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EMPLOYER LOSSES AND DEFERRED COMPENSATION

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ABSTRACT

Most large public companies offer their executives the opportunity to defer the receipt and taxation of a portion of their salary or other current compensation until retirement or some other future date, and equity compensation, which also entails deferral of pay and taxation, constitutes a large fraction of the typical executive pay package. Conventional wisdom holds that employer net operating losses (NOLs) improve the joint economics of deferred and equity compensation (henceforth together “deferred compensation”) for the parties. However, empirical studies provide little evidence of an association between employer NOLs and deferred compensation use. This paper focuses on two potential explanations for this apparent disconnect. First, this paper shows that the relationship between employer NOLs and the attractiveness of deferred compensation is more complex and less predictable than is generally recognized, that a larger NOL position does not necessarily produce a larger driving force for use of deferred compensation, and that in some cases employer NOLs can actually result in poorer deferred compensation economics. As a result, some employers and executives may rationally choose to ignore employer NOLs when making compensation decisions. Second, even if companies are sensitive to the existence of employer NOLs when making compensation decisions, it is not clear that research methods currently in use would detect the sensitivity. The commonly used proxies and simulations of employer effective marginal tax rates that have been employed in these studies may not adequately capture the complexity of the relationship between NOLs and the economics of deferred compensation.

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I. Introduction

Companies and their employees may, to a large degree, choose whether to structure pay as cash or other currently includable and deductible compensation or as deferred compensation, including equity-based pay, which will be included in income and deducted in the future. It is well understood that taxes affect the attractiveness of deferred compensation relative to current compensation and that deferred compensation is relatively more attractive when employee tax rates are expected to be lower in the future than today, when employer tax rates are expected to be higher in the future, and when an employer can earn a greater after-tax rate of return on any compensation that is deferred.1

In recent years, well over half of U.S. public companies have reported having a net operating loss (NOL) carryforward,2 reflecting deductions (including prior year NOLs) in excess of gross income. If significant, these NOLs reduce employer effective marginal tax rates (MTRs) and could make deferred compensation relatively more attractive by improving employer after-tax returns on deferred amounts and/or by reducing the value of current employer deductions relative to future employer deductions.3

However, empirical studies that utilize variations in employer NOL positions in search of evidence that taxation affects the choice between current and deferred compensation have met with only limited success.4 As Professor John Graham puts it, “[o]verall, there is only modest evidence that taxes are a driving factor affecting corporate or employee compensation decisions.”5 Moreover, in a recent survey of corporate tax executives conducted by Graham and a group of co-authors, only

2 Shane Heitzman & Rebecca Lester, Net Operating Loss Carryforwards and Corporate Financial Policies 57 (working paper, May 25, 2018) (reporting that between 2011 and 2016 over 50% of Compustat companies had an NOL according to Compustat coding but that hand-collected financial statement data indicated that 85% to 90% of companies had NOLs).
3 Scholes et al, supra note 1, at 184 (“Because deferred compensation is favored if the employer’s tax rate is expected to increase in the future, deferral may be especially appropriate when a firm in an NOL position cannot effectively use current tax deductions.”); see also Scholes & Wolfson, supra note 1, at 825. The effective marginal tax rate is defined as the present value of additional taxes paid on an additional dollar of income earned today. Scholes et al, supra note 1. I follow the accounting and finance literature in denoting the effective marginal tax rate as “MTR.”
4 Infra Part IV.
10.6% of respondents reported that marginal tax rates were the primary tax rates used in making compensation decisions, while 44.8% of respondents reported that their primary rates were statutory tax rates, which presumably would not take into account the impact of NOLs.6

These studies raise several questions. Are firms failing to consider joint tax minimization in the design of compensation programs? If so, is that failure a result of ignorance or laziness, or might it be rational? Alternatively, are researchers failing to detect tax sensitivity in compensation arrangements due to poor experimental design or the use of poor instruments?

This article does not aim to fully resolve these questions. Its more modest goal is to advance our understanding of the challenges that companies and researchers face in incorporating employer NOL positions into their compensation design analyses. The article’s novel strategy is to bifurcate and unpack the two distinct ways in which NOLs may affect employer taxes and improve (generally) deferred compensation economics. First, NOLs may increase an employer’s after-tax rate of return on deferred sums (the rate of return effect). Second, NOLs often increase the value of employer deductions at deferred compensation payout relative to grant (deduction deferral effect). I show that these two effects may work in tandem to boost the attractiveness of deferred compensation when an employer has a large NOL position, but that they may not. In some cases, employers deploy deferred funds in such a way that after-tax rates of return are less affected or unaffected by NOLs. I also show that while NOLs at grant tend to improve the economics of deferred compensation, this is not necessarily the case. In addition, even when grant date NOLs do improve the economics of deferred compensation, a larger NOL position at grant does not necessarily produce a larger driving force for deferral. In mathematical terms, the relationship is not always monotonic.

In short, while conventional wisdom holds that employer NOLs boost the economic attractiveness of deferred compensation, this article both complicates and clarifies this picture.

My analysis leads to two main conclusions. First, it may not be irrational for firms to ignore grant date NOLs in making some deferred compensation decisions. Given the complexity of the relationship between NOLs and the economics of deferred compensation as well as unpredictable payoffs, it would not be surprising to find managers making decisions based on simple heuristics, such as statutory

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6 John R. Graham et al, Tax Rates and Corporate Decision-Making, 30 Rev. Fin. Studies 3128, 3141 (2017). Of respondents listing statutory tax rates (STRs) as their primary tax rates for compensation decisions, 57% selected U.S. STRs, while 43% selected jurisdiction specific STRs. Id.
rates, rather than upon full-blown expected values incorporating the impact of NOLs.\textsuperscript{7}

Second, even if firms are sensitive to taxation in making compensation decisions, it is not clear that the research methods that have been deployed to test this sensitivity would detect it. Researchers often use NOL dummy variables, sometimes combined with a lack of profits, as proxies for low MTRs.\textsuperscript{8} These may (or may not) be good proxies for grant date MTR, but they are unlikely to be effective as proxies for the tax advantage of deferred compensation, which is not always monotonically related to grant date MTR. More sophisticated research techniques employ simulations of MTR, both at grant and payout, which, in theory, is an improvement. However, different simulations produce dramatically different estimated MTRs for the same firms in the same years.\textsuperscript{9} Moreover, a recent paper suggests that the input data used in some of these simulations is more error-riddled than previously suspected.\textsuperscript{10} It appears that we are a long way from being able to confidently test the relationship between employer tax rates and the use of deferred compensation.

The remainder of this article is organized as follows. Part II provides background on the use and basic economics of deferred compensation. Part III, the heart of the article, unpacks the relationship between NOLs, effective marginal tax rates, and the economics of both pure deferral and counterparty deferral, e.g., deferred compensation arrangements. This Part bifurcates the impact of NOLs into non-mutually exclusive deduction deferral and rate of return effects, as described above, and considers the implications for equity and other deferred compensation arrangements. The primary takeaway is that the impact of employer losses on the tax advantage of deferred compensation is more complicated and less predictable than is generally understood. This Part also presents two alternative explanations for the relatively modest use of deferred compensation by companies with losses – payment risk and an excessive focus on GAAP earnings relative to after-tax cash flows. Part IV explores empirical research on the effect of taxes on deferred compensation and suggests that commonly used proxies for company marginal tax rates may not adequately capture the impact of losses on deferred compensation economics. Part V briefly considers the impact of statutory rate changes on the economics and use of deferred compensation. Part VI concludes.

\textsuperscript{7} I assume that willingness to grapple with the complexity of NOLs with respect to compensation decisions will turn in part on the magnitude of the potential gains. Cf Graham et al, supra note 6, at 3130 (suggesting that reliance on STRs over MTRs may reflect "efficient" use of heuristics when the differences between MTRs and STRs are relatively small).

\textsuperscript{8} See infra Part IV.

\textsuperscript{9} See infra Part IV.

\textsuperscript{10} Heitzman & Lester, supra note 2
II. Background on the Use and Economics of Deferred Compensation

A. The Deferred Compensation Picture

Deferred compensation is compensation relating to current services that is payable, and taxable, in a future year or years. Deferred compensation may serve as an explicit or implicit substitute for current compensation, but in all cases the employer presumably has more funds available to use or invest, or less need to borrow, between the point of deferral and the point of future payout than it would have had if compensation had been paid currently. A considerable fraction of executive and rank and file compensation paid by U.S. corporations is deferred in this sense.

Let’s begin at the top. A recent survey by the Hay Group found that the average compensation package of the CEOs of 300 large companies consisted of 14% salary, 22% bonus/annual incentive, 16% options, 16% restricted stock, and 32% performance awards. The options, restricted stock, and performance awards are all equity-based deferred compensation. Gains on options are included in income and deductible by the employer when the options are exercised and the underlying shares can be sold, typically five or six years following grant, equating to five or six years of deferral. Absent an IRC §83(b) election, restricted stock is included in income and deducted when the stock vests and becomes transferrable, typically within five years of grant. Performance award plans are quite

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11 Hay Group, Executive Compensation 2013: Data, Trends and Strategies.
12 Treas. Reg. §1.83-7(a) (options lacking a readily ascertainable fair market value at the time of grant taxable at exercise); IRC §83(h) (deduction allowed for the taxable year in which service provider included option value in income). This tax treatment applies to non-qualified options, which make up the vast majority of options, particularly for senior executives. Incentive stock options are taxed differently. See infra note 90. Unless otherwise indicated, I will assume throughout this article that options are non-qualified.
13 Although options typically can be exercised as late as 10 years following grant, exercise of non-qualified options within a year or two of vesting is much more common. See, e.g., J. Carr Bettis et al., Exercise Behavior, Valuation, and the Incentive Effects of Employee Stock Options, 76 J. FIN. ECON. 445, 446 (2005) (finding for a sample of 140,000 option exercises by executives at almost 4000 firms between 1996 and 2002 that, on average, options were exercised a little over two years following vesting and more than four years prior to expiration); Jennifer N. Carpenter, The Exercise and Valuation of Executive Stock Options, 48 J. FIN ECON. 127, 138-39 (1998) (finding for a sample of forty firms (mainly large manufacturers) that executive stock options granted between 1983 and 1984 were, on average, exercised after 5.8 years).
14 IRC §83(a). If a §83(b) election is made, restricted stock is included in income at fair market value at grant and the stock is then held as a capital asset. The tax paid
heterogeneous, but most plans provide for payouts, in shares or cash, based on company performance over a three-year period, and taxation occurs at payout, providing for three years of deferral. In sum, the deferral associated with equity-based pay typically ranges from about three to about six years.

