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Stock and Compensation*

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ABSTRACT

Compensation planning within firms creates important corporate financial problems. Theoretical models and empirical tests of hypotheses in this area should play a much larger role than currently in the modern theory of corporate finance. Employees fund a large proportion of their firm's activities through deferred compensation arrangements tied to the performance of their company. These arrangements are generally put in place for incentive reasons, to align the interests of employees more closely with those of shareholders. Moreover, tax rules encourage or discourage these arrangements at various times. Currently, both tax rules and incentive considerations encourage stock buyback programs to fund deferred compensation arrangements. Prior to the 1980s, however, tax rules favored funding in other than company stock, implying that employees likely held company stock for incentive and not for tax reasons during this time period.

FOR MANY YEARS I have been interested in the use of company stock to compensate employees. To a greater or lesser degree corporate employees are either direct or indirect owners of their corporation's shares. That is, they hold these shares directly on own account or indirectly through company sponsored programs. The amount of company stock held on own account might be very small relative to the amount of company stock held indirectly in such company sponsored programs as corporate pension plans, qualified stock bonus plans, employee stock ownership plans, trusts, and the old standby, employee stock options or stock appreciation rights. Indirectly, employees own company stock any time their compensation depends on the performance of the firm. Examples here include deferred bonus payments that depend, in part or in whole, on the stock's performance, and even annual bonus compensation that depends on the firm's fortunes.

I am fascinated with the interplay of taxes and incentives on the form of employee "ownership." Many of my ideas on these issues were formed through wonderful and generous discussions with Merton Miller and more recently with Mark Wolfson. Moreover, I have written papers with both of them on subsets of this subject.[1]

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[1] In Miller and Scholes (1982), we argue that it is difficult to identify whether a deferred compensation program in stock or in other investments is for tax or incentive reasons. In Scholes and Wolfson (1986), we show how changes in tax rules affect the choice between current and deferred compensation.

Although deferred compensation programs tied either to stock or to performance goals provide incentive benefits, that is, tend to align the interests of employees more closely with those of shareholders, these programs force employees to bear additional risk. And risk-averse employees generally prefer current salary to the same amount of risk-adjusted deferred risky compensation using the firm's opportunity cost to effect the risk adjustment. This difference in personal benefit and corporate cost, as we know, requires that the firm trade off the benefits of the risky incentive contract against the extra risk-sharing costs of deferred compensation programs.[2] Moreover, these tradeoffs are not static: incentive requirements change over time; the amount of risk that employees are willing to bear is not independent of the economy; the independent risk of their corporation's stock might also change over time; and regulations, such as tax rules, might influence the choice of current versus deferred compensation.

Measurement problems add another dimension to determining the form of deferred compensation arrangements. That is, it is often argued that to tie employee compensation to the returns on stock is too coarse a measure of performance to create the proper incentives, a measure that is difficult for all but the firm's top executives to affect. On the other hand, shareholders prefer that managers maximize their firm's share price and not select performance measures that, on being achieved, might not lead to increases in stock price. In this regard, it is not obvious that tying bonuses to imperfect measures of firm value, other than share price (such as divisional earnings), is in the best interests of shareholders. Employees might have incentives to accomplish different goals from maximizing shareholder value.[3]

[2] Holmstrom (1979) has pioneered the development of models that trade off incentive benefits and the risk-sharing costs of programs that pay off as a function of output. Grossman and Hart (1983) have further analyzed the form of the payoff function, showing how difficult it is to characterize the optimal form of the payoff function. Stiglitz (1975) and Holmstream and Milgrom (1987) have studied the power and implications of linear payoff functions. In many cases the linear function (full partnership in the output of the projects) is the appropriate pay-off function.

[3] This is not to argue that employee payoffs are not tied to accounting measures of performance. They are. But as Lambert and Larker (1985) argue, the important issue is whether accounting or market data are the most useful for incentive reasons or whether a combination of accounting and stock market data are more efficient as a means to create the proper incentives than either alone. Jensen and Murphy (1990) conclude that the relation between pay and the firm's stock market performance is too small to provide sufficient incentives to senior executives. Rosen (1990), in an excellent review paper, argues that the Jensen and Murphy estimates are probably understated. Accounting measures provide important inputs as to current performance on which bonuses are determined. Short-term accounting measures cannot overcome the problems associated with gaming the numbers by underinvesting or not realizing losses until after a bonus period. If long-term accounting measures are used (payoffs based on output over a longer period of time than 1 year), accounting numbers might be more efficient than stock-based compensation to target specific objectives. Some of the noise in accounting performance measures is eliminated with the passage of time. I thank Bob Merton for discussions on this point.

Presumably, if the firm's top executives hold stock, it would be in their own best interest to create the correct performance incentives to assure that the actions of those working under them lead to share-price maximization. This might be incorrect, however, if these top executives can gain more on personal account through inappropriate incentive programs than they lose because the share price is too low. There is a real agency problem here because it is too costly for outsiders to monitor to what extent these indirect performance measures lead to increases in share prices. These indirect measures might create larger compensation expense (even adjusting for risk-sharing costs) without a correspondingly large enough benefit for shareholders. The greater the variety of ways in which employees *are* compensated, the more expensive it is for outsiders to measure actual levels of compensation. At the very least, there are asymmetric information problems; more likely, there are moral hazard problems.[4]

It is difficult to use indirect measures of performance to create the proper incentives to align employee and shareholder interests. With a diffuse chain of command in the organization, upper level executives possess insufficient information and skills to specify incentive programs that both motivate lower tiers of employees and cause them to maximize shareholder value. Even though these lower tier employees may not be able to as readily affect share prices by their decisions, actual stock ownership might be more efficient than

