Investment Risk and the Tax Benefit of Deferred Compensation

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I. INTRODUCTION

The thesis of this Article is that investment risk is an important consideration when assessing the tax benefit of deferred compensation of all types, including, for example, compensatory stock options, restricted stock, and deferred bonus plans. The failure of prior work to account for investment risk has lead to the widely-held yet erroneous view that deferred compensation sometimes enjoys a significant tax benefit. When risk is accounted for, the tax benefit of deferred compensation is quite small. In particular, I show that the tax benefit is, at most, an incremental yield throughout the deferral period equal to the product of the after-tax risk-free rate of return and the employee’s marginal tax rate.

This observation should be important to tax policy scholars who are interested in the core question whether and to what extent deferred

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compensation of various forms enjoys a tax preference. It also should be important to scholars of executive compensation trying to figure out why certain modes of compensation are more popular than others. Scholarship in this vein seeks to answer the question whether taxes drive the form of executive compensation, or instead whether nontax factors, such as the desire to motivate employees or to alter attitudes towards risk, predominate. Finally, it should be important to corporate governance experts who have explained that the prevalence of paying executives with certain forms of deferred compensation is, in part, a byproduct of tax planning. The analysis in this Article indicates that taxes are (or at least should be) a second-order consideration in boardroom decisions regarding the form of executive compensation, given that the tax benefit is considerably smaller than is commonly believed.

Until now, commentators studying the tax treatment of deferred compensation have used a model, which I call the standard model, in which two transactions are compared:

(1) Nonqualified deferred compensation—that is, an employer promise to make one or more future payments to its employee in lieu of current cash salary. The employer invests the forgone salary on the employee's behalf.

(2) Cash salary followed by a direct investment by the employee of the net-of-tax salary on her own behalf.

There are two facets to both transactions.

First, there is a compensatory payment from employer to employee. This payment will be larger in (1) than (2) assuming that during the period of deferral the investment earns a positive yield. Nonetheless, the tax imposed on the employee's future receipt (and the employer's

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2 For example, Brian J. Hall & Kevin J. Murphy, The Trouble with Stock Options, 17 J. Econ. Persp., Summer 2003, at 49, 53, explain that “economists have generally focused on the incentive aspects of employee options” and then argue that “the popularity of stock options reflects in large part their favorable tax and accounting treatments.”


4 For example, Bebchuk & Fried use this technique to explain the tax benefit of deferred compensation. See Bebchuk & Fried, note 3, at 233-39 nn. 2, 5, 30 & 33.
deduction on the future payment) in (1) is equivalent in present value to the tax imposed (and deduction allowed) in (2). The equivalence between the employee's income (and the employer's deduction) in these two cases is conceptually identical to the equivalence of front-and back-loaded IRAs.

The second facet of the transactions is what distinguishes them. Since the early 1980's it has been accepted that deferred compensation is tax-advantaged when the employer's marginal tax rate on investment income is lower than the employee's, given that the investment yield during the period of deferral is taxable income to the employer rather than the employee. What has been overlooked is that investment risk varies with the tax rate. After-tax investment risk is higher within deferred compensation than outside deferred compensation when the employer's marginal tax rate is lower than the employee's. When the employer has a higher rate, the opposite is true.

A fundamental precept of finance theory is that investment risk and expected return are positively correlated (investment risk is conventionally defined by some measure of dispersion in returns over the investment horizon, such as variance or standard deviation). It turns out that most of the incremental expected value benefit of deferred compensation is not a "tax advantage." Most of it is attributable to incremental investment risk.

An adjustment to the standard model is necessary to control for risk. I suggest three alternative adjustments. First, the analysis can be framed as under the standard model, but with the restriction that the deferred compensation be invested in risk-free assets. If both an employee paid deferred compensation and one paid current compensation face no investment risk whatsoever before tax, imposing tax will not change their risk profile, so the two can be compared on an apples-to-apples basis.

Second, imagine that the taxpayer who is paid a cash salary invests her net-of-tax payment in the same (risky) asset in which the employer would have invested on the employee's behalf had the employee elected deferred compensation. In addition, the employee paid cash borrows and makes an incremental investment in the risky asset such that her total holdings of the risky asset subjects her to identical after-tax investment risk as she would have borne had she opted for deferred compensation and guarantees her an identical after-tax payoff. The incremental, leveraged investment (or "gross-up") eliminates

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the difference in investment risk and performance between deferred compensation and the nondeferred compensation analogue, so the only burden borne by the taxpayer paid cash is the after-tax cost of financing the gross-up. Avoiding the cost of financing the gross-up is the only advantage reaped by an employee paid deferred compensation that is properly classified as a tax preference.6

A third way to account for risk is to frame the comparison as the standard model frames it—so that after-tax investment risk differs in the examples being compared—but to discount the after-tax expected values within and outside deferred compensation with different discount rates—rates calibrated in each case for both the time value of money and for after-tax investment risk.

My argument in favor of using one of these three risk-neutral approaches to measuring the tax preference of deferred compensation is an application of the idea, first introduced by Domar and Musgrave, which is most often used to study tax base theory.7 Domar and Musgrave's central insight is that with full loss offsets an income tax does not alter the risk-adjusted return to risky investments. An implication of this observation is that differences in the tax rate imposed on capital income do not impose a burden on the return to risk, only on the risk-free return (sometimes called the return to waiting or to time).8

My argument is fully consistent with this view: Looking at deferred compensation from the employee's perspective and accounting for risk, the tax preference for deferred compensation equals, at most, the employee's after-tax salary times the product of the risk-free rate of return and the employee's marginal tax rate. To make the point more generally, if one accepts the central implication of Domar and Musgrave's argument—that income taxation does not impose a significant burden on capital income—then it follows that avoiding that burden

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6 A number of commentators have used this "gross-up" heuristic technique to assess the tax effect of making a § 83(b) election—that is, the election to treat unvested deferred compensation as earned prior to vesting; however, none of them extends this technique to the general question of whether and to what extent deferred compensation is tax-advantaged. See Scholes et al., note 1; Michael S. Knoll, The Section 83(b) Election for Restricted Stock: A Joint Tax Perspective, 59 SMU L. Rev. 721 (2006); Robert L. McDonald, Is it Optimal to Accelerate the Payment of Income Tax on Share-Based Compensation? (Working Paper, 2003), available at http://www.kellogg.northwestern.edu/faculty/mcdonald/htm/opexer.pdf.

