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Abstract

This paper explores the risks and benefits of holding company stock in employer-sponsored defined contribution (DC) retirement plans. We address three questions: (1) What is the role and function of company stock in such plans? (2) Who might be affected by enhanced portfolio diversification in such plans? and (3) What mechanisms exist, or might be developed, to enhance portfolio diversification if more diversification were deemed useful?

Firms offer company stock within DC plans in an effort to enhance economic performance, though evidence is mixed on productivity gains from stock ownership. We demonstrate that concentrated stock positions arise most often in larger firms' DC plans where sponsors direct employer contributions and restrict diversification. Stock concentration also arises because participants systematically underestimate the risk of employer stock and over-rely on its past performance in making investment decisions.

In a retirement system with concentrated stock positions, there will always be some participants who forfeit DC plan savings to firm bankruptcy. Encouraging plan diversification mitigates this risk, but it could also induce some companies to redirect plan contributions to other forms of stock compensation or to replace stock contributions with cash compensation. We conclude by describing policy tools that might be used to encourage diversification and discuss conditions for their effective implementation.

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Company Stock and Retirement Plan Diversification

More than two decades of growth have firmly established the central importance of defined contribution (DC) plans in the US retirement marketplace. There are now more than 700,000 corporate defined contribution pension plans in the US, covering about 55 million workers and managing over \$2 trillion in assets.¹ Within this universe, 401(k) pension plans—a form of individual account pension that has grown rapidly since the 1980's—now represent over half of all DC plans, more than half of all active pension participants, and over 80 percent of private DC plan assets.² Looking to the future, DC pension plans—and 401(k) plans in particular—seem well positioned to maintain and expand their prominent role in the US retirement market. By 2030, DC plan payouts are anticipated to pay more benefits than the Social Security system for baby boomer retirees (Poterba et al., 2001). Following the US model, countries including Japan and Germany have recently adopted variants of the U.S. 401(k) model, hoping to boost retirement saving and eventual economic security.

Despite DC plans' strong appeal in the US retirement context, clouds have recently appeared on the horizon that might threaten their popularity and policy support. Poor capital market performance over 2000-2001 eroded investment returns received by many plan participants, leading some to ask whether a form of guaranteed benefit might be more compatible with retirement income promises.³ Other plan participants have found themselves suffering significant losses after they invested heavily in their own company's stock and saw its price sink suddenly and precipitously. This paper explores the risks and benefits of holding company stock in DC plans. With an eye to informing the current policy discussion, we take up three questions regarding the role of company stock in employer-provided retirement plans:

- What is the role and function of company stock in employer-sponsored retirement savings plans?
- Who might be affected (positively or negatively) by greater portfolio diversification in such plans?
- What mechanisms exist or might be developed to enhance portfolio diversification in employer-sponsored plans where diversification is deemed useful?

The discussion is organized into six sections. Section I documents the role of DC plans within the US retirement system and describes the types of plans in which company stock is most prevalent. It also summarizes the cases generating controversy over the role of company stock in DC plans. In Section II, we evaluate the prevalence of company stock in DC plans, and indicate how some employers direct contributions into stock and restrict its diversification. Sections III and IV assess rationales for DC

¹ Aggregate statistics for 2001 are based on authors' estimates utilizing US Department of Labor and Federal Reserve Board data; see Table 1. The most recent reliable data on pension assets and participants are derived for 1998 taken from Form 5500 data filed with the US Department of Labor.

² In this paper we do not treat public sector employees in detail; for more information on the rich array of public sector retirement programs see Hustead and Mitchell (2000).

³ See <http://prc.wharton.upenn.edu/prc/2002confb.html> for a range of papers on this topic.

company stock holdings by employers and plan participants, respectively. Section V reviews the debate from the perspective of policymakers. In particular, we examine the tradeoffs between encouraging employee ownership and retirement security, the impact of concentrated stock positions on retirement incomes, and the policy options available to encourage or mandate greater diversification in retirement plans. We discuss whether recent proposals to require DC plan diversification will meet lawmakers' goals of enhancing retiree security. Section VI summarizes and concludes.

To preview our findings, we observe that employers utilize company stock within DC plans in an effort to promote rank-and-file ownership of the firm's shares. The aim of employers is to improve firm productivity and enhance shareholder value. This principle of employee ownership has been a hallmark of US tax policy and fiduciary law since Louis Kelso promoted the virtues of employee stock ownership and Peter Drucker enunciated the virtues of "worker capitalism" (Drucker, 1976).

In practice, concentrated positions in company stock are more likely to occur in the DC plans of large firms, where the emphasis is on mandatory share ownership. Among small firms, company stock is less likely to be offered in DC plans, and when offered, investment in it is typically employee-discretionary. Particularly among large firms, concentrated positions tend to result from employer plan design decisions that direct firm contributions to stock and restrict its diversification. Concurrently, employees exhibit systematic errors in retirement plan decision-making. They evince myopia in assessing the risks associated with their employer's stock, and they erroneously overweight their own holdings in company stock based on strong past investment performance. These factors lead to some retirement plans and some participant accounts becoming quite concentrated in company stock. We estimate that 11 million participants hold concentrated stock positions (out of 23 million participants in DC plans offering company stock). At the same time, the potential negative effects of company stock are not limited to retirement plans with current high levels of stock concentration. When a company stock performs poorly over long periods, current stock concentration in a DC plan will be low. Yet participants will have suffered real economic losses over time due to a gradual decline in the stock's value.

Because concentrated company stock positions lead to greater investment portfolio risk, we observe that the current DC system will produce greater extremes in realized retirement wealth as well as lower median retirement wealth, than would a system of more diversified investments. In particular, concentrated stock positions will invariably produce instances where some workers forfeit their DC savings to firm bankruptcy. This downside risk is an inevitable consequence of the policy aim of encouraging employee ownership of company stock. While always present, the risk is more apparent, and affects a larger group of workers, during an economic and equity market downturn. Policymakers weighing the balance between retirement security and employee ownership have several tools that might

be used to increase diversification in DC plans, ranging from disincentives to compulsory diversification. After sketching out key alternatives, we discuss conditions for their effective implementation.

I. The Role of DC Plans and Company Stock in the US Retirement System

Company retirement plans in the US are voluntarily provided by employers. Many firms elect to offer a retirement plan supplementary to the mandatory national Social Security system, and are encouraged to do so by tax incentives under the federal Internal Revenue Code.⁴ Employees covered by such plans receive a promise of retirement benefits or contributions that are funded. A wide range of plan types and plan designs is permissible under current law.⁵

Close to half of the civilian private-sector labor force today has company-sponsored retirement plans. US Department of Labor (USDOL) data from 1998, the most recent available, reported over 700,000 private retirement plans, consisting of 56,000 defined benefit (DB) plans and 670,000 defined contribution plans (see Table 1). Updated estimates for 2001 based on US DOL and Federal Reserve data suggest that DC plans continued to grow at a rapid pace since 1998, while DB plans continued to fall gradually in number. DB plans are not only fewer in number, but they also cover less of the workforce: 22.5 million employees are active DB participants but more than 56 million active workers are in DC plans. Private sector pension assets stand at about \$4 trillion, roughly divided between DB and DC plans.⁶

Table 1 here

A number of reasons have been put forth to explain the rapid growth of DC plans. One is their lower administrative, regulatory and funding costs. Another is a decline in employer paternalism: employers have become more interested in a flexible workforce, and workers have sought greater portability of retirement savings. A third has been the rise in individual investment responsibility and financial literacy within the US. Households have taken on direct capital market risk not only in workplace retirement plans but also through mutual funds and Individual Retirement Accounts. Finally, interest in investing has been propelled by a bull market in US equities over the past twenty years.

⁴ In 2002, lost revenues attributed to retirement plan tax qualification were estimated at \$53 billion for employer-sponsored 401(k) retirement plans; \$48 billion for conventional retirement plans; \$18 billion for Individual Retirement Accounts; \$6.5 billion for Keogh plans; and \$1.3 billion for ESOP plans. These tallies could be compared to \$66 billion for home mortgage interest deductions and \$99 billion for nontaxable employer-sponsored health insurance (OMB, 2002). However it must be noted that these estimates do not take into account revenues associated with future benefit payouts.

⁵ We focus in this paper on the tax-qualified pension system. In addition, some employers offer non-qualified pension plans that typically offer additional benefits to senior executive and managerial ranks. These pensions are often unsecured and unfunded obligations of the employer, subject to risk of bankruptcy, although there is a general trend toward increasing the funding and security of executive retirement benefits.

⁶ The fact that the DB sector has more assets despite being fewer in number and including fewer active workers is explained by the maturity of the DB system. DB plans received their impetus during and immediately after World War II, whereas DC plan growth has been most rapid in just the last two decades.

Despite the trend toward DC plans, some retirement plan-covered workers have both DB and DC plan coverage. Labor Department data indicate that about one-quarter of the private-sector labor force participated *only* in a DC program, fewer than 10 percent participated in *only* a DB pension, and 15 percent had *both* DB and DC plans (in 1998; see Figure 1). Gross coverage rates (by either or both plans) stood at around half the civilian labor force. Coverage rates were higher among the full-time and full-year employee population.

Figure 1 here

A. DB Plan Characteristics

Retirement formulas in DB plans are generally given as a function of the worker's retirement age and years of service, and often his final pay. A DB benefit function may be a smoothly accruing one (e.g. the retirement benefit could grow at 1 percent of final pay per year of service), or it may be nonlinear so that higher benefits are awarded for longer years of service or pay above some threshold (c.f. Mitchell, 2000). Many DB formulas result in a meaningful benefit only for long-tenure employees with several decades of service with a single employer.⁷

In the US, private DB plans must be funded, meaning that contributions to the plan are required so that assets are available to support annuity payments when the worker retires. Plan sponsors invest DB plan assets in diversified investment portfolios, taking into account risk and return; sponsors are required to add additional plan contributions in the event that a plan falls short of funds needed to pay benefits. The Employee Retirement Income Security Act of 1974 (ERISA), the principal fiduciary legislation governing employer retirement plans, created the Pension Benefit Guaranty Corporation, a federal agency which guarantees a portion of private defined benefit pensions in the event of corporate bankruptcy. Under ERISA rules, DB plans may not invest more than 10 percent of their assets in sponsoring-company stock, so as to ensure plan diversification. Congress instituted the 10 percent limit to avoid the moral hazard problem of plan sponsors investing pensions assets heavily in their own stock and leaving pension liabilities to the federal government in the event of bankruptcy.⁸

B. DC Plan Characteristics

In the case of DC plans, a plan sponsor establishes a retirement saving vehicle into which specified contributions are deposited periodically. Employer and employee contributions to DC plans, along with investment earnings, are generally sheltered from income tax until distribution. Several types

⁷ We emphasize traditional DB pension plans in this discussion. Among large employers, an emerging trend is to offer cash balance programs, where pension credits to individual accounts are made linearly throughout the worker's lifetime, rather than being back-end loaded. Investment returns are guaranteed, typically at some fixed income rate. Such plans are more portable than traditional pensions, and may be taken as a lump sum when workers change jobs.

⁸ The question of why DC plan legislation did not embody this 10 percent rule is of some interest in light of subsequent events. As Gordon (1984) notes, most employers considered their DC plans supplementary to DB primary plans, and as a result did not worry unduly about over-concentration in company stock in their DC plans.

of DC retirement plans are available, most prominently *401(k) plans*, in which the employee makes voluntary contributions and the employer optional matching contributions. Also central to the company stock debate are *profit-sharing plans*, where the employer's contributions varies based on firm profitability; and *Employee Stock Ownership Plans (ESOPs)*, a specialized and less well-known type of plan in which the employer contribution is in the form of company stock. All of these DC plans, technically known as eligible individual account plans, are authorized to hold company stock. Many employers integrate different DC features into *combination plans*, such as a combination 401(k) / profit-sharing plan, or a 401(k) / ESOP plan, also known as a KSOP.^{9, 10}

In the US, 401(k) plans are the dominant form of DC plan. By the end of the 1990s, 401(k) plans accounted for over 40 percent of all retirement plan assets and over 80 percent of all DC assets (in 2001; authors' estimates). Employee participation in 401(k) plans is voluntary; approximately three-quarters of eligible workers actually participate. Employers determine whether, and at what level, to match employee contributions. The average 401(k) participant deposits about 7 percent of his taxable earnings in this tax-deferred vehicle, and employer matching contributions account for another 3 percent or so of pay. In total, 401(k) contributions average 10 percent of taxable pay, with wide variations by income and age (Holden and VanDerhei, 2001a).¹¹ Figure 2 shows trends in DC plan growth overall, and it also highlights the strong relative growth of 401(k) plan market share. At the end of the 1990s, 68 percent of all workers in plans were included in DC plans, and 56 percent had DC plans as their primary plan.

Figure 2 here

Most DC plans are *participant-directed*, meaning that participants make investment decisions for their own retirement plan contributions within a set of investment choices selected by the plan sponsor.¹² Participants may have less flexibility over the way in which employer contributions are invested. Large employers frequently require that their own contributions be invested in company stock, permitting

⁹ Another type of DC plan is the money purchase pension plan, in which employer contributions are based on a fixed percentage of pay. These plans are considered a form of "pension plan." While they are not guaranteed by the PBGC, they are subject to the same 10 percent limit on stock holdings as DB plans. (Some pre-ERISA plans are exempt from the 10 percent rule.) As a type of pension plan, money purchase plans are also required to offer employees an annuity option upon distribution of plan assets.

¹⁰ Legally 401(k) plans are a form of profit-sharing plan. Economically, they are similar too, as 401(k) plan matches can be variable at some firms in difficult economic times. In 2001, a number of prominent firms, including Ford Motor Company, DaimlerChrysler, and Bethlehem Steel, announced that they were reducing their 401(k) matching contributions because of the current economic slump (U.S. News, 2001).

¹¹ The most common 401(k) matching contribution is \$0.50 per employee dollar up to 6 percent of pay (Mercer, 2001). Over 90 percent of employers provide a matching 401(k) contribution (Holden and VanDerhei, 2001a).

¹² Most 401(k) plans in the US are participant-directed, at least for employee contributions. A small group of profit-sharing remains trustee-directed. In other countries the pattern of trustee-directed DC plans is more common; see Bateman and Mitchell (2002).

participants to direct investments only for their own contributions.¹³ Employees are usually able to choose from a menu of diversified funds when investing their own contributions (and the portion of employer contributions they invest). In early DC plans, sponsors allowed relatively few investment options, perhaps three or less, and these were limited typically to guaranteed investment contracts (GICs), company stock, and perhaps a diversified equity or balanced fund (Mitchell, 2000). But in the last two decades, employers have gradually expanded investment choices for participants, with the average 401(k) retirement plan now offering 12 investment choices (Fidelity, 2001).¹⁴

On leaving the company, DC participants usually take most or all of their retirement plan benefits in the form of a lump sum.¹⁵ This lump-sum distribution can be spent immediately, but at a substantial tax cost. As a result, people are increasingly likely to roll these lump sums into Individual Retirement Accounts (IRAs) where the funds may be invested. In DC plans with company stock, departing employees are typically offered the option of taking shares in-kind or in cash. By electing in-kind distribution of shares, participants may receive preferential tax treatment since capital gains on the stock are taxed at long-term capital gains rates. Cash or other investments, by contrast, whether rolled over to an IRA or spent immediately, are taxed at the worker's (higher) ordinary income tax rate. This tax benefit serves as an inducement for employees to continue to hold stock positions when changing jobs or retiring.

In most DC plans, employees bear the responsibility for making contributions, selecting investments, and managing the funds after retirement. DC plan sponsors are not responsible for guaranteeing benefit levels prior to, or after, retirement. Participants are directly exposed to capital market results for the investments they choose. If they hold company stock in their account, participants are exposed to the specific industry, sector, and firm risk associated with their employer. Should a DC plan participant elect to convert the retirement plan accumulation into a single (or joint and survivor) annuity payable until death, the annuity would typically be provided by a third party and would therefore not be guaranteed by the government, unlike the case of DB plan annuities.¹⁶

¹³ Under US law, employers may compel participants to purchase company stock (or other investments) with the employee's own contributions, but the practice is now uncommon. As described later, as a result of the Color Tile bankruptcy, mandatory employee contributions to company stock in a 401(k) plan are capped at 10 percent.

¹⁴ Less than 10 percent of corporate DC plans allow participants to select individual stocks and bonds through a brokerage account (Fidelity, 2001). Brokerage accounts lead to issues of diversification and risk similar to those arising from company stock.

¹⁵ Some participants leave their retirement savings in their employer's plan and then take withdrawals directly from the plan at retirement. In 401(k) plans, loans against plan balances are often available for active participants.

¹⁶ Data on annuity elections from DC plans at retirement are difficult to obtain. However, one survey of retirees from 1995 to 2000 (ICI, 2000) found that, of the 70 percent of respondents who had multiple options at retirement, 47 percent opted for a lump-sum distribution, 26 percent chose to keep assets within the employer's plan, 23 percent elected an annuity, and 10 percent chose installment payments from the employer plan (results do not add to 100 percent because some participants chose multiple options). For the 30 percent who had a single distribution option, 70 percent had a lump sum option, typically through a 401(k) plan, while 30 percent had a mandatory annuity option, typically through a 403(b) or 457 plan or the Federal Thrift Savings Plan.

C. Employee Stock Ownership Plans

Employee Stock Ownership Plans (ESOPs) are a less well-known type of retirement plan, numerically few but quite important in the debate over company stock in retirement programs.¹⁷ An ESOP is a DC plan in which the employer makes tax-protected contributions of company stock to workers' accounts on a discretionary basis; tax law specifically authorizes such plans to invest principally, if not exclusively, in the stock of the employer.¹⁸ ESOPs are designed to encourage employee ownership of a firm's stock and are also used to accumulate wealth for retirement. The exact number of ESOPs is in some dispute: the National Center for Employee Ownership (NCEO) reports that there are 11,500 ESOPs covering almost 9 million employees and holding about \$500B in assets (NCEO, 2002a). Perun (2000) suggests there are somewhat fewer ESOPs, on the order of 8,100 such plans, or just over 1 percent of all retirement plans.