[4] Lazear and Rosen (1981) argue that absolute performance measures such as changes in the firm's stock price are not as efficient as relative performance measures in isolating performance. An example here would be using residuals from a market model or from another pricing model to isolate firm specific accomplishments. Holmstrom (1982) shows that eliminating specific risks that are not related to incentives, such as market risk, reduces risk to employees and enhances the efficiency of these incentive contracts. It is a puzzle as to why incentive contracts are based on total returns and not on idiosyncratic returns. It is possible that employees do not trust asset pricing models: they contain their own measurement problems. Or it may be that incentive contracts are based to some extent on idiosyncratic returns. That is, Miller and Scholes (1982) argue that compensation committees make adjustments in compensation (ex post) to correct for volatile market returns. There is evidence that firms grant executives new stock options to replace old out-of-the-money options after a fall in the stock market. More study is necessary on these issues. Moreover, if employees do want to participate in market returns (hold a market index fund) and they hold their company's stock for incentive reasons, it may be more efficient to hold the "index fund" through incentive contracts that pay off on the total return on the company's stock. Tax considerations make it efficient to do so, because employees avoid taxes on dividend income on the stocks within the index and taxes that are incurred on turnover of stocks contained in the index (as we discuss more fully below). Employees also avoid the management costs of buying and managing the index fund. They do, however, incur costs if they want to reduce the size of their exposure to market forces. They might need to sell index call options or future market positions to reduce their risk. At least, they have the option to make these adjustments. On net, it might be more efficient to provide incentive contracts based on the performance of the firm's stock. These stock-based contracts provide for incentives, which are costly to employees (because of risk-sharing costs), but they also benefit employees because they reduce the cost of obtaining and holding index funds. More study is required on this important issue.

indirect performance measures as a means to motivate them to work hard and not shirk.[5]

A bottom-up approach sometimes is as effective as a top-down approach. Direct share ownership by lower tier employees puts direct and indirect pressure on upper management to devote efforts to improving share prices. Employees who own shares exert direct pressure since, as owners, they have a direct interest in challenging the decisions of upper management; they have little interest to do so otherwise unless these decisions directly affect their employment. Moreover, these employees exert indirect pressure on upper management, who know that the firm's owners are working around them, to maximize value. This is a form of partnership organization and, as such, acts as a powerful control mechanism.[6]

As noted, outsiders have difficulty assessing the extent of the firm's obligations to its employees. The implicit and explicit contracts between the firm and its employees have equity-like components that mirror the performance of risky debt. Although a straight one-period salary contract is similar to a simple debt contract, a multiperiod compensation agreement can be equivalent to equity, risky debt, and most likely a combination of both and can be virtually unfathomable to outsiders.

Since 1984, net new equity issues have been negative in the U.S. Net new equity issues averaged $5.2 billion per year between 1975 and 1983, and −$95.8 billion per year between 1984 and 1989, with a $130 billion reduction

[5] Barro and Barro (1990) and Gibbons and Murphy (1990) find evidence supporting the view that executive earn more if their stock price does relatively better than industry returns. But Antle and Smith (1986) found only weak evidence to support the relative performance notion. These studies only concentrate on senior executives, whose pay might not be as sensitive to idiosyncratic performance results as that of managers running divisions of the firm. Senior managers are in charge of a diversified portfolio of activities; higher level employees tend to concentrate on a particular business segment. These higher level managers might be more likely to benefit if the stock price increases than the top executives would. For example, employees in the investment banking industry are paid bonuses based on their own or their group's performance. When group profits are high, their firm's stock price will increase at the same time that they receive large bonuses. It is possible that other firms in the same industry in the same business segments would also do well, in part, because it would pay for them to emulate the strategies of successful competitors, an important attribute of good incentive compensation mechanisms. If part of these bonus awards were to come in the form of company stock, these employees would achieve larger (and unreported) stock holdings than the senior executives. Moreover, it makes relative performance measurement suspect because, in part, these measures do not reward employees who emulate competitors.

[6] Owning stock is a form of a bond. Employees buy into the firm by using a portion of their bonus or compensation to buy company stock each period. They become partners with other shareholders. If the firm does well their company's share price increases; if not, the share price falls. Poor performance penalizes employees. Lazear (1979) assumes that employees are paid less than marginal product during their working years and paid more than marginal product in later years and in retirement through generous pension benefits. This form of bond is returned to employees in retirement, after they leave the firm. In my model, employees post a bond by buying shares in the company. As we will see, they can sell these shares only after retaining them for many years.

in 1989 alone.[7] Coupled with this has been a great increase in the amount of new debt issues and the amount of cash leaving firms to buy the shares of other firms (leveraged buyouts and other cash transactions). Corporations have also maintained their dividend flows during this period. There are many potential explanations for the surge in share buybacks subsequent to 1983. The most likely explanations for this surge in buybacks include management's desire (1) to mitigate the threat of takeovers by reducing "free cash" flow, (2) to reduce their costs of capital by substituting debt for equity in the firm's capital structure because of tax considerations, and (3) to provide shares to fund employee direct and indirect ownership of shares acquired through incentive compensation arrangements (in particular subsequent to the 1986 Tax Act). All three of these reasons are important. The third reason, the repurchase of shares to fund employee compensation programs, has been essentially neglected by finance specialists. I stress this reason because deferred compensation arrangements and how they are financed provide ample scope for theoretical modeling and testing of hypotheses. Shares have been an important source of funding for deferred compensation programs in the late 1980s and will continue to be such into the 1990s. This surge was due, in part, to changes in tax and regulatory rules that encouraged corporations to fund employee compensation programs with their own company's stock.

The start of the 1990s has seen some movement back to equity and away from debt as a source of financing for corporate activities. This movement has resulted primarily from the failures of so many of the so-called "junk bond" issuers—firms that were so highly leveraged as to make a declaration of bankruptcy a more costly alternative than issuing equity. Since tax rules in the U.S. currently favor debt over equity, time will tell whether the current desire to issue equity is only a "hiccup," as I predict, or a longer-term trend back to equity and away from debt.[8]

The paper proceeds as follows. We start with a discussion of how tax rules affect the decision to fund deferred compensation arrangements with stock and how changes in these rules have affected the decision over time. We then describe the use of institutional arrangements to fund these programs, such as employee stock ownership plans and trusts. We then analyze the results of recent growth of these plans among financial institutions and then describe

[7] Bagwell and Shoven (1989) describe the growth in the use of share repurchases and cash tender offers as ways in which firms distribute after-tax cash flow in addition to dividend payments.

