

February 12, 2003

By Hand

The Honorable John W. Snow
Secretary
U.S. Department of the Treasury
1500 Pennsylvania Avenue, N.W.
Washington, D.C. 20220

Re: Cash Balance Pension Plans

Dear Secretary Snow:

The ERISA Industry Committee ("ERIC")¹ applauds your decision to take a fresh look at the Treasury's proposed age discrimination regulations. The regulations will have a major impact on the defined benefit pension plans of the 21st Century, including cash balance plans, pension equity plans, other hybrid plans, as well as traditional pension plans. ERIC welcomes the opportunity to assist you in your review of the regulations.

Cash Balance Plans Meet Employer And Employee Needs

Much of the criticism of cash balance plans has been fueled by mischaracterization of those plans and their purpose. The fact is, if it were not for cash balance plans, the decline in defined benefit pension coverage for employees in recent years would have been much more severe than it actually was. Cash balance plans are appealing because they do a better job of meeting both employer and employee needs than do traditional pension plans in a variety of circumstances, such as where employees do not remain with a single employer for their entire career. Specifically, cash balance plans provide benefits that are

- more understandable and more portable;
- more meaningful and more available to a larger percentage of the workforce; and
- especially valuable to women and mobile workers.

¹ ERIC is a nonprofit association committed to the advancement of the employee retirement, health, and welfare benefit plans of America's largest employers. ERIC's members provide comprehensive retirement, health care coverage, and other economic security benefits directly to some 25 million active and retired workers and their families. ERIC has a strong interest in proposals affecting its members' ability to deliver those benefits, their costs and effectiveness, and the role of those benefits in the American economy.

Unlike § 401(k) plans, cash balance plans

- are funded entirely by employer contributions;
- place investment risk on the employer rather than the employee;
- must provide a life annuity as a payment option; and
- provide benefits that are federally insured.

Employers Must Be Able To Change In A Fast-Changing Economy

While many critics recognize the value of cash balance plans, they have argued that when a traditional plan is converted to a cash balance plan, employees should be given the right to elect either to stay under the traditional formula or to shift to the cash balance formula. Their argument is based on the fallacy that once a retirement plan goes into effect, an employee acquires a permanent entitlement to continue to earn additional retirement benefits under the provisions of that plan. That argument is wholly at odds with the law governing employer-sponsored pension plans, which protects the benefits an employee has earned at the time a plan is changed, but allows the employer to change the rate at which employees earn additional benefits in the future. When Congress examined this subject in 2001, it decided to impose new disclosure requirements when a plan was amended to reduce the rate of future benefit accrual; it did not mandate that employees be given the right to stay under the old plan formula.

A company's ability to change is a fundamental strength of our economy and the voluntary pension system. A company must be able to change its way of doing business in response to new economic circumstances and challenges, such as growing employee demand for pension benefits that are compatible with employee expectations regarding future job mobility. If an employer were required to give employees the option to stay under the existing pension formula whenever the employer changes that formula, employers would quickly be driven out of the voluntary defined benefit system. Rather than being saddled with a permanent and costly commitment to maintain the status quo for those employees who prefer the status quo, employers will abandon the system altogether.

In general, cash balance plans produce far more "winners" than "losers" when cash balance benefits are compared to benefits under traditional pension plans. For example, a 2001 Urban Institute study concluded (at p. 29):

"By distributing pension wealth more equally across the population than DB plans, cash balance plans would increase median lifetime pension wealth in the total covered population and more people would gain pension wealth than lose" (emphasis added) (copy enclosed).

Many of the employers that have converted their traditional pension plans to cash balance or pension equity plans have also voluntarily provided employees with generous and equitable transition benefits. But the nature of those benefits has depended, and must depend, on the employer's circumstances. And, it is worth repeating, regardless of whether such benefits are provided or their value, employees do not lose the benefits they have accrued to date.

Some vocal employees have complained that conversions to cash balance plans have made more difficult their goal to retire at age-55 or earlier. Most U.S. workers do not retire at 55 with a full pension, and they remain employed into their 60s. Today, many workers are needed where they are. In some industries, early retirements are particularly damaging. Not only does the former employer lose the benefit of its early retirees' valuable skills, but the early retirees are recruited by the former employer's competitors. To make matters worse, the former employer is often in the position of subsidizing its competitors: its provision of substantial pension and health benefits to early retirees allows its competitors to hire the early retirees at lower cost.

Saving Money Is Not The Objective

While some critics claim that employers are converting their traditional pension plans to cash balance plans in order to save money, the truth is quite different. While it is possible, and entirely appropriate, for employers to cut costs by reducing future benefit levels, most of the employers that have adopted cash balance plans have done so to attract and retain the employees they need to compete and run a successful enterprise. In fact, the credible evidence reveals that most employers have not had a reduction in total retirement benefit costs in connection with the switch to a cash balance plan.

A 2002 study by two Federal Reserve Board economists, for example, examined 32 cash balance conversions and found (at p. 14) that the "conversions increased the PBO [projected benefit obligation] of 25 of the 32 sponsoring firms." The Federal Reserve Board economists concluded (at p. 22) that

"while critics have decried the trend of the conversion of traditional DB pension plans to cash balance plans as reducing benefit generosity, the implications for retirement security may actually be favorable. The earlier accrual and portability of benefits will better facilitate the accumulation of wealth for a more mobile labor force" (emphasis added) (copy enclosed).

The Future Of Retirement Security

The future of the voluntary pension system is at stake. If the Government bars employers from reforming their pension plans to meet both employer and employee needs, the Government will send a signal to employers to leave the voluntary pension system

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altogether, which will subject employees to greater risks in retirement. This is an outcome that neither employees nor the economy as a whole can afford.

ERIC strongly supports the Treasury's efforts to develop regulations that allow employers to offer retirement plans that are appropriate for the 21st Century, such as cash balance and pension equity plans. Nevertheless, ERIC has serious concerns about the way the Treasury's proposed regulations attempt to achieve this objective, and it is deeply concerned about the impact of the proposed regulations on all types of pension plans, including traditional plans, cash balance plans, and pension equity plans. For your convenience, a copy of ERIC's initial comments on the proposed regulations is enclosed.

We hope this letter and the enclosed comments are helpful to you. Please let us know if we can be of assistance as you review the regulations.

Very truly yours,

Mark J. Ugoretz
President

Enclosures

Can Cash Balance Pension Plans Improve Retirement Security for Today's Workers?

Author(s): [Richard W. Johnson](#), [Cori E. Uccello](#)

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Number 14 in Series, "The Retirement Project"

The nonpartisan Urban Institute publishes studies, reports, and books on timely topics worthy of public consideration. The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders.

In recent years, several large employers have replaced their traditional defined benefit plans with cash balance plans. Like traditional pensions, cash balance plans guarantee workers set retirement benefits, but they allow workers to build up savings more steadily over their careers.¹ Employers offering cash balance plans set aside a percentage of each employee's salary and guarantee a fixed interest rate return on these contributions.

Cash balance plans share some features of defined contribution plans, the type of retirement plan the majority of Americans now participate in. The two types of plans, however, differ fundamentally. Defined contribution plans offer employees tax-deferred savings accounts, such as 401(k)s, which typically allow participants to choose how to invest their money. Workers generally invest their contributions in stocks and bonds, leaving their savings vulnerable to financial market volatility. In the past year, stock market declines have cost U.S. workers billions of retirement dollars (Board of Governors of the Federal Reserve System 2002). Workers who did not adequately diversify their pension assets were hit especially hard, as became apparent after the Enron and WorldCom bankruptcies (Kadlec 2002; Wysocki 2002). By contrast, cash balance plans guarantee workers' retirement benefits. Because the employer promises to pay a certain return on plan contributions, benefits do not fluctuate with market interest rates or stock market outcomes.