ESOPs date from an earlier era when policy interest in workers' ownership of company stock trumped worries over investment diversification. These plans typically restrict participants' right to diversify company stock holdings significantly, although sponsors may adopt more liberal rules. Under current law, ESOPs may require participants to hold company stock to the later of age 55 or 10 years of service. Once that threshold is met, participants may *begin* diversifying, but then only gradually. In effect, full diversification of a participant's ESOP account is not possible until the participant attains at least age 60. Since the US median retirement age is now 62, ESOPs give workers approaching retirement little chance to recover financially in the event of a collapse in the stock's price.

Unlike other DC plans, ESOPs afford the employer a unique privilege—the ability to *leverage plan assets*. In a leveraged ESOP, the plan, using either bank debt or a loan from the employer, buys a large block of employer shares, which are held as “unallocated” (not yet designated to individual participants). Each year, as the employer makes tax-qualified contributions to the ESOP, a portion of the bank debt, both principal and interest, is paid off, and a corresponding value of the unallocated shares is transferred to individual employee accounts.¹⁹ This concept allows employee-owners to use an ESOP to acquire bank financing for capital investment, and then use earnings from the company to pay off the debt gradually. Leveraged ESOPs have also figured prominently in corporate control and financing transactions by public firms. Managers have used employee ESOPs to undertake leveraged buyouts or to

¹⁷ For more on ESOPs see Hallman and Rosenbloom (2000) and Smiley and Brown (2000).

¹⁸ The tax law definition that ESOPs must invest “principally” in employer securities would imply that some diversification would be common in ESOPs. The US Department of Labor has suggested as much (in an *amicus* court brief filed by the DOL Secretary in *Moench v. Robertson*, a 1995 court case involving an ESOP). Nevertheless, the vast majority of ESOPs is currently heavily invested in the stock of the sponsoring employer.

¹⁹ Under prior law, the bank making the ESOP loan also received special tax incentives.

stave off hostile takeovers.²⁰ One important reason is the voting control that employees can exercise through an ESOP. When tallying shareholder votes, unallocated shares are voted in the same proportion as the allocated shares voted by employees, leveraging employee voting authority over a larger block of shares than they currently own.

Leveraged ESOPs also bring tax benefits. Interest payments on an ESOP loan, like other corporate interest payments, are deductible to the company. However, employers may use dividends paid on the unallocated ESOP shares to defray those interest payments, in essence allowing dividend income to be transferred to participant-shareholders free of corporate income tax. Principal payments on the loan are seen as deductible too, as they are in the form of tax-qualified employer contributions to the plan. Freiman (1990) argues that employers have overstated these tax benefits, as both interest and dividend payments on ESOP loans constitute a form of compensation, which would otherwise be deductible if paid under a different form. Chaplinsky and Niehaus (1991) reaffirm that it is the tax sheltering of dividend payments that offers a meaningful tax benefit. To maximize this benefit, some employers utilize high-yielding preferred stock, rather than low-yielding common shares, in a leveraged ESOP.²¹

Other ESOP benefits accrue to family- or privately-held firms. ESOPs are a tool of succession planning, providing liquidity to a founding family or owners through a private sale to employees. Owners of privately-held firms receive tax benefits when they sell their holdings to an ESOP (Perun, 2000). Privately-held firms also used ESOPs as a source of investment capital; in effect, selling shares to employees through an ESOP offers a private equity capital market for the owners' shares, as well as the opportunity to borrow against that equity. This source of equity and debt capital is undoubtedly more critical to smaller or private firms than to, say, well-known ESOP sponsors like Procter and Gamble, McDonalds or Pfizer, who have access to global debt and equity markets and presumably use ESOPs for their tax and employee ownership benefits. Overall, only 10 percent of ESOPs are sponsored by publicly traded firms, while 90 percent are sponsored by private firms (NCEO, 2002a). However, a much higher percentage of ESOP participants and assets are in publicly traded ESOPs because of the public firms' larger size. ESOPs in private firms are supported by a larger percent of employee salary than in publicly traded firms (8-10 percent of pay versus 4-6 percent; NCEO 2002a).

In the public eye, there is substantial confusion between ESOPs and 401(k) plans. Several retirement plans recently taken to task by the press for high concentrations of employer stock are actually

²⁰ For example, in 1988, Polaroid Corporation utilized an ESOP to buy back shares and maintain independence in the face of a hostile bid from Shamrock Holdings (Deutsch, 2001). This contemporary case is illustrative of the risks involved in an undiversified ESOP. Polaroid filed for bankruptcy in 2001, and employees lost substantial savings accumulated in the Polaroid ESOP (Krasner, 2002).

²¹ Under older accounting rules, leveraged ESOPs offered financial reporting benefits. ESOP debt could remain off the employer's balance sheet; contributions were reported at historic cost, not market value, understating the cost of pensions, at least during the term of the ESOP loan. Some existing ESOPs still take advantage of these benefits.

ESOP-centered programs. This confusion is understandable. Although the purpose of an ESOP is to provide for *employee ownership* of the company's shares, ESOPs sometimes appear to be *retirement* plans, especially when they are combined with other types of DC retirement plan features. As one example, the Procter and Gamble (P&G) retirement program has some 95 percent of its assets invested in company stock. It is not simply a 401(k) plan; instead, it is an ESOP, profit-sharing, and 401(k) plan wrapped into one. Within the P&G plan, both ESOP and profit-sharing components are invested in P&G stock. The company does not offer a DB plan; instead, it views the stock-oriented profit-sharing component as a substitute for a DB plan. A 401(k) feature of the plan allows participants to invest their own monies in a range of diversified investment choices for retirement or in P&G stock (Jacobius 2001a, Peale 2002). With ESOP and profit-sharing components invested heavily in stock, and with employees making voluntary 401(k) contributions to the stock, the plan is, not surprisingly, highly concentrated.

Table 2 provides a list of well-known US companies—including P&G, Abbott Laboratories, Anheuser-Busch, Ford Motor Company and Pfizer—with high levels of company stock. Each of these firms uses a combination of a 401(k) plan and ESOP feature, known as a KSOP.²² Some also use leverage to gain the tax and ownership benefits noted above.

Table 2 here

These decisions by employers to create hybrid ownership/retirement programs (e.g., ESOPs or profit-sharing plans heavily invested in stock, and integrated with a 401(k) feature) have gradually blurred the distinction between plans designed to enhance employee ownership and plans designed to maximize retirement security. A number of prominent firms have taken a similar tack with DB plans, replacing DB benefits backed by diversified portfolios with programs based on company stock. In a so-called “floor offset” plan design, the employer gradually reduces or eliminates benefits under a traditional DB pension plan as it increases company stock contributions to an ESOP. These programs have been a way of further reducing corporate pension expense, but also have the effect of increasing company stock concentration among workers (Schultz and Francis 2002a).

Recent legislation has further confounded the distinction between traditional DC plans and ESOPs. The Economic Growth and Taxpayer Relief Reconciliation Act (EGTRRA) of 2001 embodied a new and quite attractive tax incentive for firms to create ESOPs. Under the law, stock dividends reinvested in an ESOP are now tax-deductible.²³ What Congress thought to be a narrowly written tax

²² In an ESOP, employers make discretionary contributions of employer stock to workers' accounts. In a KSOP, participants make voluntary 401(k) contributions to the 401(k) portion of the program. The employer provides a ESOP stock contribution and may also make a matching 401(k) contribution to the 401(k) portion, which may or may not be directed into company stock. The plan may or may not include a profit-sharing contribution, made in cash or stock. The ESOP component may or may not be leveraged.

²³ Under EGTRRA, employers can more readily qualify for a corporate tax deduction for dividends reinvested in an ESOP by participants. Earlier tax law allowed a similar deduction, but typically required payment of the dividend to

benefit for ESOPs has proved, in practice, to be advantageous to many sponsors of traditional 401(k) plans. With a simple plan amendment, traditional 401(k) plans with company stock can convert to a KSOP and garner a new and in some cases substantial corporate tax deduction (Schulz and Francis, 2002; Anand, 2001). Table 2 provides estimated tax deductions for certain large employers utilizing a KSOP structure. As a result, many plan sponsors are redesigning their traditional 401(k) plans to take advantage of the new ESOP rules, a policy change that will likely further encourage the concentration of company stock in DC plans. According to US Treasury officials, it will also represent a much larger revenue loss than Congress had assumed in the evaluative stages of the bill (Anand, 2001).

D. Current Controversies

Two factors have attracted public attention regarding company stock in US DC retirement plans. First, as shown above, DC plans are now a central element of Americans' compensation packages. No longer seen as supplemental and limited only to employees of large companies, personal accounts in the form of 401(k) and other tax-qualified vehicles are now the core of millions of workers' retirement saving. The recent bear market in US equities has raised worries about the risks of stock market investing in general, as well as company stock investments in DC plans in particular. Some would contend that baby boomers nearing retirement as well as younger workers are taking undesirable risks in their retirement portfolios concentrated in company stock.

A second factor prompting the current debate is that employees may hold company stock not only in their 401(k) plans but also in other tax-qualified plans such as profit-sharing and ESOPs, as well as in other non-retirement vehicles such as stock options and stock purchase plans. As the range of these plans has grown, there is concern that employees and retirees with concentrated stock position are being exposed to excessive risk of company bankruptcy. This concern has been highlighted by the huge corporate losses (and in some cases outright bankruptcy) of several high-profile US companies (Table 3).

Table 3 here

The Enron Case. Probably the most widely discussed case where company stock has played a prominent role in compensation arrangements is that of the Enron Corporation. In Enron's 401(k) plan, employee contributions were matched by the employer at 50 percent in Enron stock.²⁴ Participants were precluded from selling the employer-contributed Enron stock until age 50. Employees had wide discretion over investing their own contributions, which could be allocated to as many as 18 different portfolio instruments including an Enron stock component; no sale restrictions were in place for employee

the employee. In order to qualify for the ESOP deduction, sponsors must recast their 401(k) plan as an ESOP, at least insofar as the employer contribution is concerned. Sponsors must give participants the right to receive dividends in lieu of being reinvested in the plan. There are technical requirements that must be met, including separate nondiscrimination testing and participant pass-through voting.

²⁴ The match formula was \$0.50 on the \$1.00 for the first 6 percent of pay contributed by the employee.

investments. Rather than diversifying their investments, however, employees bought more stock. Enron management also actively encouraged such investments. At one point, over 60 percent of plan assets were held in company stock (Francis and Schulz, 2001; Jickling, 2002).

The Enron case also illustrates the case where other programs beyond the 401(k) plan were linked to company stock. Enron offered an ESOP invested in Enron stock. It also offered a traditional DB plan, but the company phased out the DB benefits over time as it made larger contributions to the stock-based ESOP (Schultz and Francis, 2002a; Dugas, 2002). Simultaneously, the company introduced a new cash balance DB plan, which was diversified. In total, most but not all of the retirement and wealth accumulation programs for Enron employees were stock-based.²⁵

Between 1995 and 2000, Enron's stock price rose 475 percent, peaking at around \$90 per share in August 2000. Thereafter, however, share values collapsed and fell to below \$1, after which Enron filed for bankruptcy in December 2001. A political backlash has arisen in the months following the firm's demise, partly due to the substantial losses resulting from concentrated company stock in the 401(k) and other plans. Employees' decisions to overweight holdings in Enron stock and the company's requirement to hold the stock until age 50 had probably seemed harmless, in light of the huge price gains. The subsequent losses were particularly painful because they had been preceded by years of outsized gains.²⁶

Several plan participant lawsuits were filed over the management of Enron's 401(k) plan, against company officials and the third-party recordkeeper.²⁷ These lawsuits allege that company officials knew the firm was in financial difficulty and breached their fiduciary duty by, among other things, continuing to offer company stock as a plan investment and providing inaccurate and misleading information. The Enron lawsuits also allege breach of fiduciary duty for what is a common industry practice—the freezing of assets during a “blackout” period, or the time when moving from one recordkeeper to another. These cases are currently in litigation.

Other Recent Cases. Another notable case is that of Lucent Technologies. Lucent was created as a spin-off company during the 1996 breakup of AT&T. Employer contributions to Lucent's management 401(k) plan were made in the form of stock. For non-management employees, about one-third of the workforce, the employer 401(k) match was in the form of an ESOP contribution made in stock (Lucent, 2001). It is

²⁵ A similar example is the case of Global Crossing, whose stock has fallen from over \$60 a share to less than \$1 in the past two years. At one subsidiary, Rochester Telephone, a traditional DB pension plan was terminated and replaced with an ESOP program, which is now worthless. Employees also had stock holdings in 401(k) and stock purchase plans (Fabrikant and Johnston 2001).

²⁶ Some media accounts of the Enron debacle highlight workers who lost six- or seven-figure account balances (Oppel, 2001; Dugas, 2001). Of course these balances were high due to exceptional returns on Enron stock prior to bankruptcy; participant balances would not have grown to such levels had the accounts been diversified. Enron participants may feel they have lost a million dollars, but their economic opportunity cost is what the account value would have been in a diversified investment fund; see also Purcell (2002)

²⁷ *Kemper v. Enron Corp.*, *Tittle v. Enron Corp.* and *Rinard v. Enron Corp.* See Francis and Schultz (2001).

not clear to what extent participants were able to diversify these employer contributions. The stock reached a peak of \$82 in December 1999, and then plummeted by over 90 percent in the subsequent two years, and now trades at under \$6 per share (Williamson and Jacobius, 2001). Participants have filed a lawsuit against the company, its board and plan benefit committee. They allege that the sponsor provided misleading information about Lucent stock, failed to provide accurate information, failed to adequately investigate merits of an investment in the stock, and had material conflicts of interest.²⁸

In a different circumstance, plan participants have sued Rite Aid Corporation, the plan's internal trustees, and its third-party recordkeeper. They allege that plan trustees should have known that certain company executives engaged in a scheme to manipulate Rite Aid stock.²⁹ Another lawsuit is pending against Ikon Office Solutions, an office equipment firm. Ikon's stock, held in the company's savings plan, fell from over \$50 in 1997 to a low of \$4 in early 2001; it recently recovered to about \$12 (St. Goar, 2001). In February 2001 a lawsuit was filed against Provident Financial, whose shares had fallen from over \$60 to about \$4 in a year.

Though attention focuses on high-profile cases characterized by precipitous drops in stock values, a company's stock price may decline gradually. Economic losses in such cases may be less obvious but still substantial. One such instance is the bankruptcy of Kmart Corporation in January 2002. Kmart reported that 14 percent of its DC plan was invested in company stock at the time of its bankruptcy (Schneyer, 2002). But stock accounted for some 28 percent of plan assets in 1995 (Paton, 2002). Over the last decade (ended 2001), Kmart was one of the poorest performing stocks in the Standard & Poor's 500 Index, losing 75 percent of its value as compared to a gain of 238 percent for the S&P 500. The cost of holding Kmart stock must be measured as the value lost over the decade when compared to returns on a diversified portfolio, not the loss of 14 percent of plan assets prior to bankruptcy. Focusing only on sudden and dramatic losses as in the Enron and Lucent cases is too narrow a purview.

Some plan sponsors who have faced precipitous declines in their share prices have taken action on their own. One widely publicized case is that of Federal-Mogul, whose stock, as a result of asbestos litigation, declined from near \$70 per share in July 1998 to just above \$1 in July 2001. In response, Federal-Mogul eliminated matching contributions into company stock and removed the option from its retirement plans (Jacobius, 2001b).

E. Calls to Action

The increased risk of litigation has already led some employers to liberalize restrictions on participants' ability to diversify company stock (Chen, 2002). Sponsors are also increasing their

²⁸ *Reinhart v. Lucent Technologies.*

²⁹ *Kolar v. Rite Aid Corp.*

insurance coverage for fiduciary and directors and officers' policies. Premiums have risen somewhat, and insurers are more carefully scrutinizing sponsors' retirement plan practices (McKenna, 2002).

This current policy debate is similar to that which arose in 1997 resulting from the bankruptcy of the retail chain, Color Tile. That firm's retirement plan proved to be 80 percent invested in company assets, so the firm's bankruptcy led to substantial losses by plan participants.³⁰ Concern over such losses prompted bills to limit holdings in company stock within DC plans. One key bill, proposed by Senator Boxer (D-CA), would have required a mandatory 10 percent limit on company stock holdings in DC plans. Large employers sponsoring DC plans opposed this approach, however, leading Congress to adopt a narrower restriction. Under the rule adopted at the time, employers could not compel workers to invest more 10 percent of *their own 401(k) contributions* in company stock unless employees could reallocate these investments at will. The new rule did not prohibit employees from voluntarily holding stock over the 10 percent threshold, nor did it apply to ESOPs or profit-sharing plans (England, 1997).

The Enron bankruptcy, along with the other cases mentioned above, has reawakened policymakers' interest in regulatory restrictions on the use of company stock in tax-favored plans. The numerous proposals in Washington fall into three broad groups. They differ with regard to whether it should be up to individual participants to make voluntary and active decisions to diversify employer stock contributions, or whether a more systemic approach (through employer disincentives or caps) is needed to avoid having participants "bet the farm" on company stock (as in the Enron case).

The first set of proposals focuses on expanding *participants right to diversify* employer contributions directed to stock. Some call for an immediate right to diversify all stock holdings; others set some time period, such as one or three years, before participants may sell employer stock contributions. A second set of proposals calls for *a limit on company stock holdings in DC plans*, similar to the 10 percent limit currently in place for DB plans. The most common "cap" proposed is 20 percent of plan assets. A third type of proposals focuses on a different goal: creating *disincentives for employer stock contributions*. One approach would reduce the corporate tax deduction for contributions made in stock to 50 percent of the amount contributed. A second would give employers a choice of two regimes. Employers could offer stock as an investment option but would be prohibited from directing contributions into it; alternatively, if employers directed contributions to stock, employees would be prohibited from investing their own money in it.

