the tax advantages and disadvantages of corporations transacting in options on their own common stock. Professor McDonald begins by noting that IRC Section 1032 excludes gains and losses from a corporation's transactions in its own common stock and on options on its own common stock. Because explicit interest received by the firm is includible and interest paid by the firm is deductible, option transactions with implicit borrowing (e.g., written put, held call) are tax disadvantaged and option transactions with implicit lending (e.g., written call, held put) are tax advantaged (McDonald 2001).

The analysis I present here differs from Professor McDonald's because the employer's tax treatment of stock-based compensation is not governed by IRC Section 1032. There are two principal differences. First, the expense that arises from appreciation that occurs between the grant date and the exercise date is deductible by the employer. That benefit, which does not arise under Section 1032, can be large. Second, because the employer can deduct its compensation cost, the interest on the loan embedded in its option grant is not excluded from income as under Section 1032. It is only deferred, but the cost to the employer of the deferral of its interest deduction is offset by the benefit to the employee of the deferral of her inclusion.

Second, it shows that restricted stock, NQOs and SARs are equally tax efficient when the employer and employee are taxed at the same rate. For corporations and individuals taxed at the top bracket (currently 35 percent) this is true today. This paper thus disagrees with the claim made by Professor Johnson that stock-based compensation in general and ESOs in particular are highly inefficient means of compensating employees.

Third, it shows that there is no general answer to the question is stock-based compensation tax efficient. Instead, the tax efficiency of such compensation depends upon several factors, including tax rates, what investment (if any) the grant displaces, how the displaced investment would have been held, and the implicit taxes on the displaced investment relative to those on the grant. As a result, the efficiency of stock-based compensation can vary across employers and even across employees of the same employer.

Fourth, this paper shows that over a range of circumstances, stock-based compensation is tax efficient compared to cash. Accordingly, if the grant displaces other holdings of the same stock, the joint net tax benefit is zero if the displaced investment is held in qualified account and between 0 and 20 percent if held in personal account.<sup>74</sup> Alternatively, if the grant displaces other investments, there must be added and subtracted to the above numbers the difference in implicit taxes across assets. The range of possible difference is 15 percent because individuals pay tax at 15 percent on both long-term capital gains and dividends.

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<sup>74</sup> The joint net benefit increases as the tax on the displaced asset accelerates and decreases as the tax is deferred.

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