Salary and annual bonus, making up in aggregate about one-third of average CEO pay, are taxable in the year earned unless the executive participates in a non-qualified deferred compensation (NQDC) program that allows her to defer all or a portion of these amounts, plus any earnings on these amounts, until a future date, often until retirement. Assuming all rules are met, NQDC amounts are included and deducted at payout, providing for deferral over various, fact-specific periods. Typically, however, deferral periods associated with NQDC are longer than those associated with equity-based pay.

To complete the picture, CEOs and other senior executives may also participate in tax qualified deferred compensation arrangements, such as 401(k)s, that allow them to set aside and invest some current compensation on explicitly tax-preferred terms. However, the dollar caps on these plans are so low as to render them essentially irrelevant for senior executives.

The compensation menu is similar for lower level executives and rank and file employees, although as one moves down the ranks, salary and annual bonuses tend to gain in importance and equity-based pay to decline. The opportunity to participate in NQDC programs typically kicks in at the senior vice president level or once compensation reaches six figures. Given smaller pay packages at these levels, tax qualified savings plans become relatively more important.

This article will not address tax qualified savings plans. Given the explicit tax subsidies, these are low hanging fruit. Companies that can afford to incur the administrative costs should find it in their interest to make these plans available. I cannot be recovered if the stock fails to vest, and §83(b) elections by employees of companies with publicly traded stock are rare. See David I. Walker, Is Equity Compensation Tax Advantaged?, 84 B.U.L. REV. 695, 707 (citing interview evidence). Compensation consultant FW Cook reported in 2017 that 90% of performance awards granted to executives at the 250 largest S&P 500 companies vested in three years. FW COOK, THE 2017 TOP 250 REPORT (Aug. 2017).


Id. at 2075-77.

Id.

will use the term “deferred compensation” in this article to refer to both equity-based pay and NQDC, but not to qualified plans.

B. The Basic Economics of Deferred Compensation

Although frequently overlooked or neglected, the economics of deferred compensation are well understood. As Professors Myron Scholes and Mark Wolfson demonstrated, deferred compensation is jointly preferred by employers and employees over current compensation if and only if:

\[
\frac{(1-t_{EE})(1+r_{EE})^d}{(1-t_{ER})(1+r_{ER})^d} > \frac{(1-t_{ER})}{(1-t_{ER})}
\]

where \( t_{EE} \) is the employee’s marginal tax rate in the year of grant (0) or at deferred compensation payout (d), \( t_{ER} \) represents the employer’s MTRs, and \( r_{ER} \) and \( r_{EE} \) are the after-tax rates of return available to the employer and the employee. All else equal, deferred compensation is tax preferred over current compensation when the employee faces a lower tax rate at payout, when the employer faces a higher tax rate at payout, and/or when the employer can earn a greater after-tax rate of return on deferred amounts than the employee could earn on her own.

Scholes and Wolfson derived this equation in the context of NQDC arrangements, but although it is slightly less obvious, the same analysis applies to equity compensation. An employee who receives unvested stock or options or the promise of future payouts in cash or equity based on her company’s stock price has


\[21\] Scholes and Wolfson, supra note 1, at 826; SCHOLES ET AL, supra note 1, at 183. This equation is derived by holding the employer indifferent between cash and deferred compensation and determining the outcomes for the employee. In brief, $1 of current salary would be taxed to the employee at the employee’s current tax rate and the after-tax amount could be invested at the employee’s after-tax rate of return, providing an after-tax amount after d years of: $1 * (1 - t_{EE}) * (1 + r_{EE})^d. The employer would be indifferent between paying $1 currently and setting aside $1 less the tax benefit of a current deduction. That amount would increase at the employer’s after tax rate of return. Because the employer would deduct the amount paid to the employee at time d, the employer would be indifferent if it grossed up the payment by the employer’s tax rate at time d. The employee would pay tax at her time d tax rate, leaving her with an after-tax amount at time d of: $1 * [(1 – t_{ER}) * (1 + r_{ER})^d / (1 – t_{ER})] * (1 – t_{EE}). Setting the two equations equal and rearranging terms provides the indifference point described in equation 1. An equivalent result would be had by holding the employee indifferent and determining employer outcomes.

\[22\] Scholes and Wolfson, supra note 1, at 826; SCHOLES ET AL, supra note 1, at 183.
deferred both the enjoyment and the taxation of her compensation, and her
employer has additional funds that it may invest between the grant of the equity-
based compensation and payout. The economics are the same.\textsuperscript{23}

As Professors Halperin and Warren explain, the deferral associated with
delayed compensation, one of a class of arrangements to which they refer as
"counterparty deferral," is different in kind than the "pure deferral" associated with,
say, expensing an amount that ordinarily would be capitalized.\textsuperscript{24} Expensing results
in the deferral of income inclusion relative to economic accrual.\textsuperscript{25} Deferred
compensation defers recognition for one party (here, the investment return on
deferred amounts ultimately enjoyed by an employee) by shifting the income to a
second party (the employer) in the interim.\textsuperscript{26} As they show, if employers and
employees face consistent MTRs at the points of deferral and payout, any benefit
from deferred compensation “is due entirely to the difference between the
employer’s and employee’s after-tax rate of return on income earned by investing
the deferred amount.”\textsuperscript{27}

III. NOLS, MTRs, and the Advantage of Deferral

MTRs change over time with changes in statutory rates and other factors. Some research on the sensitivity of compensation design to tax has exploited such
"longitudinal" variations in rates.\textsuperscript{28} The variation in MTRs among companies at a
given time, which is referred to as cross-sectional variation, is largely a function of
NOLs.\textsuperscript{29} This is particularly true in the U.S. today given the elimination under the
Tax Cuts and Jobs Act (TCJA) of graduation in the corporate income tax rate

\textsuperscript{23}See Walker, supra note 14. Equivalence depends on an assumption that the
employee would be able to invest in the same securities, employer stock or options
on employee stock or essentially equivalent securities, outside of the company’s
equity compensation plan. This may not be true for employees of non-public
companies.

\textsuperscript{24}See Halperin & Warren, supra note 20.

\textsuperscript{25}Id. at 317.

\textsuperscript{26}Id. at 324.

\textsuperscript{27}Id. at 328. This result follows directly from equation 1. If $t_{EE0} = t_{EEd}$ and $t_{ER0} = t_{ERd}$, then equation 1 reduces to $(1 + r_{ER})^d / (1 + r_{EE})^d > 1$ and deferred
compensation is preferred when an employer’s after-tax rate of return exceeds that
of an employee. Halperin and Warren suggest that “shifting” might be a better term
for counterparty deferral arrangements such as deferred compensation, but for the
fact that the term “deferral” has been used so extensively in the literature.

\textsuperscript{28}See infra Part V for a brief discussion.

\textsuperscript{29}Certainly there are other factors, particularly for multi-national companies. See infra Part III.D.1.
schedule.\textsuperscript{30} Most research on the relationship between taxation and compensation has attempted to exploit cross-sectional variation. This article addresses that literature, and this Part considers the relationship between employer NOLs, MTRs, and the tax advantage of deferred compensation. In order to highlight the particular characteristics of deferred compensation, and counterparty deferral more generally, I begin by analyzing the relationship between NOLs, MTRs, and the economics of pure deferral.

A. NOL Duration & MTRs

Suppose a company is in a loss position (i.e., has NOLs) and is considering entering into a transaction yielding either pure or counterparty deferral. We will assume for now that the company operates in a single jurisdiction. That company may be in an NOL position for a single year, for several years, or many years before its NOLs are consumed, if they ever are. Of course, the company may move back and forth between NOL years and years without NOLs, but for simplicity I will assume for now some number of years in an NOL position followed by consistent profitability, which is the pattern typically associated with start-up companies.\textsuperscript{31} The presence of NOLs reduces the company’s MTR for the year in which the decision is to be made.

Consider a company with a single year NOL. Incremental deductions or income items (that are insufficient to fully offset the NOL) have no impact on the company’s tax bill for that year, but that does not mean that the company faces a zero MTR. The company’s MTR depends on the duration of its NOLs. If the company has an NOL for a single year (year 1) and pays tax at the statutory rate (STR) in the following year (year 2), incremental deductions or income incurred in year 1 will affect the company’s tax bill in year 2. The year 1 impact in present value terms is simply the amount of the income or deduction, multiplied by the STR in year 2, discounted back to year 1.\textsuperscript{32} Suppose, for example, that a company incurs a $100 deduction in year 1 in which it has an NOL. That deduction increases the NOL by $100. In year 2 the company pays tax after deducting accumulated NOLs at the STR of, say 30%. The year 1 deduction reduces the company’s tax bill by $30 in year 2.

\footnotesize
\begin{itemize}
  \item The legislation colloquially known as the Tax Cuts and Jobs Act (TCJA) was enacted as Pub. L. No. 115-97, 131 Stat. 2054 (2017). See TCJA §13001 (applying a uniform tax rate of 21% to corporate taxable income).
  \item See Victor Fleischer, The Rational Exuberance of Structuring Venture Capital Start-ups, 57 Tax L. Rev. 137, 145-46 (2003) (explaining various features of the tax code that tend to result in start-up firms generating large tax losses in their early years); Gregg Polsky, Explaining Choice-of-Entity Decisions by Silicon Valley Start-Ups, 70 Hastings L.J. 409, 418 (2019) (explaining that Silicon Valley start-ups (unlike main street small businesses) are generally expected to generate large tax losses in their early years and to experience a relatively long period before reaching profitability).
  \item See Scholes & Wolfson, supra note 1, at 830.
\end{itemize}
Discounting this reduction back to year 1 at 7% yields a year 1 present value of $30 x .9346 = $28.04.  

Given that MTR is defined as the present value of additional taxes paid/saved on an additional dollar of income/deduction today, this equates to an MTR of $28.04/$100 = 28.04% (at a 7% after-tax discount rate). More generally, the MTR arising from an NOL is equal to the statutory rate in the year in which the income or deduction item first affects cash taxes discounted by the appropriate interest rate factor. The longer the NOL duration, the greater the discount, and the lower the year 1 MTR.  

Prior to the passage of the TCJA, U.S. federal tax NOLs could be carried forward for no more that 20 years. After that point, an unused NOL would expire. Effectively, the discount rate for NOLs with duration in excess of 20 years fell to zero. Under the TCJA there is no limit on the number of years that an NOL may be carried forward. If a company manages to remain in business while incurring 25 or 30 years of losses, those NOLs would be available in future years if the firm turned the corner.