³⁰ This was not precisely a garden-variety company stock purchase plan. England (1997) reported that the Color Tile 401(k) plan had purchased several stores from the parent firm and then leased them back to the company at below-market rates. Subsequently "(s)ome of these stores stopped making their lease payments, cutting cash flow into the plan. Plan administrators froze payouts, telling participants in a May 10 letter that they had no idea when they might resume or what value could be recovered from these investments."

Reflecting the complexities of the US defined contribution system, legislative proposals vary widely in scope. Some only apply to 401(k) plans and do not address concentrated stock positions in profit-sharing and ESOP plans. Others cover 401(k) and hybrid plans such as KSOPs but not standalone profit-sharing or ESOP plans. Still others address all types of plans with different rules. The question of which types of plans are covered is crucial. If diversification rules apply only to one type of plan, employers who prefer concentrated stock holdings might shift to another type of plan. A related question is whether reforms should apply to all current holdings or only to new contributions.

Many policymakers continue to make distinctions between retirement plans and ESOPs, with ESOPs being permitted less liberal diversification rules. This arises from the traditional view that employers offering stock in ESOP plans expect employees to use the funds to become long-term shareholders in the company. Going further, some legislation imposes diversification rules on ESOPs sponsored by *publicly traded* firms (e.g., Procter & Gamble), but it exempts ESOPs sponsored by *privately held* firms under the assumption that private firms will find it difficult to raise cash to pay employees who diversify their stock. In terms of caps, most schemes apply to all monies, employer and employee in a plan, though one deals only with employee monies, in the belief that if an employer directs money to stock, employees should be prevented from “doubling down” that bet.

Legislative proposals have been influenced by the specific circumstances of the Enron case, particularly regarding the plan *lockdown period*. This refers to the period when assets move from one recordkeeper to another and asset trading is frozen.³¹ One approach would require government pre-approval of lockdowns. Another would require mandatory notice to participants of a lockdown, under the assumption that participants concerned about stock volatility could diversify their holdings in advance. Yet another would clarify employer fiduciary liability while plan assets are frozen. Finally, as a result of the perceived conflicts of interest between Enron senior company officials and plan participants, some propose to freeze executive trading in company stock *outside the plan* (e.g., in personal accounts or stock option programs) while plan assets are frozen and unavailable for trading by plan participants.

The growth of DC plans has expanded the role of company-provided benefit communications and investor education. Reflecting this trend, several proposals call for mandatory disclosures, particularly around the importance of diversification and the risks of holding company stock. A related idea is to send account statements quarterly. Another, more contentious idea is to streamline the fiduciary rules for retirement plan providers when offering investment advice to plan participants.

³¹ A recent survey of benefits professionals showed that 74 percent had experienced a lockdown at some point, with the typical length of time being two weeks and one month (VanDerhei, 2002a).

II. Company Stock in DC Plans and Employees' Compensation Package

A better understanding of the controversy over company stock in compensation packages generally, and in retirement plans in particular, requires up-to-date information. In this section we discuss what can be gleaned from the data regarding plan and employee exposure, and we illustrate the variety of ways in which retirement plans shape investment in company stock. We understand that exposure to company stock can arise through several means including stock option programs, employee stock purchase plans, and a wide range of executive compensation arrangements (Lambert et al. 1991; Hall and Murphy 2001). This paper, however, focuses on stock held in tax-qualified retirement plans.

By way of preview, we find that larger firms are more likely to offer company stock in DC plans, they are more likely to direct employer contributions toward stock purchases, and they are more likely to impose restrictions limiting employee efforts to diversify those employer contributions in stock. The result is that employees in larger firms are less diversified and have higher concentrations of company stock. By contrast, among smaller firms, particularly publicly traded companies, the prevalence of stock is lower, the decision to invest employer money in stock is often up to the participant, and employers impose fewer restrictions on stock diversification (smaller privately held firms may not follow this pattern). Overall, there appears to be less concentration of employee stock among smaller plans. That said, despite these broad patterns there is substantial heterogeneity in the data, with (some) large firms not offering stock at all within the plan, and with (some) large firms offering stock, but allowing participants full discretion over investment of employer contributions.

A. Information on Company Stock in Retirement Plans

Our data are drawn from several sources. First are US Department of Labor (USDOL) statistics on the incidence of company stock in private retirement plans. These data include all plans that file Form 5500 with the USDOL (they exclude life insurance reserves used to fund corporate retirement plans). The USDOL has provided us with statistics through 1998; no more recent figures are available from this source. In 1998, there were some 673,000 DC plans covering 50 million participants and holding \$2.1 trillion in assets. Table 1 summarizes these data and offers our own forecast through 2001. A second source is the database developed under the Participant-Directed Retirement Plan Data Collection Project, jointly sponsored by the Employee Benefits Research Institute (EBRI) and Investment Company Institute (ICI) (Holden and VanDerhei, 2001; VanDerhei 2002b). The EBRI/ICI dataset covers more than 35,000 plans with a 401(k) feature, 12 million active 401(k) plan participants, and nearly \$580 billion in assets.

To examine company-specific investment patterns, we utilize information from several industry sources. One is a compilation of the 93 corporate DC plans, extracted from a survey of the 200 largest

DC plans in the trade publication *Pensions and Investments*.³² We use this file to characterize the use of company stock among the largest US firms: here the average company has \$5.4 billion in DC assets. Though few in number, these 93 plans account for \$520 billion in DC plan assets (or one quarter of the total national DC assets). A second industry source is information from the Vanguard Group on the restrictions imposed by DC plans on company stock, supplemented by additional data from Hewitt Associates and William Mercer. The Vanguard dataset represent \$65 billion in total assets and 5 percent of the market value of company stock in 2001. It provides plan rules for 173 employers and 264 DC plans offering company stock. The average plan in this dataset has \$249 million in assets and 2,500 workers, which represents the medium-sized corporate market. Since plan size is positively related to the availability of company stock, concentration levels, and restrictions, the Vanguard dataset probably offers a lower-bound view of these phenomena.

B. Plans and Participant Company Stock Exposure

As noted above, company stock in DC plans is concentrated in 401(k) plans, profit-sharing plans, ESOPs, and combination versions of these plans.³³ USDOL data in Table 4 show that about 16 percent of DC assets were invested in employer stock in 1998. We estimate 2001 DC assets at \$2.1 trillion, so company stock holding stood at \$340 billion at year-end 2001.³⁴ In the USDOL data, the fraction of plan assets in employer stock varies widely across plan type, with stock bonus plans / ESOPs being the most concentrated, and profit-sharing/thrift saving plans (which include 401(k) plans) somewhat less so. By the end of the 1990s, each plan type appeared less concentrated than in 1993. Arguably, this trend resulted from the growth of small 401(k) plans, which are unlikely to offer company stock.

Table 4 here

The DOL percentage of 16 percent of DC assets invested in company stock gives a somewhat misleading view of company stock exposure. Company stock is actually offered as an investment option by only a few retirement plans, typically those of the largest employers.³⁵ In the EBRI/ICI data, only 3 percent of DC plans offered company stock, or about 21,000 of the over 700,000 DC plans (2001

³² We arrive at 93 plans from the list of 200 by excluding public plans, plans sponsored by mutually owned or privately-held firms, and plans with stocks which recently went public (e.g., Prudential Insurance).

³³ Throughout the paper we refer to 401(k) plans as distinct from profit-sharing plans, although we recognize that 401(k) plans are a type of profit-sharing plan under the law.

³⁴ This estimate is derived by projecting the 1998 USDOL data from 5500 plans to 2001 (see Table 1). Our figure agrees with other estimates in the literature; see Benartzi (2001). Higher estimates suggest that company stock represents \$500 billion of DC assets, but this figure uses an erroneous calculation (it applies the 29 percent of company stock in 401(k) plans that offer company stock to all DC assets including plans lacking stock).

³⁵ Large plan assets tend to be associated with large capitalization firms, though plan asset size is also influenced by several factors: number of participating workers, their deferral rates, generosity of employer contribution, investment performance, and length of time plan was in existence. Here we use term “larger plans” and “larger firms” interchangeably in effect measuring firm size by number of workers.

estimate).³⁶ Moreover, the exposure to company stock among these plans is much higher, an average of 29 percent of plan assets.

While few in number, the plans offering company stock are quite important: they cover 42 percent of all DC plan participants and 59 percent of all DC plan assets.³⁷ To put it in other terms, while only 3% of plans offer company stock, some 23 million DC plan participants have access to company stock within their employer plans, and those DC plans in total command assets of \$1.2 trillion. (Below we estimate how concentrated participant holdings in stock are.)

Both the prevalence of, and asset allocation to, company stock are function of plan size. Salisbury (2002) notes that 73 percent of plans with 5,000+ participants offer company stock, while only 32 percent of plans with fewer than 5,000 participants do so. Drawing from several sources, Table 5 shows that 72 percent of plans with 5,000+ participants offer company stock as an investment option, while only 6 percent of firms with fewer than 100 employees do (PSCA, 2001). There is also a pronounced tendency for larger-asset plans to offer company stock. Asset allocation levels to company stock, like the availability of stock, are also a function of plan size. Company stock represents 31 percent of average assets among plans with 5,000+ employees, but only 17 percent of assets in small plans.

Table 5 here

Additional evidence on the prevalence and asset allocation of stock among large DC plans is provided in Table 6, where we list the top 20 corporate DC plans in the US as identified by *Pensions and Investments*. Among these 20 plans the average asset allocation to stock was 42 percent (or about \$100B). Within the larger set of 96 corporate DC plans in the *P&I* list, three-quarters (74 percent) provided data on company stock holdings. The average allocation to stock was 32 percent.

Table 6 here

A different perspective reports company stock allocations by 401(k) plan participants (Table 7). Here we see that older participants have lower equity holdings than younger participants.³⁸ Employees in

³⁶ One problem with this estimate of 21,000 plans with company stock is that it this would represent three to four times the number of publicly traded stocks in the US, and probably 10-20 times the number of mid- and large-cap stocks. One explanation is that the 3% estimate derived from EBRI/ICI is based on a subset of all DC plans more likely to offer company stock. For example, EBRI/ICI's weighting in company stock is 19 percent versus USDOL's 16 percent, suggesting that EBRI/ICI's 3 % may also modestly overstate the percent of plans with stock. Another is that many large employers offer multiple plans (typically with the same stock) to different divisions or classes of employers (in the Vanguard sample, there are 1.5 plans per firm.) A third is that some plans may have stock from merger or acquisition partners, which may or may not be active as an investment option.

³⁷ The EBRI/ICI data also indicate that, within the 3 percent of plans offering company stock, 29 percent of plan assets are invested in company stock. Applying this measure to our estimates for 401(k) and DC plan assets for 2001, it suggests a range for company stock holdings of \$290 billion to \$359 billion, confirming the results from the USDOL data of \$340 billion.

³⁸ The fact that older participants have lower equity exposure does not necessarily mean that participants sell equities as they age. The asset allocation patterns of older participants may reflect lower risk tolerance for that age cohort, as well as ongoing changes to their investment portfolios.

their 20s hold 82 percent of their portfolios in equities (50 percent in diversified equities and 32 percent in company stock), whereas older workers hold 59 percent of their portfolios in equities (35 percent diversified equities and 24 percent company stock).³⁹ It is not clear whether this is a true age effect or a cohort effect: that is, whether workers elect more conservative portfolios as they age, or whether older workers today have always held more conservative investments over their entire lives, compared to younger employees. It does appear that older cohorts maintain a similar ratio of company stock to diversified equities, despite the fact that they hold a lower percentage of their total portfolio in equities. The ratio remains essentially unchanged, at a ratio of 3:2 for diversified equities to company stock, irrespective of age. This may suggest that (a) participants do not distinguish between the risks of diversified versus non-diversified equities, a point to which we return in Section IV, or (b) participants are prohibited from diversifying over time.⁴⁰

Table 7 also indicates the number of DC participants with concentrated stock positions. On average, 46 percent of participants in plans offering company stock have stock positions exceeding 20 percent of balances. About half this group, 23 percent, has a highly concentrated position exceeding 60 percent of balances. Out of approximately 23 million DC participants offered company stock, we estimate that 10.6 million participants have a concentrated stock position exceeding 20 percent. Within this group of 10.6 million, some 3 million participants hold company stock worth 21-40 percent of their account balances; 2.3 million participants hold 41-60 percent; and 5.3 million participants exceed 60 percent of account balances in company stock (Panel C, Table 7).

Table 7 here

C. Impact of Employer Direction of 401(k) Contributions

Investment decisions by DC plan participants are unusual, in that participants' portfolio mixes are influenced not only by their own preferences and behavior, but also by their plan sponsor's decisions. Most obviously, employers play an important role because they select the menu of available investment options, including whether or not to offer company stock. There is also evidence that employer plan designs influence participant behavior. Benartzi and Thaler (2001) have noted that participants tend to hold a heavier equity allocation when the investment menu includes more equity funds; conversely, participants hold a lower equity allocation when the menu includes more fixed income funds. Arguably, the mere presence—or absence—of company stock in a DC plan sends a signal from employer to participant about the desirability of holding company stock in investment portfolios.

³⁹ Aggregate equity holdings are probably higher by 3 to 4 percent because of the equity portion of balanced funds held by participants.

⁴⁰ It would be of interest to explore whether participants actually begin selling company stock when the restrictions permit, since this would help distinguish between these two alternative hypotheses.

Another reason that plan design is so important is that the employer decides who will invest the company's contribution. Sometimes the employer chooses to invest that contribution in company stock; in other cases, participants are left to make investment decisions for all contributions. Yet another consideration is that sponsors may impose restrictions on participants' ability to diversify employer investments in company stock. As a result, understanding investment behavior in DC plans must rely on information about employer willingness to direct contributions and restrict diversification.

To understand patterns of employer direction and restrictions, one must turn to industry surveys. The Vanguard dataset summarized in Table 8 indicates that of plans offering company stock, 45 percent direct employer contributions to stock, while 55 percent do not. Fidelity (2000) and Hewitt (2001) find similar results. Large plans are more likely to direct contributions than small plans. Mercer (2001) finds that 19 percent of savings plans surveyed forced a contribution into company stock, but 39 percent of larger plans did so.

Table 8 here

Table 9 illustrates the impact of employer investment direction on participant portfolios. Across all 401(k) plans offering company stock, 29 percent of plan assets are invested in company stock. When participants may freely choose to invest the employer matching contributions, 22 percent of total assets are held in company stock. But when the employer directs employer contributions company stock, company stock concentration jumps to 53 percent of assets. Moreover, in employer-directed plans, participants' voluntary stock contributions total 33 percent of plan assets—50 percent higher than in plans where participants make all investment decisions. Section IV offers explanations for why participants hold more in company stock when the employer directs its own contributions to stock.

Table 9 here

D. The Nature of Employer Restrictions on Company Stock

To understand how employer restrictions influence retirement plan investment, we explore the Vanguard survey of qualified plan restrictions, supplemented by data on somewhat larger plans from Hewitt Associates and William M. Mercer. Table 10 examines restrictions imposed on two types of plans.⁴¹ The first set, called *directed plans*, are those where the company directs all or part of employer contributions to company stock. The second set, called *discretionary plans*, are those where all contributions are invested at the discretion of the employee. The Table reveals an interesting pattern of behavior among employers: firms with directed plans (Panel A) are likely to impede diversification

⁴¹ Although we use the term “plan” here, in fact the data in Table 10 refer to the restrictions imposed on specific investment option within a given plan. Employers with company stock may have several stock funds: e.g., the stock of the current employer plus common stock of previous acquisition or merger partners. Also Table 10 excludes so-called “wasting” funds (which no longer permit employee or employer contributions).

through various types of restrictions, while employers with discretionary plans (Panel B) are likely to encourage diversification or even discourage concentrated holdings through caps.⁴²

Table 10 here

Among the directed plans in Panel A, 68 percent restrict diversification by participants in varying ways. Some 37 percent impose diversification limits based on age, service or vesting (including statutory ESOP limits). Another 21 percent restrict diversification until termination; 9 percent impose a mandatory holding period. Meanwhile, reflecting the heterogeneity of employer behavior, 18 percent of directed plans allow immediate participant diversification or impose caps on employees' holdings of stock, all in an effort to discourage concentrated positions.⁴³ (For ease of administration, the caps are typically imposed on ongoing contributions rather than on market values.) A few plans impose trading limits, either to discourage short-term day trading or to restrict participants' ability to buy or sell during SEC earnings blackout periods. Among discretionary plans in Panel B, the tendency is for employers to encourage flexibility and diversification: 69 percent allow full flexibility or impose caps in order to discourage concentration. Reflecting the impact of firm size on the nature of restrictions, the plans in Panel A are somewhat larger than the plans in the Panel B. Directed plans in Panel A average 5,200 participants and \$272 million in assets; discretionary plans in Panel B average 4,400 participants and \$227 million in assets.

Similar results about the nature of restrictions for directed plans are depicted in Table 11, derived from Hewitt (2001) and Mercer (2001) surveys. Both Hewitt and Mercer surveys report that a larger percentage of plans impose restrictions on diversification, respectively 81 percent and 73 percent of the plans directing contributions to stock, versus Vanguard's 68 percent. In part this reflects the larger plan size of the Hewitt and Mercer plan survey universe (5,200 median participants for Hewitt and 8,100 average participants for Mercer versus 2,500 average participants for Vanguard).