7 Evsey D. Domar & Richard A. Musgrave, Proportional Income Taxation and Risk-Taking, 58 Q. J. Econ. 388 (1944).

through artful devices such as deferred compensation cannot yield a significant benefit.\textsuperscript{9}

In Part II, I describe more fully the standard model, how it neglects investment risk, and three approaches for correcting this. I show diagrammatically the relationship between the standard model and the three risk-adjusted approaches, and discuss whether the risk-adjusted approaches have any significant limitations. For the most part, this reduces to the question whether the Domar-Musgrave model has any significant limitations, a subject about which much has already been written. There are, however, some special considerations in the context of deferred compensation that merit discussion.

In Part III, I turn to the employer tax consequences. Employer tax consequences are, in principle, no less important than employee consequences, given that any tax preference afforded one may be negated by a dispreference for the other. Until both sides of the compensation contract are examined, it is impossible to identify or measure any tax preference. As I demonstrate, however, there are no employer tax consequences to paying deferred compensation, assuming the employer hedges the risk inherent in its deferred promise.\textsuperscript{10} Given the absence of employer tax consequences, the risk-adjusted deferred compensation tax advantage depends completely on employee consequences.

In Part IV, I illustrate how differences in the two models play out quantitatively using a variety of realistic parameter values.

\textsuperscript{9} The first wave of scholarship regarding the significance of Domar and Musgrave's argument concentrated on the importance of the argument for the choice between income and consumption taxation. See, e.g., Joseph Bankman & Thomas Griffith, Is the Debate Between an Income Tax and a Consumption Tax a Debate About Risk? Does it Matter?, 47 Tax L. Rev. 377 (1992); Barbara H. Fried, Fairness and the Consumption Tax, 44 Stan. L. Rev. 961 (1992); Louis Kaplow, Taxation and Risk-Taking: A General Equilibrium Perspective, 47 Nat'l Tax J. 789 (1994). A second wave is now underway. Examples of the application of Domar-Musgrave reasoning to classic problems within income taxation include recent works by David Weisbach, who shows that the deadweight loss from differential taxation of capital in an income tax is less important than had been assumed, and Mitchell Kane, who shows that divergence in rates between source and residence countries on risky cross-border investments has important distributive consequences. David A. Weisbach, Taxation and Risk-Taking with Multiple Tax Rates, 57 Nat'l Tax J. 229 (2004); Mitchell A. Kane, Risk and Redistribution in Open and Closed Economies, 92 Va. L. Rev. 867 (2006).

\textsuperscript{10} This is true assuming the employer faces a constant tax rate over time. If the employer's tax rate changes between when compensation is earned and when it is paid, there may be an employer preference or dispreference, as described in Scholes et al., note 1, at 233-35. Throughout this Article I assume constant tax rates over time for both the employer and the employee.
In Part V, I offer a brief conclusion. Given recent legislation regulating deferred compensation, the most striking implication of my argument is that policymakers should give up on deferred compensation reform. The inevitable administrative complications that result from deferred compensation reform is tantamount to a cure that is worse than the disease.

II. EMPLOYEE CONSEQUENCES

A. Standard Model

The standard model shows that deferred compensation enjoys a tax advantage when the employee's marginal tax rate on investment income is greater than the employer's rate. The reason is that, through deferred compensation, the employer is making an investment on the employee's behalf and when that investment is subject to a lower tax rate the employee is thought to receive a benefit.

To be more precise, the tax benefit of deferred compensation ($\Delta_1$) can be expressed as the difference between (1) the after-tax value of deferred compensation ($C_D$) and (2) the after-tax value of current cash salary followed by an investment by the employee for her own account ($C_C$), or:

$$\Delta_1 = C_D - C_C$$

where

$$C_D = S(1 - t_i)(1 + r(1 - t_c))$$

(ex post value of deferred compensation)

$$C_C = S(1 - t_i)(1 + r(1 - t_i))$$

(ex post value of current compensation)

$$S = \text{pretax salary}$$

$$R = \text{pretax return on investment during deferral period}$$

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12 Deferred compensation also could be tax advantaged if the employee's tax rate on compensation income decreases over time or if the employer's tax rate applicable to the compensation deduction increases; I ignore rate changes as their impact is well understood and tangential to my main point. See note 10.

13 The term $C_C$ assumes that the employee paid current compensation liquidates her investment at the end of the deferral period. This assumption is necessary to facilitate an apples-to-apples comparison with the employee paid deferred compensation, given that the employer will liquidate the investment it has made with the employee's deferred salary to raise funds for the deferred payment. In reality the employee paid current compensation can choose to not liquidate her investment, and this option has value that tends to reduce the magnitude of $\Delta_1$. The risk-adjusted models I introduce in Section II.B do not capture this option; however, the standard model used by others who have studied the tax benefits of deferred compensation does not capture it either.
\( t_t = \text{employee's marginal tax rate} \)

\( t_C = \text{employer's marginal tax rate applicable to the deferred compensation investment.} \)

Deferred compensation is tax advantaged (\( \Delta_1 > 0 \)) when the investment return is positive and the employee's tax rate exceeds the employer's tax rate, that is, when \( r > 0 \) and \( t_t > t_C. \)\(^{14} \) For example, let \( s = 1, t_t = 0.35, t_C = 0, \) and \( r = 0.1^5 \) On these assumptions:

\[
C_D = \$1(1 - 0.35)(1 + 0.1(1 - 0)) \\
= \$0.65(1.1) \\
= \$0.715
\]

\[
C_C = \$1(1 - 0.35)(1 + 0.1(1 - 0.35)) \\
= \$0.65(1.065) \\
= \$0.692.
\]

The tax advantage of deferred compensation is thus

\[
\Delta_1 = \$0.715 - \$0.692 = \$0.023.
\]

The difficulty with the standard model is that the two investment programs being compared are incomparable.\(^{16} \) Although \( \Delta_1 \) has a positive expected value when \( t_t > t_C \) and the expected value of \( r \) is positive, the employee paid deferred compensation has an investment that is riskier. One way to see this is to observe what happens if \( t_t > t_C \) and \( r \) turns out to be negative. In this case, \( \Delta_1 \) will also be negative, implying deferred compensation is tax disadvantaged.