[8] Scholes and Wolfson (1991a) discuss the role of tax rules in the recent restructurings of U.S. corporations. If the tax costs of using equity to finance corporate activities are high, firms will need to devise alternative financing alternatives. More efficient forms of bond contracts that reduce the possibility of and costs of bankruptcy are possible. We can also predict an increase in the use of contractuals to reduce the need for equity. That is, firms will use swap contracts and options to hedge part of the risk of their operations as the costs to use these contracts falls. As a result, firms that use these contracts will require less equity to cushion them against bankruptcy events.

the tradeoffs between deferred compensation plans and moral hazard issues for firms that earn noncompetitive rates of return on projects.

Tax Advantages of Deferred Compensation

Corporations deduct interest payments and are taxed on gains or losses on repurchases of their own debt. On the other hand, corporate dividend payments are not tax deductible corporate expenses nor are any gains or losses on the sale of their shares.

Interest income is taxable to bondholders, and dividend income is taxable to shareholders. Both bondholders and shareholders pay taxes on realized capital gains, generally at tax rates that are below those for ordinary income such as dividends and interest. After Miller's (1977) equilibrium analysis, it is well recognized that, depending on the relative tax rates of bondholders, shareholders, and corporations, debt will be more or less a tax preferred means to finance corporate activities.

For investors, stock is generally tax-favored relative to debt. Capital gains are taxed, generally, at reduced rates, paid only when the stock is sold, and these taxes can be eliminated under some circumstances such as by gift or bequest. As a result, the *before-tax* rates of return on shares on a risk-adjusted basis should be below that of fully taxable bonds. Investors bid up the prices of tax-favored assets such as common stock. Scholes and Wolfson (1991b) call this reduction in the before-tax rates of return on stock an implicit tax. In the Miller equilibrium, if the risk-adjusted before-tax rates of return on stock are sufficiently low, the after-tax cost to the corporation of issuing debt and equity might be the same. Although the corporation can deduct the interest payments that it makes on its debt obligations, some of this advantage is lost because it pays a higher before-tax rate of return on its debt than on its equity on a risk-adjusted basis.

Therefore, increasing the tax on the returns to shareholders relative to that of bondholders increases the before-tax required rates of return on shares (lowers the implicit tax) and lowers the subsidy to issuing shares. As a result, shares become more expensive to issue, relative to bonds; their required before-tax rates of return increase. Similarly, increasing corporate tax rates relative to personal tax rates favors more debt financing since corporate interest payments transfer before-tax income from the corporate sector (as a tax deduction) to the noncorporate sector (as taxable income).

Like interest, salary is tax deductible when paid (or employees have the right to receive it). Employees are generally paid salary that is currently tax deductible and deferred compensation that is currently not tax deductible. A portion of current salary is likely attributable to the realized outcomes of past incentive-based deferred compensation arrangements. The deferred amounts that employees set aside today increase the firm's current taxable income and fund the firm's activities. Employees, in turn, receive a "contract" from the firm promising to pay them a future amount contingent on their achievement of specified performance goals. If employees "own shares"

in the firm through these implicit or explicit contractual arrangements, their initial investment in the firm was made because they reduced their previous salary levels. Holding incentives and risk-sharing tradeoff considerations constant, at different times, tax rules can make employees better or worse off if they defer compensation and invest on corporate account rather than taking current salary and investing the after-tax proceeds on their own account. Moreover, the costs to corporations and their employees to defer compensation changes over time as a function of their respective after-tax rates of return on investment.

Prior to the 1981 Tax Act, corporate tax rates were approximately 50%, while personal tax rates were far above corporate tax rates, reaching as high as 70% during the 1960s and 1970s (and as high as 90% in years prior to the 1950s). Moreover, individual tax rates on realized capital gains ranged from 25% to 35%. This configuration of tax rates indicated that shares likely bore substantial amounts of implicit tax and corporate debt might not have been tax-favored as a financing alternative.

With the 1981 Tax Act, personal tax rates were reduced substantially to a maximum rate of 50%, and corporate tax rates were reduced only slightly. Realized capital gains tax rates were cut as well. These tax rate changes coupled with other nontax considerations (such as Jensen's (1986) view that debt financing is an efficient method to discipline managers because they must generate enough cash to pay the interest on the debt each period) moved corporations to undertake more debt financing.[9]

With the 1986 Tax Act, personal tax rates were slashed to below those of the corporation, and capital gains tax rates were increased dramatically through the elimination of the exclusion on realized capital gains from taxation by reducing it from 60% to 0%. Since interest payments avoid the corporate level tax, these changes in tax rules increased the advantage of debt financing to reduce the cost of both the corporate level and shareholder level tax on equity holders. The implicit tax on shares was substantially reduced, which implies that the before-tax rate of return on shares increased yet again relative to bonds with the 1986 Tax Act. Moreover, subsequent tax acts have not changed the relative advantage of debt over equity.

Although the effects of changes in tax rules on the debt versus equity question have been modeled extensively, the same is not the case for the current versus deferred compensation question, nor for how the firm should fund deferred compensation arrangements. As Scholes and Wolfson (1991b) have shown, the current versus deferred compensation tradeoff depends on (1) corporate tax rates now and in the future, (2) personal tax rates now and in the future, and (3) the after-tax rates of return that can be earned on the deferred compensation amounts on corporate account compared to the employee's own account.

[9] Jensen (1988) and Jensen (1989) expand on the view that managers can be disciplined by capital market transactions.