Table 11 here

III. Why Do Employers Utilize Company Stock in Retirement Plans?

Employers may utilize DC plans to encourage or mandate stock ownership under the current fiduciary framework for US retirement plans. This section evaluates a wide range of factors, including employee ownership and costs, that might explain why employers favor employee investment in company stock. The next section explores rationales for employee behavior.

⁴² These data do not reveal whether other company policy might promote employee stock purchases (e.g. via stock options, etc).

⁴³ There is no evidence that when restrictions are lifted, rank-and-file participants immediately pull out of company stock, though executives offered stock options do appear to exercise some portion at the point of vesting (Hall and Murphy, 2002).

A. The Fiduciary Framework for Company Stock in Retirement Plans

Current US pension law, most specifically ERISA and the Internal Revenue Code as amended, takes a permissive stance toward the role of company stock in DC plans. The law exempts certain eligible individual account plans—including profit-sharing, 401(k), and ESOP plans—from ERISA’s diversification standard when it comes to company stock. In addition, the law imposes no equivalent restriction on DC plan holdings of company stock like the 10 percent limit for DB plans.

ERISA requires retirement plan fiduciaries (typically the employer along with plan administrators and advisers) to manage retirement plans in participants’ best interest. Under ERISA’s standards, fiduciaries must comply with the “exclusive purpose” rule, indicating that the fiduciary must be exclusively loyal to participants and beneficiaries; the “prudent man” rule, specifying that the plan fiduciary must act with the “care, skill, prudence and diligence” that a prudent person acting in a similar capacity would use; and the “diversification rule,” requiring that the fiduciary diversify the plan’s investments with regard to type of investment, geographic area, dates of maturity, and industrial sector to reduce the chances of large losses (GAO 1997, Joint Committee 2002).⁴⁴

Because of the exemption from ERISA’s diversification requirement, plan sponsors need not diversify company stock positions in DC retirement plans. At the same time, plan sponsors must ensure that all investments, including company stock, always satisfy ERISA’s prudence standard. Some readings of this rule would infer that a poorly-performing company stock in a DC plan, while exempt from the diversification standard, might at some point become imprudent. Consequently, plan fiduciaries are advised to monitor the performance of company stock on a regular basis and ensure its ongoing suitability as an investment for participants.⁴⁵

In defined benefit plans, ERISA imposes a limit of 10 percent on “acquiring and holding” qualified employer securities and real property. It is likely that the Congressional caps on employer stock arose because DB plans are insured by the Pension Benefit Guaranty Corporation (PBGC); in DC plans, of course, participants bear all investment risk. Congress also undoubtedly exempted DC plans from the diversification standard and any cap so as not to limit ESOPs, which are designed to invest in employer stock (Hunter, 1994). Interestingly, as an historical footnote, the early legislative proposals for ERISA did include a 10 percent limit on company stock for *both* DB and DC plans. The limit for both types of plans originated early in the Kennedy administration under reform proposals from the Commission on Money and Credit. The plan resurfaced in a cabinet working group on pensions during the Kennedy commission,

⁴⁴ The law also specifies rules governing so-called “prohibited transactions,” which generally involve a conflict of interest between the plan and parties in interest.

⁴⁵ In the case of ESOPs, two court rulings have indicated that, given ESOPs’ special statutory standing as plans investing principally in company stock, fiduciaries for those plans have a presumption of prudence. As a result, participants have a somewhat higher burden of proof in any litigation. See Buckley (2001) and Joint Committee (2002) for more background on the legal status of company stock.

and in pension reform proposals developed during the Johnson Administration. The idea was then re-debated in early versions of ERISA but it was blocked for DC plans after complaints from employers who sponsored profit-sharing programs that invested heavily in company stock.⁴⁶

Though ERISA is permissive toward company stock holdings in DC plans, regulations issued in 1992 under ERISA section 404(c) provide an incentive for employers to reduce directed contributions into company stock. These regulations emerged when plan sponsors raised concerns about their fiduciary responsibility for participant investment decisions in a participant-directed environment. In response, USDOL provided sponsors with limited relief for employee decision-making, as long as certain 404(c) conditions were met. The most important 404(c) requirement is that participants must provide affirmative investment instructions. Thus, plans with employer-directed contributions into company stock are ineligible, whereas discretionary plans are eligible (assuming they meet all of the technical requirements).⁴⁷ Nevertheless, the regulations under section 404(c) offer only limited relief for plan fiduciaries. While 404(c) plans are relieved of liability for participants' individual investment decisions, sponsors retain responsibility for oversight and monitoring of the actual investments offered.

B. The Employer as Fiduciary for Company Stock

Under current law, the employer as fiduciary stands in a somewhat tenuous if not contradictory position in the oversight of company stock. According to ERISA, employers must act as an arms' length fiduciary for all plan investments, including company stock. The employer must make an independent assessment of prudence regarding company stock on behalf of plan participants. If the stock and firm are doing poorly, at some point the employer might be expected to remove company stock as an eligible investment option in the plan. In such a scenario, the firm's executives could be in the incongruous position of removing company stock from the retirement plan, while simultaneously seeking to inspire confidence in the company and its business plan among Wall Street investors. Some observers argue that only disinterested fiduciaries can make truly arms' length decisions under ERISA's standards. If this is true, employers evaluating company stock may find themselves caught in a fiduciary conflict-of-interest.

⁴⁶ One key opponent of a 10 percent cap on employer stock in DC plans was Sears Roebuck from Chicago. Sears provided a profit-sharing plan invested exclusively in Sears stock. Because of the stock's strong performance through much of the 1950s and 1960s, it would have been difficult to persuade employees to diversify. The Sears profit-sharing plan yielded very generous payouts to its participants, paying retirees sometimes five times their pre-retirement salaries. Unwillingness to limit profit-sharing programs such as Sears' led to the elimination of the 10 percent cap on DC plans proposed in the 1970's; see Gordon (1984).

⁴⁷ A plan that directs contributions into stock may choose to comply with 404(c) for participant contributions. Other requirements of 404(c) include: the opportunity for participants to choose among a range of investments, at least three of which are diversified; reasonable exchange provisions (which might be at least quarterly for diversified options, and possibly more frequently for a riskier individual stock); and affirmative and on-request disclosures. Company stock in a 404(c) plan must be publicly traded. The plan must pass through proxy voting and tender offers to participants, and designate a fiduciary to maintain confidentiality of participants' voting decisions.

One way to understand the dynamics of an employer's decisions surrounding company stock is through the decision-making model of Kahneman and Lovallo (1993). They hypothesize that individuals in an organization, in order to overcome natural risk aversion, develop an "inside view" of a future project or business plan. This inside view relies on "bold forecasts" about the future. It is based on internal data and knowledge; it is often an extrapolation of current trends. By contrast, an "outside view" is an assessment that might be provided by a dispassionate third party. An outside view is typically based on independent statistical data. It actively compares the current situation with other cases, and it develops an estimate for the likelihood of success by comparing the current situation with others.

This framework may be applied to understand the different ways in which managers and independent fiduciaries assess the business prospects for a firm and its stock. Managers are more likely to adopt an "inside view" and create a "bold forecast" of the future of a company and its stock, with the aim of orchestrating all of the firm's resources and employees around that vision. Meanwhile, independent third parties, such as an arms-length fiduciary, portfolio manager or external investor, are likely to adopt an outside view. They will take a more clinical, and dispassionate, approach in analyzing the stock's prospects. They will more likely to use statistical and comparative approaches, assessing the chances of success for a given stock in comparison with other investments. In the end, current public policy might be described as a debate between managers with an inside view, who would naturally be strong advocates for their firm's stock and employee ownership of it as part of their bold forecast for the future; and legal and investment experts with an outside view, who would more likely be advocates of statistical and comparative concepts like diversification. With its dual emphasis on employee ownership and retirement security, current fiduciary law reflects, rather than resolves, the tension between these two views.

C. Company Rationales for Encouraging Employee Stock Ownership

The overriding reason that many firms encourage or mandate employee holdings of company stock is that doing so is widely believed to align stakeholder interests. The goal of employee ownership of the firm's shares—whether as part of a DC retirement plan or more broadly in other stock ownership programs—is to increase efficiency, worker productivity, employee morale, and, ultimately, the firm's value. Employee-owners are thought to be more aligned with the business goals of the firm and as a result should be expected to perform at a higher level. Even and McPherson (forthcoming) as well as Ippolito (1998) summarize the argument, noting that employee ownership provides workers with an opportunity to own a stake in the firm which can enhance shareholder value.

This motivational view is pervasive in the theoretical literature, and it is undoubtedly important among those executives who offer company stock within DC plans. However relatively little clear empirical support exists on the effectiveness of giving company stock to rank-and-file employees. As we have shown, workers do buy employer stock given the opportunity, but the open question is whether this

has a positive effect on important company outcomes. Evidence on this topic is mixed.⁴⁸ Employees in such firms tend to more positive attitudes about their firms, but the link to firm performance is not automatic. Companies with ESOPS report 6 percent higher productivity holding other factors constant (Blasi, Conti, and Kruse, 1995). Yet productivity improvements are less in larger firms, perhaps as a result of the fact that workers are less likely to feel they can influence bottom-line results (the “free-rider” problem). In fact, restrictions on diversifying out of company stock among large firms may be an attempt by managers to overcome the inherent productivity problems of large-scale operations. Yet at the same time, it is among large firms that the evidence in favor of employee ownership is weakest.⁴⁹ It is also worth noting that recent studies on employee ownership, with their mixed results, have drawn from a period of exceptional equity market returns. It is not clear what impact more normal equity market results might have on the motivating effects of ownership.

Whether the employee-ownership incentive is influential for employees below the executive ranks is unclear. Stock compensation was traditionally restricted to managerial employees, but more recently it has been extended through the rank and file. About half of all stock plans offered to US nonmanagerial workers in 1998 were either expanded or added after 1996, and there seems to be a trend toward increased stock coverage (Lebow et al., 1999). The growth of DC plans has also produced more concentration in stock among mid- and lower level employee ranks.

Another reason employers might foster employee purchase of company stock is that this policy might put company stock into friendly hands so as to maximize managerial interests. Stock in DC retirement plans could thus be used as a takeover defense or to effect leverage buyouts. Yet whether plan participants control sufficient stock to make this phenomenon a meaningful one is unclear. In the *Pensions & Investments* survey of the largest US DC plans described earlier, we identified a subset of 65 corporate plans which had their principal stock listing in US markets. In this group of 65 plans, DC plan participants controlled some 5.9% of the outstanding market capitalization of the average firm.⁵⁰ We note that these data represent only DC company stock holdings; they exclude other types of stock ownership plans, such as employee stock purchase plan and stock options; they also exclude unallocated shares in

⁴⁸ See a number of studies reviewed in Kruse and Blasi (1997) and Kruse (2002); a recent extension is found in Oyer and Schaefer (2001).

⁴⁹ Related research has also evaluated stock-based executive compensation, since in the US context, a substantial portion of deferred compensation is in the form of company stock or stock options. The evidence shows that chief executives in key industrial companies receive about one-third of their compensation in the form of stock options (Leonard, 1990; Murphy, 1999; Abowd and Kaplan, 1999). Research indicates that company performance is positively associated with executive holding of stocks or stock options, but by much less than one-for-one. In other words, firms compensating key employees using conditional and long-term incentive plans did experience higher equity returns than those lacking such plans, but net shareholder benefits were not necessarily positive.

⁵⁰ We only had access to asset, rather than specific share, data for these computations, so we used asset holdings in the DC plan as a percentage of market capitalization, to estimate the percent of actual shares controlled by DC participants. In a close takeover battle, this amount of stock could be influential.

leveraged ESOPs that the employees may indirectly control. Nonetheless, they indicate that DC participants own a small minority holding in the largest firms.

Table 12 here

The main argument for favoring employee ownership is that employees will be more productive and more amenable to management proposals when they are shareholders.⁵¹ If true, equity-linked compensation would be expected to be widespread in DC plans and more broadly as well. Nevertheless, equity-linked compensation remains rather limited for highly-compensated managers and is rare among rank-and-file employees. One reason may be employee risk aversion: to the extent that workers feel that stock exposes them to greater uncertainty than cash compensation, they would demand a risk premium in compensation. Within the plan, employees could require more stock to offset the uncertainty and to compensate for restrictions imposed on the stock sale. Low or moderate income workers are likely to be more risk averse since they have only undiversified human capital, and their largest financial asset is likely the company-sponsored retirement plan—although offsetting this risk is the higher replacement income provided by Social Security benefits during retirement.

D. Costs of Providing Company Stock

Some who favor the use of company stock in DC plans argue that it is more cost-effective: that is, they believe that employers contributing stock to their retirement plans expend less than when they contribute in other forms (Ward, 2001; Hedges and Neikirk, 2002). By this argument, if employers were prohibited from making contributions in the form of employer stock, the effective cost of employer contributions to retirement plans would be higher. If required to find a substitute for stock, employers would replace current stock contributions with less generous cash contributions.

The simplest version of the cost argument is that stock contributions to a DC plan are cheaper when the employer issues new shares. By issuing new shares and contributing them directly to the plan, the firm avoids spending cash on a matching contribution. Issuing new shares preserves cash flow, so this approach might be expected to be popular among cash-strapped firms. The dilemma, of course, is that issuing new shares to the retirement plan dilutes existing shareholders' interest; economically, the firm's net present value has been reduced, whether the contribution is in cash or in stock.⁵²

There is very limited evidence on the prevalence of issuing new shares for retirement plan contributions. Benartzi (2001) reports that half of all firms buy stock in the open market to finance their DC plan contributions, and half issue new stock. His result, however, is based on a sample of firms who do and do not make 11K filings with the SEC (needed when new shares are issued), so it may simply

⁵¹ Under current tax law, company equity offerings are more tax effective from the employee side if provided in the retirement plan instead of in other stock-based (e.g. stock option) plans.

⁵² Also these new shares could be offered to investors more cheaply, presumably, since the risk would be low.

reflect different interpretations of when an 11K filing is needed. Anecdotally, several plan sponsors have indicated to the authors that common practice at large employers is to always expense plan contributions, whether made in cash or stock. Still others have indicated that the impression that “stock is cheap” may come from older leveraged ESOPs, where plan contributions are reported on financial statements at historic cost, not market value. Overall it is not clear how common this practice of issuing new shares is. To the extent that some do make this argument, it is possible that they are engaged in a kind of “mental bracketing,” a narrow framing of the cost issue which overemphasizes the impact of a cash contribution on reported earnings, and downplays the economic cost of shareholder dilution. A cash contribution reduces reported earnings-per-share (EPS) immediately and is highly visible to shareholders. Diluting existing shareholders by issuing new shares has a much smaller, and less visible, effect; and any reduction in the firm’s share price from the dilution is likely to be swamped by daily stock price volatility.⁵³

Another cost argument relates to ESOPs. Here the benefits are more concrete, relating to the unique issuance, tax, and leverage features of ESOPs. In terms of issuance, smaller privately-held or family firms may find issuing shares to an ESOP a lower-cost and more flexible method for raising investment capital, without the need to resort to public capital markets. Tax benefits accrue when certain private firms are sold to employee-owned ESOPs, and when dividends are used for interest on a leveraged ESOP loan. In 2001, EGTRRA also boosted tax savings on reinvested ESOP dividends.

Finally, in assessing the cost argument, the issue of cost-effective stock contributions is sometimes confused with two other questions—the question of employer generosity with stock and the certainty-equivalent value of stock contributions. Under the current DC system, employers contributing stock are achieving two aims—encouraging (or mandating) employee stock ownership and providing a competitive retirement savings benefit. If limited in their ability to offer (or mandate) stock ownership, employers may reduce their retirement plan contributions and redirect them elsewhere, probably to other forms of stock ownership. This argument is not necessarily about the inherent cost advantages of company stock; rather, it reflects the employer’s desire to encourage stock ownership. Additionally, from a certainty-equivalent perspective, if employers did substitute smaller cash contributions for current stock contributions in the future, this change may not necessarily be welfare-reducing for employees. In other words, a smaller cash contribution with no volatility might be deemed as valuable to plan participants as a higher stock contribution with stock-specific volatility. If restrictions on company stock in employer

⁵³ For example, consider a firm with \$1 billion in earnings, 200 million shares outstanding, and a share price of \$80. EPS is \$5.00 per share and the firm’s market capitalization is \$16 billion. A \$50 million cash contribution to a DC plan will reduce reported EPS by 5 percent to \$4.75. Yet issuing an additional \$50 million in shares (625,000 shares at the market price) would require an offsetting decline in the stock price from \$80 to \$79.75, or about 0.31%, to maintain the firm’s current market value. The percentage decline in share price is small in relation to the normal stock market volatility, whereas the reported reduction in earnings is widely publicized to investors.

plans are implemented, and employers replace stock contributions with less generous cash contributions, the change may be welfare-reducing depending on the size of the reduction (in effect, the marginal utility that employers assign to the ownership aspects of stock holdings), the volatility of the underlying stock, and participants' risk aversion.⁵⁴

E. DB Plan Coverage and Stock Price Volatility

Other factors may help explain why employers use company stock in DC plans, particularly larger employers who mandate stockholdings. One is the existence of some other retirement plan such as a defined benefit pension, and the other relates to the volatility of common stock.

On the first point, the data suggest that large companies are more likely to offer *both* DB and DC plans. Rosen (2002) reports that three-quarters of all ESOP participants who are heavily concentrated in company stock also have some other form of retirement plan. These are usually traditional pension plans, though some large employers have substituted cash balance plans in their stead. For the *Pensions and Investments* sample of 96 corporate employers described above, we find that all but one also offer a DB plan.⁵⁵ In the Vanguard sample of medium-sized corporate plans offering company stock, 77 percent of plans with 2,500+ active participants had a DB plan, as did 67 percent of plans with under 500 employees (see Table 13). Having a DB or other DC plan provides a rationale for why employers might tolerate high concentrations of company stock: in the event of a collapse of the stock, workers will still have a retirement benefit from the other, diversified plan. It may also explain why participants might allocate their own contributions to company stock within their DC plans. Long-term employees with a valuable DB benefit providing a guaranteed income stream (or with other diversified DC assets) might reasonably seek greater single-stock risk in the DC plan with company stock.

