

**AN EMPIRICAL ANALYSIS OF THE TRANSITION TO
HYBRID PENSION PLANS IN THE UNITED STATES**

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The proportion of the labor force covered by an employer-provided pension plan has remained stable during the past three decades; however, the shape of the pension universe is being rapidly transformed. Since the passage of the Employee Retirement Income Security Act during 1974, there has been a strong and continuing movement away from the use of defined benefit plans as more and more firms have chosen to offer defined contribution plans, especially 401(k) plans (Pension Benefit Guaranty Corporation, 1999). The movement toward greater utilization of defined contribution plans has occurred primarily among smaller employers.¹ However, in the most recent Fortune list of the largest 100 publicly traded corporations in the United States, 16 now have a defined contribution plan as their retirement plan.

During the past decade, another significant change in the type of pension plan has emerged, the conversion of traditional final pay defined benefit plans to hybrid style plans, either cash balance or pension equity plans. Cash balance plans define a worker's "account" based on an annual contribution rate for each year of work plus an accumulating interest on the sum of annual contributions. A pension equity plan defines the benefit as a percentage of final average earnings for each year of service under the plan. Both types of plans specify and communicate the benefit in lump-sum terms payable at termination rather than as an annuity payable at retirement which is typical for defined benefit plans. While these plans take on some characteristics of defined contribution plans from workers' perspectives they continue to be funded, administered, and regulated as defined benefit plans. The recent shift toward hybrid pension plans is occurring primarily among larger employers. In a number of cases where corporate

giants of America have switched to a hybrid plan, there has been considerable publicity about the conversions.

The on-going tendency for firms to offer defined contribution plans has been the focus of research studies for over ten years as analysts have attempted to explain the reasons for the shift and its impact on workers and firms (Clark and McDermid, 1990; Gustman and Steinmeier, 1992; Ippolito, 1997). In contrast, the conversion of traditional defined benefit plans to hybrid plans has only recently become the focus of scholarly research (Brown, et al, 2000; Clark and Munzenmaier, 2001 forthcoming; and Clark and Schieber, 2001 forthcoming). The void in research has to some extent been filled by reporting in the popular press that has relied extensively on selected interviews with senior workers in large companies who have been adversely affected by the adoption of hybrid plans.

The analysis in this paper attempts to provide new and unique evidence on the impact of plan conversions on workers and to examine the full extent of the conversion process including changes in supplementary defined contribution plans. We also include the use of transition benefits to moderate the effect of the conversion on senior workers, and the ending of early retirement subsidies.

The assessment of plan conversions is divided as follows:

1. We begin with a brief discussion about the relative characteristics and merits of defined benefit and defined contribution plans and show how some plan sponsors are offering new pensions, hybrid plans known as cash balance or pension equity plans, that provide certain elements of each.

2. Next, we introduce a sample of 77 plan sponsors that have converted traditional defined benefit plans to a hybrid plan since 1985. This set of plans is used throughout most of the remaining analysis to assess the implications of the shift to hybrid plans. In this section we use this set of plans to show how the benefits from the new plans ultimately will compare with those that these plan sponsors had offered previously. The evidence leads to the conclusion that the shift to hybrid plans will likely benefit most workers covered by the new plans who change jobs prior to retirement eligibility. The new plans also will likely reduce pension benefits for early retirees in many cases.
3. In the third section of the paper we investigate early retirement incentives that are widely available in employer-sponsored defined benefit plans in the United States today. We begin by exploring the motivations for introducing these incentives during the last quarter of the twentieth century. We show how early retirement subsidies alter pension accruals in traditional pension plans and how the shift to hybrid plans is eliminating these subsidies and altering accrual patterns.
4. The fourth section of the paper analyzes the implementation of hybrid plans for existing workers who had been covered under prior plans and the transition benefits that sponsors have adopted to moderate the effects of the new plans on them.
5. The fifth section dissects the component elements of the transition to a hybrid pension to show how various workers gain or lose relative to their prior plan and to each other.

6. The sixth section reviews limited evidence on worker attitudes toward hybrid plans and the process of converting from a traditional defined benefit plan to plans with individual accounts.
7. The final section summarizes the policy issues raised by the introduction and conversion to hybrid pensions.