That is, if t_{co} is the current corporate tax rate, t_{po} is the current employee tax rate, and t_{cn} is the future corporate tax rate, n periods from now, when the employee receives the compensation and pays tax rate t_{pn} and r_{cn} is the after-tax corporate rate of return on the invested funds, the corporation would be indifferent to paying \$1 of current salary or deferred compensation in the amount of DC_n where

$$DC_n = \frac{(1 - t_{co})(1 + r_{cn})^n}{(1 - t_{cn})}. \tag{1}$$

The \$1 of current salary has an after-tax cost of $\$1(1 - t_{co})$ to the corporation, and this after-tax amount (not paid out) can be invested at rate r_{cn} for n periods. The deferred compensation amount is a tax deductible corporate expense when paid out as salary to employees at the end of period n. To be indifferent to paying \$1 of salary currently and DC_n in the future, the corporation can pay out $DC_n(1 - t_{cn}) = \$1(1 - t_{co})(1 + r_{cn})^n$. Solving for DC_n gives equation (1).

After personal tax, the employee retains $DC_n(1 - t_{pn})$. If the employee had received \$1 of salary initially and invested on own account, she would accumulate $\$1(1 - t_{po})(1 + r_{pn})^n$ after investing the after-tax salary at an after-tax rate of return of r_{pn}. For deferred compensation to be preferred to current salary for tax reasons, it is necessary that

$$\frac{(1 - t_{co})(1 + r_{cn})^n(1 - t_{pn})}{(1 - t_{cn})(1 + r_{pn})^n(1 - t_{po})} > 1. \tag{2}$$

If corporate and personal tax rates remain unchanged over the investment period, deferred compensation is tax advantageous only if the corporation can earn at a higher after-tax rate of return than can the employee on personal account. If corporate tax rates are expected to increase in the future, this favors deferred compensation: tax deductions are more valuable for the corporation at higher tax rates. If personal tax rates are expected to decrease, this favors deferred compensation: taxable income is preferred at low personal tax rates.

Competitive Rate of Return Projects

If the corporation can only invest in competitive rate of return projects that are in large supply in the economy, such as investing in corporate bonds or investing in its own stock, the corporation could offer deferred compensation arrangements that promise the highest after-tax rate of return that it could earn after paying corporate taxes, if any. If the corporation invests the after-tax deferred compensation amount in bonds, it earns the after-corporate tax bond rate. If it invests in the stock of other companies, it earns the after-tax stock return after paying taxes on dividend income (after the dividend received deduction) and capital gains taxes on the sale of the shares. If it invests in its own company's stock (or projects within the firm that earn

competitive rates of return), it earns the before-shareholder-level-tax return since it pays neither a tax on dividends nor capital gains on its own stock.

For example, if tax rates on shares are low and corporate tax rates are below personal tax rates (and both corporate and individual tax rates are expected to remain unchanged over the investment period), the firm can offer employees the after corporate tax bond rate because the expected risk-adjusted before-tax return on its shares is likely to be below (because of high implicit taxes) the after-tax bond rate. If the corporation invests in bonds at before-tax rate R_b, its employees earn the corporation's after-tax bond return, $R_b(1 - t_c)$ (or r_{cn} as in equation (1)) through the deferred compensation arrangement. Employees on their own account would earn $R_b(1 - t_p)$, their own after-tax bond return (r_{pn} as in equation (1)). In periods in which the firm expects that the risk-adjusted before-tax rate of return on its stock exceeds its after-tax bond rate, it can offer its employees the before-tax return on its stock. It would fund its programs by buying company stock. Moreover, tax rules encourage deferred compensation programs when corporate after-tax returns exceed personal after-tax returns, and even more so if corporate tax rates are expected to fall relatively less than employee tax rates.

If the corporation uses the after-tax proceeds generated by initiating deferred compensation programs for its employees to repurchase its own shares, it earns r_c, the required before-shareholder-level tax rate of return on its own stock (the before-tax rate of return on its own shares). A corporation pays no tax on the resale of its shares in the open market nor on any dividends that it pays itself on these same shares. The level of the required before-shareholder-level-tax rate of return on its shares on a risk-adjusted basis depends on several factors. With long investor deferral periods, high rates of interest, and large exclusions from taxation on realized capital gains (low capital gains tax rates relative to personal rates), holding shares is quite tax advantageous. If so, this implies that r_c could be close to or even below the after-tax bond rate on a risk-adjusted basis.

Prior to the 1980s, the before-tax risk-adjusted return on stock likely fell below the after-tax bond return on corporate account, because the combined tax rate on both the corporation and its shareholders was likely below the personal tax rate. This encouraged corporations to issue equity, repurchase debt, and expand assets within the corporate form. Employees, however, preferred that the firm not fund its deferred compensation arrangements with equity but with fully taxable instruments such as bonds held on corporate account.

Moreover, prior to the 1980s, firms realized that it was even more tax advantageous to seek out passive investment alternatives that were even more tax-favored than holding taxable bonds on corporate account to fund deferred compensation arrangements. This was the golden age of defined benefit pension funds. During this time frame, there were few restrictions on skewing benefits toward more highly compensated employees—those employees who valued deferred compensation arrangements to save for the future more highly than employees just starting off in the labor market. Benefit

limits were also relatively liberal. A pension promise is like a deferred compensation promise. It can be funded, however, in a tax-advantageous manner. That is, \$1 invested in a pension account at before-tax rate R_b for n periods accumulates to

$$\$1(1 + R_b)^n(1 - t_{pn})$$

after personal tax is paid on the accumulation at rate t_{pn}. For the corporation, pension fund contributions are tax deductible expenses, just like salary. As a result, ignoring nontax considerations, the corporation is indifferent between contributing \$1 to a pension account or paying it in salary. Assets within the pension fund accumulate at the before-tax rate, and employees pay tax at their marginal tax rates only when they receive pension promises. Deferring compensation through tax-favored vehicles such as pension funds invested in tax-disadvantageous instruments such as bonds, even with constant employee tax rates, is superior to receiving a salary and investing it on one's own and superior to deferring compensation through investing in bonds on corporate account. We would expect, therefore, that only deferred compensation beyond pension fund contribution limits or for shorter periods of time than allowed for deferral under pension regulations would have been funded in other than pension accounts.