One caveat. The MTRs faced by a company are not simply a factor of NOLs. STRs may change between the year of deferral and the year of reckoning. For simplicity, however, I will assume that STRs are consistent over time and that MTRs are only affected by NOLs.

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33 For simplicity, I have adopted default assumptions of a 30% statutory employer tax rate, a 10% pre-tax interest rate, and a 7% after-tax interest/discount rate. A 7% after-tax discount rate is consistent with these other assumptions in the absence of NOLs and in cases of relatively short NOL duration. As Professor John Graham notes, however, the relationship between after-tax discount rates and MTRs in the presence of NOLs is circular. John R. Graham, Debt and the Marginal Tax Rate, 41 J. Fin. Econ. 41, 47 (1996). The appropriate after-tax discount rate for greater NOL duration cases would be somewhat greater than 7% under these other assumptions. In some cases, results will also be reported under more conservative assumptions of a 20% STR and 5% pre-tax interest rate.

34 Formally, MTR = ($1 * \text{STR}_n)/(1 + r)^n$, where $r$ is the after-tax discount rate and $n$ the NOL duration. Scholes et al., supra note 1, at 158. The after-tax interest rate $r$ is equal to the pre-tax rate (i) multiplied by (1-STR).

35 IRC §172(b)(2017). The 20-year carryforward limit was adopted in 1997. Prior to 1997, NOLs could be carried forward no more than 5 years. See Lewis T. Barr, BNA Tax Management Portfolios: Net Operating Losses and Other Tax Attributes – Section 381, 382, 383, 384 and 269 (780-4th).

36 IRC §172(b)(2018). However, under the TCJA, NOLs may only be used to offset 80% of taxable income, which will tend to extend NOL durations. IRC §172(a).
B. Impact of NOL Duration on the Advantage of Pure Deferral

Consider the paradigm case of an opportunity to expense an amount that ordinarily would be capitalized. Suppose that a $100 deduction would have been allowed in ten years had the item been capitalized. At an STR of 30% and a 7% after-tax discount rate, the present value of that deduction would be $15.25.\textsuperscript{37} If there are no NOLs and the party's MTR equals the STR, expensing increases the present value of the deduction to $30, a $14.75 improvement, or 14.75% of the amount deducted. More generally, in the absence of NOLs, expensing increases the present value of the deduction by

$$\text{(2)} \quad (X \times \text{STR}) - (X \times \text{STR} \times \text{DF}),$$

where DF is the appropriate after-tax discount factor for the period preceding deduction following capitalization.\textsuperscript{38}

Now suppose that the taxpayer faces an NOL in year 1, but consumes all NOLS and returns to net profitability in year 2. The taxpayer will not be able to take advantage of expensing until the second year, reducing the present value of the expensing opportunity and the overall benefit of expensing or deferral, which now becomes

$$\text{(3)} \quad (X \times \text{STR} \times \text{DF}_1) - (X \times \text{STR} \times \text{DF}_{10}),$$

where DF\textsubscript{1} is the discount factor for a single year and DF\textsubscript{10} is the discount factor for the 10 year period prior to deduction following capitalization.\textsuperscript{39} At an STR of 30% and a 7% after-tax discount rate, the single year NOL would reduce the value of deferral from 14.75% of the amount expensed to 12.79%.\textsuperscript{40} The benefit of expensing continues to decline as NOL duration approaches the length of the deferral period. If NOL duration equals or exceeds the period of deferral, expensing no longer provides any economic benefit. To see this, suppose that a start-up company was in an NOL position for 12 years and began paying tax in year 13. That taxpayer would receive the benefit in the same year (year 13) of an amount expensed in year 1 or deducted following capitalization in year 10.

\textsuperscript{37}The discount factor is .5083.
\textsuperscript{38}See Theodore S. Sims, Income Taxation and Asset Valuation (II), The Value of Preferential Taxation, 71 Tax L. Rev. 53, 80 (2017) (presenting an equivalent equation for the benefit of deferral). The discount factor, of course, is equal to the reciprocal of $(1+i(1-\text{STR}))^d$, where $i$ is the pre-tax interest rate and $d$ the period of deferral. I will use the DF notation to simplify the exposition.
\textsuperscript{39}See id. at 80, note 76 (presenting a more general version of this equation).
\textsuperscript{40}A one-year NOL reduces the present value of expensing to $30 \times .9346 = 28.04\%$, which is 12.79 percentage points better than capitalization.
Several points are worth noting here. First, as exemplified in Figure 1 below, a single year NOL has a relatively modest impact on the benefit of expensing; but the benefit of expensing is quickly eroded with a more extended NOL duration. Second, while one might generally assume that expensing is valuable in any case in which a taxpayer faces a positive MTR, this is not necessarily the case if a taxpayer’s MTR is reduced as a result of NOLs. Consider, for example, a taxpayer that expects to be in an NOL position for 10 years. Assuming a 30% STR and 7% after-tax discount rate, the taxpayer’s MTR at the point of expensing would be about 15%. But an opportunity to expense an amount that otherwise would be capitalized and deducted ten or fewer years hence would provide no benefit to that taxpayer as its deduction would occur at the same point (year 11) under either scenario. By contrast, a taxpayer facing a consistent 15% statutory rate and no NOLs would benefit from expensing an item that would otherwise be deducted at any point in the future. 41 In other words, when it comes to the relationship between MTR and the advantage of expensing, the basis or source of the MTR matters.

![Impact of NOLs on Expensing Advantage](image)

C. Impact of NOL Duration on Deferred Compensation

The impact of NOLs on the joint economics of deferred compensation (and other examples of counterparty deferral) is more complex. Consider a typical NQDC arrangement in which an employee elects to defer a portion of her current compensation in exchange for her employer’s promise to deliver that compensation

41 The benefit of expensing at a 15% STR would be exactly 50% of the benefit at a 30% STR.
42 Assumptions: 30% STR; 10% pre-tax interest rate; 7% after-tax discount rate.
in the future plus some agreed return. In the case of cash compensation, of course, the employee would be taxed at the time of receipt and the employer would be entitled to an equivalent deduction. If all NQDC requirements are met, however, the employee in our hypothetical will be taxed on her entire receipt at payout and her employer would be entitled to an equivalent deduction at that time.43 In between deferral and payout the employer holds extra funds and invests them as it sees fit—in the business, in securities that form the basis for the return promised to the employee, or whatever it chooses.

The circumstances under which deferred compensation will be jointly tax advantaged relative to current compensation are described in Equation 1 above. Employer NOLs can impact the economics of deferred compensation in two separate, but non-mutually exclusive ways—by increasing the after-tax rates of return available to the employer and by reducing the after-tax value of employer deductions at the point of deferral relative to payout. I will begin with the latter.

1. The Deduction Deferral Effect

Because the employer’s baseline would be immediately deductible compensation and the alternative is deferred compensation deductible at payout,44 I will refer to the impact of employer NOLs on the relative value of this deduction as the deduction deferral effect.45 As before, I assume that an employer is in an NOL position at the time of deferral and consider the impact of NOL duration on the attractiveness of deferred compensation.46 For now, I also assume that the employer’s after-tax rate of return on deferred amounts is not affected by NOLs.47

43 See supra note 16.
44 To reiterate, I am assuming that all deferred compensation is deductible by employers at payout, if there is a payout. Options may expire out of the money, in which case there is no employee inclusion and no employer deduction. However, options have a positive expected payout. In exchange for and in the event of favorable employee taxation, incentive stock options (ISOs) do not provide an employer deduction at any time. As noted above, my focus is on the more common examples of deferred compensation in which there is symmetry between employee and employer taxation. I exclude ISOs from my analysis unless otherwise indicated. For a brief discussion of ISOs, see infra note 90.
45 Conceivably, a recipient of deferred compensation could be in an NOL position, but the focus of this article is on the impact of employer NOLs on deferred compensation economics and practices. Moreover, I would think it unusual for executives or other high level employees, whose incomes consists largely of compensation and investment returns, to be in an NOL position.
46 Note again that I am assuming some number of years in an NOL position followed by a number of years without an NOL, i.e., the start-up model.
47 I also assume that the compensation deduction (and in the next section, the return on deferred amounts) are sufficiently small relative to the employer’s other income
This assumption allows me to isolate the deduction deferral effect, and it is not a wholly unrealistic assumption in the context of NQDC/equity compensation arrangements in which the freed up funds may be invested in the employer's own stock or in corporate owned life insurance (COLI).48

As equation 1 indicates, all else equal, deferred compensation is more attractive relative to current compensation when the employer’s MTR is greater at payout than at the point of deferral. NOLs can, of course, affect the employer's effective tax rate at both points. All else equal, employer NOLs leading to a reduced MTR at the point of deferral favors NQDC/equity pay because the deduction for the alternative immediately includable compensation would be of lesser value. The impact increases monotonically with NOL duration until infinite NOLs render the employer effectively tax exempt. The longer the duration of NOLs and the lower the employer’s MTR at the point of deferral, and the greater the advantage of deferred compensation, all else equal.

But all else is not always equal, because a reduced MTR at the point of NQDC or equity payout reduces the employer’s tax benefit from that payout, which reduces the joint value of counterparty deferral. As a result, and as described in Figure 2 below, the overall relationship between NOL duration and the deduction deferral benefit of deferred compensation is not monotonic. As in the case of pure deferral, a single year NOL has only a modest (in this case, modestly positive) impact on the economics of deferred compensation. The deduction deferral benefit is greatest in cases in which NOL duration matches the period of deferral. In such a case, MTR at the point of deferral is significantly reduced, favoring deferral, but MTR at payout is unaffected. If NOL duration extends beyond the deferral period, MTR at payout is reduced, reducing the joint value of deferred compensation. Given the diminishing present value significance of cash flows far out in the future, the marginal impact of additional NOL years on the value of the deduction at payout (closer in time and larger) more than offsets the marginal impact on the value of the deduction at the point of deferral (further in time and smaller), and the combined deduction deferral benefit begins trending downward once NOL duration exceeds the deferral period. Ultimately, infinite NOLs would result in a zero MTR at the point of deferral and payout, and the timing of employer deductions, in isolation, would have no impact on the economics of deferred compensation.49

and deductions that the decision to pay current or deferred compensation does not affect whether the employer is in an NOL position in any year.