This analysis sheds new light on the plan conversion process. Our findings support previous conclusions that younger workers with limited job experience gain from plan conversions because of the low probability that they will remain with their current employer until retirement. Senior workers with considerable job tenure at the time of the conversion are more likely to receive lower benefits unless special transition rules are applied. We find most plan sponsors provided at least some transition protection to workers with advanced tenures affected by the shift to a hybrid plan.

An interesting new finding of this study is that most of the reduction in benefits that these workers expect is due not to the plan conversion itself but is instead the result of eliminating subsidized early retirement. In a final policy section, we examine this change in the context of national retirement policies, changes in Social Security, and the desire to encourage continued work among older persons. The central question is whether plan sponsors should be encouraged or discouraged from eliminating early retirement incentives in their pension plans. If companies are expected to conform to national retirement policies that are consistent with an aging population, then perhaps pension plans in the twenty-first century should not contain provisions that subsidize worker retirements in their fifties.²

Evolving Pension Universe

Traditionally, analysts have divided pension plans into two types: defined benefit plans and defined contribution plans. These plan types differ substantially in their basic structure including benefit determination, funding, investment risk, portability, and regulatory status. A primary difference in retirement plans is the method of benefit determination. Typically, defined benefit plans promise a benefit based on years of service and pay.³ In defined contribution plans, employers and employees make regular contributions into individual accounts for each worker.

Traditional defined benefit plans are considered advantageous for workers because they provide a specified retirement benefit linked to preretirement earnings, coverage is universal among qualified employees, and workers do not face any investment risk. Traditionally, the benefits under these plans have been paid in the form of an annuity for life, providing insurance against retirees outliving their retirement accumulations. Since the passage of ERISA in 1974, these benefits have been insured on a limited basis against the plan sponsor's insolvency or financial inability to meet promised benefits. A disadvantage for workers under these plans is that those who change jobs will accumulate considerably smaller total retirement benefits than those who remain with a single company.

Advantages to employers from defined benefit plans include the ability to use the benefit accrual structure in these plans to reduce turnover rates and to reward loyal workers (Ippolito, 1997, Chapter 2). In addition, sponsors have structured these plans, as we will show later, to manage the orderly exit of workers from the workforce toward the end of their careers. The major disadvantage of these plans for sponsors is that the

regulatory structure has been somewhat more burdensome for them than for defined contribution plans (Hustead, 1998, and Schieber, 2001 forthcoming). Another disadvantage is that this method of benefit accrual is somewhat difficult to explain to workers since the benefit a person would receive if they left the company today is much different than the ultimate benefit based on service to date if the individual remains with the company until retirement.

Under defined contribution plans, retirement benefits depend on the size of contributions over the working life and the returns on accumulated assets. If contributions are made at a relatively stable rate during a worker's career, benefits will accumulate more proportionately than under a typical defined benefit plan with its back-loaded benefit structure. In this regard, the most important advantage of defined contribution plans to many workers is the portability of benefits when they change jobs. Workers who move from one employer to another with some frequency will typically have a larger accrued benefit under a defined contribution plan at each job change during their careers than under a defined benefit plan of comparable cost or generosity. A major disadvantage of these plans for workers is that participation and the size of contributions by the employee is often voluntary. Workers who are myopic or have high discount rates may decide not to make pension contributions or defer them until late in life. These employees will have low pension accumulations at retirement. In addition, the defined contribution participant bears the investment risk. Finally, these plans tend to pay their benefits in the form of lump sums that, by themselves, do not provide the same insurance against longevity risk as annuities. Retirees can purchase annuities themselves but likely face costs that would be higher than offered through a typical employer sponsored

defined benefit plan. Alternatively, retirees can roll over lump sums into individual retirement accounts and withdraw the benefits incrementally over their life expectancy that may be recalculated each year. However, the insurance element present in life annuities is still missing because the participant rather than the plan or annuity carrier bears the risk of longevity.