A second way to see that deferred compensation is riskier in the circumstance that the conventional analysis classifies as tax advantaged is to decompose into their constituent parts the terms that express the ex post values of deferred and current compensation. Begin with deferred compensation, which can be expressed as follows:

\[
C_D = s(1 - t_t)[t_C + (1 - t_C)(1 + r)].
\]

\(^{14} \) This also assumes that \( 0 \leq t_t < 1, \) as is always true.

\(^{15} \) Although an overall marginal tax rate of zero is unusual for profitable employers, corporations are exempt from tax when dealing in their own stock or in options on their own stock. IRC § 1032. As a consequence, deferred compensation arrangements such as employee stock options and restricted stock are effectively tax-exempt, so positing an employer tax rate of zero (\( t_C = 0 \)) is a reasonable assumption in an important class of cases. Indeed, this is arguably the most important class of cases. Nonqualified stock options are now the single largest component of CEO pay, eclipsing cash salary. Kevin J. Murphy, Executive Compensation, in 3 Handbook of Labor Economics 2485, 2515 (Orley Ashenfelter & David Card eds., 1999). By nonqualified stock options I mean compensatory stock options that are not qualified stock options within the meaning of § 422. For a description of the tax efficiency of qualified stock options, see Scholes et al., note 1, at 247-52.

\(^{16} \) This assumes \( t_t \neq t_C. \) If \( t_t = t_C, \) then the investment programs are (roughly) comparable. But in that case \( \Delta_1 \) equals zero (no tax benefit), so the problem is uninteresting. The reason the investment programs are roughly, not perfectly, comparable when \( t_t = t_C \) is the option discussed in note 13, and noneconomic factors such as the employee's inability to vote corporate stock held indirectly by the employee within deferred compensation.
The deferred salary net of the inchoate tax liability that will be due when the salary is paid equals $s(1 - t_1)$. This is the term on the right-hand side before the square brackets. The product of the net salary deferred and the first term within the square brackets is the after-tax value to the employee of the employer's tax basis in the deferred compensation investment. This term does not depend on $r$. The product of the net salary deferred and the second term inside of the square brackets is the investment return earned on the net salary, reduced by the tax due when the investment is liquidated. This term does depend on $r$.

$C_C$ can be decomposed analogously, as follows:

$$C_C = s(1 - t_1)[t_1 + (1 - t_1)(1 + r)].$$

Again, the first term inside the square brackets is the value of tax basis per dollar of net salary deferred, which is safe, and the second term is the after-tax gross return per dollar of net salary deferred, which is risky.

The deferred compensation investor, in effect, has committed $t_c\%$ of her net salary to a safe investment (tax basis) yielding nil, and $(1 - t_c)\%$ to a risky investment, whereas the nondeferred compensation investor has allocated $t_1$ and $(1 - t_1)\%$ of her salary to safe and risky investments, respectively. When conditions are such that the standard analysis implies a tax preference for deferred compensation ($t_1 > t_c$), the after-tax variability of the deferred compensation investment is greater because, in effect, the employee choosing deferred compensation has committed more of her portfolio to the risky investment, and correspondingly less to the safe investment (tax basis).

To make this concrete, use the same assumptions as in the prior example ($s = 1$, $t_1 = .35$, $t_c = 0$), and assume further that the expected return on employer stock (again, $r_E = .1$ as in the prior example) is the average (expected value) of two equally likely outcomes ($r_U = .3$ and $r_D = -.1$). Plugging the tax rates and possible values for $r$ into $C_D$ and $C_C$ indicates that the net return inside of deferred compensation will be either .845 or .585, depending whether $r$ goes up or down, whereas the net return outside of deferred compensation is either .777 or .608. The standard deviation for $C_D$ is .13, whereas the standard deviation for $C_C$ is .085 (35% less). In its role as tax collector, the government captures 35% more of any (positive or negative) return outside of

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17 A third way to see that when $t_1 > t_c$, $C_D$ is riskier than $C_C$ is to use calculus. Differentiate $\Delta_1$ with respect to $r$:

$$\frac{\partial \Delta_1}{\partial r} = s(1 - t_1)(t_1 - t_c).$$

Holding $s$ and $t_1$ constant, the sensitivity of $\Delta_1$ to changes in $r$ depends on $t_c$; the greater the difference between $t_1$ and $t_c$, the more $\Delta_1$ varies with $r$. A benefit that varies with the yield earned on a risky investment is at least in part a benefit attributable to risk-bearing, rather than a tax benefit per se.
deferred compensation than it captures inside of deferred compensation.  

B. Risk-Adjusted Approaches

There are three approaches to calculating what portion of the (expected) advantage of deferred compensation is attributable to taxes as opposed to investment risk. The first approach is to assume that the investment under consideration both within and outside of deferred compensation is risk-free. If risk is factored out of the comparison, the standard comparison is adequate. The second approach is to compare examples where net investments within and outside deferred compensation are risky, but the investments are calibrated so that the comparison frames a choice between programs that are equally risky, considering the effect of taxes on risk. The third approach, which can be used when investment risks within and outside deferred compensation are different, is to compare discounted present values, where the discount rate accounts for both risk and the time value of money.