48 As discussed infra Part III.D.1, in cases in which an employer invests deferred amounts in its own stock or in COLI products, an employer may face no tax on investment returns irrespective of any NOL position.

49 Another way to see this is to first imagine that an employer has no NOLs, such that its MTR at grant and payout are equal to the STR, which is assumed to be consistent. In such a case, the right-hand side of equation 1 is unity and the deduction deferral effect is nonexistent. Next imagine that the employer has NOLs that reduce MTR at grant but not at payout. In this case, the right hand side of equation 1 is less than 1,
As portrayed in Figure 2 below, the potential impact of the deduction deferral effect is, unsurprisingly, a function of the deferral period. It is also a function of the employer’s statutory rate (here assumed to be 30%) and the pre-tax interest rate (here assumed to be 10%).

Figure 2

![Deduction Deferral Effect of NOLs](image)

The deduction deferral effect is quite sensitive to these assumptions. For example, assuming an employer STR of 20%, a pre-tax interest rate of 5%, and a 10-year deferral period, a 10-year NOL duration would result in an 8.1% improvement in deferred compensation economics arising from this channel, versus the 21% improvement associated with my default assumptions.

This graph reflects the improvement in deferred compensation economics given various NOL durations. Other assumptions are: 30% STR; 10% pre-tax interest rate; 7% after-tax discount rate. As demonstrated in the Appendix and following the methodology of Scholes & Wolfson, supra note 1, and Scholes et al, supra note 1, the improvement in joint economics associated with the deduction deferral effect is [(1 - STR * DFc)/(1 - STR * DFd)] - 1; where, for any given NOL duration, DFc is the discount factor for the number of years until a current deduction would first be useful and DFd is the discount factor for the number of years until a deferred deduction would first be useful.
2. The Rate of Return Effect

The second way that employer NOLs can affect the economics of deferred compensation is by increasing the after-tax rates of return available to the employer on the deferred funds during the period of deferral. Recall that deferred compensation is more advantageous when an employer can earn a greater after-tax rate of return on deferred sums than an employee could earn on her own. And employer NOLs increase an employer’s after-tax rates of return. The impact of NOLs on after-tax rates of return will be greatest when, absent NOLs, returns are taxed at the statutory rate. This will not always be the case, and exceptions are discussed in Section D below, but the examples provided in Figure 3 below assume a baseline STR of 30% on investment returns, as well as a pre-tax rate of return of 10%. As demonstrated, the improvement in deferred compensation economics arising from the rate of return effect increases monotonically with NOL duration. The impact of just a year or two of NOLs is quite small, even trivial, but a longer period of NOL years can result in a substantial increase in joint tax advantage, particularly for longer periods of deferral. An infinite stream of NOLs would render an employer effectively tax exempt with respect to investment returns on deferred funds.\textsuperscript{52}

\textsuperscript{52} Under my default assumptions, an infinite stream of NOLs would result in improvement in counterparty deferral economics of 31.9% for 10-year deferral, 14.8% for 5-year deferral, and 8.6% for 3-year deferral. For 10-year deferral, for example, under my assumptions, deferred funds would grow by $1.07^{10}$ in the absence of NOLs. With infinite NOLs, deferred funds would grow by $1.1^{10}$, a 32% improvement.
3. Combined NOL Effects

In cases in which both the deduction deferral effect and the rate of return effect apply, the effects combine to increase the attractiveness of deferred compensation. This would be the case, for example, for an NQDC plan sponsor that invested deferred funds in taxable bonds. The overall improvement in deferred compensation economics reaches a peak at the point at which NOL duration matches the period of deferral and continues steadily thereafter. An example of the separate and combined effects, based on 10 years of deferral, a 30% statutory employer tax rate, and a 10% pre-tax interest rate is presented in Figure 4 below.\textsuperscript{54}

\begin{itemize}
    \item Assumptions: 30% STR; 10% pre-tax interest rate; 7% after-tax interest rate. Calculation details are provided in the Appendix. As in the case of the deduction deferral effect, the impact of NOLs on the rate of return effect is quite sensitive to these assumptions. For example, assuming an employer STR of 20%, a pre-tax interest rate of 5%, and a 10 year deferral period, a 10 year NOL duration would result in less than a 2% improvement in deferred compensation economics arising from an increased after-tax rate of return, versus a 9% improvement associated with my default assumptions.
    \item Although the combined effects line in Figure 4 exhibits a slight bowing for NOL durations in excess of the deferral period, in actuality the combined benefit in this range is perfectly consistent and the bowing in the chart reflects the fact that in the presence of NOLs the after-tax discount rate is not exactly equal to the pre-tax rate multiplied by (1-STR). See supra note 33. To understand why the combined benefit of the two effects is unaffected by NOL duration that extends beyond the deferral period, imagine that an employer anticipating an NOL period that extends beyond a
\end{itemize}
Figure 4

Impact of NOLs on Counterparty Deferral Advantage
(10 Year Deferral; 30% STR; 10% Pre-Tax Int. Rate)

4. Sensitivity to Tax and Interest Rates

As noted above, the impact of NOLs on the joint tax advantage of deferred compensation is sensitive to statutory corporate tax rates and to pre-tax rates of return on deferred amounts. While a 30% STR and a 10% interest rate are convenient and perhaps reasonable assumptions over the long term, both tax and interest rates are lower than these levels today. To provide a sense of the sensitivity of joint tax advantage to these assumptions, Figure 5 below replicates the analysis presented in Figure 4, substituting a 20% STR and a 5% pre-tax rate of return. Under these assumptions, the maximum improvement in joint tax advantage deferral period sets aside and invests $1 that would otherwise be paid as current compensation. If paid currently, the deduction would yield an NOL of $1. Suppose after 10 years of investment the gross amount is paid to the employee, yielding a deduction of $1+r, where r is the pre-tax return over the 10 year period, and income over the period of r, for a net NOL of $1. In year 10, the compensation has produced an NOL of $1 under either scenario and the employer is indifferent. Whether that NOL is consumed in year 10, 11, 12 or later has no bearing on the attractiveness of deferred versus current compensation, which is solely determined by the improvement in the employee’s position. I thank Gregg Polsky for highlighting this alternative analytical approach.

55 The Tax Foundation puts the post-TCJA population weighted average combined U.S. state and federal statutory corporate tax rate at 25.7%. Kyle Pomerleau, The United States’ Corporate Income Tax Rate is Now More in Line with Those Levied by Other Major Nations (Feb. 12, 2018).
of deferred compensation is 1/3 as large in the combined effect scenario as under my default assumptions.

![Figure 5: Impact of NOLs on Counterparty Deferral Advantage](image)

**D. Implications for Deferred Compensation Arrangements (and Complications)**

This section considers the implications of the forgoing for NOL firms designing or negotiating compensation arrangements, as well as some further complications. I begin with some general observations and then consider issues specific to equity-based pay and to NQDC.

**1. In General**

The rate of return effect depicted in Figures 3 through 5 is based on an assumption that, absent NOLs, the employer pays tax at the statutory rate on the returns on the funds that are freed up between the points of deferral and payout. But in many cases employer after-tax rates of return on deferred funds are unaffected by NOLs. For example, deferred funds may be invested in the employer’s own stock through tender offers or open market purchases, in which case gains or losses on those holdings are not taxed per IRC §1032. To my knowledge, this gambit was first recognized by Professor Daniel Halperin. Daniel I. Halperin, *Interest in Disguise: Taxing the “Time Value of Money,”* 95 YALE L.J. 506, 540 (1986).
position would not affect the firm’s after-tax rate of return on the deferred funds as the tax has already been reduced to zero.\textsuperscript{57}

As another example of a situation in which employer rates of return are unaffected by NOLs, consider a deferred compensation plan sponsor that invests deferred funds in corporate owned life insurance (COLI).\textsuperscript{58} If operated in accordance with IRC §101(j), COLI death benefits (and hence deferred compensation returns) are untaxed and, again, the presence of NOLs would have no impact on employer after-tax rates of return.\textsuperscript{59}

In other cases, an employer’s pre-NOL MTR on deferred amounts will not be zero but will be less than the STR. Given the dividends received deduction, the pre-NOL MTR on dividends corporations receive from portfolio companies is already reduced by half.\textsuperscript{60} As a result, the impact of NOLs on an employer’s after tax return on dividends would be half that depicted in Figures 3 through 5.

Thus, one can readily imagine scenarios in which NOLs would affect the value of current and/or deferred deductions for compensation but not rates of return on deferred amounts (or affect the latter to a lesser degree). However, it is difficult to think of a scenario in which the opposite would be true – in which NOLs would affect after-tax rates of return but not the relative value of current and deferred deductions – at least within a single jurisdiction. So while isolating the rate of return effect may be helpful for exposition, it does not reflect a single-jurisdiction real world scenario. The single-jurisdiction real world scenarios likely are represented by the deduction deferral effect alone and the two effects combined.

It is possible, however, that a multinational company would face different tax regimes for compensation deductions and the income earned on deferred compensation. Presumably, compensation deductions would, in the first instance, be permitted in the jurisdiction in which an employee is based while taxation of

\textsuperscript{57} This is not to suggest that this and other investment decisions are exogenous. As described below, investment of deferred amounts in own company stock is more commonly associated with equity compensation programs than with NQDC. \textit{See infra} Parts III.D.2&3.

\textsuperscript{58} Surveys of NQDC plan sponsors suggest that COLI use is quite common in this context. \textit{See}, e.g., MULIN TBG, 2014 EXECUTIVE BENEFITS SURVEY, SUMMARY OF RESULTS 9 (2015) (54% of surveyed companies that reported informally funding NQDC obligations reported some use of COLI); NEWPORT GRP., \textit{supra} note 19, at 53 (73% of informal funders reported some use of COLI); \textit{see generally}, Walker, \textit{supra} note 16, at 2104-09.

\textsuperscript{59} \textit{See} Walker, \textit{supra} note 16, at 2105-07.

\textsuperscript{60} IRC §243 (allowing a deduction of 50% of dividends received from portfolio companies, i.e., companies in which a taxpayer owns less than 20% of the stock by vote and value). Under prior law, 70% of portfolio company dividends were deductible.
returns on deferred amounts would depend on where the money is invested. A multinational could have NOLs in either or both jurisdictions. In such a scenario, any of the three patterns depicted in Figures 4 or 5 represents a feasible outcome.