Employers find defined contribution plans advantageous because funding of benefits is more straightforward and the administration and communication of the program is greatly simplified relative to defined benefit plans. The concentration of contributions under the most widely used defined contribution plans is generally directed at workers who demonstrate characteristics particularly associated with high productivity (Ippolito, 1997, Chapter 9). Employers today tend to believe that pensions with individual accounts are a more valuable human resource tool as workers are able to more easily understand these plans and they place a greater value on this type of pension. Finally, plan sponsors often prefer defined contribution plans because the investment risk is shifted to the participants in them. Disadvantages to individually managed accounts are that some employees may select assets with relatively low return and thus have a smaller account balance at retirement while others may select very risky investments and suffer the consequences of this choice. In addition, the retention power of these plans is not as strong as in defined benefit plans during workers' prime career years. Finally, it is impossible to put the same sort of retirement incentives into these plans to manage the orderly exit of workers at the end of their useful careers with the sponsors.

To a considerable extent, hybrid pensions are an attempt by employers to offer workers a retirement plan that provides some of the advantages of both defined benefit

and defined contribution plans while overcoming some of the disadvantages of each type of plan. Participants in hybrid plans are assigned individual pension accounts that facilitate communication and appreciation of the plans. Coverage is generally universal for full-time employees who are credited with annual contributions to their accounts, thus overcoming the problem of workers needing to contribute to actually benefit from typical defined contribution plans. Account balances are also credited with an annual rate of return equal to some specific rate such as the T-bill rate, thus overcoming the investment risk a typical defined contribution participant faces. Sponsors do retain the investment risk with hybrid plans but typically guarantee an investment return to workers such that expected return on plan assets should cover the cost of these risks. In such a plan, benefits tend to grow more evenly over the individual's career in much the same manner as those in a defined contribution plan facilitating the accrual of pension wealth for workers who change jobs with some frequency. These plans are also more age neutral in their retirement incentives and do not have early retirement incentives which may be perceived as either an advantage or disadvantage given a sponsor's perception about the relationship between age and worker productivity.

The first hybrid pension, a cash balance plan, was created by BankAmerica in 1985 and initially only a few companies copied this new form of pension. However, a May 1999 survey by *Pensions and Investments* reported that at least 325 plan sponsors had adopted a cash balance plan. An updated list of cash balance plans can be found online at <http://www.cashpensions.com/alluscb.html>. This list currently has 385 companies identified as using cash balance plans including many firms that are household names.

While the evolution of hybrid pensions is an attempt to offer workers some of the perceived advantages of both defined contribution and defined benefit plans for sponsors in a single plan, in almost every case where these plans have been adopted, they have replaced a traditional defined benefit plan. Because a hybrid plan is different than a traditional plan, some workers who have been shifted to hybrid plans perceive that there are disadvantages to them under the new structure. The implications of the shift in plan types vary considerably from employer to employer and from worker to worker under each conversion. Some employers have coupled the shift to a hybrid plan with the reduction in their pension cost. Others have actually increased the overall generosity of their pensions in the shift to a hybrid plan while changing other elements of the retirement package they offer workers (Brown, et al, 2000, pp. 18-19, and 47). The one consistent element of change across virtually all of the conversions to hybrid plans has been the elimination of early retirement incentives embedded in the preceding traditional plans (Clark and Schieber, 2001 forthcoming). This is such a universal phenomenon that it warrants special attention.

The Change in Plan Benefits in the Shift to Hybrid Plans

In developing the previous analysis of the implications of the shift to hybrid plans Brown et al (2000) analyzed the changes made by 78 plan sponsors. Clark and Schieber (2001 forthcoming) used 77 of these sponsors in developing their analysis, eliminating one plan because of its relatively small size. In developing this analysis, we are using the same 77 plans employed in our earlier analysis. In this case, however, we have synchronized the transition to the hybrid plans differently than in the prior analyses.

A number of the plans analyzed in the prior research were converted from a traditional defined benefit structure to a hybrid plan structure over the past decade with one conversion occurring 15 years ago. Some of the earliest hybrid plans have been modified since they were first adopted and the authors of the prior studies did not have all the detail on those modifications. In the prior analyses, benefits for hypothetical workers were calculated under the defined benefit plan in operation at the time of the initial shift to a hybrid plan and compared to the benefits that are provided by the current hybrid plan. The prior analyses looked at the implications of the shift for certain hypothetical workers at various age and tenure combinations in 1999 taking the plans studied at their current state of evolution from the prior to current system. Under this approach, the actual transition provisions in a hybrid plan adopted 10 years ago are not reflected in benefit calculations that were presented.⁴

In this analysis, we treat all of the plan conversions as though they occurred in 1999. This means that a worker aged 55 with 20 years of service in 1999 will have the same age and tenure characteristics at the point of plan conversion for all the plans. We could have alternatively set workers' age and tenure characteristics at consistent levels at the point of each of the transitions, but that would have complicated the calculation and presentation of salary levels.