All three approaches are conceptually similar, but rest on different assumptions about the likelihood and feasibility of taxpayer responsiveness to tax rules. I describe the three approaches below and then compare them.

1. Comparing Risk-Free Alternatives

If both the deferred compensation taxpayer and the taxpayer paid cash compensation invest in a risk-free asset with a yield of \( r_F \) \( (r = r_f) \), then the tax benefit from deferred compensation is

\[
\Delta_t^* = C_D^* - C_C^* = s(1 - t_f)r_f(t_f - t_c)
\]

where \( C_D^* = C_D \) and \( C_C^* = C_C \) given that \( r = r_f \).

Assuming \( t_f > t_c \), the deferred compensation investor gains a tax advantage (\( \Delta_t^* > 0 \)) because a greater proportion of the after-tax salary grows at the risk-free rate during the deferral period. To see why, refer back to the decomposition of \( C_D \) and \( C_C \). Inside of deferred compensation, \( t_c \% \) of the after-tax salary is tied up in tax basis and \( 1 - t_c \% \) grows at the risk-free rate, whereas the split is \( t_f \) and \( 1 - t_f \) outside of deferred compensation.

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18 This assumes that the tax system treats gains and losses symmetrically, which is not necessarily true. For a further discussion of this point, see text accompanying notes 27-29.

19 See text accompanying notes 16-17.
To illustrate, suppose that the tax rate applicable to deferred compensation investment is zero, and that the nondeferred compensation investment is taxed at 35%. In this scenario, within deferred compensation the entire net-of-tax salary earns a positive return, whereas outside of deferred compensation 35% is locked up in tax basis, which yields zero, and only the 65% balance earns a positive yield.

2. Equalizing After-Tax Risk

An alternative way to adjust for risk is to assume that the taxpayer opting out of deferred compensation grosses up her investment in the risky asset so her risk exposure is identical to the deferred compensation investor. Define $G$ as the incremental exposure to the risky asset within deferred compensation compared with the exposure of a nondeferred compensation investor committing the same after-tax salary to the risky asset at the inception of the investment program:

$$G = s(1 - t_f)[(1 - t_c)/(1 - t_f) - 1] = s(t_f - t_c).$$

A risk-neutral comparison would reckon the results of (1) the ex post value of deferred compensation ($C_D$) and (2) the ex post value of current compensation invested to earn a before-tax yield of $x$ during the deferral period ($C_C$), plus an incremental investment of $G$ dollars of borrowed funds in the risky asset during the deferral period (made to equalize the risk within and outside of deferred compensation), minus repayment (with interest) of the funds borrowed to gross-up the investment. The comparison is as follows:

$$\Delta_2 = C_D - C_C - G[1 + (r(1 - t_f))] + G[1 + r_f(1 - t_f)] = s(1 - t_f)r_f(1 - t_c) = \Delta_1^*. $$

The first two terms on the right side of the top line are familiar. The third term is the after-tax return on the gross-up. The fourth term is the net-of-tax cost of repaying the lender that financed the gross-up (repayment to include principle plus tax-deductible interest accruing at the risk-free rate).

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20 For reasons explained above, this is very often true, particularly for equity-based compensation such as incentive stock options. See note 15.

21 The computation assumes the nondeferred compensation investor is able to borrow at the risk-free rate. This might be true if she borrows from herself by diminishing her commitment to safe investments earning the risk-free rate elsewhere in her portfolio and redeploy the funds by making an incremental risky investment. In this circumstance, the taxpayer's cost of funds is the after-tax risk-free return she did not earn on the redeployed funds. It is also possible that the nondeferred compensation investor might have a higher cost of funds if, for example, she must borrow from a third party.
To illustrate using the same assumptions as before, the nondeferred-compensation taxpayer would borrow $G = $1(1 - .35)((1 - 0)/(1 - .35) - 1) = $.35 and invest it in the risky asset. This will give her a nominal total investment in the risky asset of $1, comprised of her $.65 net salary and $.35 of borrowed funds. She will keep $1 - t_i = 65\%$ of the yield on this nominal investment, which puts her on an even footing risk-wise with the deferred compensation investor, who also has a nominal total investment in the risky asset of $1$, and gets to keep 65\% of the yield.

The deferred compensation investor is able to finance at zero interest the portion of her total nominal investment that represents the discounted present value of her deferred tax liability ($$.35$). The ability to defer the tax liability is effectively a no-interest loan from the government. The nondeferred-compensation investor, by contrast, must pay the market rate of (tax-deductible) interest on the $.35 she borrowed to gross up her investment. This interest cost is the difference between the two taxpayers.

If the individual tax rate differs for risky and safe investments, things become more complicated. The additional complication, however, does nothing to illuminate the tax benefit of deferred compensation. To illustrate, suppose individual ordinary income and capital gains tax rates are $t_{CG}$ and $t_{OI}$, that risky investments bear the capital gains tax rate, and that borrowing (and lending) generates interest taxed (and deducted) at the ordinary income tax rate. Substituting these rates as appropriate on the right hand side of $\Delta_2$ in the immediately preceding equation indicates that the after-tax benefit of deferred compensation equals

$$\Delta_2' = \Delta_2[(1 - t_{OI})/(1 - t_{CG})].$$

In the usual case, the ordinary income tax rate is higher than the capital gains tax rate ($t_{OI} > t_{CG}$), which implies that the tax benefit of deferred compensation is reduced on account of the rate differential ($\Delta_2 > \Delta_2'$). The reason is that the employee paid current compensation is able to exploit a tax arbitrage. The grossed-up investment generates a return taxed at one (usually lower) rate whereas the loan incurred to fund the grossed-up investment generates interest expense deductible at another (higher) rate.