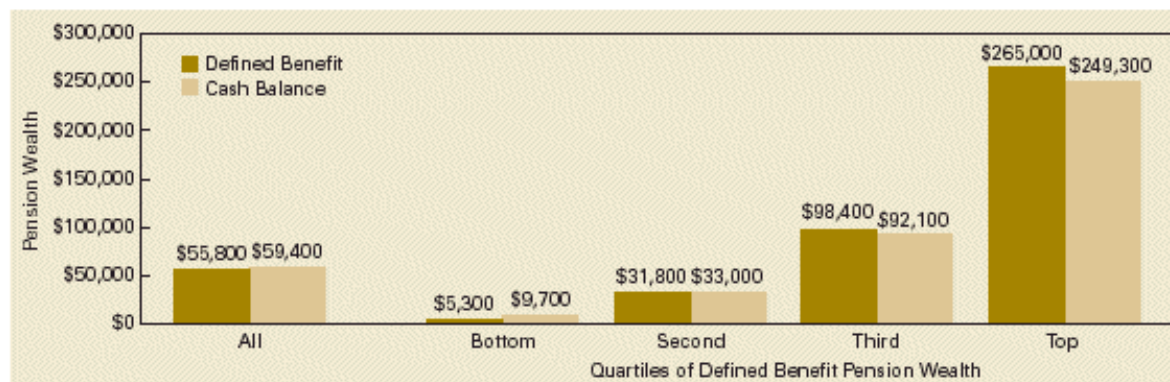
Some employers have switched from traditional defined benefit plans to cash balance plans to better attract and retain workers. Typically, traditional pension plans have provided generous guaranteed retirement income to workers who spend most of their careers at one company, an increasingly rare occurrence among today's highly mobile workforce. Indeed, because pensions depend on years of service and final salary, job changers fail to accumulate substantial retirement benefits under traditional defined benefit plans. In cash balance plans, by contrast, even workers who change jobs frequently can accumulate sizable pension wealth.

So far, the cash balance debate has centered mostly on the merits of converting from defined benefit plans to the newer plans. Some critics argue that midcareer changeovers discriminate against older workers who have spent many years working for the same employer. Most analysts agree that without

Pension Wealth Comparison

According to our estimates, typical participants would have slightly higher lifetime pension wealth if they had participated in cash balance plans. The estimated median lifetime pension wealth in the defined benefit plans totals \$55,800 (figure 1). If all defined benefit plans in our sample were replaced by cash balance plans, median lifetime pension wealth would increase by 7 percent, to \$59,400.

FIGURE 1. Median Lifetime Pension Wealth in Defined Benefit and Cash Balance Plans



Source: Johnson and Uccello forthcoming.

Note: Estimates are based on a sample of 3,228 individuals age 51 to 61 in the 1992 Health and Retirement Study who participated in defined benefit pension plans. Parameters of the cash balance plans were set to equalize expected aggregate pension benefits paid by the employer under the cash balance plan and defined benefit plan.

Median lifetime pension wealth would increase under cash balance plans because these newer plans distribute pension wealth more equally across the covered population. Thus, even though we hold overall defined benefit pension wealth constant, the distribution of that wealth changes. In particular, people at the bottom half of the distribution would see their pension wealth rise, while those at the top half would see their benefits decrease. The individuals with the least defined benefit wealth would gain the most: At the bottom quartile, cash balance plans would boost median pension wealth 81 percent.

This overall shift, however, only tells part of the story. The age at which workers accumulate pension benefits also determines how certain groups would fare under cash benefit plans. We consider age differences in our sample by comparing pension wealth from past jobs (held at relatively young ages) with current-job wealth for workers in their 50s.

Employment Patterns and Pension Outcomes

Regardless of plan type, pension wealth tends to increase with the number of years of service. However, as noted, traditional pensions result in particularly large gains late in a person's work life, just before the specified early and normal retirement ages. At young ages, the annual increments to pension wealth are generally modest. In most cash balance plans, pension wealth grows more evenly over the course of an individual's career. As a result, for plans from past jobs that workers generally began at relatively young ages, median pension wealth for those with many years of service would be higher in defined benefit plans than in cash balance plans, but median wealth for those with fewer years of service would be lower in defined benefit plans (figure 2).

special provisions for long-term employees, late-career conversions would result in lower benefits for many older workers. Few researchers, however, have considered whether cash balance pensions can improve retirement outcomes for the next generation of workers who could participate in these plans for their entire careers. Although we cannot predict precise outcomes for future workers, we can simulate how those with defined benefit pensions now completing their working lives would have fared if they had instead participated in cash balance plans for their entire careers.

This brief compares outcomes in traditional defined benefit plans and hypothetical cash balance plans for a sample of Americans near retirement with pension coverage.² We compare the pension benefits workers can expect to receive from their employers under each plan. Our analysis examines how cash balance plans might affect the distribution of pension wealth across different groups, assuming that workers participated in cash balance plans instead of defined benefit plans during their entire period of covered employment.

We find that replacing traditional pension plans with cash balance plans would redistribute pension wealth from those who held long-term jobs to those with a series of short-term jobs. Individuals with limited pension wealth, especially those in the bottom quartile, would also benefit. Surprisingly, we find that many women now approaching retirement age would lose pension wealth under cash balance plans, because few held pension jobs at young ages. However, future cohorts of older women may fare better, since women now work longer and earn more than in the past.

Employer-Sponsored Retirement Plans

Fewer and fewer employers are offering workers defined benefit pensions. These traditional plans typically pay annual retirement annuities equal to a specified fraction (such as 1 percent) of annual earnings received near the end of a worker's career (often averaged over the last three to five years of employment) multiplied by years of service. With each added year of service, both the multiplier and the earnings base (assuming salary rises with tenure) typically increase. The annual increment to pension wealth often turns negative after workers reach the plan's normal retirement age, because the modest increase in the size of the annuity from an additional year of work does not offset the loss of a year's worth of benefits.

Overall, defined benefit pension wealth—the present value of the expected future stream of pension benefits—grows slowly early on in an individual's career, increases rapidly near the end, and then declines at older ages. The worker begins receiving payments once he or she leaves the employer and reaches the plan's retirement age.³ But workers who quit before reaching retirement age forfeit substantial pension wealth.

Over the past decade, as employers have aimed to give workers greater control over their retirement assets and to accommodate worker mobility, defined contribution plans have become the retirement plan of choice. In 1998, nearly two-thirds of workers with pension coverage secured primary coverage through defined contribution plans, up from just one-third a decade earlier (Copeland 2002).

But not all companies looking to make a change have joined the legions of firms offering 401(k)s and other savings vehicles. Instead, some companies have converted to cash balance plans, a new type of defined benefit pension. In 1999, 19 percent of Fortune 1000 firms sponsored cash balance plans; more than half of these plans had been established within the previous five years (U.S. General Accounting Office 2000).

In cash balance plans, employers set aside a given percentage of salary for each employee and credit interest on these contributions at a predetermined rate. As in defined contribution plans, cash balance plans express benefits as an account balance, but participants hold individual accounts on the books only. They actually receive benefits from commingled funds invested in a pension trust on behalf of all participants. Those who leave their jobs before retiring can generally reinvest their plan assets elsewhere, instead of having to wait until they retire to access their money (as in most defined benefit plans).

Compared with traditional pensions, cash balance plans generate retirement wealth more evenly over

time for a couple of reasons: Contributions made early on earn interest for many years, and lifetime earnings rather than final earnings determine benefits. Consequently, a worker changing jobs incurs only a small penalty. For women, who tend to have higher turnover rates than men, the ability to change jobs without jeopardizing pension wealth may be particularly important.

Cash balance plans also better protect the retirement security of workers who are laid off or whose firms go bankrupt. The federal government guarantees vested benefits in both defined benefit and cash balance plans but does not insure future expected benefits. Workers depending on traditional pensions build most of their wealth late in their careers, and they can end up with limited retirement benefits if they lose their jobs before their pension wealth can grow sufficiently. By contrast, participants in cash balance plans accumulate more pension wealth at younger ages. Thus, workers in cash balance plans let go in midcareer or forced into early retirement will not lose as much in expected benefits as defined benefit participants.

Cash balance plans also have an advantage over defined contribution plans—they protect workers from downturns in the stock market. Defined contribution plans can pay high returns, but they also expose workers to substantial risk. Dips in the stock market, or prolonged periods of unusually low interest rates, can substantially reduce defined contribution wealth. Employers are better able to bear this risk than workers because, in general, they have greater access to credit markets and broader diversification opportunities.