Furthermore, pension funds failed to invest in fully tax disadvantageous assets such as bonds, assets that should be held in pension accounts. Many pension funds invested over 50% of their assets in common stocks, highly tax-favored assets bearing high implicit taxes during this period thereby apparently foregoing the advantage of the tax-free inside buildup in the pension fund. This discrepancy has been called the pension puzzle and has been studied by others, notably Black (1980) and Tepper (1981). Tax and nontax considerations might, however, move a pension fund to invest pension assets in stock. For example, if the firm can overfund its pension plan, it can earn the before-tax return on the overfunded assets held in the plan. But for the firm to overfund its pension fund requires that its actuaries specify that the fund is underfunded in the first place. Scholes and Wolfson (1991b) argue that if the funds' managers invest in stocks, which exhibit far greater variability than do bonds, the fund's actuaries could make more conservative estimates of not having sufficient funds available to pay off future employee benefits, thereby allowing the firm to contribute more into the fund currently (to overfund it) to protect against this eventuality. In a more dynamic equilibrium model, at a later date the fund switches to holding only bond and thereby reaps the full benefits of overfunding the plan, since it is not necessary for the firm to recapture the excess pension assets immediately on switching the fund's assets into bonds but could do so over a period of many years.

There are probably other nontax issue that came into play during this period that affected the decision to invest pension fund assets in common stock. By encouraging fund managers to invest in common stock, corporate

managers placed many shares in "friendly" hands, reducing the probability that outside shareholders could garner enough votes in proxy contests to restrain managerial actions. In recent years, the active funds voicing concern over managerial actions have been the noncorporate pension funds (e.g., State pension funds), whose managers are not worried about losing pension fund assets if they are too critical of corporate management policies.

During the early 1980s, the tax advantages of deferring compensation by investing in pension accounts and investing contributions in bonds through the corporation were reduced dramatically. Maximum personal tax rates were slashed to about the same level as corporate rates. Moreover, capital gains tax rates were reduced, and investing in company stock in a deferred compensation program in the early 1980s, when interest rates were high, provided after-tax returns to employees that were slightly higher than investing in bonds. With high interest rates, the value of the deferral of tax on realized capital gains is greater, and stockholders will bid up stock prices (or require lower before-tax rates of return) to reflect this value. By 1984 interest rates had fallen, thereby increasing required before-tax rates of return on stock, and deferred compensation programs funded with stock became more tax advantageous. This likely caused an increase in the amount of stock that was repurchased to fund deferred compensation programs. Also, during the early 1980s it became more expensive to use pension funds to defer the compensation of the more highly compensated employees in the firm. Outright restrictions on the amount of compensation that could be deferred and anti-discrimination rules precluded executives from using pension funds too agressively to fund deferred compensation programs.[10]

With the 1986 Tax Act, corporations found that debt-for-equity swaps and that financing their investment programs with the proceeds of debt issues were highly tax advantageous. Likewise, corporations found that their employees would benefit by funding deferred compensation programs with company stock. The required before-tax rate of return on shares increased dramatically subsequent to the 1986 Tax Act, most notably because of the elimination of the exclusion of part of the realized capital gain from taxation. Corporations are increasingly funding stock buy-back programs by using the proceeds of deferred compensation programs.

In addition, subsequent to the 1986 Tax Act, other tax-favored programs, such as pension funds and life insurance programs, became less tax favored. Regulators placed greater restrictions on the ability to overfund pension funds; strict anti-discrimination rules prevented corporations from skewing benefits too sharply toward the more highly compensated, who prefer to defer compensation; and restrictions were placed on the corporate use of life

[10] Regulations currently set the maximum pension benefits that can be paid to any employee to be no more than $109,000 per year. Over the years Supplementary Executive Retirement Plans have been put into place to supplement executive pension benefits. Most of these plans are unfunded or are funded with company stock. In 1990 over 80% of the Fortune 500 companies had excess coverage plans for senior executives. (See Vosti (1991) for more information on these plans.)

insurance policies, and some forms of insurance (such as single premium deferred annuities) became no longer available to corporations.[11]

Let us assume that the before-tax rate of return on equally risky investments to corporate investment, but undertaken in partnership form (a conduit form of investment), is 12% before partner's tax. Assume that the partner's tax rate and the capital gains tax rate is 30%, while the corporate tax rate is 35%. Equalizing after-tax returns on undertaking this investment in either a partnership or a corporation requires that corporate investors, who are assumed to have a 5-year investment horizon, must expect to earn a before-shareholder-level-tax rate of return r_c of approximately 11.3% per year, only 0.7% below the before-tax return on the partnership form of investment. To see this, we must solve for r_c from

$$(1 + r_c)^5(1 - 0.30) + 0.30 = [1 + 0.12(1 - 0.30)]^5$$

which implies that $r_c = 11.3\%$.

If the corporation buys its own stock to fund the deferred compensation program, its employees, if their marginal tax rates remain unchanged, expect to earn a return of 11.3% before and after tax.[12] Employees, investing on their own (e.g., in partnership investments) could earn only 8.4% after tax (12%(1 − 0.30) on investing in fully taxable bonds or stock on their own account on a risk-adjusted basis (a 2.9% return differential). The corporation can repurchase its shares, earn the before-tax rate of return on investment in its own shares, and then sell these shares in the market to provide employees with their deferred compensation without paying tax on the capital gain (or on the dividends) on its share returns. The 1981 and, in particular, the 1986 Tax Acts encouraged employees to own more of their company's stock through deferred compensation programs.

Returning to equation (2), using the above assumptions and assuming a 5-year deferral period, we find that employees are better off by 14% using company stock to fund their deferred compensation arrangements. That is,

$$\frac{(1 - 0.35)(1 + 0.113)^5(1 - 0.30)}{(1 - 0.35)(1 + 0.084)^5(1 - 0.30)} = 1.14,$$

assuming that corporate and personal rates remain unchanged over the period. Some of the advantage would be mitigated if personal rates increased

[11] Life Insurance contracts, like pension funds, are tax-advantageous savings vehicles. Although contributions into an insurance policy are not tax deductible, the returns on the inside buildup (that portion of the premium that is not initially necessary to fund insurance costs) accumulate tax free. When investors expect that their marginal tax rates will fall, pensions dominate insurance contracts.