It is worth emphasizing that the impact of NOLs on the relative value of grant and payout-date employer deductions – the deduction deferral effect – is highly sensitive to the relationship between the period of deferral and NOL duration. In cases in which NOLs also affect employer rates of return, under-estimation of NOL duration would have no impact on the overall economics of deferred compensation, but in cases in which the economics turn solely on the deduction deferral effect, under-estimation of NOL duration could have a significant impact. Consider, for example, a company that anticipates being in an NOL position for 10 years and that sponsors NQDC with expected deferral of 10 years. Under the assumptions of a 30% STR and 10% pre-tax interest rate, if NOL duration actually extends to 15 years, the company will have overestimated the impact of NOLs on NQDC economics by 36% if NOLs do not affect the company’s rates of return on the investment of deferred funds.

To be sure, in none of the cases presented above does an employer NOL position at the point of deferral result in deferred compensation economics that are poorer than those pertaining in the absence of NOLs. In other words, NOLs may be more or less beneficial, but they always improve the economics of deferred compensation. The impact may be complex and unpredictable, but it is always positive. While these points are correct, they are in part artifacts of my setup. I have assumed a series of NOL years followed by profit years. Imagine instead a case in which an employer is in an NOL position at the time of deferral. A year or two later the employer returns to a profit position and deducts any NOLs. Prior to payout, however, the employer returns to an NOL position and remains there indefinitely. In this scenario, losses could well have a negative impact on the economics of deferred compensation, as the employer’s grant year MTR and rates of return would be only modestly affected by the grant year NOL, while its payout year MTR would be significantly diminished by the later string of NOL years. While this pattern of losses may be uncommon, it is clear that the conventional wisdom that being in a loss position in the year of a potential deferral makes deferred compensation more attractive economically is an over simplification. This claim is not necessarily true for companies that move in and out of loss positions.

Having highlighted these general points, I now turn to more detailed exploration of the impact of employer NOLs on equity-based pay and NQDC.

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61 This follows from the non-monotonic relationship between NOL duration and the improvement in deferred compensation economics arising from the deduction deferral effect.
62 See Figure 4. At a 20% STR and 5% pre-tax interest rate, the overestimation would be 21%. See Figure 5.
2. Equity-Based Compensation

The most important and noticeable change in equity-based pay over the past two decades has been the declining use of stock options and offsetting increased use of performance share awards.\(^6^3\) In 1990, options accounted for over 60% of the total ex ante value of compensation granted to the median S&P 500 senior executive. In 2013 options accounted for less than 20%, while performance awards accounted for over 30%.\(^6^4\) This transformation has had a significant impact on deferral periods. While options are typically exercisable for ten years, and typically exercised within five or six years, performance awards typically cover a three-year period.\(^6^5\) To the extent that performance share awards have displaced options, the deferral period associated with equity pay has been reduced by about half.

To be sure, start-ups remain somewhat more likely than mature public companies to issue options, and start-ups are more likely to be in an NOL position, but NOLs are by no means limited to start-ups.\(^6^6\) In any event, the equity-based pay in the typical modern executive pay packages does not involve extensive deferral, which limits the potential impact of NOLs on each of the elements that contribute to the economic benefit of counterparty deferral.

In addition, many companies that utilize equity-based pay regularly repurchase shares on the market to manage dilution.\(^6^7\) These buybacks can result in a zero tax rate on investment returns, with or without NOLs.\(^6^8\) In these cases, NOLs


\(^6^4\) Id. at 405-06. The adoption of performance shares and other performance-based pay instruments has been encouraged by the proxy advisors, principally Institutional Shareholder Services (ISS). INSTITUTIONAL SHAREHOLDER SERVICES, UNITED STATES PROXY VOTING GUIDELINES 40-49 (Dec. 6, 2018) (outlining problematic executive pay practices including pay insufficiently connected with company performance).

\(^6^5\) See supra note 13.

\(^6^6\) Recall the evidence, presented above, that 50% to 90% of Compustat firms have reported NOLs in recent years. Heitzman & Lester, supra note 2.

\(^6^7\) See, e.g., Richard Teitelbaum, Share Buybacks May Be Bad – Just Not for the Reasons You Think, INSTITUTIONAL INVESTOR (March 7, 2019) (reporting that share buybacks by S&P 500 companies reached a record $798 billion in 2018, accounting for more than 70% of the aggregate earnings of the companies in the index).

\(^6^8\) As noted above, companies are not taxed on gains or losses on treasury shares per IRC §1032. See supra text at note 56. In theory, repurchasing company shares eliminates taxation on equity compensation investment returns only if shares are repurchased at the time of an equity grant, not at payout. The key question under this approach is how freed up funds are invested between the point of deferral (grant) and payout. Moreover, there is evidence that stock buybacks are more closely associated with equity compensation payouts than with grants. See Ilona
impact the advantage of deferral only through the deduction deferral mechanism. Suppose, for example, that a stock grant vests in three years, that the statutory employer tax rate is 30%, that the pre-tax interest rate is 10%, and that the employer repurchases its own shares at the time of grant, eliminating the rate of return effect. The deduction deferral effect alone would improve the economics of this equity pay, but at most by about 8%, as shown in Figure 2 above. And even this large a gain would be achieved only if NOL duration happened to match the deferral period. A single year NOL would only improve the economics of the deferral by about 3% and, less obviously, but perhaps more importantly, a 10-year stretch of NOL years would result in an improvement of only about 4% in the benefit of deferral.

So should we expect companies to take NOLs into account in designing or negotiating equity pay arrangements? I assume that willingness to grapple with the complexity of NOLs with respect to compensation decisions will turn in part on the magnitude of the potential gain. In some cases, the potential gain may be significant; in other cases, less so.

For a company in the position described immediately above – making hedged grants of three-year stock awards – the impact of an NOL position at grant on the overall economics of the deal is small and uncertain. One would not be surprised to find such a firm falling back on the simple STR heuristic in making these decisions.

The impact of NOLs would be greater for a cash-poor start-up company that was considering issuing options and planned to use freed up funds in the business instead of buying back shares. Options often remain outstanding for five years, increasing the payoff to deferral somewhat, and absent hedging, both the deduction deferral and rate of return effects would be in play. At my default tax and interest rates, the potential payoffs as seen in Figure 6 below might be sufficient to induce the start-up to hire a consultant to do the math and help the firm think through the various scenarios. Query, however, whether the driving force would be adequate at current tax and interest rates.

Babenko, *Share Repurchases and Pay-Performance Sensitivity of Employee Compensation Contracts*, 66 J. Fin. 117, 118 (2009) (finding a positive relationship between share repurchase and stock option exercise); Alok Bhargava, *Executive Compensation, Share Repurchases and Investment Expenditures: Econometric Evidence from US Firms*, 40 Rev. Quant. Fin. Acct. 403, 405 (2013) (finding share repurchase to be associated with option exercise but not grant). Nonetheless, stock repurchase programs have become so large and popular in recent years that it seems reasonable to assume that a significant fraction of funds freed up through equity issuance in lieu of cash is going into company stock, thus largely eliminating taxation on investment returns associated with equity compensation.
3. NQDC

NQDC typically involves longer periods of deferral, relative to equity-based pay, which magnifies the potential impact of NOLs on the economics of deferral. This factor alone suggests that companies should more frequently take NOL positions into account in designing and negotiating NQDC arrangements.\(^69\)

As in the case of equity-based pay arrangements, some NQDC plan sponsors will manage their investments in such a way as to reduce or eliminate tax on investment returns, which, of course, limits or eliminates the impact of NOLs on these returns. The main ways that NQDC plan sponsors do so are by investing deferred funds in their own stock (relatively rare), investing in COLI products (quite common), and purchasing dividend paying stocks entitling them to the dividend received deduction (also common).\(^70\)

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\(^69\) Firms can, for example, encourage NQDC participation through expansion or augmentation of company matching programs. See Robert A. Miller, Nonqualified Deferred Compensation Plans, in EXECUTIVE COMPENSATION 211, 215-16 (Yale D. Tauber & Donald R. Levy eds., 2002).

\(^70\) Most NQDC plans allow participants to select investment choices that determine their promised payouts and many NQDC plan sponsors hedge the notional holdings in participant accounts by purchasing identical securities with deferred amounts. Companies do this primarily for accounting reasons; not for tax. As a result, plan sponsors would tend to hold own company stock when participants have selected to “invest” in company stock (rare) or other stocks or bonds that make up participant notional investment portfolios (more common). COLI can be used as a tax efficient
However, the use of these strategies is unlikely to be random. For example, COLI products are typically purchased specifically to minimize tax burdens associated with plan sponsors’ NQDC investment portfolios. A firm that is in an NOL position, and expects to remain so for some time, would be unlikely to purchase a COLI product to manage its investments. It could manage those investments and its hedging activities through much cheaper, nominally taxable accounts.\textsuperscript{71}

It is also true that while the NOL impact on longer-term deferrals is greater, the firm’s NOL position will probably be less predictable over that period. Nonetheless, the prize is potentially substantial. Assuming that both the deduction deferral effect and rate of return effect are in play, in the case of my stylized example of 10 year deferral at a 30% STR and a 10% pre-tax interest rate, NOLs could increase the joint value of NQDC by over 30% if NOL duration matches or exceeds the deferral period. To be sure, the NOL boost falls to about 10% under more conservative (20% STR; 5% pre-tax interest rate) assumptions, but one could still imagine companies taking these sorts of improvements into account in deferred compensation planning, despite the attractiveness of the simple STR heuristic.

4. Other Factors Influencing the Attractiveness of Deferred Compensation at Loss Firms

In some cases the complexity and unpredictability of the impact of losses on the economics of deferred compensation may cause these arrangements to be somewhat less attractive for loss companies than might be envisioned at first blush. This is not to suggest, however, that uncertain economic benefits are the only obstacles to loss companies embracing these arrangements. One can think of at least two additional factors that might discourage loss firms and their employees from taking advantage of the opportunity to minimize their joint tax obligations through deferred compensation.

One factor is risk of nonpayment. Some loss firms may be financially solid start-ups that have not yet turned the tide to net profitability. Other loss firms may be on a shakier footing financially. Employees of the latter may be loath to accept the promise of an equity-based payout in three to five years in lieu of current cash or to voluntarily defer current compensation in exchange for an unsecured promise to deliver funds in the future.