Despite some of the advantages, the switch from traditional pension plans to cash balance plans has sparked controversy. According to some critics, employers that convert to cash balance plans discriminate against older workers who put many years into the former plan and will not have time to gain significant benefits under the new plan. By this rationale, these workers will miss out on the large late-career increases that occur in traditional plans. Some older workers, fearing for their retirement security, have sued employers, claiming age discrimination. At least one federal court, however, has ruled that cash balance plans do not violate federal age discrimination laws.⁴ Workers have also brought lawsuits about the proper interest rate to use when calculating lump-sum payments in cash balance plans for workers who leave their jobs before retirement.

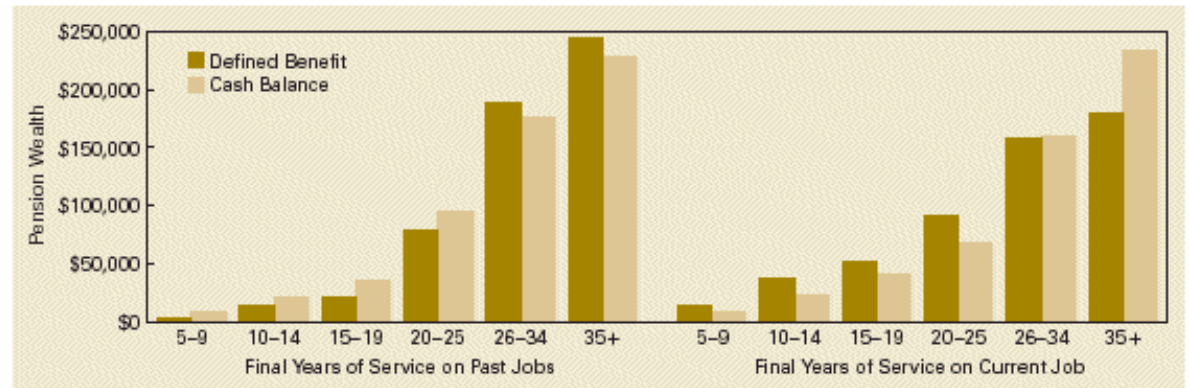
Estimating the Effects of Cash Balance Plans

To examine the potential impact of cash balance plans on the distribution of pension benefits, we use a two-step methodology. First, we estimate lifetime pension wealth for a nationally representative sample of 51- to 61-year-olds who had defined benefit pension coverage in 1992.⁵ The analysis focuses on older individuals because retirement income depends on pension wealth accumulated over an entire lifetime. We then simulate the group's overall pension wealth as if the members had participated in cash balance plans instead of defined benefit plans for their entire period of coverage. In addition, because the impact of the changeover can vary by age, we compare the wealth for past jobs (held at relatively young ages) and for current jobs.

As in all simulations, we must make certain assumptions. Admittedly, our boldest is that all workers would behave the same way under both types of plans. Because participants in cash balance plans do not have to wait until they reach their 50s to accumulate substantial pension wealth, few may end up staying with a single employer until they retire. Still, our somewhat stylized scenario gives a general sense of how these new plans might play out. Further analysis will need to answer questions about how the two types of plans might affect worker behavior.

Constructing the plans also requires some speculation. According to recent studies, the majority of employers that have converted to cash balance plans did not cut pension costs (Brown et al. 2000; Copeland and Coronado 2002). Rather, companies tend to offer cash balance plans equal in generosity to their defined benefit plans. Thus, for the purposes of our cash balance simulations, we set the pay credit rate (percentage of pay set aside for future pension benefits) for each worker to equalize aggregate benefits paid by employers in both types of plans. For a full description of the methodology and analytical assumptions, see Johnson and Uccello (forthcoming).

FIGURE 2. Median Pension Wealth on the Current Job and Past Jobs, by Final Years of Service



Source: Johnson and Uccello forthcoming.

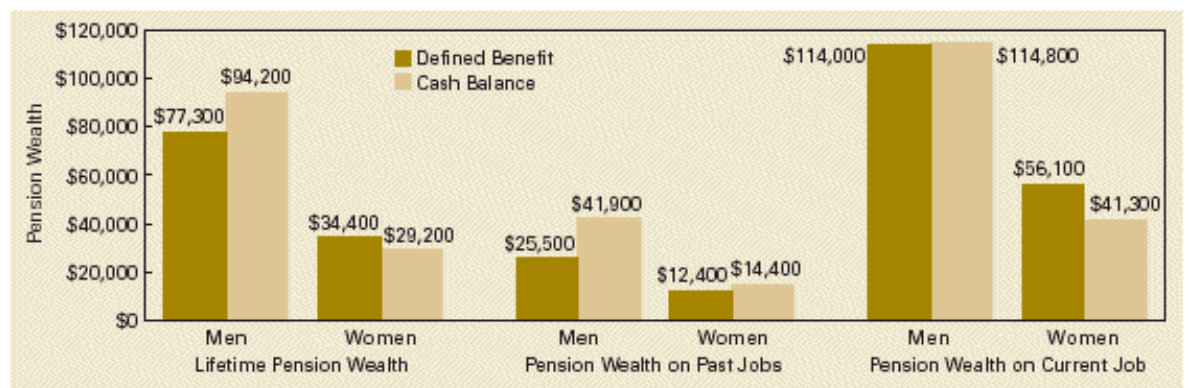
Note: Estimates are based on a sample of 3,228 individuals age 51 to 61 in the 1992 Health and Retirement Study who participated in defined benefit pension plans. Parameters of the cash balance plans were set to equalize expected aggregate pension benefits paid by the employer under the cash balance plan and defined benefit plan.

The pattern differs on the current job—with traditional pension plans favoring workers in their 50s with limited seniority. Median pension wealth for workers with few current-job years (fewer than 10) would be 45 percent lower in cash balance plans than in defined benefit plans, but wealth for those with many years of service (35 or more) would be 31 percent higher in cash balance plans. Workers at midlife with relatively few years of service would lose wealth in cash balance plans, as defined benefit pension wealth accrues rapidly just before retirement, even for workers with limited tenure. As a result, workers at midlife with limited job tenure would, on average, accumulate less pension wealth in cash balance plans than in defined benefit plans. However, workers in their 50s and 60s who worked at their current jobs for virtually their entire careers would tend to fare better in cash balance plans than in defined benefit plans, because wealth in defined benefit plans often grows slowly (and even sometimes declines) once workers become eligible to receive retirement benefits.

Gender Differences

Participation in cash balance plans would affect the pension wealth of men and women approaching retirement differently, because the sexes have generally exhibited different employment patterns. For men, median lifetime pension wealth would be 22 percent higher in cash balance plans than in defined benefit plans. For women, pension wealth would be 15 percent lower (figure 3). As a result, in our sample, the gender gap in median pension wealth would increase from \$42,900 in defined benefit plans to \$65,000 in cash balance plans.

FIGURE 3. Gender Differences in Median Pension Wealth



Source: Johnson and Uccello forthcoming.

Note: Estimates are based on a sample of 3,228 individuals age 51 to 61 in the 1992 Health and Retirement Study who participated in defined benefit pension plans. Parameters of the cash balance plans were set to equalize expected aggregate pension benefits paid by the employer under the cash balance plan and defined benefit plan.

Women's employment patterns partly explain the wider gap. The female cohort examined was less likely than the male's to have participated in pension plans at young ages, when cash balance plans

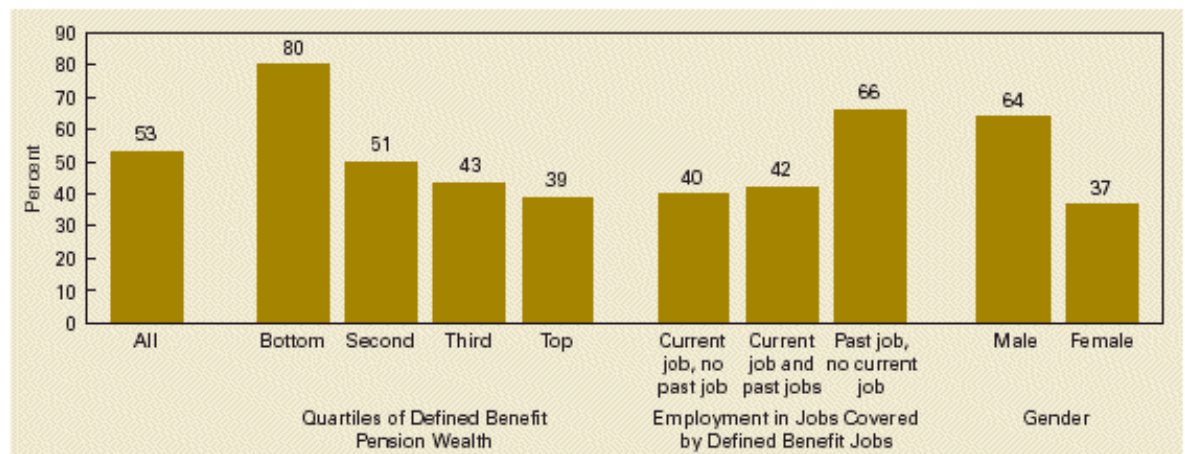
can generate relatively greater returns. Because these women accumulated so little defined benefit wealth early in their careers, their median pension wealth from past jobs would only be \$2,000 higher in cash balance plans than in defined benefit plans, compared with a \$16,000 difference for men.