In order to get a general sense of how plans were adjusted, we begin this analysis by considering the case of a hypothetical worker hired at age 30 with a starting salary of \$40,000 assumed to grow at a rate of 4 percent per year over the worker's remaining career. We compare the benefit this worker would accrue at various termination ages under the traditional and hybrid plans in each of the 77 pension conversions being

analyzed here. In each case, we used the formulas specified in the plans for calculating benefits. The interest rates used to increment accumulating cash balance accounts ranged between 3 and 7 percent per year. We used a 7 percent interest rate for comparing account accumulations in hybrid plans with annuity values in traditional plans over the remaining life expectancy of the worker at each age of termination.

Table 1 shows the results of our analysis for this worker terminating employment at four different ages: 50, 55, 60, and 65. The top panel of the table shows the benefit provided by the new hybrid plan stated as a percentage of the benefit that would have been provided by the prior plan. The bottom panel of the table shows the benefit provided by the new hybrid plan plus the additional employer-financed defined contribution benefits available to the worker under the modified pension scheme. The bottom part of the table merely reflects the fact that many employers changed their defined contribution plans at the same time they adopted their hybrid pension. In virtually all cases that we have found of such coordinated changes, the defined contribution plan was made more generous when the hybrid plan changes were adopted.

The results in Table 1 suggest that almost universally, workers terminating at earlier ages under a hybrid plan, reflected by the age 50 column in the table, will be better off than they would have been under their prior plan. This same result also would apply to workers younger than age 50. At age 55, however, the story is decidedly different. The reason is that most of the prior plans provided a subsidized early retirement benefit for this worker at age 55, whereas the hybrid plan does not. The benefits in the hybrid plan continue to deteriorate relative to the prior plan at age 60. Between age 60 and 65, this deterioration pattern is substantially reversed. For example, at age 60, 39 percent of

the hybrid plans provide a benefit that is less than 75 percent of the prior plan benefit. By age 65, only 30 percent of hybrid plan would provide a benefit this low. While we have not calculated benefits beyond age 65, if we continued the series, the hybrid plan benefits would rapidly overtake the value of benefits in many of the traditional plans if our worker were to extend his or her career beyond what is shown here. We will return to an explanation of this latter phenomenon later, but first we explore the underlying motivations for early retirement incentives in traditional pensions and the implications of their elimination in the shift to hybrid plans.

Table 1: Hybrid Pension Benefits as a Percentage of Benefits Provided by a Prior Plan for a 30-Year-Old New Hire with a \$40,000 Beginning Annual Salary

New benefit as a percentage of the prior plan benefit	Age at Termination			
	At age 50	At Age 55	At age 60	At age 65
	Hybrid Plan Benefits Only			
Less than 50 percent	1.3	10.4	11.7	12.9
50 to 74.9 percent	5.2	32.5	40.3	35.1
75 to 99.9 percent	9.1	26.0	24.7	31.2
100 to 124.9 percent	15.6	18.2	14.3	10.4
125 to 149.9 percent	20.8	6.5	7.8	5.2
150 to 174.9 percent	18.2	3.9	0.0	3.9
175 to 199.9 percent	13.0	0.0	1.3	1.3
200 percent or more	16.9	2.6	0.0	0.0
	Hybrid Plan Plus Added Defined Contribution Benefits			
Less than 50 percent	1.3	7.8	7.8	9.1
50 to 74.9 percent	3.9	20.8	31.2	20.8
75 to 99.9 percent	6.5	29.9	29.9	33.8
100 to 124.9 percent	9.1	20.8	15.6	15.6
125 to 149.9 percent	22.1	7.8	9.1	7.8
150 to 174.9 percent	13.0	2.6	1.3	7.8
175 to 199.9 percent	13.0	3.9	1.3	2.6
200 percent or more	31.2	6.5	3.9	2.6