This tax arbitrage opportunity, however, is limited by § 163(d), which restricts the deductibility of interest expense to the extent of investment income and (subject to this limit) available to be exploited by taxpayers without regard to the form of their employment remuneration.22

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22 For purposes of the interest expense deduction limitation rule, investment income does not include income eligible for the capital gains preference, IRC § 163(d)(4)(B). If
Assuming a single tax rate for individuals (as I generally do in this Article) is functionally the same as assuming that the employee has already taken advantage of this noncompensation-related tax arbitrage to the extent feasible. This is justified because the arbitrage is neither an intrinsic feature nor a byproduct of any particular form of compensation, and the ability to exploit it is limited by statute.

3. Risk-Adjusted Discounting

Under standard assumptions about capital market equilibrium, the capital market presents investors two prices: "the price of time, or the pure interest rate . . . and the price of risk, the additional expected return per unit of risk borne . . . ."\(^{23}\) Increasing risk drives up the expected rate of return but, by definition, it also drives up the dispersion in investment outcomes. Put differently, an increase in expected return compensates for increases in risk and, therefore, the return to risk is not a source of market value.\(^{24}\)

This fact is the key to performing a risk-adjusted, discounted present value comparison of investments with different risks. When the expected future values of current and deferred compensation are discounted to their present values at the time compensation is earned using discount rates calibrated for risk, their values are roughly the same.\(^{25}\) Assume for purposes of illustration that they are exactly the same, equal to \(s(1 - t_i)\). This process of discounting at risk-adjusted rates extracts risk from the comparison. Next translate the (equivalent) present values into future values using the riskless rate of return available within and outside of deferred compensation. In both cases the before-tax risk-free rate is \(r_f\). Within deferred compensation the after-tax risk-free rate is \(r_f(1 - t_c)\); outside of deferred compensation it is \(r_f(1 - t_i)\). The risk-adjusted difference between deferred and

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25 More specifically, discounting should be done using discount rates calibrated for the expected after-tax return given the systematic (nondiversifiable) risk inherent in the risky portfolio for which the single risky asset in my model is a proxy. For a description of how the standard capital asset pricing model, which specifies the relationship between risk and return, can be extended to account for generally applicable taxes on dividends and capital gains, see Edwin J. Elton & Marin J. Gruber, Modern Portfolio Theory and Investment Analysis 323-24 (5th ed. 1995).
current compensation, adjusted for the time value of money in each case at the appropriate discount rate, is thus
\[ s(1 - t_l)[r_f(1 - t_c) - r_f(1 - t_l)] = s(1 - t_l)r_f(t_l - t_c) \]
which is equivalent to both \( \Delta_2 \) and \( \Delta_1^* \).

C. Illustrative Comparison

Figure 1 plots the investment opportunities available to taxpayers in return-risk space both within and outside deferred compensation using the basic assumptions that are common to the standard model and the three risk-adjusted approaches (that is, one risky asset with an expected value of \( r_E \), taxpayers can borrow and lend at \( r_f \), employees face a marginal tax rate of \( t_l \), and the employers face a marginal tax rate of \( t_c < t_l \)). I arbitrarily assign a value of 1 to the risk inherent in the risky asset, before tax.

**Figure 1**

**Investment Opportunities for Taxpayers Within and Outside Deferred Compensation Plans**

In the standard model, the points labeled \( C_D \) and \( C_C \) are compared. To see my argument against the standard model in the context of Fig-
Figure 1, imagine traveling from point $C_D$ to point $C_C$ in two steps. In the first step, the employee slides down the higher diagonal line, from point $C_D$ to the point marked with an asterisk (corresponding to risk of $1 - t_1$). In this step there is a proportionate reduction in the employee’s risk and return to risk: the government’s claim to both increases from $t_C$ to $t_1$. This does not diminish the market value of the employee’s claim because the government is charging the market price for the risk it absorbs, expressed as a diminution in the expected rate of return.

In the second step, the employee slides down vertically from the asterisk on the higher diagonal line to point $C_C$ on the lower diagonal line. This step corresponds to the imposition of tax on the risk-free rate of return. This step strips market value from the employee’s claim because the reduction in return is not accompanied by a corresponding reduction in risk. Whereas the standard analysis explains the entire reduction in return between points $C_D$ and $C_C$ ($t_1 - t_C$ percentage points) as a tax burden, a risk-adjusted approach would divide this reduction into two components. Only the second component constitutes a burden in an economic sense.

In Figure 1, the tax preference for deferred compensation is the vertical distance between the two lines depicting feasible investments within and outside of deferred compensation. The three risk-neutral approaches outlined above are alternative ways of measuring this distance. First, the taxpayer paid current compensation and the one paid deferred compensation can be put on an even footing risk-wise if they both invest in riskless investments. In this case the proper comparison is between points $C_D^*$ and $C_C^*$, both of which lie on the vertical axis (implying zero risk).

Second, an employee paid current compensation can put herself on even footing risk-wise with one paid deferred compensation by borrowing and grossing up her risky investment. If she does this, she slides along the lower diagonal line from point $C_C$ to point $C_C^+$. A direct comparison between points $C_D$ and $C_C^+$ is meaningful in a way that a comparison of points $C_D$ and $C_C$ was not, given that $C_D$ and $C_C^+$ are equally risky.

A strength of the second approach is that if taxpayers do respond as required to equalize risk, the analogues being compared face both equally risky opportunities ex ante and have comparable outcomes ex post ($\Delta_2$ is not a function of $r_E$, the risky return). A potential weakness, discussed below, is that taxpayers’ propensity to make the necessary portfolio adjustments is contestable.