Women would lose even more current-job pension wealth. Median pension wealth accumulated on women's current jobs would fall \$15,000 under cash balance plans, while this wealth category for men would increase slightly. Many women in their 50s who are currently working have been at their jobs for a fairly short time, so they would not accumulate many benefits in cash balance plans. However, future cohorts of women—who will have worked longer and more steadily than women born in the 1930s—would likely see better results under cash balance plans.

Potential Winners and Losers

Overall, our analysis suggests that slightly more than half (53 percent) of individuals age 51 to 61 in 1992 would accumulate more lifetime pension wealth in cash balance plans than in defined benefit plans (see figure 4). Likely winners in cash balance plans include those with limited defined benefit wealth and those who accumulated their pension wealth at relatively young ages. Eighty percent of those in the bottom quartile of the defined benefit wealth distribution would realize gains in cash balance plans, while 61 percent of those in the top quartile would fare worse. About 66 percent of those in their 50s who received all of their pension wealth from past jobs would fare better in cash balance plans. And 64 percent of men would accumulate more lifetime pension wealth in cash balance plans than in defined benefit plans, compared with only 37 percent of women.

FIGURE 4. Share of Adults Age 51 to 61 in Defined Benefit Plans Who Would Have Fared Better in Cash Balance Plans



Source: Johnson and Uccello forthcoming.

Note: Estimates are based on a sample of 3,228 individuals age 51 to 61 in the 1992 Health and Retirement Study who participated in defined benefit pension plans. Parameters of the cash balance plans were set to equalize expected aggregate pension benefits paid by the employer under the cash balance plan and defined benefit plan.

Conclusions

Replacing defined benefit plans with cash balance plans would shift pension wealth to individuals who held a series of relatively short-term jobs and those who had pension wealth from jobs held early in their work lives. Put another way, individuals with limited defined benefit wealth, whose pension benefits often came from short-term jobs or jobs held early on, would see gains. In contrast, workers who accumulated most of their pension wealth from a single job held until retirement would lose wealth in cash balance plans. Overall, most individuals near the bottom of the defined benefit wealth distribution would fare better in cash balance plans than in defined benefit plans, while most workers near the top of the defined benefit wealth distribution would fare worse.

Cash balance plans, by distributing pension wealth more equally across the population, would increase median lifetime pension wealth in the total covered population, and more people would gain, rather than lose, pension wealth. Pension wealth tied to current jobs would shrink for older workers

under cash balance plans. However, large increases in pension wealth from past jobs held at relatively young ages would more than offset that decline.

Many advocates of cash balance plans contend that women, in particular, would benefit under these plans because they have higher turnover rates than men. But based on our findings, most women age 51 to 61 in 1992 with defined benefit coverage would have lost pension wealth if they had participated in cash balance plans throughout their working lives, primarily because this female cohort was less likely than men to have gained pension wealth on past jobs. Nonetheless, pension wealth from jobs held early on would increase sharply in cash balance plans, relative to defined benefit plans, offsetting the loss in current-job pension wealth. But many working women at midlife did not work earlier and have had relatively short tenures on their current jobs. Since defined benefit wealth grows rapidly as workers approach retirement, even for those with limited service, replacing large late-career accruals with much smaller cash balance accruals would substantially shrink women's pension wealth.

Still, future cohorts of women may realize greater advantages from cash balance plans, as men's and women's employment and earnings patterns continue to grow more similar. For example, although women continue to have higher overall turnover rates than men, rates among young workers no longer differ by gender (Royalty 1998). If these trends persist and the gender gap in earnings diminishes, future women approaching retirement may accumulate almost as much pension wealth in cash balance plans as men.

For decades, traditional defined benefit coverage and the guaranteed pension income it offered were the most reliable path to a secure retirement. However, traditional defined benefit plans may no longer be the best choice for today's more mobile workforce. With employee turnover increasing (Farber 1999), fewer workers will reach retirement with enough years serving a single employer to qualify for a substantial defined benefit pension. Defined contribution plans have emerged as the principal alternative to defined benefit coverage. But these retirement vehicles saddle workers with enormous responsibilities. To accumulate enough pension wealth for a comfortable retirement, participants must make regular contributions throughout their working lives and must carefully manage their pension assets. Cash balance plans may be a better option for many workers, because even those who change jobs frequently can earn sizeable pension benefits. At the same time, cash benefit plans guarantee set benefits and protect workers from investment risk.

Notes

1. Although cash balance plans are a special type of defined benefit plan, when we refer to defined benefit plans in this brief, we mean traditional pension plans that are not cash balance plans.
2. Results are drawn from Johnson and Uccello (forthcoming).
3. Some plans allow workers to take reduced benefits at younger ages.
4. *Eaton v. Onan Corporation*, 117 f.supp.2d 812 (S.D. Ind. 2000).
5. We do not consider outcomes in defined contribution plans because only firms with traditional defined benefit plans have switched to cash balance plans.

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THE RETIREMENT PROJECT

The Retirement Project is a research effort that addresses how current and proposed retirement policies, demographic trends, and private-sector practices affect the well-being of older individuals, the economy, and government budgets.

The nonpartisan Urban Institute publishes studies, reports, and books on timely topics worthy of public consideration. The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders.

State Tax Policy *A Political Perspective*

Cash Balance Pension Plan Conversions and the New Economy

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April 2002

Abstract

Many firms that sponsor traditional defined benefit pensions have converted their plans to cash balance plans in the last ten years. Cash balance plans combine features of defined benefit (DB) and defined contribution (DC) plans, and yet their introduction has proven considerably more controversial than has the increasing popularity of DC plans. The goal of this study is to estimate a hierarchy of the influences on the decision of a firm to convert its traditional defined benefit pension plan to a cash balance plan. Our results indicate that cash balance conversions have been undertaken in competitive industries with tight labor markets and can be viewed largely as a response to better compensate a more mobile labor force.

The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Federal Reserve Board or its staff.

Introduction

Many firms that sponsor traditional defined benefit pensions have converted their plans to cash balance plans in the last ten years. Cash balance plans are often referred to as hybrid plans as they combine features of defined benefit (DB) and defined contribution (DC) plans, and yet their introduction has proven considerably more controversial than has the increasing popularity of DC plans. Critics assert that corporations are trying to reduce the benefits of workers in a way that is not transparent. Defenders claim that companies are actually trying to better compensate more mobile employees who realize little pension wealth under traditional DB pensions.

Understanding the motivations and goals of firms who convert their traditional DB pensions to cash balance plans is critical in assessing the implications of such conversions for the retirement security of affected employees. To date, only a handful of papers have looked at the trend toward cash balance conversions, with mixed results. Most have either explored the issue on a conceptual level, or through simulation analysis. In this paper we apply the tools of implicit contract theory and construct a unique data set of firms who have undertaken cash balance conversions that allows us to disentangle the factors driving the trend toward cash balance conversions. While there is evidence that benefits were reduced in some conversions, in general our results indicate that cash balance conversions have been undertaken in competitive industries with tight labor markets and can indeed be viewed as a response to better compensate a more mobile labor force.