\textsuperscript{71} COLI products tend to be relatively expensive. The insurance companies that market these products extract a portion of the buyer’s tax savings. Where there is little or no tax to be saved, it makes little sense to purchase COLI. \textit{Id.} at 2106-07.
A second reason that loss firms might fail to fully exploit deferred compensation opportunities might be an excessive focus on financial accounting relative to after-tax cash flows. NOLs that a company expects to fully deduct in the future have no impact on book deductions for deferred compensation.\textsuperscript{72} Prior to the passage of the TCJA, NOLs expired after 20 years, and it would not have been reasonable to assume full deductibility of NOLs in all cases.\textsuperscript{73} In these cases, companies were required to make valuation adjustments for their deferred tax assets, which would have had some impact on book deductions for deferred compensation in the presence of NOLs.\textsuperscript{74} Nonetheless, a company that focused solely or excessively on GAAP earnings would tend to ignore NOLs or discount their impact significantly in evaluating the attractiveness of deferred compensation.

Focusing on GAAP earnings instead of after-tax cash flows in making incremental decisions is inconsistent with basic corporate finance theory, but it is apparently quite common. In a recent survey of corporate tax executives by Graham, Hanlon, Shevlin, and Shroff, 44.8% of respondents reported that they relied primarily on statutory tax rates in making compensation decisions, while only 10.6% reported relying chiefly on marginal tax rates.\textsuperscript{75} Of course, marginal tax rates should be used in making incremental decisions, such as decisions regarding compensation mix, and the authors suggest that in some cases reliance on statutory rates may be a simplifying heuristic given the difficulty of determining marginal rates under complex circumstances. But GAAP earnings are based on statutory rates, so another possibility is that these firms focus primarily on maximizing GAAP earnings rather than maximizing after-tax cash flows.

\textbf{IV. Empirical Research on the Role of Taxation in Compensation Design}

There is a large finance and accounting literature that investigates the relationship between company tax status and the use of equity and other deferred compensation. This literature has come in two waves. The first wave followed the explosion in stock option use in the 1990s as researchers sought to determine the extent to which companies respond to taxes in deciding whether to use equity pay and how to design that pay. A second wave followed the 2008 financial crisis and was focused primarily on the relationship between deferred compensation held by executives and risk taking incentives, but many studies included controls for company tax status. This Part considers what these studies tell us about the impact


\textsuperscript{73} \textit{See, e.g.,} Polsky, supra note 31, at 419 (noting that the time to profitability for start-ups is “expected to be long, often much longer than [the] investment horizon of investors”).

\textsuperscript{74} Presumably, NOLs will not result in valuation adjustments going forward, since NOL carryforwards no longer expire.

\textsuperscript{75} Graham et al, \textit{supra} note 6, at 3141.
of NOLs and MTRs on deferred compensation use as well as the prospects for identifying that impact through existing and improved empirical methods.\textsuperscript{76}

A. Do Researchers Understand the Tax Implications of Deferred Compensation?

As a starting point, it is worth asking whether accounting and finance researchers fully understand the tax implications of these complex deferred compensation arrangements. In this case, I believe the answer is “yes and no” or “yes to a limited extent.” As Professors Shackelford and Shevlin suggest, “an appreciation of the nuances of the tax law stands as a substantial barrier for entry for many accounting researchers.”\textsuperscript{77}

Scholes and Wolfson promulgated a framework of analysis for the role of tax in corporate finance decisions in their 1992 textbook, “Taxation and Business Strategy.”\textsuperscript{78} Their “all parties, all taxes, and all costs” framework is basically self-explanatory; it requires researchers to identify and understand each of the parties, taxes, and costs involved in financing decisions. Scholes and Wolfson clearly laid out the “all parties, all taxes” economics of deferred compensation relative to current compensation in their 1992 book, and the analysis has been included in later editions, as well.\textsuperscript{79} Most published research in this area embraces that framework.

That is to say that researchers investigating cross-sectional variation in the use of equity or other deferred compensation recognize that variations in corporate tax rates may be an explanatory factor.\textsuperscript{80} While some researchers seem to recognize that employer tax rates can affect the rate of return on deferred funds,\textsuperscript{81} most appear to focus on Scholes and Wolfson’s observation that deferred compensation

\textsuperscript{76} Note that this Part is not intended to provide an exhaustive survey of the finance and accounting literature on the role of taxation in deferred compensation. For such a review, see, e.g., Douglas A. Shackelford & Terry Shevlin, \textit{Empirical Tax Research in Accounting}, 31 J. ACCT. & ECON. 321 (2001).

\textsuperscript{77} \textit{Id.} at 324.

\textsuperscript{78} \textbf{MYRON S. SCHOLE & MARK A. WOLFSON, TAXES AND BUSINESS STRATEGY: A PLANNING APPROACH} (1\textsuperscript{st} ed., 1992).

\textsuperscript{79} \textit{See, e.g., SCHOLE \textsc{et al.}, supra note 1.}

\textsuperscript{80} Consistent with the “all parties” framework, researchers also recognize that employee tax rates affect the economics of deferred compensation. Longitudinal studies take employee tax rates into account but cross-sectional variations in employee rates are unobservable and are not considered in analyses of this nature. Moreover, it is probably reasonable to assume that most executives pay tax on equity and deferred compensation at the highest marginal rates. Longitudinal analysis of deferred compensation practices is briefly considered \textit{infra} Part V.

tends to be advantaged when the employer’s tax rate is expected to be higher at payout than at the time of deferral.\textsuperscript{82} To some extent, this is a “no harm, no foul” type situation, because, as we have seen, NOLs at the time of deferral tend to improve employer after-tax rates of return on deferred funds as well as the relative value of their deduction for deferred compensation. On the other hand, I see no recognition in this literature that the implications of NOLs on deferred compensation economics depends in any way on how employers handle deferred amounts, e.g., hedging equity grants or investing in COLI products to manage NQDC accounts.

B. Proxies for Employer Tax Status

Because employer marginal tax rates are not directly observable, researchers employ various proxies for those rates. One of the simplest and most commonly used proxies is an indicator or “dummy” variable reflecting the existence, or not, of an NOL for a given company in a given year. The existence of an NOL is associated with a low MTR; while the absence is associated with a high MTR. Companies report NOL positions in their financial statements and these disclosed NOLs are reported in the Compustat database.\textsuperscript{83}

Some researchers, following the suggestion of Professor George Plesko, add some nuance to this approach by adopting a binary dummy variable. Under Plesko’s approach, a firm is designated as having a low MTR in a year if, in each of the preceding three years, it reports an NOL and negative taxable income. A firm is designated as having a high MTR if it has no NOLs and positive taxable income in each of the three preceding years. In other cases, a company is considered to have neither a high nor a low MTR.\textsuperscript{84}

A more sophisticated approach is to create a simulation that forecasts a firm’s future taxable income and factors NOLs into predicted taxes and marginal tax rates. Some researchers have employed simulations to estimate current year MTRs, while a still more sophisticated approach, adopted by few, is to estimate MTRs both for the current year, the year of the possible deferral, and the year of payout.\textsuperscript{85}

\textsuperscript{83} Not without error. See Shackelford & Shevlin, supra note 76, at 366; Heitzman & Lester, supra note 2.
\textsuperscript{84} George A. Plesko, \textit{An Evaluation of Alternative Measures of Corporate Tax Rates}, 35 J. ACCT. & ECON. 201 (2003). Plesko finds that this binary variable is closely correlated with more sophisticated estimations of MTR, but Shackelford and Shevlin criticize this approach. Shackelford & Shevlin, supra note 76.
Shackelford and Shevlin argue that as a general matter simulated MTRs should be preferred to the use of NOL dummy variables, including Plesko’s binary NOL/taxable income dummies. The existence of an NOL seems a particularly poor proxy for the attractiveness of deferred compensation, which depends on the employer’s MTR at grant and at payout, and which can bear a non-monotonic relationship to NOL duration. Presumably, the idea behind classifying firms with three years of NOLs and three years of negative taxable income as low MTR firms is to identify firms with particularly low current year MTRs. This might be a sensible approach for cases in which the relationship between MTR and cost or benefit is monotonic, but, as we have seen, if a firm’s MTRs do not impact its after tax rate of return on deferred funds, the tax advantage of deferred compensation begins to decline if NOL duration exceeds the deferral period.

To my knowledge researchers investigating the impact of taxes on deferred compensation have not employed either NOL duration or dummy variables for the existence of NOLs at the time of payout as alternatives or supplements to current year/grant date dummies. To be sure, payout date data reflect ex post observations and questions might arise regarding endogeneity, but this would still seem to represent an improvement over the use of current year NOL dummies alone. Of course, the use of an NOL duration or NOL payout dummy would require researchers to estimate the period of deferral.

In any event, given the complex relationship between the tax advantage of deferred compensation and NOL duration/grant date MTR, the use of simulations to estimate grant date and payout MTRs would seem to be particularly valuable. Presumably, simulations could also be used to estimate employer after-tax rates of return on various investments, estimates that reflect a firm’s NOL position in the year of grant.

C. Specific Tax Proxies and Results of Empirical Investigations into the Role of Taxation in Compensation Design

1. Equity Compensation Studies

While some of the earliest analyses of the determinants of equity compensation used employer NOL dummies, later studies utilized MTR simulations. Neither approach, however, has resulted in consistent findings of statistically significant associations between employer MTR and reliance upon or design of equity pay.

(estimating stock option exercise dates and company MTRs at the time of estimated exercise).

86 Shackelford & Shevlin, supra note 76, at 367.
As examples of the former approach, Professor David Yermack used a simple NOL dummy variable as a proxy for employer tax status in his 1995 analysis of the determinants of CEO stock option awards, and he failed to find a statistically significant relationship.\(^{87}\) In their 2001 analysis of the determinants of options granted to non-executives, Professors John Core and Wayne Guay used the Plesko dummies, combining multi-year NOLs and negative taxable income into proxies for low and high MTR. They found that high MTR companies were less likely to make use of options, but the relationship between low MTR firms and option use was not statistically significant.\(^{88}\) Core and Guay’s 2001 study is also an example of the use of simulations to estimate MTRs. Core and Guay reported that they repeated their analysis using Professor Graham’s simulated MTRs, and found similar results.\(^{89}\)

Unfortunately, many of the equity compensation studies are complicated by the fact that companies can issue either or both of two types of options – non-qualified options (NQOs), which result in the kind of counterparty deferral that is the focus of this article, and incentive stock options (ISOs), which provide preferential tax treatment to employee-recipients but at the cost of employer deductions.\(^{90}\) Employers receive no deduction at any time with respect to ISOs that qualify for favorable employee tax treatment.\(^{91}\) For example, Professors Bryan, Hwang, and Lilien also employed Graham’s simulation in their 2000 study of the determinants of CEO equity-based pay.\(^{92}\) While they found that high MTR companies were less likely to use options (as predicted),\(^{93}\) it was unclear if this result was driven by the complete loss of deductions associated with ISOs. They found no statistically significant relationship between employer MTR and grants of restricted stock, which provides a more straightforward test of the impact of NOLs on deferred compensation.\(^{94}\)

Similarly, Professors Austin, Gaver, and Gaver used a simulation procedure developed by Professor Terry Shevlin in analyzing company decisions to grant ISOs

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\(^{88}\) Core & Guay, *supra* note 82, at 275.