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

Early Retirement Provisions in Employer-Sponsored Pensions

Pension plans initially evolved because of employers' desire to retire superannuated workers. Sponsorship of these plans proliferated in the United States after the end of World War II, at least in part, because of the way our Social Security system was introduced (Schieber 2001 forthcoming). In the first decade after World War II, the overwhelming majority of pension plans specified age 65 as the normal retirement age for all workers, although about a quarter of the plans provided an earlier normal retirement age for women. There was some provision of early retirement but it was often at the mutual discretion of the employer and employee and related to special situations such as disability (Strong, 1951, p. 277). Workers who retired early under these plans were typically provided a reduced benefit that was the actuarial equivalent of the benefit payable at normal retirement age. In insured plans, actuarial equivalency included an added benefit reduction in recognition of the fact that many of the beneficiaries would not be expected to live to normal retirement age (McGill, 1955, pp. 50 and 62).

From a historical perspective, many early retirement provisions that crept into plans did so because of changing perspectives on what was a reasonable time to retire. Whether this was because of some fundamental change in worker values (i.e., a labor supply factor), or because of productivity considerations (i.e., a factor affecting the demand for older workers) or both is unclear. The wide acceptance of age 65 as the traditional "normal retirement age" for retirement plans was somewhat serendipitous, although more related to selection of 65 as the Social Security retirement age than anything else.

The Introduction of Early Retirement in the United States

Social Security's early retirement age of 62 was established for women in 1956. The rationale for this change had nothing to do with labor market considerations: rather it was the social phenomenon that wives tended to be three years younger than their husbands on average, and policymakers thought it would be nice to let couples retire together. The discussion on changing Social Security's early retirement age to 62 for men in 1961 focused on reducing unemployment levels. This latter reduction set the stage for employers to modify their pension plans to encourage earlier retirement than they had previously.

As attitudes shifted on when it was desirable for workers to retire, employers faced a dilemma in offering early retirement options in their pension plans. If they offered workers a benefit at the early retirement date of equivalent value to the benefit payable at the normal retirement age, the actuarial reductions often reduced the benefit to the point that the resulting pension was inadequate to meet the retiree's consumption needs. That was undoubtedly a major reason that most of the early retirements were disability cases where workers had little choice other than taking the reduced benefit. If the goal in sponsoring and structuring the plan was to get workers to leave the sponsor's employment at some relatively specific age, the provision of an inadequate pension was not an effective way of getting workers to terminate employment at the desired age. As a result, employers offering early retirement options in their pensions began to subsidize early retirement under their plans by providing a benefit of greater value than would be payable at normal retirement age.

Given the three-year cycle on major union contract negotiations, it was more than coincidence that three years after Social Security's early retirement age for men was reduced, the United Auto Workers (UAW) won \$400 monthly retirement benefits for workers at age 60 with 30 years of service. These benefits were also payable to workers retiring prior to age 60 or with less than 30 years of service, but they were reduced. Under this arrangement, the normal retirement benefit was reduced to account for the early retirement, but a supplemental benefit brought the combined benefit level up to \$400 per month for the 30-year worker. These "supplements" were payable until age 65 as long as the retiree did not take another job. Employment income from another job reduced the pension supplement by two dollars for each dollar of earned income. Other heavily unionized industries followed the auto industry patterns in introducing early retirement benefits for union workers.

The early versions of the "30-and-out" provisions linked to age soon evolved into the pure "30-and-out" provisions for unreduced benefits that are now found in some plans. This trend, coupled with the influx of the baby boom workers, made strictly service-related "30-and-out" provisions a negotiating priority by the early 1970s. During the auto negotiations on these provisions in 1973, the young workers were as committed to "30-and-out" as older workers, even though the discounted value of the additional benefits would have been relatively small for them at the time. They were not so concerned about their personal added value of retirement benefits, but in clearing rungs on the position ladders that they could fill as older workers left. During the first half of the 1970s, the "30-and-out" plan became common in the steel and auto industries and then began spreading to other industries as well.