Overview of cash balance plans

Cash balance plans combine features of defined benefit and defined contribution pension plans. Legally, cash balance plans are DB plans and are regulated as such under ERISA, and benefits in such plans are insured by the Pension Benefit Guaranty Corporation (PBGC). Similar to a DC plan, however, in a cash balance plan the employer regularly sets aside a percentage of the employee's pay in an individual "account". The account is only a notional account and employees have no choice about how funds are invested. The employer invests the pooled assets of the pension plan and bears the investment risk, just as in a DB plan. The funds in the account earn a rate of return guaranteed by the employer, usually the yield on the 30-year Treasury or the one-year T-bill plus a fixed percentage, and the employee receives a periodic statement on her account status. Upon retirement, what the employee has accrued in their notional account is their retirement benefit.

Two features of cash balance plans are key in distinguishing them from traditional DB pensions, as well as in understanding both their popularity and the controversy surrounding them. The first is that benefits under a cash balance plan are far more portable than most DB plans. Cash balance plans allow an employee to take a pre-retirement lump sum distribution from a cash balance plan if they leave the firm. Most traditional defined benefit plans do not allow for pre-retirement lump-sum distributions. The second notable distinguishing feature is that benefits accrue earlier in a participant's career under a cash balance plan.

Under both traditional DB and cash balance plans, employees accrue benefits in each year of work, and the present value of benefits accrued is called the projected

benefit obligation, or PBO. The PBO under a typical cash balance pension plan and a traditional DB plan are shown in Chart 1. The PBO is the actuarial present value of benefits earned by an employee for service rendered prior to that date plus projected benefits attributable to future salary increases. In the chart, the age of an employee is on the horizontal axis and the vertical axis measures multiples of the employee's annual salary. The kink in the PBO under the traditional DB plan is when the employee qualifies for the early retirement subsidy, a feature common in DB plans but not in cash balance plans. Under the cash balance plan, the value of the pension right is larger at earlier ages and can be withdrawn by employees if they change jobs.¹

As will be discussed in more detail later, the deferred accrual--or back-loading of benefits--under traditional DB plans is an inducement for employees to stay with the firm, since they forfeit a significant amount of future compensation if they leave. The defining characteristic of cash balance plans is that they remove the penalty to the employee for changing firms through earlier benefit accrual and portability of benefits. We will show that this is a competitive response by firms to changing technology and labor market conditions.

The Trends and the Controversy

The first company to convert its traditional DB pension plan to a cash balance plan was Bank of America in the mid 1980s. However, the popularity of cash balance

1. What employees actually have a right to if they leave the firm is a measure called the accumulated benefit obligation (ABO), often referred to as the termination benefit. In a cash balance plan, the ABO and the PBO are not very different. Without going into technical detail, under a traditional DB plan, the ABO is much less than the PBO until the employee is close to retirement age. This is a result of the back-loading of benefits. Charting the ABO under each type of plan would therefore accentuate the relative accrual patterns shown in Chart 1. We choose to illustrate the different accrual patterns using the PBO as we will use it later in the analysis.

conversions really took root in the mid-1990s. By 1998, approximately eleven percent of all DB plans had converted to cash balance plans. Converting companies were generally larger; 24 percent of S&P 500 firms with DB pensions had converted their pension plans by 1998. Converted plans hold about 30 percent of the assets and cover 25 percent of the employees covered by DB pension plans. However, most converting plans had grandfathering provisions that allowed older workers to remain under the provisions of the traditional DB plan, which would mean that some assets and employees in converted plans are still associated with the old DB plans.

Most cash balance conversions were undertaken with little fanfare. The exception was IBM, whose conversion catapulted the cash balance trend into the media and Congressional spotlight. Cash balance conversions were characterized as an example of corporate greed; a way to reduce benefits generosity in a way employees did not fully understand. An examination of the PBOs graphed in chart 1 illustrates that any employee who plans on staying with the same firm until retirement and is switched from a traditional DB pension plan to a cash balance plan will generally take a significant hit to their expected future retirement wealth. However those that change jobs before retirement will realize a greater pension benefit under a cash balance plan. Cash balance conversions therefore reallocate pension wealth from employees who stay with a single firm to those who change jobs at least once before retirement.

The benefit accrual pattern in a cash balance plan implies that some of the same explanations given for the trend toward DC pension plans, including increased portability of benefits for a more mobile workforce and encouraging later retirement, can also explain why firms might be converting their traditional DB pensions to cash balance

plans (Even and Macpherson, 2001). However, firms could simply terminate their DB plan and establish a DC pension in its place. Ippolito (2001) suggests that is precisely what firms who undertake cash balance conversions would like to do. He argues that firms do not do so because their pension plans are overfunded and they would face stiff tax penalties on their excess assets. The tax on excess assets in a terminated plan, known as the reversion tax, was raised to 50 percent in 1990, from 15 percent. A cash balance conversion is a way of establishing a DC-like pension plan while avoiding the reversion tax, and Ippolito suggests that these tax considerations are the primary driving force behind the creation of cash balance plans.

A Framework for Thinking about Cash Balance Conversions

In thinking about the reasons underlying the trend toward conversion of traditional DB pension plans to cash balance plans, it is useful to establish a framework that first justifies the existence of traditional DB pension plans.² The back-loaded nature of benefits in a DB pension plan imposes a capital loss on workers who leave the firm. The worker essentially posts a bond with the firm by accepting this arrangement and forfeits the bond if they quit or are fired.

Firms are generally thought to offer such arrangements in order to reduce turnover, enhance productivity, and regulate retirement behavior. Reducing turnover may be desirable either because productive technology is enhanced by long-term commitments or team production, or because the firm has high training costs for new employees. The capital loss incurred in separating from the employer also provides

² A review of the literature on the demand for pensions by workers and firms can be found in Even and MacPherson (2001) and Gustman, Mitchell, and Steinmeier (1994).

workers with an incentive to work hard and thus can boost productivity. The mechanism of deferred compensation is thought to be particularly useful for enhancing productivity in production settings where the monitoring of worker effort is difficult or costly (Lazear 1979, Hutchens 1989). Pensions simply provide a tax efficient way for firms to design a deferred compensation arrangement (Even and Macpherson 1992). Finally, the firm may want a lever to induce workers to leave later in life when productivity wanes (Mitchell 1990). Pensions allow employers to provide incentives for retirement in a way that avoids claims of age discrimination.

Employees have limited incentive to accept this arrangement. Reasons that workers may want pensions include the desire to earn tax-favored returns, or to realize economies of scale on the transaction costs of investment. Both of these goals can be realized in a DC plan as well as a DB plan.³ In a DB plan workers may also realize the opportunity to insure to some degree against mortality, inflation, macroeconomic, and disability risks through inter- and intra-generational risk sharing. The demand for insurance that is possible in a DB plan will be offset by the risk of changing jobs prior to retirement.

A useful model for analyzing the forces underlying changes in the structure of DB pension plans was developed by Ippolito (1994). The model is based on implicit contract theory where a firm's desire to increase tenure is assumed at the outset. The contribution of the model is its focus on the equilibrium labor market conditions in which DB plans play a role in compensation. The idea that firms are simply reducing benefits is

³ This assumes forward-looking, rational workers. If individuals suffer from lack of self-control, they may appreciate either a DB or DC pension as a commitment mechanism (Laibson, Repetto, and Tobacman, 1998). In the same vein, while DC plans offer individuals control over their investments, some may prefer that their employers make those decisions on their behalf (Choi, et al., 2001).

partial equilibrium in nature and begs the question of how firms operating in competitive industries could reduce compensation and still attract and retain employees. The model is also able to capture the empirical observation that wages can be higher at firms with pensions. Essentially, firms must pay workers an “indenture premium” for forgoing mobility.

In the model there are firms who are not interested in long-term contracts with their employees and firms who are. Again, the desire on the part of some firms for long-run contracts is assumed and can be related to any of the issues outlined above. Firms who are not interested in long-term contracts pay a first period wage equal to unity. At the end of period one some workers, with probability q receive a random productivity shock that increases their wage by d . Workers work for two periods so their expected lifetime income in the first period from working at a firm without long-term contracts is

$$(1) \quad w_1 + w_2 = 2 + qd$$

The firm who wants to reduce turnover could just pay the workers who receive the positive shock in period 2 the higher wage of $1+d$. There are several reasons why this approach might be costly and it can be shown that a deferred wage arrangement dominates a policy of paying workers $1+d$ in period 2 for firms who desire long-term arrangements with their employees. An equilibrium condition in this setting is that the long tenure firm pays its employees a pension, p , in the third period such that

$$(2) \quad w_1 + w_2 + p \geq 2 + qd$$

The extent to which this inequality holds represents the indenture premium that long-tenure firms must pay. Two other equilibrium conditions must also be met. The first is that the first period wage in the long-tenure firm must be less than unity in order that workers suffer a capital loss from leaving the firm in period 2, so

$$(3) \quad 0 \leq w_1 < 1$$

The second condition that must be satisfied is that the second period wage plus the pension in the long-tenure firm must be at least equal to the alternative wage

$$(4) \quad w_2 + p \geq 1 + d$$

The degree of wage tilt in the working periods and the amount of the pension will depend on the relative values of q and d , that is the likelihood of receiving a productivity shock and the amount of the increase in wages that results from receiving the productivity shock. Implicit in the model is the notion that the long-tenure firm will only be willing to pay a premium as long as the cost of the premium is no greater than the increased productivity the firm realizes from establishing long-term contracts with its employees.