The third approach to risk-neutral analysis is essentially premised on the idea that one should compare the market value of opportuni-
ties, rather than outcomes. Observe that all points on the higher line are feasible for a taxpayer who chooses to participate in deferred compensation—and all have equivalent market values. If the risk-free rate of return is known (here it is assumed to be $r_j$), then the (time-value adjusted) market value of all feasible portfolios is the taxpayer’s after-tax salary increased at the risk-free rate $(r_f(1 - t_c))$, which corresponds to point $C_D^*$ in Figure 1. Expected value will increase with risk, but this does not augment market value. The same argument applies to the lower line, except the return for the riskless portfolio is $r_f(1 - t_i)$, which corresponds to point $C_C^*$. Because the two lines are parallel, the vertical distance between points $C_D^*$ and $C_C^*$ is the same as that between $C_D$ and $C_C^+$, consistent with the identity of expressions $A_1^*$ and $A_2$.

A strength of the third approach is that it does not depend on taxpayer choice regarding investment portfolios. On the other hand, the comparability between the analogues being compared only holds ex ante. One who believes that differences in circumstances ex post are important when gauging the magnitude of the tax burden will not be satisfied with this approach because the only thing it classifies as a tax burden is a diminution in opportunities.

### D. Assessing Risk-Adjusted Approaches

Because the risk-adjusted approaches are applications of the standard Domar-Musgrave model, they share the same limitations as the model, most significantly:

- dependence on a symmetrical tax treatment of gains and losses;
- some approaches rest on contestable assumptions regarding taxpayer behavior in response to tax rules, and others are only neutral ex ante, not ex post; and
- uncertain general equilibrium effects.

These limitations have been thoroughly examined in the tax-base theory literature assessing the relative merits of income and consumption taxation,²⁶ so I will address them only briefly with an emphasis on how important the limitations are likely to be in the context of deferred compensation.

If gains and losses are subject to different tax rates then it is not possible for an employee to make portfolio adjustments to avoid the

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burden of the tax. This seems to be a minor consideration for the vast bulk of deferred compensation, which is paid to executives who are in (and who are likely to remain in) the top marginal tax rate, and which is paid by corporations subject to a flat marginal tax rate (including sometimes a flat rate of zero, given the application of § 1032 to equity-based deferred compensation).

Variation in statutory rates for gains and losses, however, is the not the only tax law asymmetry. The limitation on the deductibility of capital losses is also relevant, both for the employer and the employee. The extent to which this limitation is important in the deferred compensation context is an empirical question. The empirical data that exist suggest that capital loss limitations are not a significant factor for a clear majority of taxpayers.

Next, it could be argued that the risk-neutral model depends on a contestable assumption regarding taxpayer behavior, specifically that taxpayers will respond to differential taxation within and outside of deferred compensation by recalibrating their investments to equalize after-tax investment risk. Several commentators have lodged this criticism against the Domar-Musgrave model. One response to this observation is that a suggestion that individuals do not behave as the model predicts—as rational beings in pursuit of constant preferences—begs the question of how individuals actually do behave. "Without an alternative theory, the standard theory [of taxpayer behavior] may be the best we have."

A second response, one that has been discussed in the economics literature but far less so in the legal literature, is that no behavioral response is required. As I demonstrated above, even when risks within and outside of deferred compensation are different (because the predicted behavioral response does not occur), it is still possible to

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28 IRC § 1211.

29 Between 1987 and 1994, 72% of taxpayers with losses were not subject to the loss limit. Among those that were subject to the limit, approximately two-thirds were able to use their losses within two years, and over 90% were able to use their losses within six years. Alan Auerbach, Leonard E. Burman & Jonathan Siegel, Capital Gains Taxation and Tax Avoidance: New Evidence from Panel Data, in Does Atlas Shrug?: The Economic Consequences of Taxing the Rich (Joel Slemrod ed., 2000). For an earlier study with similar findings, see James M. Poterba, How Burdensome Are Capital Gains Taxes?, 33 J. Pub. Econ. 157, 165 (1987).


31 Weisbach, note 26, at 44.
perform a risk-neutral comparison of the alternative transactions by calibrating the discount rate to account for differences in risk.32

A potential difficulty with the second response is that the transactions compared using risk-adjusted discounting are not fully equivalent in the sense that after-tax wealth will differ in alternative future states when the expected value does not eventuate. One who accepts a view of tax parity that depends on an ex post perspective will therefore not be satisfied with risk-adjusted discounting—recall Michael Graetz's memorable formulation that "lucky gamblers are not the same as unlucky gamblers"33—but in my view a strong case can be made for giving primacy to equality of opportunities when measuring the extent to which taxes impose a burden, which augers in favor of an ex ante perspective.34

Finally, uncertainty regarding general equilibrium effects sometimes is cited as casting doubt on the validity of the Domar-Musgrave model.35 The argument is that an increase in private risk-taking due to taxation will drive down the yield to risky assets. Louis Kaplow developed an elegant general equilibrium model that shows that the general equilibrium concerns regarding the Domar-Musgrave model can be resolved by assuming that the government takes the opposite side on all risky investments made by taxpayers.36

One way to understand Kaplow's argument is that the general equilibrium concerns are not concerns regarding the tax system per se, but are really concerns about government portfolio policy, which can be considered separately from inquiries into tax policy.37 One could draw the same lesson from Gordon, who sets out a general equilib-

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33 Michael J. Graetz, Implementing a Progressive Consumption Tax, 92 Harv. L. Rev. 1575, 1601 (1979); see Alvin Warren, Would a Consumption Tax be Fairer Than an Income Tax?, 89 Yale L.J. 1081, 1098 (1980).


35 See Schizer, note 32, at 1891.

36 Kaplow, note 9.

37 Id. at 795.
rium model premised on risk-adjusted discounting and shows that taxpayers are made no worse off by a capital income tax because, essentially, the expected value of the risky investment outcomes captured by the government through the tax system is recycled back to taxpayers as stochastic lump-sum transfers (a proxy for government programs or support payments that vary with the government’s risky revenue stream). Both Kaplow’s and Gordon’s arguments apply in the deferred compensation setting.