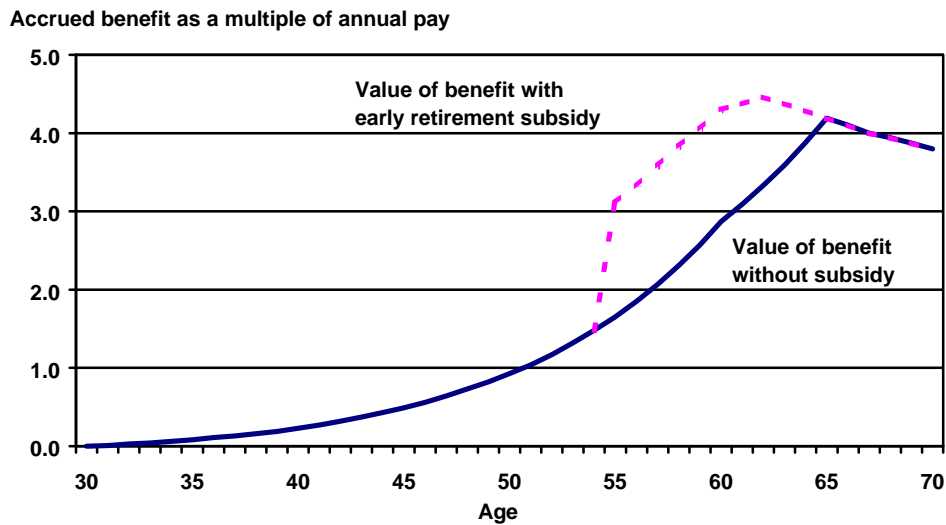
Early-out provisions spread to white collar plans partly because of the success of organized labor in negotiating these provisions. Unionized companies have always been faced with the potential of their white-collar workers unionizing if their compensation packages do not move somewhat along parallel tracks. In addition, the expansion of the U.S. work force as the baby boom entered during the late 1960s and early 1970s placed fantastic pressures on the workers nearing retirement by increasing competition for jobs. But employers were increasingly limited in their ability to control the age composition of their work force by any means other than financial incentives because of the adoption and expansion of age discrimination laws. Employers put incentives into their retirement programs to entice older workers to retire whom, without those incentives, would not do so otherwise. By 1971, 80 percent of the Fortune Top 50 companies offered benefits prior to age 65 with less than full actuarial reductions (Watson Wyatt, 1971). By the early 1980s, 98 percent of the pension plans sponsored by firms with more than 100 employees permitted some form of early retirement. By 1997, this had dropped slightly to 95 percent. In the vast majority of cases, the reductions in pension benefits provided prior to normal retirement age were less than full actuarial reductions from the normal retirement age in the plan (U.S. Bureau of Labor Statistics, various years).

Pension Accruals with Early Retirement Subsidies

The implications of the early-retirement subsidies in defined benefit plans can best be understood by considering Figure 1. The solid line in the figure shows the accrued value of benefits stated as a multiple of annual pay for a hypothetical worker hired at age 30 with a starting salary of \$40,000 per year under the basic benefit formula in a typical final average pay defined benefit plan. In this case, the value of benefits

grows gradually over the worker's career relative to pay up to a point and then begins to decline if the individual continues to work beyond age 65. The value of benefits relative to pay begins to fall at age 65 in this case because the plan has a 35-year maximum number of creditable years of service over which a worker can accrue benefits. Once the worker hits that limit, an additional year of work under the plan shortens the number of years that a benefit can be drawn. The failure to take benefits can reduce the value of total lifetime benefits if pay is flat, which is fairly common for workers at advanced ages, because the number of years over which benefits will be received is reduced given the worker's finite life expectancy.

Figure 1: Value of Accrued Pension Benefit as a Multiple of Annual Wage at Various Ages for a New Hire at Age 30 with a Starting Wage of \$40,000 per Year for a Typical Pension



Source: Authors' computation from data provided by Watson Wyatt Worldwide.