This model provides a convenient framework for thinking about recent changes to traditional DB pension plans. Cash balance plans essentially remove the capital loss to workers from leaving the firm. Within the context of the model, this may be driven by the likelihood or value of productivity shocks to workers that make worker mobility more

attractive to workers and more expensive to avoid for long-tenure firms. The probability of receiving a productivity shock, q , is analogous to the probability of receiving an outside job offer. Holding the technology of the firm constant, if the probability of receiving outside offers rises or these outside offers become more lucrative, or both, the amount of compensation employees would demand to accept a deferred compensation arrangement may simply exceed the increased productivity the firm realizes from reduced turnover.

Alternatively, with no changes in labor market conditions, the technology of a given firm may change such that the gain from tenure is not as great, and it is no longer worth paying indenture premia to reduce employee turnover. However, since labor market conditions are an outcome of production technology, these scenarios will be difficult to disentangle empirically. Production technology is generally not wholly idiosyncratic, that is, shifts in production technology that reduce the benefit from long tenure will likely be realized by entire industries and thus result in a labor market characterized by more mobile workers.

Previous Work on Cash Balance Conversions

While cash balance conversions have drawn a great deal of media and Congressional attention, there has been little empirical work that has looked at the factors underlying this trend. Ippolito (2001) has argued on conceptual grounds that firms would ultimately like to eliminate their traditional DB pension plans altogether, but do not do so because they are overfunded and would face stiff tax penalties on their excess assets. He takes a view not unlike the popular view of cash balance conversions, although expressed

in the terms of implicit contract theory, that firms are seeking to reduce overall benefits generosity by appropriating the value of employees' pension bonds and converting it into shareholder value.

Niehaus and Yu (2001) place the idea of appropriating the pension bonds of employees in the context of a competitive industry. They assume firms would only attempt to reduce benefits generosity if they were lagging in profitability and were pressed to cut costs. They find that most firms converting their traditional DB pensions to cash balance plans are actually profitable relative to their peers. However, they find that many plans are overfunded on the eve of conversion and therefore conclude that, while firms may not be seeking to reduce benefits generosity, they might otherwise be terminating their DB plans in favor of a DC plan in the absence of the stiff tax penalties on excess assets.

Several papers have taken the approach of using profiles of workers with different wage and tenure patterns to simulate winners and losers under several actual conversions (Brown, et al. 2000, Clark and Schieber 2000, Clark and Schieber, 2001). The findings of these studies illustrate the transfer of benefits under these plans from single job holders to multiple job holders. These authors show that the elimination of early retirement subsidies is the primary source of benefit loss to single job holders and conclude that eliminating the economic incentives for early retirement is one of the primary motivations for firms converting traditional DB pensions to cash balance plans.

Empirical Analysis

Our analysis sifts through the various explanations and estimates a hierarchy of the influences on the decision of firms to convert their traditional defined benefit pension plans to cash balance plans. In the context of the model described above, we would expect a reduction in the amount of compensation that is deferred to be associated with increased labor mobility in a firm's industry that makes the required premium to retain employees prohibitively expensive, and is possibly the result of shifts in technology that reduce the productivity enhancement from long tenure. Indeed, as we will show below, one striking feature in the trend towards cash balance conversions is how concentrated they are by industry, a stylized fact that is consistent with shifting technologies leading to a new, more mobile labor market equilibrium in given industries. In addition to examining the predictions of the implicit contract model, we will evaluate the hypothesis that firms are appropriating the pension bonds of their workers and reducing the overall generosity of their pension plans, as well as the hypothesis that the trend is driven by the reversion tax.

We proceed in two stages. In the first stage we look at whether firms that convert their traditional DB pensions to cash balance plans are doing so to appropriate the pension bonds of their workers, as well as the extent to which this trend is driven by tax considerations. We use detailed data on the finances of a relatively small number of individual pension funds for which we could identify dates of conversion from a traditional DB pension to a cash balance plan to address these questions. In the second stage we use a broader analysis of all S&P 500 firms that sponsor a DB pension plan and include data on industry-specific labor market conditions that allow us evaluate the predictions of the implicit contract model outlined above and sort through the variety of

influences on the probability that a firm will convert its DB pension into a cash balance plan.

Stage One: Benefit Generosity and the Tax Hypothesis

While the idea that firms are undertaking cash balance conversions to reduce benefits lacks analytic underpinnings, it has nonetheless served as the basis of various legislative proposals in Congress and has been the dominant theme in media coverage of this trend. Because of its influence, the idea is worthy of empirical analysis.

In order to test whether a cash balance conversion reduces the overall generosity of the pension plan, we look at forward-looking measures of a pension plan's liability before and after a conversion. We use the projected benefit obligation, which was described above and graphed in chart 1. The PBO is the actuarial present value of benefits earned by employees as of a specified date incorporating assumptions about future salary growth. It is the forward-looking measure of the firm's total pension liability and, thus, captures the overall benefit generosity of the pension plan. If firms are seeking to reduce benefits generosity, the PBO of the pension plan will decline upon conversion.

The very simple and testable implication of the hypothesis that the decision to switch to a cash balance pension plan instead of terminating a DB plan is driven by tax considerations is that firms who switch to cash balance plans should be overfunded prior to conversion.

While it sounds simple enough to look at funding ratios and PBOs before and after a cash balance conversion, the data is not quite so easy to obtain. Because cash

balance plans are still legally DB plans there are no disclosure requirements for a conversion. We began with a list of nearly 400 public and private firms who had converted their traditional DB plans to cash balance plans by 1998. We focused on publicly traded firms in the S&P 500, which left us with 75 firms. We then scoured the financial statements of these firms for information that would allow us to determine the date of conversion.⁴ We restricted our attention to firms for whom we could identify the date of conversion, and for whom we were able to obtain the necessary data in the year before, the year of, and the year after conversion. Our sample for this stage of the analysis includes 32 firms.

The firms in our sample are listed by industry in the first column of Table 1. The first column shows the funding level of the firm's DB pension plan in the year prior to conversion. A third of the firms in the sample are more than 5 percent overfunded in the year prior to conversion. For these firms tax penalties on excess assets may have influenced their decision to convert to a cash balance plan instead of terminating the DB plan altogether. However, half the sample was actually underfunded in the year prior to conversion. So while tax considerations may have played a role in how some firms chose to alter their deferred compensation arrangements, it certainly cannot explain the entire trend.

The second column shows the percentage change in the PBO between the year after conversion and the year prior to conversion. Movements in the PBO can also be the result of changes in the plan's discount rate, which are regulated to move in concert with

4 The Financial Accounting Standards Board established consistent rules for measuring the actuarial liability of a pension plan in the late 1980s and required enhanced disclosure of these measures in a firm's financial statements after 1996. The consistent and forward-looking nature of these measures, as well as the disclosure of the actuarial assumptions underlying them make them a consistent and useful basis for analyzing the issue of benefit generosity.

the 30-year Treasury bond. We controlled for changes in the PBO arising from changes in the assumed discount rate of the plan by regressing percentage changes in the PBO on changes in the discount rate. We used the resulting coefficient to adjust changes in the PBO, and thus the measure presented in Table 1 represents changes in the plan's liability arising from the different provisions of the cash balance plan.