Table 13 here

Having a DB plan does not fully explain the pattern of company stock in DC plans. One reason is that traditional DB plans are more often back-loaded and hence not very valuable to most employees in the event of layoff or company bankruptcy; only long-tenured employees near retirement age are likely to enjoy a significant DB pension benefit. As well, as we illustrated in Section II, younger participants are more likely to hold stock, though they are less likely to enjoy a meaningful benefit under a DB plan.⁵⁶ In terms of risks to the employer, plan fiduciaries under current law cannot defend themselves against

⁵⁴ As Lambert et al. (1991) show, the certainty-equivalent of company stock may be worth much less than the dollars contributed by the employer, depending on the participant's risk aversion and the fraction of other wealth in company stock.

⁵⁵ Some of these plans may be officially terminated: e.g. in the *Pensions & Investments* data, Procter & Gamble reports DB plan assets from its prior pension plan and from acquisitions. We also recognize that any given employee might not be eligible for both types of plans.

⁵⁶ Cash balance plans do accrue benefits more evenly over the work career and provide current value to workers assuming participants are vested.

company stock lawsuits by claiming the existence of another DB or DC plan. The DC plan with company stock must stand on its own with respect to ERISA's prudence standard.

Another factor possibly explaining company stock holdings are the risk and return characteristics of company stock. "Blue chip" stocks are generally less risky than stocks of smaller firms. It may be that managers of larger firms with "blue chip" stocks are more willing to assume the risks of concentrated holdings, whereas managers of smaller firms with riskier stocks are not. Table 14 summarizes risk and return characteristics for two groups of stocks. Panel A reports on stocks offered by the largest DC plans in the US, from the *Pensions & Investments* sample. Over long periods, these stocks in large DC plans have underperformed the unmanaged S&P 500 as a group, and they have also exhibited average volatility of about twice the market. Below-market returns from this group of "blue chip" stocks would be expected because of their relative size; higher returns (and higher volatility) would be expected from medium- and small-sized firms. Panel B summarizes statistics on market volatility by size of firm (ranked by market capitalization). The largest 20 and 100 stocks are between two and two-and-a-half times as volatile as a broad market index like the S&P 500; the entire sample of over 2,500 stocks is nearly four times as risky. Overall, because of the higher volatility of their stocks, managers in smaller firms may be more sensitive to concerns about concentrated stock risk. At the same time, managers in larger firms may be willing to take greater risk with their "blue chip" stocks, with only twice the market volatility, but as a group they have accepted below-market returns in exchange.

Table 14 here

F. An Aside on ESOPs

As we have noted above, employers may utilize ESOPs to obtain various benefits in terms of share issuance, tax savings, and leverage. ESOPs have also figured prominently in corporate control and merger and acquisition transactions; hence their use extends for managers beyond the narrow calculus of tax efficiency and cost-effective debt. Polaroid Corporation used an ESOP to rebuff an unwanted takeover from Shamrock Holdings in the 1980s; it just recently declared bankruptcy, rendering these shares virtually worthless. ESOPs are also used to create employee-owned firms, sometimes to stave off bankruptcy or a hostile takeover. Examples here include union purchases of the Rath Meatpacking Company and the participation of American Airlines employees in the company's refinancing efforts.

There are observable differences in behavior and incentives for the 95 percent of ESOP firms sponsored by private- or family-owned firms, versus the 5 percent of ESOPs sponsored by public firms. The former are likely to be drawn to such advantages as tax-advantaged succession planning, a private market for equity, access to ESOP-based debt, and a strong emphasis on employee ownership and

control.⁵⁷ Public firms generally are likely to find appealing the tax and leverage benefits, employee ownership and control incentives are likely to be more diffuse depending on the size of the firm involved.

IV. Why Plan Participants Hold Company Stock In Their Retirement Plans

Next we turn to the question of why employees hold company stock in their retirement plans. This is particularly puzzling, since even unsophisticated individuals have likely been told that *diversification* is a central tenet of investing (Farrell, 2002). As a rule, investors should not expect to be rewarded for assuming single-stock risk, since investing in a single stock must be a zero sum game across investors, with all participants in the aggregate earning the market return. Furthermore, a rational DC plan participant would choose his employer in part based on the benefits package, including whether contributions are made in stock or not. He will mentally value an employer contributions in stock using its certainty-equivalent value: due to the stock's volatility, a 401(k) plan with a match in stock will be worth less than a 401(k) plan with the same dollar match in cash.

Plan participants would be expected to hold no more than a market-weighted share of their firm's company stock in their portfolios. But as we have shown, workers hold a much higher percentage of DC plans in company stock, 22 percent in the case of employee-discretionary plans, and 53 percent (33 percent employee and 20 employer) in the case where the employer directs money to stock. Why then do plan participants depart from the theoretically implied norms?

A. Conventional Rationales for Holding Company Stock

Earnings profiles for many young employees are relatively independent of stock market returns, so some equity investment is recommended. Recent work by Davis and Willen (2000) and Baxter (2001) uses individual-level income information to explore how employee compensation covaries with aggregate equity returns, long-term bond returns, and returns on other assets. The analysis suggests that aggregate equity returns are not correlated with occupational income changes, implying that younger savers would do well to hold diversified equities in their portfolios. The research also indicates that in several occupations, income shocks are correlated with portfolios concentrated in large companies and specific industries. These patterns indicate that holding a diversified equity portfolio can make good financial sense, and that younger workers should diversify out of a large firm stock.

In practice, this advice is confounded with several factors. One is that workers may be persuaded by the appeal of employee ownership; they may want to own part of the firm they are working for. A second is that the tax code makes holding company stock through DC plans cost-effective, since the purchase of company stock is with pre-tax funds, and participants do not pay retail brokerage

⁵⁷ Of course, most such firms could have issued stock to outside investors, which would enhance liquidity while reducing sponsor control.

commissions. It is true that these same tax and price incentives exist for all diversified investment options within the plan. The one exception is the special long-term capital gain treatment of company stock upon distribution — though it is debatable, given the obscurity of this tax provision, how large a factor in plays in participants’ initial investment decisions.

A third rationale for participants’ holdings is the information argument. Employees may feel they have a superior understanding of the firm and its business prospects. This insider view allows participants to overweight company stock holdings and realize excess returns on the stock when the firm’s results are reported to public shareholders. If true, this informational advantage leads to a direct conflict of interest between employee and public shareholders. As we note below, however, there is some evidence that no such informational advantage exists.

As employees near retirement, many should perceive that company stock investment is unduly risky, since it substantially boosts the variance of eventual retirement incomes. This would apply even to employees in large companies, whose stock price volatility is at least twice that of a market portfolio. Older workers near retirement may also focus less on future price appreciation and more on downside risk (i.e. the chances of losing all their money). Counterbalancing this expectation, however, is the role of other income and wealth holdings. Some 60% of defined contribution participants say they are saving outside their employer’s plan, according to a national poll (Vanguard, 2001), and many have housing equity. Participants may have spouses or partners with 401(k) and other retirement benefits. Workers might feel comfortable taking a concentrated bet on their company’s stock if they have these other assets. And finally, if returns to an employee’s human capital and company stock are felt to be uncorrelated, as people age they may feel more comfortable investing in stock as they age.

B. Behavioral Explanations for Why Plan Participants Invest in Company Stock

In addition to the conventional reasons explaining why employees might want to hold company stock, there are behavioral explanations for this phenomenon. One factor is employee myopia regarding the risks of company stock. Two national surveys demonstrate participants’ systematic errors in assessing the risks of their company stock (see Figure 3). John Hancock (2001) reports that DC plan participants rate company stock as less risky than a diversified equity fund. Confirming these results, Vanguard Group (2001) reports that participants properly rate “individual stocks” as more risky than an equity mutual fund, but still consider their employer’s stock as less risky—saying in effect that they think of their own company stock quite differently than other individual stocks. The Vanguard results also show that participants fundamentally misunderstand the relative risks of individual stocks. The average volatility of an individual stock is at least twice the volatility of a diversified market portfolio, yet participants rate individual stocks as only slightly more risky.

Figure 3 here

The behavioral finance literature offers several rationales that might explain why participants systematically underestimate the risk of their employer's stock. One is Kahneman and Lovallo's "inside view," which we discussed earlier in Section III on employer rationales. Just like employers, workers may strongly identify with the firm's business plans and its own vision of its prospects (the "inside view") and may find it difficult to formulate an independent perspective on the likelihood of the company's and stock's success (the "outside view"). Workers' decisions to invest in stock could be based on loyalty and commitment to the firm and its mission. They could also be encouraged through management promotion of the stock, and possibly organizational pressure to buy and own shares in the company.

Choi, Laibson, Madrian, and Metrick (2001) make a persuasive case that participants follow the "path of least resistance" in making contribution and investment choices within retirement plans. One such path may be to adopt the management team's own view of the prospects for an individual stock, rather than develop an independent view. Another behavioral explanation for participant behavior has to do with mental bracketing. Employees may view employer matching contributions, whether made in stock or cash, as "found money" and accordingly are less concerned with the risk and return characteristics of the employer's contribution than their own investments. (But confounding this view, they also tend to put their own money in firm stock, as we have shown above).

Financial advisers are well aware that participants tend to misestimate the risks of company stock. They must employ their own psychological techniques to induce long-tenure employees to sell company stock upon retirement (Schneider, 2001). Participant risk myopia is evident in the data on participant holdings of company stock, cited in Section II (see also Table 7). Older participants have lower equity exposure than younger participants. Yet across age cohorts, participants maintain the same relative exposure to company stock, despite its higher volatility.

Another explanation for why employees invest so heavily in company stock is Benartzi's "endorsement effect" (Benartzi, 2001). By making a contribution in company stock, and restricting its diversification, an employer is implicitly endorsing company stock as an investment, and encouraging employees to invest their own funds as well. Rational, risk-averse employees would ignore the employer endorsement and diversify around the employer's decision, reducing their own holdings of stock to reflect the employer's matching contribution. On the other hand, plan participants might take company stock contributions as an employer endorsement and invest even more than required in the stock.

Data from EBRI/ICI provide some evidence of an endorsement effect (see Section II, Table 9). When participants make all investment decisions, total holdings of company stock amount to 22 percent of plan assets. But when the employer directs employer money into company stock, total holdings of company stock soar to 53 percent of assets. Of the 53 percent, 33 percent is the participant's money and 20 percent is the employer's. Arguably there are differences in directed versus discretionary plans that

account for some of the difference. Employers who direct contributions to stock are more likely to be large, well-known companies; their “blue chip” stock may be somewhat less volatile; they may be somewhat more likely to offer a DB or other DC plan. Still, the difference in asset allocation patterns between these two groups is striking and suggestive of an endorsement effect.

A final factor influencing company stock allocations is past performance. Benartzi (2001) finds that participants’ decisions to invest their own monies in company stock are related to the stock’s long-term (particularly 10-year) total return performance. When a stock ranks in the top performance quintile, participants devote about 40 percent of their own assets to company stock (see Figure 4). When a stock ranks in the bottom performance quintile, participant holdings of stock fall to 10 percent of portfolios. Benartzi also found that participants’ decisions to over- or under-weight company stock were not based on any hidden insight into the firm’s prospects. On average, participants tended to overweight stocks that would deteriorate in performance, and underweight stocks that would improve.

Figure 4 here

V. Policy Perspectives on Company Stock in DC Retirement Plans

The current tax-qualified retirement system supports two distinct goals: employee ownership and retirement savings. Both through tax subsidies (amounting to \$55 billion in 2002⁵⁸) and through exceptions in fiduciary law, employers are permitted to either encourage or mandate employee holdings of company stock within the defined contribution component of the US pension system. An estimated 23 million participants have access to company stock, and 11 million have concentrated stock positions exceeding 20% of account assets. Company stock, both in terms of prevalence and concentration, is more characteristic of large firms than medium and small companies.

Policymakers are evaluating three types of questions in the current environment: Does current tax and fiduciary law strike an appropriate balance between the competing goals of employee ownership and retirement security? Should that balance be altered in light of the bankruptcy risk faced by some participants with concentrated stock positions, brought to light by the recent decline in US equity prices? And if policy were changed to emphasize greater diversification, what impact might it have on employer and employee behavior?

To answer these questions we explore several aspects of these plans, first summarizing reasons for some policy conflict between employee ownership and retirement security. We then consider the impact of holding company stock on retirement incomes — in general, median retirement incomes are lower, there are greater extremes in wealth, and there is a higher “downside” risk that some participants

⁵⁸ OMB (2002) notes that this refers to both the tax expenditure due to the exclusion of employer contributions and earnings in 401(k) and ESOP plans.

will lose DC assets to firm bankruptcy. Next, we assess various policy alternatives for encouraging or mandating higher levels of diversification in the current system. We conclude with observations about potential effects on employer and employee behavior.

A. Dual Policy Goals: Employee Ownership versus Retirement Security

Over time, the public policy goal of employee ownership has been espoused repeatedly, with Congress periodically weighing in support of the concept. Policymakers have encouraged the trend towards mandatory stock ownership in several ways. Both tax and fiduciary law encourages concentrated stock positions: ERISA exempts company stock from its diversification standard; employers are permitted to make contributions in company stock and restrict its diversification; there is no 10 percent limit on company stock in DC plans comparable to the one imposed on DB plans; ESOPs are able to impose strict age and service limits on diversification; EGTRRA provides additional incentives for ESOPs; and participants are afforded special tax treatment for company stock upon distribution. ESOPs also have an array of other advantages, including the privilege of borrowing, which has made them a tool of corporate financing and corporate control. Sales of private companies to ESOPs are also granted tax advantages.

Within this legal framework, some employers have chosen to emphasize the employee ownership aspects of their tax-qualified retirement programs. Many large employers make matching 401(k) or profit-sharing contributions in company stock; some integrate ESOP provisions with other defined contribution components into combination plans. A few have used ESOP contributions to reduce DB plan benefits. These plan trends reflect current policy, which blurs the distinction between employee ownership and retirement security.

An 1983 U.S. Court of Appeals for the Fifth Circuit opinion, although referring narrowly to ESOPs, summarized the broader conflict about company stock in retirement savings plans:

“Congressional policies [...] seem destined to collide. ...On the one hand, Congress has repeatedly expressed its intent to encourage the formation of ESOPs....Competing with Congress’ expressed policy to foster the formation of ESOPs is the policy expressed in equally forceful terms in ERISA: that of safeguarding the interests of participants in employee benefit plans by vigorously enforcing standards of fiduciary liability.”⁵⁹

As we have noted, this collision of policy goals occurs not only in ESOPs, where it is inherent, but in 401(k) and profit-sharing plans with concentrated stock positions.

In a broad sense, current policy incorporates two competing views of the role of workers: employee ownership and diversification. The ESOP or employee ownership view is that of Drucker’s

⁵⁹ *Donovan v. Cunningham*, 716 F.2d 1455, 1466 (5th Cir. 1983).

“worker capitalism,” in which employees own stock in the factory that employs them, and employee ownership drives higher worker productivity, wealth, and income. This view predates modern portfolio theories of diversification and risk, and it overlooks the potential correlation between the value of company stock and the chances of workers losing their jobs. By contrast, ERISA’s prudence and diversification standards derive from the modern portfolio view of the world. Under this view, it is risky for workers to own stock in a single factory; rather, they should be encouraged to own a small, representative portion of all of the factories in the world, by investing through a fully diversified market portfolio. When workers own a higher-than-market weighting of any one company’s stock, their labor and capital market earnings will be positively correlated. In the event of firm bankruptcy, both wages and financial assets are more likely to fall simultaneously.

B. Measuring the Impact of Company Stock on Retirement Outcomes

Policy discussion of the impact of company stock on retirement incomes is often anecdotal rather than comprehensive in scope. For each Enron or Polaroid or Kmart bankruptcy, there are also compelling stories of extraordinary wealth created through company stock—the stories of Procter & Gamble, General Electric, Microsoft, Dell and others. Rather than analyze individual stock-by-stock outcomes, we model retirement incomes for all participants holding company stock, taking a system-wide view.

Within a mean-variance portfolio framework, the higher volatility of company stock in the DC system produces two results. First, wealth extremes are greater without portfolio diversification. In other words, company stock generates small numbers of retirement outcomes in which DC participants are either exceptional company stock winners or losers. Policymakers are most concerned with the downside risk (i.e. the “Enron losers”) where people forfeit substantial DC assets to firm bankruptcy. Second, median wealth for DC participants with company stock may be lower.⁶⁰ This somewhat counterintuitive result comes directly from the higher volatility of company stock: when volatility is higher, cumulative wealth compounds at a lower rate. To summarize in another way, increasing diversification would be expected to increase employees’ median wealth, and simultaneously it reduces wealth extremes at both ends of the spectrum: while curtailing bankruptcy risk for company stock losers it also limits the chance of outsized gains for the company stock winners.

Our analysis models participant contribution behavior for three portfolios: one invested 100 percent in company stock, one invested 100 percent in a market portfolio, and the last that invests 50/50 mix of the two. Our hypothetical participant earns \$50,000, contributes 10 percent of annual income to his DC plan (whether employer or employee contributions), and contributions grow non-stochastically at

⁶⁰ If inducing employees to hold stock actually increased productivity, overall returns might rise. However, as we noted earlier, there is little hard proof of this point.

3% to account for inflation.⁶¹ Returns on company stock and the market portfolio are assumed to be normally distributed, with identical expected mean returns of 10 percent.⁶² Consistent with the data in Table 15, the volatility of company stock at 40 percent is assumed twice that of the market, at 20 percent. Terminal wealth is log normally distributed.