\(^{89}\) Id.

\(^{90}\) IRC §422 specifies the conditions for ISO treatment. If the requirements of IRC §422 are met, including post-exercise stock holding requirements, employees exercising ISOs are not taxed until they sell the underlying shares and at that time they are taxed at the capital gains rate on their entire gain, rather than at the ordinary income rate. IRC §421(a).

\(^{91}\) IRC §421(a).


\(^{93}\) Id. at 663.

\(^{94}\) Id. at 686.
or NQOs. Austin, Gaver, and Gaver used the simulation to estimate the exercise date of the options and the MTR at that time. What they found, however, was that firms tended to issue ISOs despite a combined tax disadvantage. Summing up the evidence regarding company choices between ISOs and NQOs, Shackelford and Shevlin concluded, “if we were forced to make a judgment on the current state of knowledge, we would interpret the evidence as consistent with taxes not being an important determinant.”

As this small sample of studies suggests, some researchers investigating the determinants and design of equity pay have employed MTR simulations as suggested in the literature. Despite this, results have been mixed. It does not appear that cross-sectional variation in MTR is a large factor in equity pay use or design. There could be several reasons for this. The ISO/NQSO decision might be driven by executive preferences dominating corporate costs or, relatedly, a desire to camouflage compensation. As I’ve suggested above, however, it may be the case that MTR variations simply are not that significant in the context of relatively short-term equity pay arrangements, particularly hedged grants of equity. Of course, it could also be the case that proxies for and simulations of corporate MTRs have not been up to the task.

2. Nonqualified Deferred Compensation/Inside Debt Studies

A number of studies of non-equity deferred compensation were published in the wake of the 2007-2008 financial crisis. The idea behind most of these studies is that non-qualified deferred compensation represents “inside debt” in the company that might help align executive incentives with those of debt-holders and act as a check on the sort of risk taking incentives that shareholders might prefer and that would be incentivized by stock options. As in the case of equity-pay studies, researchers in this area generally understand that employer MTR could help explain cross-sectional variation in the use of inside debt. Indeed, the tax analysis is essentially the same as in the earlier wave of equity pay studies. Researchers working in this area have employed NOL proxies and have not employed simulated MTRs in these studies. Perhaps unsurprisingly, these studies have not found statistically significant relationships between tax status and the prevalence of deferred compensation.

\[95\] Austin et al, supra note 85, at 2.
\[96\] Id. at 3.
\[97\] Shackelford & Shevlin, supra note 76, at 331.
\[98\] Although employers generally sacrifice their deduction for compensation conferred through ISOs, employees generally benefit from ISO tax treatment if the shares increase in value and the capital gains rate is less than the rate on ordinary income. Scholes et al, supra note 1, at 193. This benefit is likely to be overlooked by outside observers in assessing overall compensation.
For example, Professors Sundaram and Yermack used an NOL dummy as a proxy for tax status in their 2007 analysis of the determinants of CEO non-qualified executive pension levels. The NOL dummy was not statistically significant in any of their regressions and even carried an inconsistent sign.\textsuperscript{99} Professor Cen similarly employed an NOL dummy in his 2011 study of the determinants of CEO inside debt, a variable that generally was not statistically significant.\textsuperscript{100} In a 2010 paper, Professor Gerakos investigated the tradeoff that is made between CEO pay and non-qualified pension benefits.\textsuperscript{101} He recognized that low MTR firms should be more likely to favor deferred compensation but he found that companies providing pensions are significantly less likely to have NOLs for the three prior years.\textsuperscript{102} In a 2012 paper, Professors Alces and Galle investigated cross-sectional variation in the fraction of compensation that takes the form of inside debt.\textsuperscript{103} They included lags of firm tax status in their regressions, again using NOLs as proxies for low MTRs. They explained that they did not expect to find a statistically significant association since the bulk of compensation consists of equity and inside debt, both of which represent deferred compensation, the benefit of which may increase with reduced employer MTRs.\textsuperscript{104} And, indeed, they did not find the tax proxy to be a significant control variable.\textsuperscript{105} Like the other studies noted here, however, they did not employ simulated MTRs.

D. The Empirical Road Ahead

It is disappointing that the inside debt studies employed only low power NOL dummy variables in testing whether employer tax status helps explain cross-sectional variation in the use of deferred compensation. It is difficult to know from these studies whether companies ignore or disregard their particular tax positions in making deferred compensation decisions or whether researchers just aren’t picking it up. It is particularly disappointing because, as I’ve argued above, the

\begin{thebibliography}{99}
\bibitem{100} Wei Cen, \textit{The Determinants of CEO Inside Debt and its Components} 48-51 (working paper, 2011).
\bibitem{102} \textit{Id.} at 316.
\bibitem{104} \textit{Id.} at 96-97. While Alces and Galle are right that employer tax status could affect the use of equity pay as well as of non-equity deferred compensation, I would expect the impact of low employer MTRs to be greater for non-equity deferred compensation given its generally longer time frame and the greater likelihood that equity grants would be hedged.
\bibitem{105} \textit{Id.}
\end{thebibliography}
potential impact of employer tax status is likely to be greater for non-equity deferred compensation than for equity pay given the differences in typical deferral periods and likely hedging patterns. But that is by no means a slam-dunk. As suggested above, firms with large NOL positions may be on shakier financial footing than other firms causing employees to think twice about entering into lengthy unsecured deferred compensation arrangements. It is difficult to predict the relationship, but it is also worth more rigorous investigation.

Ideally, researchers investigating the role of employer tax status in deferred compensation arrangements would simulate employer MTRs at the time of deferral and at the time of payout, as estimates of both are needed to determine the deduction deferral effect. A composite of the two could be used to determine the rate of return effect. Apparently, estimation of MTR at payout has only rarely been attempted in the literature thus far. Of course, doing so would require an estimation of the period of deferral. In the case of restricted stock or performance shares with fixed terms, this would be straightforward. In the case of option plans, one would need to estimate years to exercise. And in the case of NQDC, one would need to estimate years to payout, which is somewhat more difficult but not unmanageable.

So is this the ideal solution – just use simulated MTRs? Actually, a number of concerns would remain. First, two sets of researchers have developed simulations of corporate MTRs employing differing starting points and taking onto account various factors, including not just NOLs but also the AMT, etc., and the results vary – not by a little – but by a lot. The following figure plots estimates of MTRs for the Execucomp group of companies for 2012 derived from simulations designed by John Graham (on the Y axis) against estimates derived by simulations of Professors Jennifer Blouin, John Core, and Wayne Guay.

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106 Supra Parts III.D.2&3.
107 Supra Part III.D.4.
108 See, e.g., Austin et al, supra note 85 (investigating the role of taxes in selecting between ISOs and NQSOs and using Shevlin’s procedure to estimate firm MTRs at the time of estimated option exercise).
109 The Compustat Execucomp database provides the ages of the “top five” executives of S&P 1500 companies. For this population, estimating years until retirement would be feasible and would seem to provide a reasonable estimate of deferral period.
110 Professor John Graham provides simulated MTRs on his website: [https://faculty.fuqua.duke.edu/~jgraham/](https://faculty.fuqua.duke.edu/~jgraham/). His estimation approach is described in John R. Graham, Debt and the Marginal Tax Rate, J. FIN. ECON. 41 (1996). MTRs derived through simulations by Professors Jennifer Blouin, John Core, and Wayne Guay are available in Compustat. The Blouin, Core, and Guay approach is described in Jennifer Blouin et al., Have the Tax Benefits of Debt Been Overestimated?, 98 J. FIN. ECON. 195 (2010). Graham’s simulation begins with Compustat reported NOLs, while the Blouin, Core and Guay simulation starts with historical estimates of taxable income. See Heitzman & Lester, supra note 2, at 9.
Jennifer Blouin, John Core, and Wayne Guay (on the X axis). The correlation coefficient is only 0.28, but visual inspection alone suggests that these estimations are far from consistent.\textsuperscript{111}

![Figure 7](image)

A second concern is that the data that is used to drive these simulations may not be very good. It has long been understood that Compustat’s NOL data is less than perfect, but in a recent paper, Professors Shane Heitzman and Rebecca Lester report that Compustat’s NOL data failed to pick up one-quarter of firms with NOLs identified through hand-collection of financial statement data. Using their hand-collected data, they found that NOL benefits were positively, and statistically significantly, associated with the marginal use of equity funding.\textsuperscript{112} All of which at least raises the question whether poor MTR proxies or estimates have stymied the search for evidence that employer MTRs affect deferred compensation arrangements.

Third, and finally, what are we to make of the survey evidence provided by John Graham and his colleagues in which only 10.6\% of tax managers reported that their firms used MTRs in making compensation decisions, versus almost 45\% that

\textsuperscript{111} Author’s calculation. Note that these estimated MTRs represent MTRs after deductions for interest, which are generally thought to be the appropriate rates to use for incremental decisions regarding, e.g., the structure of executive pay packages. Graham and Blouin, Core, and Guay also simulate pre-interest deduction MTRs. The correlation between the two for the 2012 Execucomp population of firms is somewhat better at 0.58. Author’s calculation.

\textsuperscript{112} Heitzman & Lester, supra note 2.
reported using either U.S. or jurisdiction-specific STRs?\textsuperscript{113} Does this data confirm the notion that the complexity, non-monotonicity, and, in some situations, limited impact of NOLS on equity and deferred compensation discourage firms from even making the effort to incorporate NOLS into their compensation decision-making and suggest that looking for relationships between MTRs and the use of equity and deferred compensation is futile? Perhaps, but this is survey data, and one can never be sure how respondents interpreted the questions. As the authors’ note, respondents at firms that base decisions on the STR but take into account NOLS might have selected the STR option in responding to the survey.\textsuperscript{114} However, for those anticipating highly rational, firm-specific cost/benefit based compensation decisions, this data must be discouraging.