It can be gleaned from an examination of the PBO for a traditional DB pension and a cash balance plan in chart 1 that, if everyone was simply moved from the traditional DB plan to the cash balance plan, the effects on the total PBO of the firm would be ambiguous.⁵ Employees with more years of service would see the present value of their pension reduced, and younger employees would see an increase in the present value of their pensions. The net effect for the firm would depend on the age distribution of its employees. However, if the firm is seeking to appropriate the pensions bonds of its workers the implication is unambiguous, the PBO for the firm should decline after conversion to the cash balance plan. If the firm's intention is to release its employees from the long-term contract and better compete for employees in the labor market then we might expect to see the reverse. Firms may allow longer tenure employees to remain under the old plan, or provide them with an initial cash balance of equivalent value, while moving employees with fewer years of service to the new plan. Under this scenario the PBO of the firm would increase.

The results in Table 1 heavily favor the latter scenario. Cash balance conversions increased the PBO of 25 of the 32 sponsoring firms, with 15 seeing increases of more

⁵ It should be noted that the PBOs graphed in chart 1 are meant to represent typical plans. There is a great deal of variety in the provisions of both traditional DB pensions and cash balance plans, which will affect the contours of the lines shown.

than 5 percent in their PBOs after conversion.⁶ The results are not all that surprising when viewed in the context of the implicit contract model. Firms cannot generally unilaterally cut compensation and continue to attract and retain workers. The firms in the sample were profitable firms operating in extremely tight labor markets. A handful of firms were significantly overfunded prior to conversion and reduced their PBOs. For these firms the reversion tax and appropriation hypotheses may be at work. However, for the majority of firms it appears that cash balance conversions better compensate employees on net.

Stage Two: Evaluating the Predictions of Implicit Contract Theory

The evidence from the cash balance conversions of the firms presented in Table 1 suggests that explanations that rely on reversion taxes or the appropriation of employee pension bonds can explain at best only a small fraction of this trend. To evaluate these hypotheses we needed data immediately before and after the year of conversion, which restricted our sample to a very small number of firms. We now broaden our sample to include all firms in the S&P 500 that sponsor a DB pension plan and incorporate data that will allow us to consider variables suggested by the implicit contract model.

The model assumes that firms are price takers in labor markets and will pay the market wage. Changes in the degree to which compensation is deferred in order to induce employees to stay will be related to the degree to which firms benefit from long-term arrangements with their employees, as well as the labor market conditions the firm must compete in. In particular, the nature of deferred compensation contracts will be

⁶ It should be noted that mergers and acquisitions are not driving any of the increases in PBOs for the firms in this sample.

affected by technology shifts that change the benefit firms realize from long-term commitments, making them less willing to pay an indenture premium, as well as changes in the external opportunities of the workers they compete for that make the amount of deferred compensation required for retention prohibitively expensive. These two scenarios are observationally equivalent and imply that cash balance conversions will likely be clustered in particular industries and these industries will be characterized by tight labor markets with highly mobile workers.

In addition to examining the implications of the implicit contract model, we will embed the other hypotheses we have discussed. While we cannot examine the reversion tax and benefits expropriation hypotheses as directly as in the first stage since we do not have conversion dates for all the firms, we will use measures that allow us to approximate tests of these propositions.

Our sample includes all firms in the S&P 500 who sponsor a DB pension plan and consists of 319 firms, 75 of which had converted their pension plan to a cash balance plan by 1998. All of our data will be for 1998 since we know the firm had converted their pension plan by that year. We make use of a number of variables that measure industry specific labor market conditions, where industry is defined at the level of 2-digit SIC codes. The values of the industry measures are shown in Table 2, and the correlations between the variables are shown in Table 3. The first column of Table 2 shows the percent of DB pensions in the industry that have been converted to cash balance plans. The rate of cash balance conversions is highly concentrated: it is as low as zero and as high as 55 percent. The second column shows the percent of firms in the industry with a DB pension. In general DB pension plans are offered less frequently in service industries,

possibly because firms may not realize as great a benefit from long-term contracts. As seen in Table 3, there is a strong negative correlation between these measures indicating that, the less prevalent are deferred compensation contracts in the industry, the more likely firms with such arrangements are altering them.

Accurately capturing industry-specific measures of labor market mobility is key to testing the implicit contract model. The third column of Table 2 shows the employer-to-employer rate, which was developed by Fallick and Fleischman (2001) using data from the Current Population Survey. The measure represents the percent of workers in an industry who left their jobs for other jobs (in the same or a different industry) without a spell of unemployment. While the measure is imperfect as mobility may in some cases be occupation specific rather than industry specific, it exhibits great variation and sensible patterns. Workers are more mobile in service industries, and the employer-to-employer rate is negatively correlated with industry DB coverage and positively correlated with the rate of cash balance conversions in the industry indicating that cash balance conversions may indeed be a response to labor force conditions.

The fourth column of Table 2 shows the unemployment rate by industry. This is a measure of excess labor supply and is negatively correlated with the likelihood that firms in the industry are converting their pensions to cash balance plans. This is precisely what we would expect if the implicit contract model is applicable and firms are converting to cash balance plans as a retention mechanism in a tight labor market. If on the other hand firms were trying to reduce overall benefits generosity we might expect the unemployment rate to be positively correlated with cash balance conversions.

The last column displays the percent of employees in an industry that are over 45 years of age. Older employees stand to lose the most in a cash balance conversion. Therefore, if the conversion is simply a cost cutting device the firms with older employees could realize the greatest savings. Older workers are more likely to be covered by a DB pension, as they are concentrated in the industries with the greatest DB coverage. Yet industries with a greater proportion of older workers are less likely to be undertaking cash balance conversions casting doubt on the appropriation hypothesis.

The industry-level measures presented in Tables 2 and 3 are consistent with an implicit contract story of firms in industries characterized by younger, more mobile workers, and tighter labor markets undertaking cash balance conversions as a way of staying competitive.

We next estimate a probit model of the probability that a firm with an existing DB pension plan converts to a cash balance plan. Explanatory variables include the industry-level measures, as well as firm-specific characteristics. This framework will allow us to sort through the variety of influences on a firm's decision to undertake a cash balance conversion. The results are presented in Table 4. The table includes the marginal effects and t-statistics for the explanatory variables from two specifications. Both specifications include the industry-level measures described in Tables 2 and 3. In the first specification, in addition to the industry variables, we include the benefit obligation per participant as a measure of benefits generosity, an indicator for whether the plan is subject to collective bargaining as a possible institutional constraint, the assets of the plan as a scaling variable, and the funding ratio as an approximation of the tax hypothesis. The second specification further includes firm-level measures of profitability: the diluted earnings per

share as a gross measure of profits, the price to earnings ratio as a more forward-looking measure of profitability, and the price to earnings ratio relative to the mean of such ratios in the firm's industry to capture the firm's own productivity.

In both specifications the industry variables have signs consistent with the implicit contract model. A percentage point increase in the employer to employer rate in a firm's industry increases the probability of conversion by 4 to 6 percent, so that more mobility leads to a greater likelihood of conversion, although the variable is not significant. A percentage point decline in the industry unemployment rate raises the likelihood of conversion by 7 to 9 percent indicating that tighter labor markets lead to conversions. The greater the percentage of employees over 45 in an industry, the lower is the likelihood that a firm will convert its pension plan by 2 to 4 percent. Finally, the sign on industry DB coverage is positive but very small in size and insignificant. The picture of firms restructuring their benefits to reduce the amount of deferred compensation and attract mobile employees in a tight labor market holds up in both specifications.

Plan level variables have less explanatory power. Benefit generosity as measured by the benefit obligation per participant has a very small positive, but insignificant effect on the probability that a traditional DB pension will convert to a cash balance plan. Being subjected to a collective bargaining agreement actually increases the chances of conversion, between 4 and 5 percent, although it is also insignificant in both specifications. We included assets as a scaling variable since conversions seemed to be correlated with plan size. The coefficient is indeed positive but insignificant. The funding ratio is intended to approximate a test of the reversion tax hypothesis, although it

is the funding ratio in 1998, which is after conversion. The coefficient is small and insignificant in both specifications.

In the second specification we included a number of measures of a sponsoring firm's profitability in order to test the idea that converting firms are reducing benefit generosity because they are not profitable. The coefficients on these variables provide mixed signals. Lower diluted earnings per share, a measure of total profits, do indeed positively affect the probability that a firm will convert to a cash balance plan, although the variable is insignificant. A higher price to earnings ratio, a more forward-looking measure of profitability, has a positive, significant, but small effect on the probability of conversion to cash balance plan. A one point decrease in the price ratio of the sponsoring firm relative to its peers has a positive and significant influence on the probability of a cash balance conversion, giving a possible indication that the conversion might be an attempt to "catch up" to the peers of the firm. However, the marginal effect is quite small.