Table 15 here

Table 15 and Figure 5 illustrate the range of results generated by a Monte Carlo simulation forecasting retiree wealth 30 years hence, using these modeling parameters. As the percentage of company stock increases in a participant's portfolio, median expected wealth declines due to the compounding of more volatile returns. Median wealth with the market portfolio is \$830,000, but it is only \$411,000 with the company stock portfolio. Extremes of wealth are also greater. In the best-case scenario, there is a 5 percent chance of earning \$4.1 million with company stock, versus only \$2.7 million with a market portfolio. In the worst-case scenario, the ordering of outcomes is exactly the reverse. The market portfolio provides the participant with a low of \$281,000 in 30 years; the company stock investor ends up with only \$66,000 after 30 years.

Figure 5 here

A few caveats are in order. Employees often change jobs during their careers, so job changes will keep some participants from accumulating too much in a single stock. Our analysis reflects the worst-case results for a long-tenure employee. If participants accumulate several single-stock positions during a career, the retirement outcome will depend on the correlation among the old and the new stocks. Finally, this analysis models outcomes only from the DC component of retirement incomes. Sponsors who also provide a corresponding DB (or other non-company stock DC) plan will mitigate the risk to total retirement income for covered employees, assuming there is a meaningful vested and accrued DB payout (and taxable savings).

The issue facing policymakers is whether the employer-provided DC pension system should be designed to produce such widely disparate outcomes. The downside—as well as the upside—risk created by company stock is particularly concentrated for long-tenure employees within a single firm whose DC assets are bound up tightly with the company. When a stock drops precipitously, long-tenure workers with an important fraction of DC assets tied to a single security will experience a substantial loss of a

⁶¹Future simulations will incorporate a positive real wage growth.

⁶² VanDerhei (2002b) models company stock portfolios with a marginally higher return because participants with company stock, in practice, hold higher equity allocations than those without company stock. We note, however, that in our sample of very large DC plans (Table 14), the company stocks that dominate those plans have provided below-index returns over the last two decades. Since this set of large firms is not necessarily representative of all plans with company stock, for purposes of our analysis, we assume that all company stock held by participants in the aggregate will provide the same expected return as the market. Within individual participant accounts, volatility is assumed to be twice the market. Since we presume that the covariance of earnings and company stock returns is zero, this is a lower-bound on returns.

lifetime's worth of savings. Diversification will clearly reduce the chances for these extreme worst-case (and best-case) outcomes—less obviously, it will also increase median wealth among all DC plan participants holding company stock.

One dilemma for policyholders is that, if the system becomes more diversified, these effects will not be readily observable by employers or participants. Improvements in median retirement wealth will likely occur, but there will be no way to compare results with a company-stock-heavy system. Participants avoiding losses due to bankruptcy will be generally quite small, though there will always be the possibility of an Enron event. Meanwhile, the restrictions imposed on employees at firms with successful stocks will be highly visible. Given employees' tendency to focus on past performance, employees at successful firms are likely to be disappointed with their inability to buy top-performing stock through a tax-qualified plan. Employers and employees will find it easier to measure the costs of prohibiting single-stock holdings than the benefits of diversification.

C. Policy Options for Encouraging or Mandating Diversification

In this section we evaluate several options that would encourage diversification of employee stock holdings within DC pension plans. We discuss proposals affecting 401(k) and profit-sharing plans, and then we return to the question of ESOPs because of their special status, complexity, and integration with other DC components. To the extent policymakers alter the balance between company stock holdings and diversification, a corresponding response from employers and employees would be expected, which we consider in the next section.

1. Maintain status quo: One option is to maintain the system as it is, allowing employers wide-ranging flexibility to utilize company stock within DC plans of various kinds. Our Monte Carlo analysis summarizes the expected outcomes. There will be an ongoing risk that some participants forfeit all or most of their DC plan savings to firm bankruptcy. There will be greater wealth extremes, with a slightly higher (though small) chance of generating large wealth as opposed to large losses with company stock. Median wealth will be lower among DC participants investing in company stock.

2. Enhance participant risk disclosure: Our evidence indicates that DC plan participants systematically underestimate the inherent risks associated with company stock. One way to encourage diversification would be to have the US Department of Labor require periodic disclosure statements encouraging participants to limit their own company stock holdings to some stated cap such as 20 percent of assets. Depending on policymakers' assessment of the depth of participants' knowledge, this disclosure might include explicit warnings about sector and company risks. It might also be pervasive—incorporated in all communications media, whether print, telephone, meetings or the Internet. A related point is that a DC plan can become concentrated when a stock's performance is strong, so statements must be issued fairly frequently to achieve the goal of continued diversification. Educational messages and portfolio warnings

might be *dynamic*—they could appear on statements and websites when a particular limit, such as 20 percent, is breached. One difficulty with disclosure, whether passive or active, is that plan sponsors may feel deeply conflicted over their dual roles as company executives and plan fiduciaries.⁶³ An alternative option would permit “safe-harbor” disclosure statements (adapted to a variety of communications media) to be provided by federal regulators; another is for disclosure to be provided by an independent party with ERISA fiduciary status, such as a recordkeeping provider or a third party adviser to the plan.

3. *Promote participant investment advice:* To encourage diversification further, disclosure might be combined with expanded use of third-party advice providers. Advice is currently rarely offered with DC retirement plans, and various proposals have been made to simplify the fiduciary rules surrounding the provision of advice, which is the subject of a separate policy debate. Of course, providing participants with investment advice will encourage diversification only if participants with highly concentrated positions are actively encouraged to sell those holdings, even if such sales are explicitly against the wishes of the employer. It is worth noting that the leading providers of advice rely on participants to determine how much company stock they want; they do not explicitly instruct participants to sell company stock as many independent financial planners do (Halsey, 2002). Any efforts to utilize third-party advice to encourage diversification will have to address the independence of advice offered on company stock offerings. The dilemma is that plan sponsors ultimately select advice providers, in part on how aggressively or passively they address the question of diversification of company stock. One question is whether advice providers should assume fiduciary responsibility for, and make active buy and sell decisions for, all investment options within a plan, including company stock.

4. *Strengthen fiduciary oversight:* Reports from the continuing Enron investigation indicate a number of possible conflict-of-interest problems, which may lead to suspension of the directors’ and officers’ liability insurance as well as ERISA fiduciary insurance.⁶⁴ This may leave the company’s board members exposed to personal bankruptcy as legal costs rise. Some reformers propose that tougher conflict-of-interest standards would be useful in getting fiduciaries to focus on the risks associated with DC plan investments (Olsen, 2002). A different tack would require an independent fiduciary responsible for monitoring company stock performance frequently and recommending steps (such as plan design changes or participant education efforts) to be taken by employers to minimize concentrated holdings in the stock.

5. *Restrict DC plans from holding “too much” company stock:* DC plans and participants could be discouraged from holding an excess of company stock in several ways:

⁶³ See for instance Chen and Francis (2002), Lublin and Emshwiller (2002), and Norris (2002).

⁶⁴ For instance it appears that the board of directors may have waived company ethics codes in order to establish the off-books partnerships that ultimately brought the company down (Lublin and Emshwiller, 2002).

- *Statutory diversification rules:* One method would encourage participants to diversify concentrated stock positions without mandating diversification per se. For instance, many plan participants (though not all) have the right to diversify their own contributions out of company stock; an alternative policy would have to grant explicit rights to diversify both employee and employer money. The change would likely apply only to vested contributions; the decision variable would be the timeframe over which the holdings could be altered (e.g. immediate, after 90 days, after one year, at age 35, etc). Rules based on the employee's years of service will be easier to recordkeep and communicate than rules based on the class year of stock contributions. Sponsors and providers should also still be able to create reasonable limits on trading within stock to discourage participant "day trading," but such rules would stop short of prohibiting diversification by average participants. An alternative approach would restrict the number of annual "round-trips" in each account, to limit churning.
- *Alternative regimes for company stock:* One proposal, adapted from Olsen (2002), would provide employers with a choice of company stock regimes. If the employer elected to direct contributions into stock to encourage employee ownership, employees in this case could be prohibited from investing their own contributions in stock. This prevents the "doubling down" of investments in company stock when employees concentrate their own holdings in stock on top of company contributions. Alternatively, the employer could offer stock as simply another investment option in the plan but would not direct contributions to stock. Rather, it would be up to the participant to decide whether or not to allocate employer and/or employee monies to the option. In either regime, any monies in company stock, whether invested by the employer or employee, would be diversifiable at the participant's discretion. This proposal builds on the findings cited in Section II and IV: when the employer directs contributions to stock, participants also overweight their personal holdings, leading to excessive levels of concentration; when investment decisions are fully up to the participant, concentration in company stock is markedly lower. This proposal does not address participants' willingness to overweight company stock based on a misunderstanding of risk or strong past performance; these concerns would need to be addressed by other policy changes.
- *Curtailed tax subsidies.* As noted earlier, the tax code in various forms subsidizes concentrated stock positions. One option would be to phase out the EGTRRA dividend reinvestment incentive for ESOPs, and long-term capital gain treatment for distributions of stocks to participants. To raise the relative costs of making contributions in stock, the tax deduction for stock contributions to retirement plans could be reduced. As we have noted in the use of leveraged ESOPs by public companies, and the conversion of 401(k) plans to ESOPs under EGTRRA, tax incentives can shift plan sponsor behavior.

- *Prescribed limits on company stock:* This approach would cap the total amount that could be held in company stock in a DC plan at some level, such as 10, 20, or 50 percent of assets.⁶⁵ (Whether this limit should be independent of, or related to, the corresponding limit in DB plans also must be evaluated.) A “tight” 10 percent cap deeply reduces individual stock risk in the system; a “loose” 50 percent cap would eliminate the “worst-case” outcomes of employees losing all of their DC savings at once. The question in this case is how high the limits might be, and how they might be effectively implemented. A cap of 50 percent would address the subset of plans with designs that encourage high concentration (such as directed contributions and restrictions). Such a rule would affect the estimated 6 million participants with company stock holdings exceeding 50 percent of account balances in the US. A 10 percent cap would affect a much larger group of plans and participants.

Caps, if implemented, are actually quite complex and would require detailed regulation on several points. Because of the inherent volatility of individual stock prices, regulators will want to consider triggering the cap based on a rolling average of exposure, rather than a point-in-time calculation. To minimize investment transaction costs and excessive trading, appropriate bands around the target cap (based on stock price volatility) could be established. A phase-in period would not only be necessary for recordkeeping and communication changes but also in maintaining the stability of individual stock prices. Regulators might also clarify the fiduciary status of employers who, in complying with a legal cap, sell company stock in a participant account and reinvest the funds either in the participant’s existing holdings or a default fund.

In assessing these options to curtail company stock holding, policymakers concerned about the flexibility of the current system, employer support for employee ownership aspects of DC plans, and the central role of individual investment decisions are likely to propose rules that encourage diversification. Policymakers concerned about the difficulties of company executives acting as independent fiduciaries for their stock, participant myopia about risks and performance, and participant inertia generally, are likely to consider statutory rules that mandate diversification.

6. Develop new pension investment protections: One approach to protect against excessive company stock in DC plans is that employers could offer plan participants insurance against severe loss of company stock value (Yip, 2002).⁶⁶ The dilemma, as the Enron bankruptcy illustrates, is that if the firm self-insures,

⁶⁵ Caps could also be structured based on contributions to the plan as opposed to asset values. For example, participants and/or employers might be permitted to direct only 20% of new contributions to company stock, and participants would be unable to transfer money from other options into company stock. Such rules are considerably simpler to administer, both from an investment, recordkeeping and communications point of view; they would lead to concentrated positions only in situations of strong stock performance.

⁶⁶ In theory, people could buy derivatives outside their 401(k) plans that would accomplish the desired diversification. Some executives do exactly this (e.g., through custom put options) in order to mitigate single-stock exposure. However, it is likely that NASD account strictures (requiring certain financial assets and/or sophistication

there will likely be no assets available in the worst-case scenario, and if the firm obtains third party insurance, that coverage could be contested. There is also the moral-hazard problem, of firms with insurance “betting the farm” on company stock. Another option might be to require all DC plans to offer one or two explicitly guaranteed investment options; currently many DC plans offer private-insured guaranteed investment contracts as an option. Two legislators have already proposed that DC plans be insured, perhaps on a federal level (Joint Committee, 2002). More research on the feasibility, structure and cost of guarantees is clearly required.

7. The special case of ESOPs and combination plans: As we have demonstrated throughout this paper, any policy changes must take into account the varied role of ESOPs—as standalone plans or hybrid KSOPs, as leveraged or unleveraged plans, and as plans sponsored by public versus private- and family-owned firms. Assuming that profit-sharing and 401(k) plans are subject to one regulatory regime, the question remains as to how ESOP plans are to be evaluated in any reform proposal.

The importance of this question is illustrated by the number of plans converting from 401(k) plans to KSOPs to capture the reinvested dividend deduction made available under EGTRRA. Suppose ESOPs were permitted to retain their strict prohibitions on diversification, while 401(k) and profit-sharing plans were recast with liberal diversification rules. There is a strong likelihood, as with the EGTRRA deduction, that employers with heavy concentrations of stock in 401(k) or profit-sharing plans would redesign their existing plans and incorporate a restrictive ESOP component, offsetting any expected diversification benefit.

Any redesign of ESOP rules needs to account for their varying uses by public and private firms. Private firms will have difficulty complying with immediate diversification rules because any diversification of company stock must be paid for with company cash flow, as participants sell their stock back to the company. Accordingly, to avoid imposing cash flow problems among the smaller firms that typically sponsor ESOPs, diversification rules for private firms could be phased in more gradually than for public firms. Diversification rights for participants on stocks of publicly traded companies would be easier to implement. Of course, depending on the size of the plan holdings, a phase-in period, would be necessary to avoid excessive impact on stock market prices (as noted previously). It is also possible to imagine different diversification rules depending on whether the firm was publicly or privately held, given the differential impact on firm cash flow.

One common approach in dealing with ESOPs is to grant them a somewhat more restrictive diversification environment than those applied to other types of DC plans, all the while placing greater

for derivatives holdings) would impede the average worker from taking advantage of such a strategy. Further, derivatives pose pricing, liquidity, and renewal risks for the employee seeking to hedge exposure over the long haul, making this a costly endeavor.

emphasis on diversification. In particular, most reform proposals repeal the current age 55 and 10 year holding period. (As noted earlier, these rules do not actually permit full diversification until age 60 or later; since the median retirement age in the US is now age 62, this leaves little time for financial recovery in the event of poor stock performance.) Another choice would provide a mandatory level of diversification for ESOPs (e.g., 25 percent) that would serve as a residual value in the event of firm bankruptcy.

A broader public policy issue hinges on the scope of ESOPs and their special tax and leverage benefits. One notion might be to narrow the use of ESOPs exclusively to cases of employee majority-owned firms that inspired their creation. In this way, their tax and leverage benefits would not be available to private or public owners simply to place a small portion of voting shares in employee hands. ESOPs then would be refocused on unique employee ownership situations. While this still represents an obvious risk to those working in privately held ESOPs if those companies were to go bankrupt, some ESOP-specific disclosure could accompany these higher-risk arrangements. Perhaps there would be some mandated diversification rules or mandatory diversified holdings as discussed above as a residual value. Such a policy represents a distinct narrowing of the legislative mandate for ESOPs, though it illustrates a key point: any attempt to address concentrated stock positions cannot simply deal with 401(k) or profit-sharing plans. Any policy solution must address ESOPs (and combination ESOP plans) as well.

D. Potential Impacts on Employers and Employees

Policy proposals to alter the role of company stock in private DC plans often seek to change both employer and employee behavior. Both stakeholders assign some marginal utility to compensation that comes in the form of (mandatory or optional) stock holdings with a DC plan. Policy proposals would change this form of equity-linked compensation either modestly or significantly, and the question taken up here is how employers and employees might respond. At best, we offer only an educated guess on the responses to policy changes. Other economic factors will also influence benefit policies. The lawsuits surrounding company stock have likely raised employers' perceptions of litigation risk. In the insurance market, rising premiums and closer scrutiny of employer retirement plan practices are also evident. Media attention surrounding Enron and other cases has raised both employer and employee awareness of single-stock risk.

Although we cannot directly observe employer and employee marginal utilities for stock held in DC plans, we can observe their actual level and concentration, indicators that proxy for their desired holdings. To some extent, actual holdings of company stock may reflect inertia and risk myopia, both by employers and employees. Nonetheless, we can suppose that sponsors or participants with, say, 70% of assets in company stock, may assign a higher utility to equity-linked compensation in DC plans than those with, say, 15% of assets in company stock. Clearly, some employers have marked preferences for

providing stock versus cash. Yet employer preferences for stock are not homogenous, and some employers do not exhibit strong attitudes about company stock holdings. We noted earlier that 55 percent of plans offering stock, a majority of such plans, do not direct contributions to stock and are liberal in allowing participant diversification. Even among the 45 percent of company stock plans that direct employer contributions to stock, some plans have no restrictions on diversification or impose caps.

One of the questions about employer responses to policy changes is whether new plan formation would decline, or whether sponsors might terminate retirement plans in response to changes in company stock rules. These seem unlikely. Plan formation is principally a concern among smaller firms where company stock is generally not offered; workers' preferences for wages and firm profitability are reported to be the main obstacles to offering retirement benefits (EBRI, 2001b). In terms of plan termination, virtually all large corporate employers in the US offer DC plans. While most of these employers offer stock, there is still heterogeneity in the level of stock concentration and the types of restrictions imposed. The universality of DC benefits among large firms would suggest that employers would continue to maintain some DC retirement program in order to remain competitive in the labor market.