[12] Earning 11.3% per year before-shareholder-level tax requires that the firm earn 17.4% (0.113/(1 − 0.35)) before corporate level taxes while the same investment requires a 12% return in partnership form. Undertaking this investment in corporate form requires that other nontax benefits are important to the corporate form compared to partnership form (such as limited liability and access to liquid markets).

relative to corporate rates, and the firm could not alter the program before the change in rates went into effect. For example, if corporate tax rates remained unchanged at 35% and personal tax rates increased to 40% at the time of payout, the deferred compensation advantage is reduced to only 6% or

$$\frac{(1 - 0.35)(1 + 0.113)^5(1 - 0.35)}{(1 - 0.35)(1 + 0.084)^5(1 - 0.30)} = 1.06.$$

In the later 1980s, we also witnessed a large increase in employee stock ownership plans (ESOPs). These plans are used to buy company stock. Over $25 billion of company stock was acquired for these programs alone in 1989. An ESOP had several additional tax advantages for the corporation besides using its own stock in deferred arrangements. The most important one was that 50% of the interest paid on debt, the proceeds of which were used to finance the advance funding requirements of leveraged ESOP deferred compensation programs was excludable from taxation.[13]

Another important explanation, however, for the growth of these plans was that a leveraged ESOP allows management to concentrate a large block of its stock in the hands of its employees. Under Delaware law this tended to prevent unfriendly suitors from gaining control of the firm without the consent of management, if, as was likely, employees voted their shares with management. Employees voted both their allocated shares and their unallocated but reserved shares (shares that they would acquire in the future under the leveraged ESOP plan). The unallocated shares could be a large fraction of the total, for the corporation could borrow to buy shares and prefund, say, the next 20 years of allocations.

After the 1989 Tax Law eliminated the 50% exclusion from taxation of the interest paid on leveraged ESOP debt, for most ESOPs, the growth of ESOPs among the large corporations has slowed down. One could argue that when the tax advantage was curtailed, the vehicle was abandoned because of other nontax costs to set up, run, and administer them, including strict anti-discrimination rules.

Others might suggest that the collapse of leveraged buyout programs and the stricter limitations on hostile takeovers imposed by regulators might have reduced the urgency to reacquire shares in ESOP programs. There is an identification problem here as to whether tax and nontax considerations, or a combination of both, explain the growth and slowdown in growth of these ESOP programs.

Tax and Nontax Tradeoffs in the Funding Decision

If the corporation faces only competition rate of return projects, it has no need to undertake "new" investments. It's employees, however, will still

[13] For further details on ESOP plans and the tax and nontax reasons for their use by corporations, see Scholes and Wolfson (1991) or Scholes and Wolfson (1990).

need to be compensated using incentive-based contracts to align more closely their own and shareholders' interests. As a result, these incentive contracts will require some form of deferred compensation arrangement. Prior to the 1980s, there were tax incentives to fund these programs by acquiring bonds and establishing pension fund arrangements, and likewise not to use company stock. During the 1980s, and, in particular, after the 1986 Tax Act, there were tax incentives to fund these programs with company stock.

Although it was not tax advantageous to fund employee deferred compensation programs with stock prior to the 1980s, many employee compensation programs (in addition to company pension funds) were funded with stock or stock options. This suggests that the nontax advantages of aligning the interests of employees with shareholders by using stock-based programs dominated the tax costs of granting them stock or options to some extent. There was a conflict here between tax and nontax considerations. To achieve the correct incentive benefits, firms had to compensate employees by promising them high enough rates of return to overcome not only the risk-sharing costs that they incurred by concentrating in company stock but also the tax costs of holding the wrong instruments. As the tax costs of holding stock fell in the 1980s (unless the need for incentive based stock compensation increased), the tax model predicts that firms would institute or increase their stock-based deferred compensation programs over this period, and these programs *have* accelerated in recent years.

Another reason for part of the demand for stock-based deferred compensation programs is that employees want to own company stock. Deferred compensation programs funded with stock are more tax efficient than owning stock outright on own account.[14] Alternatively, employee option grants are hard for outsiders to value. That is, the employee gives up current compensation for the grant, but the amount of compensation that the employee gives up is not observable to shareholders and outsiders. There is a large moral hazard problem here between employees and shareholders that most likely results in a transfer from shareholders to current managers. Some have argued that granting tax-qualified options benefits employees at the expense of the corporation—a transfer from the corporation to employees through the tax authorities. Moreover, if risk-averse employees value the options less than outsiders would value comparable warrants, the firm is using inefficient and costly financing alternatives.

[14] Employees made large investments in the shares of the company they worked for prior to the 1929 stock market crash. Employee ownership fell off dramatically after the crash. As the perceived risk to investing in shares has fallen over the years (a belief that we will not experience a disaster as befell us during the depression, employees have been less reticent to take on additional risk by concentrating their investmentsin the shares of their own company. Risk-sharing costs might be lower today than they were 10 or 20 years ago. This makes employees r ıore willing to accept deferred arrangements at a lower price than previously. As a result, the use of deferred incentive arrangements has increased. I have benefited from discussions with Mark Wolfson on this point.

In the late 1980s, we also saw the growth of funded trusts, so-called "Rabbi Trusts," that hold company stock to fund deferred compensation arrangements. Employees are required to defer part of their current bonus for a period of time. The percentage of their bonus must be determined prior to the start of a compensation period. The deferral increases the corporation's after-tax income, and the incremental income is used to acquire company stock. Essentially the firm buys back stock in the market for its employees and places the acquired stock in a grantor trust. As long as the employee does not have the right to receive the stock currently (subject to restrictions as to when the employee can receive the award), the stock grant is not taxable to the employee until she does have the right to receive it. It is a funded deferred compensation program in company stock. Employees have the right to vote these shares but are general creditors of the firm in case of bankruptcy (if the shares in the trust have any value). The program deferral periods generally run from 3 to 5 years, and in many programs the employee has the option to extend the deferral period.