The broken line in Figure 1 reflects the operation and value of the early retirement subsidy in this plan. The solid line in the figure shows that the present value of pension benefits for this worker grows in value from zero at the point of hire, to the equivalent of roughly 1.5 years of annual pay at age 54.⁵ By working from age 54 to 55, the value of

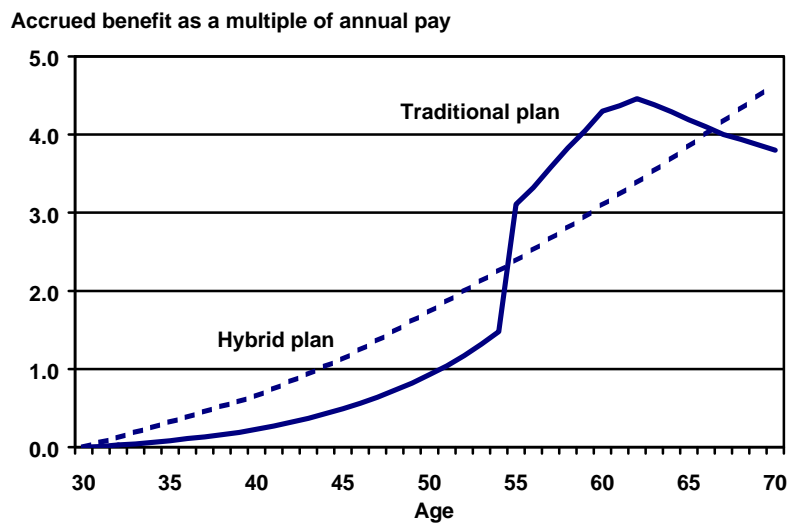
the benefit for this worker follows the broken line in Figure 1, suddenly jumps from 1.5 times pay to slightly more than 3.0 times pay. This occurs because the plan provides an immediate benefit at age 55 with less than a full actuarial reduction relative to the benefit that would be provided at normal retirement. If the worker does not continue to work under the plan until reaching age 55, he or she would not qualify for this special subsidy and would receive benefits under the regular benefit formula.

For the worker who retires at age 55, in this case the value of the subsidy is roughly 1.5 years of pay. The subsidy holds relatively constant until age 59 and then declines steadily beyond that and is completely exhausted at age 65. The subsidy at age 55 increases pension wealth significantly and thus increases the incentive to retire. Even with the early retirement incentive in the plan, pension wealth in this plan continues to grow relative to pay from age 55 to 62 at a rate that is comparable to the rate it would have grown absent the early retirement incentive. This continued accrual of pension wealth for added years of work would somewhat offset the wealth effect of the early retirement subsidy provided at age 55. But the gradual erosion of the subsidy beyond age 62 acts as a significant disincentive to continued employment for the workers subject to these benefits. In this case, it acts as a discount of one third of a worker's pay for working from ages 62 to 63 or 63 to 64, and roughly 40 percent of pay for continuing to work from age 64 to 65. This accrual pattern provides a significant economic incentive to retire after a worker has satisfied the requirements for early retirement. This disincentive to continue working can be overcome for individual workers by increases in annual pay levels, but in most cases pay increases are not likely to be sufficiently large to overcome the effects of the plan.

Eliminating Early Retirement Subsidies in the Shift to Hybrid Plans

One important aspect of the shift away from traditional defined benefit plans to hybrid plans has been the elimination of early retirement subsidies. Figure 2 shows the benefit accrual pattern in a hypothetical cash balance plan relative to that of the worker in the traditional plan plotted in Figure 1. This particular depiction of the accrual patterns in the two types of plans is reflective of the types of shifts that have occurred in many cases and helps to explain some of the negative publicity about the shift to hybrid plans. For this particular worker, the suggested shift to a hybrid plan would be an advantage if he or she terminated employment with the sponsoring employer prior to age 55 or after age 66. If the worker stays with the firm until age 55 and leaves sometime between age 55 and age 66, the old plan would provide a significantly superior benefit. The significant subsidy of early retirement has been completely eliminated in the shift to a hybrid plan and the disincentives for added work in the traditional plan have been eliminated.

Figure 2: Value of Accrued Pension Benefit for a New Hire at Age 30 with a Starting Wage of \$40,000 per Year under a Traditional and a Hybrid Pension Plan



Source: Authors' computations from data provided by Watson Wyatt Worldwide.