A second option is that some employers may reduce retirement plan contributions when faced with caps or limits on stock. Stock contributions could be replaced with smaller cash contributions or simply smaller stock contributions than before, as the DC plan environment becomes less favorable toward holding company stock. In times of labor scarcity, employers cutting stock contributions would be reducing pay so employer would be expected to have to boost other forms of compensation over time to remain competitive. The substitution may be less than one-for-one on an after-tax basis in the hands of employees, since the employer is no longer directing compensation to a tax-qualified plan.⁶⁷

That leads us to a third, and perhaps more likely, policy response from employers: redirecting existing retirement plan contributions into other form of stock compensation. Because policy reforms would reduce the attractiveness of company stock in DC plans, employers with concentrated positions might reduce part of their contributions to tax-qualified DC plans. But to avoid a unilateral and uncompetitive reduction in employee pay, they would direct the money into other forms of equity-linked compensation that would support the employer's goal of stock ownership among employees.

Several choices come to mind for employers seeking alternative vehicles for equity-linked compensation. First is the greater use of stock *options*, though many option programs are less restrictive than current DC plans (in terms of holding period). Wider use of options might also increase accounting scrutiny about options' dilutive effect and the substitution of visible compensation expense for less-

⁶⁷ How much less the cash-equivalent value of company stock in pensions plans might be worth is not clear. The fact that it can be substantially less than dollar for dollar is demonstrated by Hall and Murphy (1999), Lambert et al. (1991), and Meulbroek (2000), among others, in the case of executives, but similar metrics have not been derived for rank and file employees.

transparent option grants. A second possibility would be employee *stock purchase* plans. These are typically voluntary, however, and lack the compulsory nature of directed employer contributions in DC plans. A third avenue would provide employees with direct *grants of stock* from the company. These might come in the form of a special restricted class of shares, if feasible.

None of these options have the same tax benefits, market appeal, or transparency (in terms of public and media scrutiny) as do contributions to DC plans. Hence it is unlikely that there would be a direct and complete substitution effect, with employers reducing current retirement plan contributions by \$1 and redirecting the same \$1 to one of these other forms of compensation. In the end, it hinges on employees' marginal value associated with mandatory stock contributions in DC plans, as well as employer valuations of these contributions. Also as noted above, movement toward diversification and less company stock could well raise median wealth while reducing the chances of exceptional wealth and loss of all assets due to company bankruptcy. On the other hand depending on workers' preferences and other wealth, risk-averse workers may accept a decrease in total compensation as a result.

Assuming that employers who prefer large holdings of company stock by employees direct some of their contributions to other forms of equity compensation, what might be the impact on retirement plans? One possibility is that employee participation rates in DC plans might fall. Participation rates are linked to employer matching contributions, though there is some question as to whether it is the size, or the mere existence, of the match that counts most.⁶⁸ Large firms, which more often offer company stock, already have lower participation rates, in part it is thought because they also are more likely to offer another retirement plan. An interesting question is how a decline in participation from lower stock contributions to the plan might compare with this existing differential in large firms' participation rates.

The dynamics of employer contributions are further complicated by nondiscrimination testing in DC plans. Nondiscrimination rules require that non-highly compensated employees contribute at some minimum rate; the goal is to ensure that the tax benefits associated with a DC plan are not simply provided to highly-compensated employees. If non-highly paid employees fail to contribute adequate, highly-paid employees are limited in their ability to contribute. Employers who decide to reduce plan contributions made in stock (and thereby decrease participation or savings rates among non-highly compensated workers) could inadvertently lead to savings restrictions on highly-compensated employees, decreasing the value of the retirement plan benefit for this segment of the employee population.

Finally, what impact might a change in public policy have on employees? Today an estimated 11 million participants have concentrated stock positions exceeding 20% of account assets. If forced to diversify, some proportion of these people will believe themselves worse off, since they were required to

⁶⁸ See Papke (1995), Papke and Poterba (1995), Basset, Fleming and Rodrigues (1998), and Munnell, Sunden and Taylor (2000).

modify their desired stockholdings. On the other hand, since some participants underestimate the risks of owning company stock, and employer plan design and past performance have a strong influence on their decision to invest, they may experience lower satisfaction currently, but greater benefit later in retirement. Others will not perceive a reduction in welfare, possibly because they are concentrated in stock on an involuntary basis, through a misunderstanding of the risks, or inertia. Given the tendency of participants to overweight stock holdings based on past performance, employees perceiving the greatest welfare reduction will be those employed by firms with a history of strong stock performance. (Presumably prior to the fall of their employer's stock, Enron and Lucent employees would have been avidly opposed to limits on company stock holdings.) As we noted in our policy discussion, a dilemma for policyholders is that improvements in median retirement wealth will not be observable, and the group of participants avoiding losses to bankruptcy will be generally quite small.

VI. Conclusions

This paper explores issues regarding the role of company stock in employer-sponsored retirement plans. We repeat the questions posed at the outset, and then we summarize our responses:

- *What is the role and function of company stock in employer-sponsored plans?*

Employers utilize company stock within DC plans in an effort to promote employee share ownership, particularly among rank-and-file workers. The aim of such ownership is to improve morale, productivity and shareholder value. Company stockholdings in DC plans are encouraged in the US through various incentives in fiduciary and tax law.

Current policy has permitted a blurring of the lines between plans intended for *employee ownership* versus those intended for *retirement security*. Some employers have reinforced this by making company stock central to the design of their retirement programs. The conflicting goals of current policy become evident in the employer's role as fiduciary for company stock in a retirement plan: managers are expected to champion the firm's stock to external investors, but at the same time, they are also expected to act as an independent third party in evaluating the stock for plan participants.

Within this legal framework, large firms tend to emphasize compulsory ownership of shares in the DC plan. Small firms are less likely to offer stock as a retirement plan investment; or, when it is offered, they allow employee investment to be discretionary. Concentration levels are highest among large firms not only because they are more likely to offer stock, but because they are also more likely to direct contributions into stock and restrict diversification. *Directed plans* (where employer contributions are invested in stock and often restricted) hold on average 53 percent of plan assets in company stock. *Discretionary plans* (where employees make all investment decisions) average concentration levels of 22

percent of plan assets. An estimated 11 million plan participants (of 23 million having access to company stock) hold concentrated positions that exceed 20 percent of account balances.⁶⁹

What factors might explain employers' use of company stock, including the variations in behavior by employer size? The main rationale for company stock holdings consists of the benefits derived from employee ownership. However, evidence on these benefits is mixed, particularly among larger firms, and the employer ownership research does not shed much light on why stock ownership is compulsory in large firms but optional in small firms. It may be a function of the productivity problems of large-scale organizations. Another reason offered to explain company stock in DC plans is employee control of a friendly block of shares, yet this explanation is not dominant since we estimate that DC participants control only 6 percent of the shares of large firms. Other factors that may explain the differential behavior of large versus small employers include: the higher prevalence of DB (or other DC) plan coverage among those firms that direct contributions to stock; and the relative stock price volatility of "blue chip" companies compared with smaller stocks. These two factors might explain why large employers are more willing to accept higher concentrations of company stock in DC plans.

The role of company stock differs in ESOPs, which have unique issuance, tax, and leverage features. In publicly traded companies, ESOPs tend to be similar in purpose to 401(k) plans that hold company stock; they are becoming more even more alike, given the new tax incentives to form KSOPs enacted in EGTRRA. Private- and family-held firms obtain tax benefits when they sell to employee-owned ESOPs, and they often use ESOPs as a private equity market and collateral for debt financing. ESOPs can be used in leveraged buyouts and takeover defenses.

- *Who might be affected by greater portfolio diversification in employer-sponsored plans?*

Current policy for DC plans seeks to both *encourage employee ownership* and *provide a secure retirement income*. The current system, which permits concentrated stock positions, will inevitably produce some DC participants who lose their plan assets to firm bankruptcy. More broadly, for participants with concentrated stock positions, there are likely to be both greater extremes of accumulated retirement wealth *and* lower wealth for the median participant. Higher single-stock volatility not only contributes to a wider range of extreme outcomes—company stock "winners" and "losers—but it also means lower median wealth for participants due to the compounding of more volatile returns.

How might companies respond if the rules are changed, either encouraging or mandating diversification? Large firms, with high levels of concentration in their DC plans, will likely be most affected; by contrast, many medium and smaller sponsors have diversification features or levels of

⁶⁹ As noted at the outset of Section II, there are other ways employees might invest in company stock, stock option and stock purchase plans, and various forms of executive stock compensation. We do not focus on these in the present analysis since most (though not all) of these are limited to top management ranks.

concentration that already conform with many proposed diversification plans. It appears that such rule changes would be unlikely to quash new plan formation or to spur plan terminations, at least in the short and medium run. They would also not be expected to lead employers to reduce employee compensation, since in a competitive labor market, unilateral pay cuts will not be effective. Instead, employers might redirect some compensation away from retirement plans toward other equity-linked programs such as options, stock purchase plans, or stock grants. Alternatively employees might receive more cash, though probably not substituted dollar-for-dollar. Whether reductions in stock contributions are welfare-reducing depends on the certainty equivalent value of such stock contributions, not simply on a change in the dollar value of the contribution.

In terms of participant impact, besides the retirement wealth outcomes noted above, some portion of the current 11 million participants with concentrated holdings might perceive mandatory diversification as a net reduction in welfare, because of their desires to continue to hold a concentrated position. Participants intending to hold a concentrated stock position in their top-performing firm may be the most disappointed. While they cannot know whether their company's stock will continue to outperform, the evidence indicates that they expect it to do so. Other participants who inadvertently reached a concentrated position, due to through employer plan design, misunderstanding of the risks involved, or inertia, could well be at least neutral or actually better off, depending on whether their firms substitute cash for stock, and what the rate of substitution proves to be.

The policymakers' dilemma is that restrictions on top-performing stocks will be highly visible, while long-term improvements in retirement wealth due to diversification are difficult to measure and potentially diffuse. Reductions in bankruptcy risk will affect only a relatively small group of participants, and the utility gain to risk-averse participants whose plans become diversified may be even harder for politicians to identify.

- *What mechanisms exist, or could be developed, to enhance portfolio diversification in such plans?*

As we have shown, policymakers face a range of options depending on the importance they place on retirement income security versus employee ownership. One option, maintaining the *status quo*, would reinforce the employer practice of mandating compulsory stock ownership. This will generate more disparate wealth outcomes and reduce median wealth accumulations, as compared to a diversified retirement investment portfolio. A second approach would reduce downside risk by limiting incentives to hold single-firm shares in a DC plan. Mechanisms could include mandatory diversification rights for participants, enhanced (and repeated) risk disclosure efforts, curtailed tax incentives, and the adoption of mandatory third-party fiduciaries. There will be some policymakers who believe that even under these scenarios, plan participants will be unable to make informed choices about company stock. A third approach would put in place rules pertaining to company stock holdings in DC plans. These might

include plan design choices for employers (e.g., employers who direct contributions to stock cannot allow employee contributions) or compulsory caps on company stock holdings.

If policymakers are intent on moving down the path from less to more restrictive investment, trading, disclosure, and related rules, it would be invaluable to distinguish which policy changes are directed at diversification of retirement plans from rules intended to influence ESOP practice. Further, when companies do offer ESOPs, it would be useful for policymakers and employers to consider ways to communicate the unique risks of such plans, and how they may (or, in the worst case, may not) contribute to retirement income security.

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Table 1. Aspects of US Private Sector Pension Plans : 1985-2001

A. Number of Pension Plans

<u>Year</u>	<u>Total</u>	<u>DB Plans</u>	<u>DC Plans</u>	<u>401(k) Only</u>
1985	632,135	170,172	461,963	29,869
1990	712,308	113,062	599,245	97,614
1995	693,404	69,492	623,912	200,813
1998	730,031	56,405	673,626	300,593
2001 ^e	758,000	51,000	707,000	361,000

B. Number of Active Pension Plan Participants (000)

<u>Year</u>	<u>Total</u>	<u>DB</u>	<u>DC</u>	<u>401(k) Only</u>
1985	62,268	29,024	33,244	10,339
1990	61,831	26,344	35,488	19,548
1995	66,193	23,531	42,662	28,061
1998	73,328	22,994	50,335	37,114
2001 ^e	78,000	22,500	55,500	43,800

Note: Some portion of these 401(k) eligible participants may be covered by another DB or DC plan.

^e: Estimated 401(k) eligible participants for 2001 is 58.4 million based on 75% participation rate.

C. Pension Plan Assets (\$M)

<u>Year</u>	<u>Total</u>	<u>DB</u>	<u>DC</u>	<u>401(k) Only</u>
1985	\$1,252,739	\$826,117	\$426,622	\$143,939
1990	\$1,674,139	\$961,904	\$712,236	\$384,854
1995	\$2,723,735	\$1,402,079	\$1,321,657	\$863,918
1998	\$4,021,849	\$1,936,600	\$2,085,250	\$1,540,975
2001 ^e	\$4,000,000	\$1,900,000	\$2,100,000	\$1,700,000

Source: Data from 1985 to 1998: Form 5500 Reports provided by PWBA-USDOL: Tables E1, E23, E8, E11. ^e: Estimated 401(k) eligible participants for 2001 is 58.4 million based on 75% participation rate.

Table 2. Large Hybrid 401(k) and ESOP Plans (KSOPs)

Company	% of Pension in Company Stock	Estimated ESOP Deduction from EGTRRA (\$ millions)
Abbott Laboratories	82%	\$28
Anheuser-Busch	83%	\$15
Bank of America	43%	\$8
Ford Motor	50%	\$90
Marsh & McLennan	61%	\$10
McDonalds	74%	\$4
Pfizer	82%	\$23
Procter & Gamble	92%	\$127
SBC	38%	\$56
Verizon	51%	\$31

Source: Schultz and Francis (2002b).

Table 3. Recent Performance of Company Stock in Corporate 401(k) Pension Plans

Company	% of Pension in Company Stock	% Stock Price Change 3/00-12/01
Polaroid	19%	-99.6%
Enron	41	-99.6
Global Crossing	16	-97.5
Weirton	16	-96.4
Crown Cork & Seal	11	-92.5
Providian Financial	19	-91.8
KS City Southern	80	-91.8
Lucent Technologies	16	-89.2
Owens Corning	25	-88.5
Montana Power	25	-88.0
Northern Telcom	30	-86.6
Corning	32	-86.0
W.R. Grace	11	-84.3
Chiquita Brands	11	-82.8
ADC Telcom	46	-80.4

Source: Farrell (2002).

Table 4. Company Stock Holdings within DC Plans

	Employer Securities as % of Plan Assets		
	<u>1993</u>	<u>1996</u>	<u>1998</u>
Total DC plans	17.4	15.5	16.2
Profit-Sharing and Thrift Saving	17.6	12.8	14.4
Stock Bonus / ESOP	51.3	48.9	41.6
Target Benefit	0.5	0.4	0.4
Money Purchase	1.2	1.7	2.4

Source: US DOL, published and published data from Form 5500 Series for various plan years.

Table 5. Prevalence and Asset Allocation of Company Stock by Plan Size

Each survey includes only plans offering company stock

A. Profit-Sharing / 401(k) Council of America

Source: PSCA (2001)

<u>Number of plan participants</u>	<u>% of plans offering company stock</u>	<u>Asset allocation to company stock (%)</u>
5,000+	72	43
1,000-4,999	40	11
200-999	19	6
50-199	6	4
1-49	7	1

B. Vanguard Group

Source: Vanguard Group (2001)

<u>Number of plan participants</u>	<u>% of plans offering company stock</u>	<u>Asset allocation to company stock (%)</u>
2,500+	49	25
500-2,499	23	18
<500	4	17

<u>Plan assets</u>	<u>% of plans offering company stock</u>	<u>Asset allocation to company stock (%)</u>
Over \$500 million	75	28
\$100 to \$500 million	44	19
Below \$100 million	8	8

C. Fidelity Investments

Source: Fidelity (2001)

<u>Number of plan participants</u>	<u>% of plans offering company stock</u>	<u>Asset allocation to company stock (%)</u>
2,500+	62	28
500-2,499	20	23
<500	2	21

Table 6. Company Stock in the 20 Largest Private-Sector DC Plans

Source: Authors' estimates based on data from *Pensions and Investments* (2002); data as of December 31, 2001

<u>Company Name</u>	<u>DC Assets (\$ millions)</u>	<u>% of DC plan held in company stock</u>
General Electric Company	25,669	68%
Boeing Company	20,250	N/A
Verizon Communications Inc.	19,594	56%
International Business Machines Corp.	18,577	15%
General Motors Corporation	17,900	22%
Exxon Mobil Corporation	14,740	64%
SBC Communications Inc.	14,635	64%
Ford Motor Company	14,000	N/A**
Lucent Technologies	12,467	N/A**
Lockheed Martin Corporation	12,069	26%
Proctor & Gamble Company	10,468	93%
AT&T Corp	9,897	23%
Citigroup Inc.	9,751	46%
E.I.DuPont De Nemours & Co., Inc.	8,963	12%
Bellsouth Corporation	8,838	66%
Philip Morris Cos. Inc.	8,637	30%
United Technologies Corporation	8,137	22%
BP America Inc	7,750	45%
Shell Oil Company	7,371	19%
Northrop Grumman Corp.	7,038	N/A
All <i>Pensions & Investments</i> firms, top DC plans	200	
Total private-sector companies*	93	
Percent providing company stock data	69 (74%)	
Average asset allocation to stock		
Top 20 DC plans	42%	
All 69 DC plans with company stock information	32%	

* Excludes government plans, plans of mutually held companies, and other firms that recently went public

** Company stock offered in savings plan but data unavailable on holdings

Table 7. Participant Company Stock Holdings in 401(k) Plans Offering Company Stock

Source: Holden and VanDerhei (2001b) and Vanderhei (2002b).