The Rabbi trust is tax advantageous because the returns on company stock are tax exempt to the corporation. It earns the before-tax rate on its own stock, which after the 1986 Tax Act might be close to the before-tax bond rate on a risk-adjusted basis. Notice that holding company stock for employees in this form is more efficient than holding company stock in pension funds such as Keogh-like 401(k) programs. This is so because dividends are tax "deductible" to the corporation when paid on shares in a Rabbi trust and when paid on ESOP shares if paid to employees but not tax deductible when paid on shares held in a qualified pension program.[15] This is yet another facet of the pension fund puzzle.

The firm does not have to fund its deferred compensation programs by using vehicles such as ESOPs, Rabbi Trusts, or Pensions funds. Instead the corporation could use the proceeds generated from the deferral of current compensation to acquire company stock and retire it. As a result, the firm establishes a nonfunded program. It just promises its employees the total return on its stock and sells shares in the market to make good on its promise when employees receive their deferred compensation.

One difficulty with nonfunded plans, however, is that the corporation can use the deferred compensation proceeds to lever up the firm. That is, it could

[15] In a Rabbi trust, the employee is credited with additional shares when the dividend is paid: the dividend is used to buy additional stock. These dividends are not taxable to the corporation and its employees when paid. When the employees receive the total appreciation on the common stock (dividends and capital gains), the corporation receives a tax deduction and employees have taxable income for the total amount. It is as if the employees receive the returnon their investment in the company as compensation. Rabbi trusts and ESOP programs are ways in which the corporation can replicate partnership taxation (one level of taxation) and still retain the nontax benefits of the corporate form. Employee-owners are only taxed once on compensation and on the returns to their investment in the company. In most other cases, it is impossible to achieve tax deductions for dividends paid on company stock.

promise its employees the return on company stock, not buy back shares, and use the proceeds to invest in other risky projects.

The Likely Effect on Share Prices on Announcing These Stock-Based Programs

On the firm's announcing these plans, we should expect that its stock price would increase for several reasons. One is that stock ownership aligns the interests of employees and shareholders by concentrating more stock ownership in employee hands. Another is that instituting these programs could signal that management expects higher future profits for the firm and as a result are increasing their own relative ownership position in the firm. Moreover, the share price could increase as shares are anticipated to be acquired for these programs from investors who must liquidate their positions, at a potential tax cost, to satisfy the corporation's demand for shares. It might not be possible for pension fund to liquidate their share holdings to supply all the shares demanded by these programs.[16]

On the other hand, if concentrating ownership in employee hands serves as an effective takeover deterrent, the firm's share price could fall. Employees tend to vote with management, maybe because they fear that a change in the old ways might hurt their employment opportunities. In any case, as the costs to shareholders of disciplining managers have increased through tougher hostile takeover rules in recent years, concentrating ownership in employee hands is not as valuable a defensive tool for management.

Another negative for share prices is that the company incurs costs to initiate and run these programs. It is not uncommon for the firms to offer shares at a discount to employees because of risk-sharing costs. Moreover, some programs require that employees stay with the firm for a period of time before receiving the grant, a form of "golden handcuff." These handcuffs might be beneficial if employees who should stay with the firm do stay, but they are detrimental if the converse were true. On balance, however, the company would not initiate such a program unless there was a net advantage to doing so. Managers, however, could initiate these programs to effect transfers from equity holders to themselves.

Firms That Are Using These Programs

Many financial institutions, including investment banks such as Merrill Lynch, First Boston, Morgan Stanley, and Salomon Brothers and commercial banks such as CitiCorp and J.P. Morgan, have instituted stock-based com-

[16] It would be interesting to investigate the effects on share prices of these stock buy back programs. How does the day to day presence of the corporation in the market for its own stock affect the microstructure of share prices? Presumably, the corporation would not be an information trader in the market. It would place a steady demand for shares into the market. The firm, however, is likely to acquire more shares if corporate profits are higher since employees will receive higher bonus awards and therefore be granted more shares.

pensation arrangements in the late 1980s and early 1990s. Moreover, other nonfinancial firms have done likewise but not to the extent of these financial institutions.

J.P. Morgan and Salomon Brothers established fully-funded trusts and currently acquire shares in the open market to fund their deferred compensation programs. Other firms, such as CitiCorp and First Boston, have given employees the returns on their company's stock in lieu of a current bonus. The employees in these firms are directly financing their firms' operations. These programs could also be tax advantageous if these firms are currently experiencing net operating losses for tax purposes. As seen by the model in equation (2), deferred compensation as a financing alternative is tax favored for firms with lower current tax rates than future tax rates.

Noncompetitive Rate of Return Project Firms

As Scholes and Wolfson (1991b) have shown, those firms that are earning *noncompetitive rates* of return on investments would prefer to operate these investments in partnership form subsequent to the 1981 Tax Act. Absent an ability to operate in partnership form, corporations can reduce the effect of the corporate level tax by levering-up as much as possible to finance new investments. By levering-up the corporation cannot avoid paying tax on the noncompetitive portion of the returns. Moreover, if employees fund corporate investments as shareholders through deferred compensations arrangements, this helps reduce the effects of the corporate-level tax on the noncompetitive return projects. As we have shown, dividends paid to these employees are tax deductible as a compensation expense. Given the firm prefers to use debt to finance new investments, it also favors deferred compensation arrangements to finance these investments. As a result, some of the growth in deferred compensation arrangements using company stock might result from the fact that funding in this way is the lowest cost financing alternative to fund new investment projects. The incentive effects might be incidental or an added bonus. Once more we find that there is an identification problem between tax and incentive reasons to use deferred compensation. Empirical studies will have to sort out what firms are doing with the proceeds of deferred compensation arrangements. It is not possible to conclude that all stock-based programs arise from a desire to effect more efficient incentives within the firm.