V. Longitudinal Effects

Thus far this article has focused on cross-sectional variations in employer MTRs and deferred compensation. But statutory tax rates change from time to time, as the U.S. has recently experienced in unprecedented fashion. By cutting the corporate tax rate to 21% while leaving individual rates essentially unchanged, the TCJA increased the attractiveness of equity and other deferred compensation, at least for some companies and employees. It did so by boosting employer after-tax returns on some deferred funds relative to the after-tax returns that employees can achieve on their own. All else equal, the rate cut should result in increased use of deferred compensation and increased periods of deferral. Is this likely to happen?

There is some evidence that tax rate changes have led to differences in deferred compensation use over time – longitudinal differences – as compared to the cross-sectional differences that researchers have focused on in the studies discussed above. For example, Professors Hite and Long found evidence of a switch in emphasis from tax-qualified to non-tax-qualified options in the wake of reductions in individual tax rates in 1969 that caused non-qualified options to be relatively more attractive.\textsuperscript{115} And there are reasons to think that companies would be more likely to respond to secular changes in statutory tax rates than to firm-specific variations. For one thing, almost half of tax managers report relying on STRs in making compensation decisions.\textsuperscript{116} For another, companies appear to exhibit herd behavior in designing compensation policies. If some firms were to return to longer duration stock options in lieu of shorter term performance share plans, for instance, it is conceivable that other would follow and a trend would be set.

\textsuperscript{113} Graham et al, supra note 6.
\textsuperscript{114} Id.
\textsuperscript{115} Gailen L. Hite & Michael S. Long, Taxes and Executive Stock Options, 4 J. ACCT. & ECON. 3 (1982).
\textsuperscript{116} Graham et al, supra note 6.
But there are also reasons for skepticism. The reduction in the corporate rate, if lasting, impacts only rates of return. In the absence of NOLs, there is no deduction deferral effect if the new corporate rate remains consistent going forward. Interest rates are low to begin with, and in many cases the rate cuts will not affect employer after-tax returns on deferred sums because employers have hedged equity grants or have purchased COLI products to manage nonqualified deferred compensation balances.\footnote{See supra Part III.D.} To be sure, if companies predict that the rate cut will be short lived and that corporate rates are likely to increase substantially prior to a deferred compensation payout, the deduction deferral effect would improve the expected payoffs from deferred compensation. It is, as they say, an empirical question.

**VI. Conclusion**

In this article, I have attempted to advance understanding of the impact of employer NOLs and MTRs on the benefits of deferred compensation by bifurcating and unpacking two effects that I’ve termed the deduction deferral effect and the rate of return effect. I have shown that these two effects may work in tandem to boost the attractiveness of deferred compensation when an employer is in a large NOL position, but they may not. In some cases, employers deploy deferred funds in such a way that after-tax rates of return are unaffected by NOLs. For multinationals, the taxation of the two effects may even occur in different jurisdictions. I have also shown that the relationship between NOL duration and the relative value of employer deductions at payout and grant – the deduction deferral effect – is non-monotonic, with the benefit peaking when the period of deferral matches NOL duration and quickly declining thereafter.

In sum, the relationship between employer NOLs and the attractiveness of deferred compensation is complex and in some cases the payoffs may be limited or non-existent. Turning to the empirical literature, which is only sampled in this article, there is little evidence that cross-sectional variation in the use of equity and non-equity deferred compensation is driven by employer NOLs. Moreover, four times as many tax managers report using STRs in their decision making regarding compensation as report using MTRs.\footnote{Graham et al, supra note 6.} Employing an STR heuristic and essentially ignoring NOLs in compensation decision-making could be a rational response given the complexity and, at times, limited payoffs that have been described.

Or, perhaps, researchers are failing to find statistically significant relationships between employer tax status and the use of deferred compensation because of the weakness or misuse of NOL proxies or MTR estimations. NOL dummy variable proxies are unlikely to be up to this complex task and simulated MTR estimations suffer from poor input data. The latter problem can likely be fixed, but researchers also need to understand the importance of including estimates of

\footnote{See supra Part III.D.}
\footnote{Graham et al, supra note 6.}
employer MTRs at payout as well as at grant in their analyses in order to fully capture the economics of deferred compensation.

As a final point, I should emphasize that while I have focused on deferred compensation in this article, the analysis is generalizable to counterparty deferral more broadly. Outside of the deferred compensation universe, it may be more common to find cases in which the deferral is in an NOL position, in which case deferral party NOLs would make deferral less attractive, not more attractive, and the deduction deferral effect and rate of return effect could be in tension rather than working in tandem. Almost certainly, context-specific factors will impact the deduction deferral and/or rate of return effects, much as employer hedging can negate the rate of return effect in the deferred compensation context. Researchers will need to be sensitive to these context-specific factors.
Appendix

Deduction Deferral Effect

Approach is to hold employer (ER) whole after tax and measure improvement in employee's (EE) after-tax position. In the absence of NOLs, ER is indifferent between paying current compensation of 1 and setting aside deferred compensation of \((1 - \text{STR})\), where STR is the ER's statutory tax rate. Between the points of deferral and payout after \(d\) years, deferred funds grow by \((1 + i(1 - \text{STR}))^d\). At deferred compensation payout, ER deducts the payment that it can then gross up by \(1/(1 - \text{STR})\) and EE pays tax at her ordinary income rate, leaving EE after tax:

\[
(1) \quad [(1 - \text{STR}) * (1 + i(1 - \text{STR}))^d / (1 - \text{STR})] * (1 - \text{t}_{\text{EE}})
\]

Assuming that ER NOLs have no affect on investment rates of return, introducing NOLs results in the following modifications to (1):

\[
(2) \quad [(1 - \text{STR} * \text{DF}_C) * (1 + i(1 - \text{STR}))^d / (1 - \text{STR} * \text{DF}_D)] * (1 - \text{t}_{\text{EE}})
\]

where, for any given NOL duration, \(\text{DF}_C\) is the discount factor for the number of years until a current deduction would first be useful and \(\text{DF}_D\) is the discount factor for the number of years until a deferred deduction would first be useful. For example, for 10 year deferral and a 5 year expected NOL period, \(\text{DF}_C\) would be the appropriate discount factor for 5 years and \(\text{DF}_D\) would be 1; for 10 year deferral and a 15 year expected NOL period, \(\text{DF}_C\) would be the appropriate discount factor for 15 years and \(\text{DF}_D\) would be the appropriate factor for 5 years.

The impact of NOLs on the joint economics of deferred compensation as a result of the deduction deferral effect is \(((2) - (1))/(1)\), which simplifies to

\[
(3) \quad [(1 - \text{STR} * \text{DF}_C)/(1 - \text{STR} * \text{DF}_D)] - 1.
\]

Example: \(\text{STR} = \text{t}_{\text{EE}} = .3; \ i = 0.1; \ d = 10\) years. After 10 years, EE receives after tax deferred compensation times:

Baseline (no NOLS): \([(1-.3)*(1+.1(1-.3))^{10}/(1-.3)]*(1-.3) = 1.377\)
5 year NOL: \([(1-.3*.713)*(1+.1(1-.3))^{10}/(1-.3)]*(1-.3) = 1.546 (12.3% more)\)
15 year NOL: \([(1-.3*.3624)*(1+.1(1-.3))^{10}/(1-.3*.713)]*(1-.3) = 1.561 (13.4% more)\)
Rate of Return Effect

Absent NOLs, deferred funds at payout \((d)\) grow by:

\[
(4) \quad (1 + i(1 - STR))^d
\]

For NOL duration \((n)\) < deferral period \((d)\), value at end of deferral period is:

\[
(5) \quad (((1+i)^n)\times(1+i(1-STR)))-(((1+i)^n)-1)*STR\times (1+i*(1-STR)^{d-n})
\]

For NOL duration \((n)\) > or = deferral period \((d)\), value at end of deferral period is:

\[
(6) \quad (1+i)^d - ((1+i)^d-1)*STR*DF
\]

where DF is the appropriate discount factor for \(n-d+1\) years.

The impact of NOLs on the joint economics of deferred compensation as a result of the rate of return effect is \(((5)\ or\ (6) - (4))/(4)\).

Example: \(STR = t_{EE} = .3; i = 0.1; d = 10\) years. After 10 years, deferred amount is increased after tax by:

Baseline (no NOLS): \((1+.1(1-.3))^10 = 1.967\)

5 year NOL: \(((1+.1)^5)\times(1+.1(1-.3)))-(((1+.1)^5)-1)*.3\times(1+.1*(1-.3)^4) = 2.019 \ (2.6\%\ more)\)

15 year NOL: \((1+.1)^{10}-(1+.1)^{10}\times.3\times.6663 = 2.275 \ (15.6\%\ more)\)
Combined Effect

This is essentially the same as the deduction deferral analysis, but now we include NOL impacts on ER after-tax rate of return. Approach is to hold ER whole and measure improvement in EE position at end of deferral period (d).

Absent NOLs, EE has at d:

\[(7) \quad [(1 - \text{STR}) \times (1 + i(1 - \text{STR}))^d / (1 - \text{STR})] \times (1 - t_{EE}).\]

With NOLs, NQDC provides EE:

\[(8) \quad [(1 - \text{STR} \times \text{DF}_C) \times (1 + i^*(1 - \text{STR}))^d / (1 - \text{STR} \times \text{DF}_D)] \times (1 - t_{EE}).\]

The 2nd term \((1 + i^*(1 - \text{STR}))^d\] is the growth in set aside funds over the deferral period as increased by ER NOLs for various periods: call it Z. As before, for any given NOL duration (n), \text{DF}_C is the discount factor for the number of years until a current deduction would first be useful and \text{DF}_D is the discount factor for the number of years until a deferred deduction would first be useful.

The impact of NOLs on the joint economics of deferred compensation as a result of the deduction deferral effect is \(((8) - (7))/(7)\), which simplifies to:

\[(9) \quad [(1 - \text{STR} \times \text{DF}_C)^Z/(1 - \text{STR} \times \text{DF}_D) - (1 + i(1 - \text{STR}))^d] / (1 + i(1 - \text{STR}))^d].\]

Example: \text{STR} = t_{EE} = .3; \text{i} = 0.1; \text{d} = 10 years. After 10 years, EE receives after tax deferred compensation times:

Baseline (no NOLS): \([(1-3)^*(1+.1(1-3))^{10}/(1-3)]*(1-3) = 1.377\]
5 year NOL: \([(1-3*.713)*2.019/(1-3)]*(1-3) = 1.587 (15.3\% more)\]
15 year NOL: \([(1-3*.3624)^2.275/(1-3*.713)]*(1-3) = 1.806 (31.1\% more)\]