Conclusions

The trend toward cash balance plans shows no signs of waning. We estimate that, with the conversions that were undertaken in the last three years, converted plans now account for more than 40 percent of all DB assets. In this paper, we have shed some light on the motivations of firms that are converting their traditional DB pensions to cash balance plans.

The results in stage one indicate that the reversion tax hypothesis and the pension bond appropriation hypothesis appear to explain only a small fraction of the trend toward

cash balance conversions. Given the doubt cast upon the reversion tax hypothesis, the question then arises as to why the firms do not simply terminate their DB plans in favor of a DC plan. All firms in our samples in both stage one and two already sponsored DC plans. While there are some costs in terminating a DB plan, it would be relatively easy for firms to assign balances to DB participants and transfer them to the DC plan. We believe the explanation may be that some form of deferred compensation is still desirable. Most cash balance plans still have five year vesting requirements and increased employer contributions with tenure. Thus, while cash balance plans greatly reduce the amount of deferred compensation, they do not eliminate it completely.

Our results from stage two suggest that implicit contract theory provides a useful framework for understanding the trend toward cash balance conversions. Cash balance conversions are highly concentrated by industry, and the probability that a firm will convert its traditional DB pension to a cash balance plan is largely a function of the labor market conditions in which the firm competes. In particular, industries with younger, more mobile workers and tighter labor markets have a greater concentration of cash balance conversions. Workers may be more mobile because increases in labor productivity have been concentrated in these industries in recent years making retention through deferred compensation prohibitively expensive. In addition, productivity in these industries may have become less dependent on long-term contracts with workers. These results suggest that we should not necessarily expect to eventually see all DB pensions converted to cash balance plans. Certain industries may still rely productive technology that is enhanced by long tenure, and deferred compensation may still be an efficient way to achieve this goal.

We should note that other authors cited previously have highlighted the importance of the elimination of early retirement incentives as an important factor in the decision to convert a traditional DB plan to a cash balance plan. Our results do not speak to this issue directly, although the fact that cash balance conversions uniformly eliminate such subsidies certainly indicates that this is part of a firm's motivation. This is consistent with the desire to retain labor in tight markets.

Our results indicate that, while critics have decried the trend of the conversion of traditional DB pension plans to cash balance plans as reducing benefit generosity, the implications for retirement security may actually be favorable. The earlier accrual and portability of benefits will better facilitate the accumulation of wealth for a more mobile labor force.

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Table 1 – Companies Converting to Cash Balance Plans by Industry

	Funding Level in Year Prior to Conversion	Change in Benefit Obligation After Conversion
		(Percent)
<i>Manufacturing</i>		
AK STEEL HOLDING CORP	90.1	13.6
BADGER METER INC	116.0	14.9
COMMONWEALTH INDUSTRIES INC	90.6	9.2
DONALDSON CO INC	102.3	12.1
GOODYEAR TIRE & RUBBER CO	99.2	38.2
OWENS CORNING	100.5	21.5
<i>Energy</i>		
ALLIANT ENERGY	111.6	4.0
DUKE ENERGY CORP	74.7	15.6
EL PASO ENERGY PARTNERS -LP	98.6	1.0
ENRON CORP	105.7	-9.7
NIAGARA MOHAWK HOLDINGS INC	111.1	-3.9
<i>Telecommunications</i>		
AT&T CORP	141.7	-7.3
BELLSOUTH	115.9	1.0
SOUTHERN NEW ENGLAND TELECOM	118.1	-11.5
<i>Finance, Insurance, and Real Estate</i>		
AETNA INC	97.1	-0.3
ALLMERICA FINANCIAL CORP	103.1	-14.0
AMERICAN EXPRESS	84.3	10.5
CITIGROUP INC	94.1	5.6
NATIONAL CITY CORP	135.2	0.9
PNC BANK	87.5	2.7
SAFECO CORP	112.1	0.8
WELLS FARGO & CO	102.5	11.9
<i>Technology, Business Services</i>		
ELECTRONIC DATA SYSTEMS CORP	94.6	25.9
INTL BUSINESS MACHINES CORP	114.1	4.0
TEKTRONIX INC	95.6	12.3
XEROX CORP	99.0	2.7
<i>Other Industries</i>		
AVON PRODUCTS	88.3	0.2
CSX CORP	81.0	12.7
GENESCO INC	65.5	6.1
HANNAFORD BROS	105.0	9.5
RJR NABISCO	88.5	1.5
SUBURBAN PROPANE PRTNRS -LP	122.8	-2.3
Number of companies less than fully funded before conversion:		16 (50%)
Number of companies whose projected benefit obligation increased after conversion:		25 (78%)

* This measure controls for changes in the discount rate over the conversion period.

Source: Author's tabulations from annual 10K report filings of S&P 500 firms.

Table 2 – Industry Level Data of Employee Characteristics and Benefit Characteristics

Industry	Percent of DB Plans Converting Cash Balance*	Percent of Firms with a DB Plan*	Employer to Employer Rate	Percent of Employees Over 45	Unemployment Rate
<i>Manufacturing Durable</i>	23.0	66	1.8	33.0	3.4
<i>Manufacturing Non-Durable</i>	18.6	81	2.0	32.3	4.7
<i>Transportation</i>	14.3	80	1.3	35.2	4.0
<i>Utilities and Sanitation Services</i>	24.2	90	1.9	38.8	2.4
<i>Communication</i>	50.0	67	1.7	29.8	2.4
<i>Finance, Insurance, and Real Estate</i>	26.0	72	2.5	31.9	2.5
<i>Technology, Business Services</i>	54.5	50	4.3	26.2	2.9
<i>Wholesale Trade</i>	22.2	83	2.4	30.7	3.7
<i>Retail Trade</i>	28.6	49	3.8	21.1	6.0
<i>Mining</i>	0.0	79	2.4	34.4	3.2
<i>Construction</i>	0.0	25	3.5	28.4	7.5

*S&P 500 firms

Source: Compustat, author's tabulations from annual 10K report filings of S&P 500 firms, Bureau of Labor Statistics

Table 3 – Correlations of Industry Level Data on Employee Characteristics and Plan Characteristics

	Percent of DB Plans Converting to Cash Balance	Percent of Firms with a DB Plan	Employer to Employer Rate	Percent of Employees Over 45	Unemployment Rate
Percent of DB Plans Converting to Cash Balance Plans	1.000	-.609	0.438	-.507	-.258
Percent of Firms with a DB Plan	-.609	1.000	-.751	0.875	-.302
Employer to Employer Rate	0.438	-.751	1.000	-.772	0.267
Percent of Employees Over 45	-.507	0.875	-.772	1.000	-.545
Unemployment Rate	-.258	-.302	0.267	-.545	1.000

Source: Compustat, author's tabulations from annual 10K report filings of S&P 500 firms, Bureau of Labor Statistics

Table 4 – Probit Equation for Probability that a Firm will convert its Traditional DB Pension to a Cash Balance Plan

	<hr/>		<hr/>	
	Marginal Effect	t-statistic	Marginal Effect	t-statistic
<i>Industry Variables</i>	<hr/>			
Employer to Employer Rate	0.063	1.51	0.038	0.81
Unemployment Rate	-0.066	-2.01	-0.085	-2.24
Percentage of Employees Over 45	-0.022	-1.50	-0.039	-2.36
Industry DB Plan Coverage	0.003	1.08	0.004	1.01
<i>Plan Level Variables</i>	<hr/>			
Benefit Obligation Per Participant	0.000	1.18	0.000	1.67
Subject to Collective Bargaining	0.047	0.82	0.042	0.67
Assets	0.000	1.33	0.000	1.36
Funding Percentage	0.001	0.61	0.000	0.04
Diluted Earnings Per Share			-0.023	-1.57
Price to Earnings Ratio			0.001	2.52
Relative Price to Earnings Ratio			-0.000	-2.11
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Number of Observations		292		249
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Chart 1 – Projected Benefit Obligation Under Different Pension Plans