Previously, the deferred compensation model assumed that r_c, the return paid to employee-shareholders, was the market rate of return, a competitive rate of return. It also assumed that the corporation was kept neutral and all of the tax benefits flowed through to its employees. Corporate shareholders benefit because of incentive effects but must pay for risk-sharing costs. Moral hazard issues become more important when the firm has non-competitive rate of return projects. Employees might be able to garner higher rates of return in situations where such projects exist. As a result, deferred compensation arrangements might not be the lowest cost alternative.

Outsiders cannot observe perfectly the returns on investment projects within the firm, and managers are likely to possess private information about the firm's prospects. Firms can offer employees deferred compensation contracts tied to the performance of their division or unit or special project. If successful, employees can garner some of the returns on the investments that would accrue to stockholders. It is likely more difficult for outsiders to monitor the returns on unique noncompetitive projects than on competitive projects. There is a larger moral hazard problem regarding noncompetitive return projects.

With deferred compensation programs, employees own stock in their divisions or units through bonus arrangements based on performance. They own a share of a franchise. Also, shareholders own a share of the same franchise. The relative share owned by employees and outside capital suppliers depends on the many variables, but I think that the proportion of physical capital that is needed to fund the project, the life of the project, the ease with which the present value of the project can be known, and the ability of outsiders to monitor managers are all important variables. Deferred compensation contracts that are tied to unit performance are likely to transfer more to employees than straight salary contracts because employees do not refund past salary if their unit suffers a loss. Employees do not actually pay back previous salary if a division of a firm suffers a loss. They achieve option-like returns: they achieve a larger equity position as the project pays off. Holding company stock (that can be forfeited under certain circumstances) reduces this option-like effect. Deferred compensation arrangements paying out to employees only after the resolution of uncertainty also help mitigate the option-like effect. Here, tax and nontax issues might both foster deferred arrangements.

If the firm's managers hedge their commitment to employees by repurchasing equity in the market, they might not be able to hedge all of the abnormal return, only the normal part of the returns. That is, there might be hidden information that is possessed by managers running the franchises within the firm that is not known by other managers or shareholders. If the firm announces a new deferred compensation arrangement tied to new investment projects, the share price is expected to increase but not as much if there was no moral hazard problem among insiders and between insiders and outside shareholders. Share ownership by insiders does reduce the extent of this problem. Once again there is an identification problem that makes it difficult for outsiders to disentangle tax from nontax moral hazard concerns.[17]

[17] Deferred compensation arrangements in company stock make excellent sense for firms that are currently experiencing net operating losses for tax purposes. Their marginal tax rates are currently low and can be expected to increase in the future. They might offer deferred compensation programs to accelerate the use of their net operating losses. The tax benefits might outweigh the risk-sharing costs irrespective of incentive considerations. As Scholes and Wolfson (1991b) document, many start-up companies with net operating losses use deferred compensation programs (not pension accounts) very heavily.

Use of Deferred Compensation

During the 1980s, we have witnessed an acceleration in the growth in the use of stock to fund deferred compensation arrangements. This is due, in part, to enhanced tax benefits, to reduced risk-sharing costs, and to an increased appreciation among corporate executives of the benefits of incentive arrangements. As these benefits have become more appreciated, firms have been experimenting with ways to device more efficient combinations of stock and compensation arrangements. This will continue into the future.

To illustrate, it is not necessary for the firm to buy back its stock and only promise its employees that they will receive the returns on the stock as deferred compensation. The firm has the freedom to select various alternatives. For example, it could pay the returns on divisional profits or on a bond index to its employees. The key is that the firm still buy back shares to fund the program and to earn the before-tax return. Before moral hazard considerations, the firm has residual risk in doing so, but this will be a positive present value activity.

To show how this will work and is even possible without the firm incurring residual risk, consider the case of using a swap contract arrangement between the firm and its own pension fund (or the pension fund of another firm) if it is holding company stock. If would be tax efficient for the firm to reacquire its shares from the pension fund and offer to swap the returns on its shares back to the pension fund in return for, say, the returns on a bond index. Since the pension fund does not care whether it swaps the returns currently or deferred (ignoring important credit risk considerations), it would be tax advantageous to pay the returns on the stock when the deferred compensation arrangement ends and to receive the cumulative returns on the bond index at the same time. At the time, the corporation sells the stock, uses the appreciation to pay off the pension fund, receives the returns on the bond index from the pension fund, and uses the proceeds of the stock sale and the returns from the pension fund to pay off its employees. After-tax employees make the before-tax rate of return on bonds. Obviously, this creates a superior synthetic strategy to fund deferred compensation—including deferred incentive compensation, deferred health, and deferred pension benefits.[18] These deferred payments and commitments are not readily observable to outsiders. Financial statements do not combine transactions in financial instruments but account for them only in their constituent parts, making it extremely difficult for outsiders to monitor performance.

Conclusion

Stock and deferred compensation is a fertile arena for finance specialists. We started from a simple model to determine if deferred compensation in

[18] For further elaboration of these synthetic strategies, see Scholes and Wolfson (1991b). They discuss the use of swap contracts and other contractuals in combination with other tax-advantaged assets in tax-planning decisions such as funding deferred combination and retirement health care arrangements.

stock is tax advantageous and realized that the model's structure provides a rich framework with which to study the interplay of taxes and incentive issues in compensation arrangements.

Compensation arrangements that are tied to the performance of the company are extremely important for researchers in finance because the "actual" number of shares outstanding might be far different from that shown on the balance sheet (even adjusting for risky debt). Shares held by employees change over time, causing the expected returns on shares to change as well. Many interesting theoretical issues need to be modeled and many hypotheses remain to be tested in this important corporate finance area. I hope that you will join me in this endeavor. Compensation planning is an important growth area in corporate finance.

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