A. Asset allocation to company stock by age (%)

<u>Age</u>	<u>Equity funds</u>	<u>Company stock</u>	<u>Balanced funds</u>	<u>Bond funds</u>	<u>Money mkt / GIC funds</u>	<u>Other</u>
20s	50	32	6	3	8	1
30s	51	32	5	3	8	1
40s	47	31	6	3	11	2
50s	43	29	6	5	16	1
60s	35	24	6	7	28	0
ALL	44	29	6	4	15	2

B. Degree of concentration in stock by age (%)

<u>Age</u>	<u>0</u>	<u>1% to 20%</u>	<u>21% to 40%</u>	<u>41% to 60%</u>	<u>61% to 80%</u>	<u>Over 80%</u>	<u>Total Over 20%</u>
20s	39	13	15	10	6	17	48
30s	34	18	15	11	5	17	48
40s	33	20	13	11	6	17	47
50s	32	22	13	9	6	18	46
60s	38	22	10	7	5	18	40
ALL	35	19	13	10	6	17	46

C. Degree of concentration by number of participants (millions)

Authors' estimates; based on estimated 23 million participants in plans offering company stock

<u>Age</u>	<u>Asset allocation</u>						
	<u>0%</u>	<u>1% to 20%</u>	<u>21% to 40%</u>	<u>41% to 60%</u>	<u>61% to 80%</u>	<u>Over 80%</u>	<u>Total Over 20%</u>
ALL	8.0	4.4	3.0	2.3	1.4	3.9	10.6

Table 8. Prevalence of Employer Direction by Plan Size

Source: Unpublished data provided by Vanguard Group

Plan size	% of plans with employer direction	% of plans with employee direction
Average	45	55
<i>Number of Plan Participants</i>		
Over 2,500	51	49
500-2,400	38	62
Under 500	37	63
<i>Plan Assets</i>		
Over \$500MM	48	52
\$100-\$500MM	47	53
Under \$100M	40	60

Table 9. 401(k) Plan Asset Allocation Patterns by Degree of Direction (%)

Source: Holden and VanDerhei (2001b) and Vanderhei (2002b).

	<u>Equity funds</u>	<u>Company stock</u>	<u>Balanced funds</u>	<u>Bond funds</u>	<u>Money mkt/GIC funds</u>	<u>Other</u>
All 401(k) plans	51	19	8	5	14	3
All plans w/ company stock	44	29	6	4	15	2
All plans w/ company stock & full participant direction	46	22	10	3	17	2
All plans w/ company stock where employer directs match	26	53*	5	1	13	2

* Includes 33% of employee monies and 20% of employer monies

Table 10. Qualified Plan Restrictions Regarding Company Stock

Source: Unpublished data provided by Vanguard Group.

A. DIRECTED PLANS -- Restrictions Imposed by DC Plans with Contributions Directed to Company Stock (106 plans, 121 plan/fund combinations)

Restriction	Impact on diversification	No. of plan/unds imposing	% of total	Category %
Age/service/vesting limits	Negative	45	37%	
Restricted until termination		25	21%	
Mandatory holding period		11	9%	
Minimum % in co stock		1	1%	68%
No restrictions	Positive	16	13%	
Caps/maximums		6	5%	18%
Trading limits	Varied	5	4%	
Other		12	10%	14%
TOTAL		121	100%	100%

B. DISCRETIONARY PLANS -- Restrictions Imposed by DC Plans with Discretionary Contributions to Company Stock (114 plans, 124 plan/fund combinations)

Restriction	Impact on diversification	No. of plan/unds imposing	% of total	Category %
No restrictions	Positive	60	48%	
Caps/maximums		25	20%	69%
Age/service/vesting limits	Negative	6	5%	
Restricted until termination		5	4%	
Mandatory holding period		2	2%	10%
Trading limits	Varied	7	6%	
Other		19	15%	21%
TOTAL		124	100%	100%

Table 11. Other Survey Results on Restrictions Imposed by Directed Plans

Source: Hewitt (2001) and Mercer (2001)

Plans that direct contributions into stock	45%
Plans that do not direct contributions	55%

Source: Hewitt 2001

DIRECTED PLANS -- Restrictions Imposed by DC Plans with Contributions Directed to Company Stock

<u>Restriction</u>	% of plans imposing	
	<u>Hewitt 2001</u>	<u>Mercer 2001</u>
Age	34	40
Age/service, including ESOP	22	15
Restricted until termination	19	12
Holding period	3	6
Vesting	<u>3</u>	<u>-</u>
<i>Subtotal</i>	81	73
No restrictions	15	19
Other	<u>4</u>	<u>8</u>
<i>Subtotal</i>	19	27
<i>Total</i>	100	100

Table 12. Percentage of Market Capitalization Controlled by Participants in DC Plans

Source: Authors' estimates on *Pensions and Investments* (2002) and Vanguard Group data*

<u>Company Name</u>	<u>DC Assets (\$ millions)</u>	<u>% of mkt cap 12/31/01</u>
General Electric Company	25,669	4.4
Boeing Company	20,250	N/A
Verizon Communications Inc.	19,594	8.5
International Business Machines Corp.	18,577	1.4
General Motors Corporation	17,900	14.6
Exxon Mobil Corporation	14,740	3.5
SBC Communications Inc.	14,635	7.1
Ford Motor Company	14,000	N/A
Lucent Technologies	12,467	N/A
Lockheed Martin Corporation	12,069	15.3
Proctor & Gamble Company	10,468	1.6
AT&T Corp	9,897	3.5
Citigroup Inc.	9,751	1.7
E.I.DuPont De Nemours & Co., Inc.	8,963	2.5
Bellsouth Corporation	8,838	8.2
Philip Morris Cos. Inc.	8,637	2.6
United Technologies Corporation	8,137	5.9
BP America Inc	7,750	N/A
Shell Oil Company	7,371	N/A
Northrop Grumman Corp.	7,038	N/A
Total companies in <i>Pensions & Investments</i> top DC plans	200	
Total private-sector companies**	93	
Percent with company stock and US market capitalization data (excludes foreign firms traded as ADRs)	65 or 70	
Average market capitalization controlled by DC plan (%)		
Top 20 DC plans	5.8	
All 65 DC plans with company stock and market capitalization data	5.9	

* Vanguard Group market data provided by Vanguard, Center for Research in Securities Prices at the University of Chicago, FT Interactive Data, and Wilshire Associates.

** Excludes government plans, plans of mutually held companies, and other firms that recently went public

Table 13. DC Reliance on Company Stock as Related to DB Plan Availability

Source: Data provided by Vanguard Group

<i>Number of Plan Participants*</i>	<u>% of DC Plans with Companion DB Plan</u>
Over 2,500	77
500-2,400	66
Under 500	67
 <i>Plan Assets**</i>	
Over \$500MM	76%
\$100-\$500MM	76%
Under \$100M	66%

* DB status uncertain in an additional 6%, 15% and 23% of DC plans, respectively

** DB status uncertain for an additional 9%, 6% and 19% of DC plans, respectively

Table 14. Company Stock and Related Volatility

Source: Authors' estimates based on *Pensions & Investments* (2001) and Vanguard Group data*

A. Risk and Return Characteristics of Largest DC Plans (%)

	10 years ending 2001 (n=69 stocks)	20 years ending 2001 (n=80 stocks)
<i>Pensions & Investments Largest DC Plans</i>		
Average annual return of company stock	10.9	13.9
Average annual return of S&P 500	12.9	15.2
"Excess" return relative to market index	(2.0)	(1.3)
Average standard deviation of company stock	34.5	31.9
Standard deviation of S&P 500	17.3	14.7
Risk multiple	2.0x	2.2x

B. Volatility of Individual Stocks (Standard Deviation of Annual Return)

	10 years ending 2001
S&P 500	17.3%
Top 20 stocks **	34.4%
Risk multiple	2.0x
Top 100 stocks**	43.0%
Risk multiple	2.5x
2,579 stocks with continuous history	63.9%
Risk multiple	3.7x

* Vanguard Group market data provided by Vanguard, Center for Research in Securities Prices at the University of Chicago, FT Interactive Data, and Wilshire Associates.

**Companies ranked by 12/31/2001 market capitalization

Table 15: Impact of Company Stock on Retirement Incomes

Source: Authors' computations using Monte Carlo simulation; see also Figure 5.

Initial worker income:	\$50,000
Contribution rate:	10%
Contribution growth rate:	3% (non-stochastic)
Expected return, market:	10%
Volatility, market:	20%
Expected return, company stock:	10%
Volatility, company stock:	20%
Correlation, market / co stock	0.9

A. Wealth Outcomes in 30 Years

Portfolio mix	Expected wealth in 30 years		
	100% market portfolio	50% co. stock / 50% market	100% company stock portfolio
95 th percentile	\$2,733,000	\$3,384,000	\$4,070,000
Median	\$830,000	\$615,000	\$411,000
5 th percentile	\$281,000	\$139,000	\$66,000

B. Increase/(Decrease) In Wealth Compared With Market Portfolio

Portfolio mix	Difference in wealth in 30 years versus market portfolio		
	100% market portfolio	50% co. stock / 50% market	100% company stock portfolio
95 th percentile	-	\$651,000	\$1,337,000
Median	-	(\$215,000)	(\$419,000)
5 th percentile	-	(\$142,000)	(\$215,000)

Figure 1. Coverage by Pension Plans Over Time, Private Sector Workforce
 Source: US Dept of Labor, PWBA (2001)

% of Labor Force
 with Pension of Specified Type

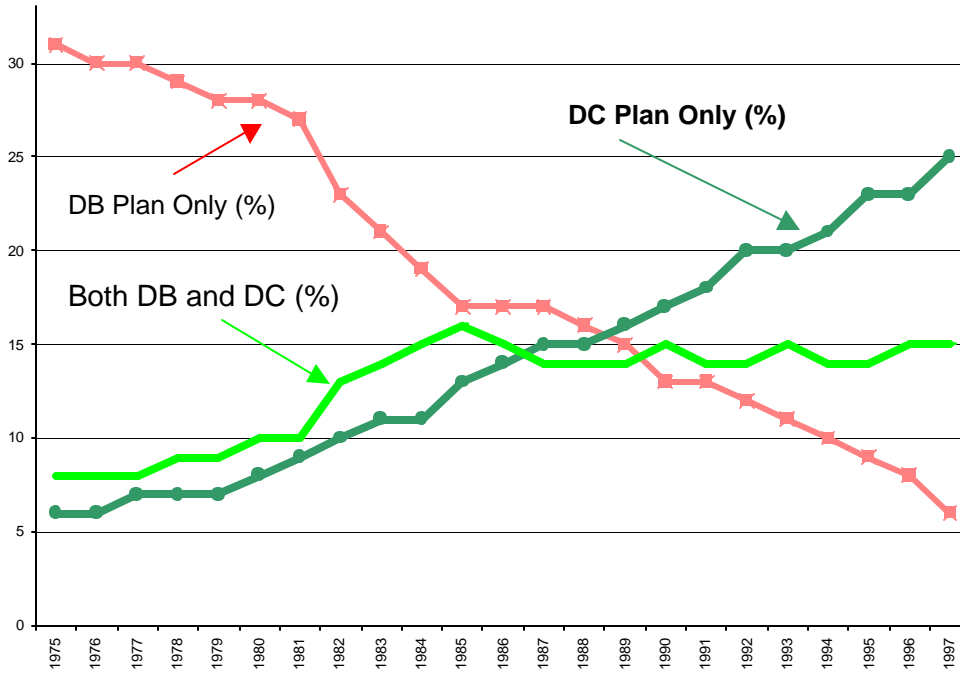


Figure 2. Growing Dominance of DC Plans In Private Sector Workforce
 Source: US DOL (2002), Table E4,

Pension Mix for those
 with Pensions (% of covered)

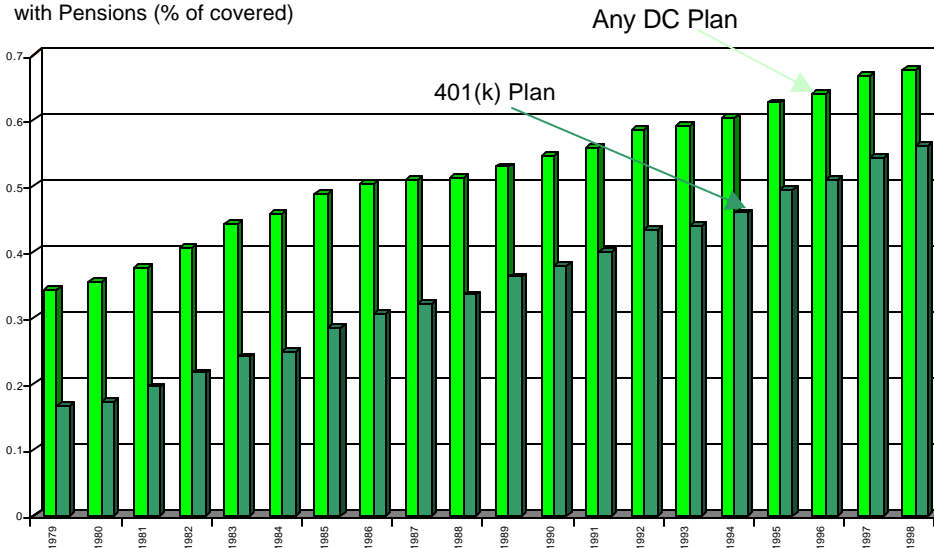
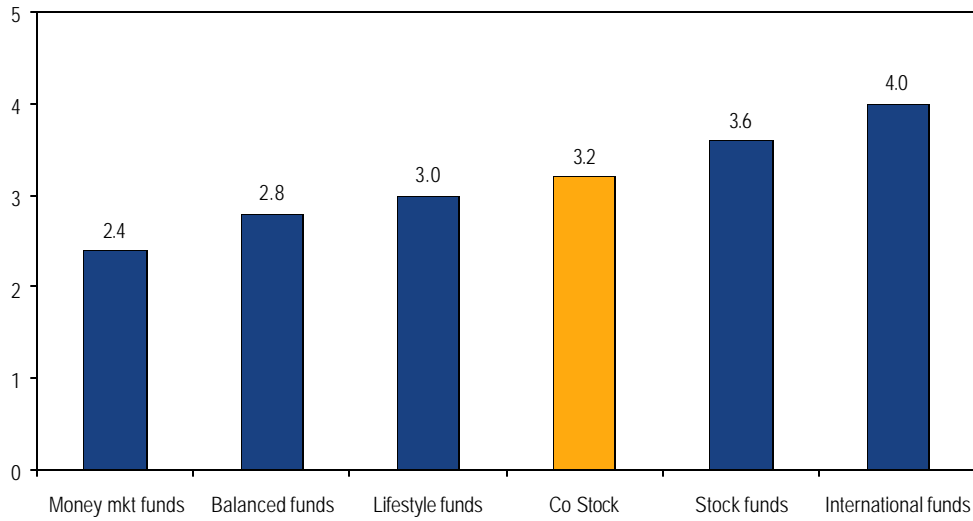


Figure 3. Participant Knowledge About Risk/Return of Company Stock

A. Company Stock vs Other Fund Types

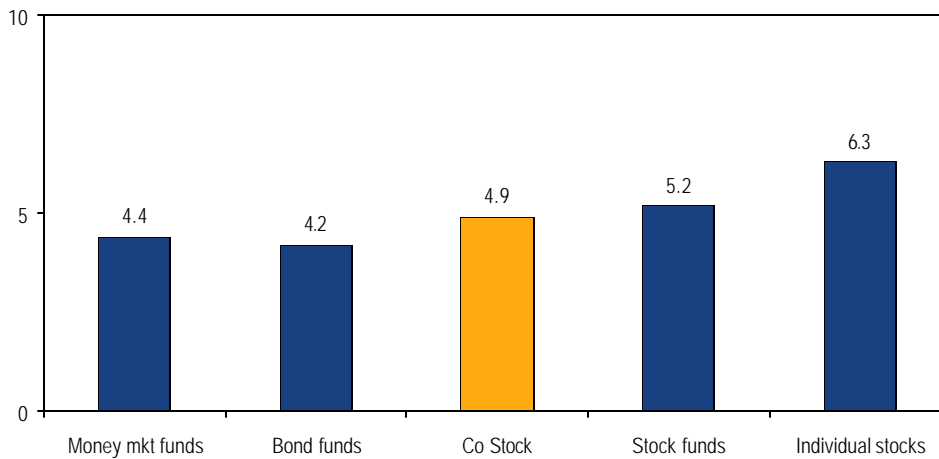
Relative Risk (Scale of 1-5)



Source: John Hancock Financial Services (2001)

B. Company Stock vs Other Fund Types

Relative Risk (Scale of 1-10)



Source: Vanguard 2002 [a]

Figure 4. Relationship Between Performance of Company Stock and Employee Contributions

Participant allocation of own monies to company stock based on performance quintile of stock
 Source: Authors' derivation from Benartzi (2001).

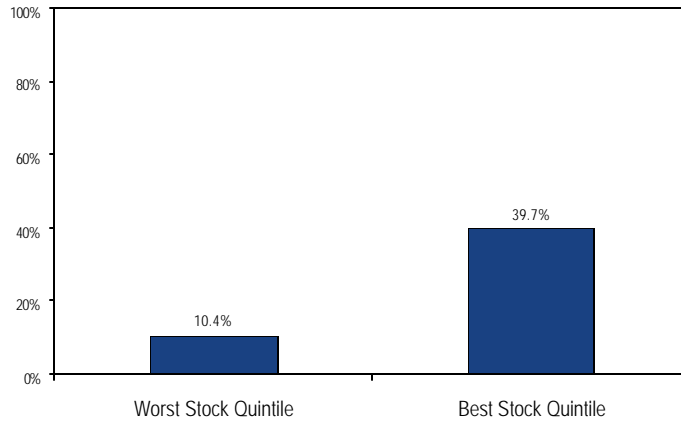


Figure 5. Impact of Company Stock on Retirement Incomes

Source: Authors' computations using Monte Carlo simulation; see also Table 14.

Retirement Wealth Outcomes After 30 Years