Finally, even one who rejects the findings of Kaplow’s and Gordon’s general equilibrium models might be less concerned with the application of the Domar-Musgrave model to deferred compensation than to the choice of the tax base. The reason is that a wholesale revision of the tax base is likely to have an impact on equilibrium asset prices in the capital markets far in excess of any impact caused by the taxation of deferred compensation.

III. EMPLOYER CONSEQUENCES

Employer tax consequences are, in concept, just as important as employee consequences because any tax preference afforded to the employee could be negated by a dispreference for the employer. Until both sides of the compensation contract are examined, it is impossible to identify the existence of a tax preference, let alone to measure it. Fortunately, if differences in risk and cash flow within and outside deferred compensation are negated, the net consequences for the employer paying deferred compensation are exactly the same as for the employer paying current compensation. It follows that the tax benefit or detriment of deferred compensation depends solely on the employee tax consequences, described above. (If differences in risk and cash flow within and outside of deferred compensation are not negated, then employer investment and possibly capital structure decisions are combined with the decision to pay deferred compensation, which is inimical to isolating any distinct tax benefit flowing from the compensation decision.)

The reason that the employer has the same result whether it pays cash or deferred compensation is that an employer that pays deferred compensation can perfectly hedge the investment risk implicit in its deferred compensation obligation without cost, using the funds saved by deferring its compensation liability. To illustrate, consider an em-

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38 Gordon, note 26, at 9-17.
39 Scholes, note 1, at 253.
40 This result holds assuming the employer’s tax rate or rates do not change over time. See note 10.
41 See Knoll, note 1, at 207-08.
ployer that, at Time 0, promises its employee a Time 1 payment of $s$ dollars adjusted by the after-tax return to the employer of investing in a risky asset expected to yield $r_E$ during the interval between Time 0 and Time 1. From the employer’s perspective this promise is both a compensation decision and an investment decision because, through its promise, the employer is effectively taking a short position in the risky asset.

More specifically, if the employer faces a marginal tax rate of $T$, the employer has a Time 1 liability, before tax, of $s(1 + r(1 - T))$, and an after-tax liability of $s(1 - T)(1 + r(1 - T))$, considering the benefit of its tax deduction, worth $s(1 + r(1 - T))T$. The employer can hedge its Time 1 after-tax liability by purchasing $s(1 - T)$ worth of the risky asset at time 0, which will provide an after-tax return of $s(1 - T)(1 + r(1 - T))$ at Time 1. Hedging in this fashion exactly matches the employer's risk and cash flow to the risk and cash flow it would have incurred had it paid cash compensation. The employer has a Time 0 net negative cash flow of $s(1 - T)$ in both cases, and, because the employer's Time 1 liability is fully funded by its net return on the hedge, the employer bears no risk in either case.

To ensure an apples-to-apples comparison, the employer paying equity compensation must take care in designing its hedge to eliminate not only any discrepancies in cash flow and investment risk but also in its capital structure (since paying an employee in deferred stock has the same effect on capital structure as selling shares). Controlling variations in capital structure is an additional complication not implicated by non-equity-based deferred compensation. Michael Knoll has clearly explained the mechanics.

IV. Quantifying the Significance of Risk

Table 1 shows the present value of the tax benefit of deferred compensation under the standard model, and under a risk-adjusted model, and then shows the difference between the two. There are three

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42 This result does not depend on the fact that the employer faces a single marginal tax rate.

43 Knoll, note 1, at 210. The hedge payoff is $s(1 - T)(1 + r(1 - T))$ and the employer's before-tax liability is $s(1 + r(1 - T))$. The gap between these amounts is bridged by the employer's Time 1 compensation deduction.

44 Id. Despite § 1032, corporate employers that pay with deferred stock, nonqualified stock options, stock appreciation rights, and the like are allowed to deduct the same amount the employee includes in income, in the same period the employee includes it. The effect of this rule is to tax the employer on investment gains and losses earned on the implicit short investment the employer holds in its own equity. See Alvin C. Warren, Jr., Taxation of Options on the Issuer's Stock, Taxes, Mar. 2004, at 47, 48. The effective tax rate on these gains and losses is the same rate the employer uses to compute the value of its compensation deduction ($T$).
**Table 1**

**Present Value of the Tax Benefit of Deferred Compensation Under Standard and Risk-Adjusted Models**

<table>
<thead>
<tr>
<th>Deferral (years)</th>
<th>Case (a) 20% Annual Yield on Risky Asset</th>
<th>Case (b) 10% Annual Yield on Risky Asset</th>
<th>Case (c) -100% Total Return on Risky Asset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Model</td>
<td>Risk-Adjusted Model</td>
<td>Standard Model</td>
</tr>
<tr>
<td></td>
<td>Difference</td>
<td></td>
<td>Difference</td>
</tr>
<tr>
<td>1</td>
<td>.021</td>
<td>.004</td>
<td>(.060)</td>
</tr>
<tr>
<td>2</td>
<td>.046</td>
<td>.008</td>
<td>(.080)</td>
</tr>
<tr>
<td>3</td>
<td>.074</td>
<td>.011</td>
<td>(.086)</td>
</tr>
<tr>
<td>4</td>
<td>.108</td>
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<td>.194</td>
<td>.022</td>
<td>(.081)</td>
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</tr>
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<td>.313</td>
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</tr>
<tr>
<td>9</td>
<td>.390</td>
<td>.032</td>
<td>(.075)</td>
</tr>
<tr>
<td>10</td>
<td>.480</td>
<td>.036</td>
<td></td>
</tr>
</tbody>
</table>

| Deferral (years) | Difference |                                         |
|------------------|------------|
| 1                | 444%       |
| 2                | 494%       |
| 3                | 551%       |
| 4                | 615%       |
| 5                | 688%       |
| 6                | 771%       |
| 7                | 866%       |
| 8                | 975%       |
| 9                | 1099%      |
| 10               | 1241%      |

| Deferral (years) | Difference |                                         |
|------------------|------------|
| 1                | 158%       |
| 2                | 167%       |
| 3                | 177%       |
| 4                | 187%       |
| 5                | 198%       |
| 6                | 209%       |
| 7                | 221%       |
| 8                | 233%       |
| 9                | 247%       |
| 10               | 261%       |

| Deferral (years) | Difference |                                         |
|------------------|------------|
| 1                | -1654%     |
| 2                | -1144%     |
| 3                | -852%      |
| 4                | -673%      |
| 5                | -556%      |
| 6                | -475%      |
| 7                | -416%      |
| 8                | -372%      |
| 9                | -337%      |
| 10               | -310%      |

**Source:** Author's calculations. The model used to compute the figures in Table 1 is specified in the Appendix.

Assumptions: \( r_i = .04, t_i = .35, t_G = .15, t_c = 0 \). Difference in Column (3) is Column (1)/Column (2) - 1 (numbers rounded)

Illustrative cases.\(^{45}\) Most of the parameter values are constant throughout. In particular, in all cases I assume that the risk-free rate

\(^{45}\) I assume here, as I have throughout, that outside of deferred compensation the employee would realize any gains or losses in her investment at the same time as the deferred compensation is paid out by the employer in the analogue transaction. If the employee outside of deferred compensation holds property beyond this time, the model overstates
of return is 4%, that current top federal income and capital gains tax rates apply to the employee’s compensation and investment income ($t_1 = .35, t_g = .15$), and that the corporate tax rate applicable to investment earnings accruing on deferred compensation is zero.\(^{46}\) The difference between the three cases is the return to the risky investment. In case (a) the risky investment yields 20% per year (a plausible value for stock option investments), in case (b) the risky investment yields 10% per year (a plausible value for an investment in equities), and in case (c) it yields –100% in the aggregate over the deferral period (the outcome if stock options settle out of the money). In each case, the results are stated for a deferral period ranging from one to ten years.

V. CONCLUSION

The standard approach to measuring the tax benefit of deferred compensation indicates that deferred compensation enjoys a significant tax advantage over current compensation coupled with investment by the employee on her own behalf. I have demonstrated that this supposed tax preference is, in large measure, a byproduct of an inapt comparison of investment programs that expose employees to different levels of risk. In precisely the circumstances when the standard analysis indicates the greatest tax preference for deferred compensation, the difference in risk is the greatest. When the analysis is altered so that the level of risk within and outside of deferred compensation is the same, the tax benefit of deferred compensation is shown to equal (1) the after-tax value of the compensation at the time the deferral decision is made times (2) the product of (a) the after-tax risk-free rate of return over the period of deferral and (b) the difference between the employee’s marginal tax rate and the employer’s marginal tax rate.

The relatively meager tax benefit of deferred compensation indicates that legal reform might not be justified given the staggering complexity of recent legislative forays into this domain (most significantly recently enacted § 409A). It also indicates that either (1) managerial incentives and accounting considerations are more important than taxes when it comes to boardroom decisions regarding the form of executive compensation or (2) firms and their executives are influenced more by the perception of significant tax savings than by reality.

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46 See note 15 (describing § 1032, which exempts corporate employers from tax on gains and losses from dealings in its own stock and stock options).
Table 1 presents a comparison of the standard and risk-adjusted models for assessing the tax preference for deferred compensation. This Appendix describes how the figures in Table 1 were computed.

Both the standard and risk-adjusted models assume that the investment on behalf of the employee paid deferred compensation is subject to a zero rate of tax and that investment returns compound continuously at rate \( r \) for \( n \) periods until distribution, when they are taxed at rate \( t_i \). Period \( n \) return inside of deferred compensation thus equals

\[
A = (1 - t_i)\exp(rn).
\]  \[\text{[a1]}\]

The standard model compares \( A \) against \( B \), an investment by the employee of her after-tax salary at rate \( r \) for \( n \) periods, but where gains are subject to tax at rate \( t_G \) on sale in \( n \) periods, as follows:

\[
B = (1 - t_i)(1 - t_G)\exp(rn) + (1 - t_i)t_G.
\]  \[\text{[a2]}\]

The first term on the right side of \[\text{[a2]}\] is gain net of tax; the second is basis recovery. The present value of the tax benefit under the standard model, given in column (1), is computed using the following expression, where \( S \) stands for the standard model.

\[
S = (A - B)/\exp(r(1-t_l)n)
= t_G(1 - t_i)(\exp(rn) - 1)\exp(-r(1 - t_i)n).
\]  \[\text{[a3]}\]

The risk-adjusted model compares \( A \) against \( C \), defined as follows:

\[
C = B + D - E
\]  \[\text{[a4]}\]

\[
D \equiv G[(1 - t_G)\exp(rn) + t_G]
E \equiv G\exp(r(1 - t_G)n)
G \equiv (1 - t_i)[1/(1 - t_G) - 1] = t_G(1 - t_i)/(1 - t_G).
\]

The term \( B \) is given in \[\text{[a2]}\]; \( G \) is a gross-up factor calibrated to match the nondeferred compensation investor's after-tax risk to that borne by the taxpayer in expression \[\text{[a1]}\];\footnote{G is the same term used in the text. See Subsection II.B.2.} \( D \) is the after-tax investment return on the gross-up; and \( E \) is the cost of financing the gross-up.\footnote{As discussed above, I assume that the taxpayer has fully exploited her ability to deduct investment interest under § 163(d) and therefore that the incremental investment interest in \( E \) is only deductible against capital gains income by making the election permitted by § 163(d)(4)(B)(iii). See note 22 and accompanying text.} Therefore the present value of the tax benefit under the risk adjusted model, given in column (2), is computed using the following expression:

\[
RA = (A - C)/\exp(r(1-t_l)n)
= [(1 - t_i)(\exp(r(1-t_G)n) - 1)t_G\exp(-r(1-t_i)n)]/(1 - t_G).
\]  \[\text{[a5]}\]