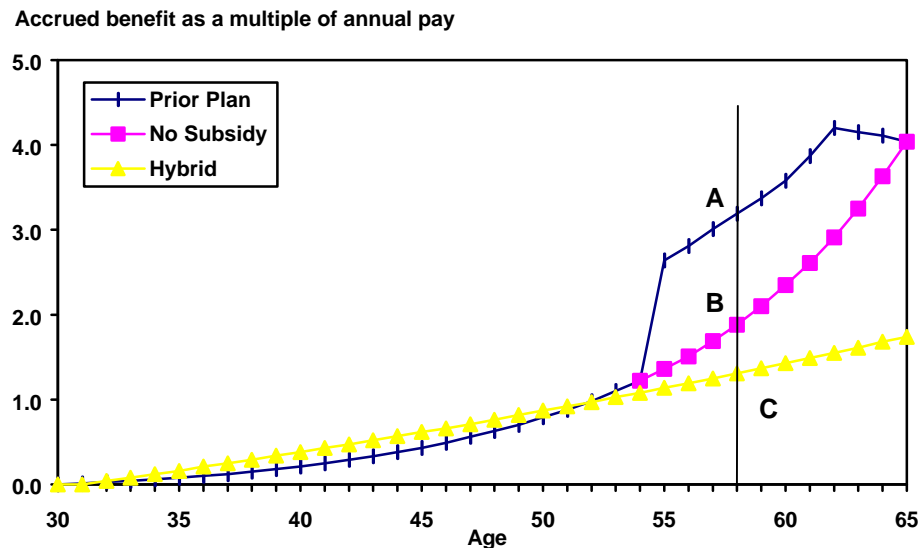
Brown et al (2000) classified employers who shifted from traditional pensions to hybrid plans into three groups: cost reducers, cost neutral shifters, and cost increasers. When looking at the changes made only to defined benefit plans, they found that 56.4 percent of the plans they studied fell into the cost reducing class; 20.5 percent adopted changes that were cost neutral; and that 23.1 percent increased their pension cost in the shift to hybrid plans. Overall, they estimated that plan sponsors reduced long-term annual pension plan costs by an average 10.3 percent on a projected unit credit basis, the actuarial method used for estimating pension costs under the Financial Accounting Standards Board rules for pension accounting. Next, they considered changes made to plan sponsors' defined contribution plans adopted in conjunction with the shift to a hybrid plan. Adding in these changes, they found that 44.9 percent of sponsors reduced costs in the shift to their new pension package, 17.9 percent adopted changes that were cost neutral, and 37.2 percent adopted changes that increased costs. On average, they found pension costs were reduced by an average of only 1.4 percent in the shift to the new package (Brown et al, 2000, p. 18).

Clark and Schieber (2001 forthcoming) refined the earlier analysis on the implications of the shift to hybrid plans by looking at the extent to which cost reductions realized in the shift were related to the elimination of early retirement subsidies in the old plans. They also grouped employers into three groups. The first group included employers who reduced plan costs in the shift to a hybrid plan by more than the cost of the early retirement subsidies in their plan. The second group included employers who reduced plan costs in the shift to a hybrid plan, but reduced costs by less than they would

have if they had simply eliminated early retirement subsidization. The third group included employers who increased plan costs in the shift to a hybrid plan.

The nature of the shift in benefits in the first group of plans is reflected in Figure 3. The vertical line at age 58 in the figure helps sort out the benefit adjustments in the plan shift in this case. For a worker who began coverage under the old plan at age 30 with a starting salary of \$40,000, the value of the accrued benefit at age 58 would have been 3.19 times pay as reflected by point A in the figure. If the employer had simply eliminated the early retirement subsidy in the old plan but otherwise kept the prior formula, the accrued benefit for this worker at age 58 would have been 1.88 times pay as reflected by point B in the figure. But under the newly adopted hybrid plan, the accrued benefit is only worth 1.31 times pay, reflected by point C in the figure.

Figure 3: The Relative Role of the Elimination of Early Retirement Subsidies in the Total Reduction in Benefits in the Shift to a Hybrid Pension in Scenario 1



Source: Authors' computations from data provided by Watson Wyatt Worldwide.

Of the total reduction in benefits in the shift to a hybrid plan for the worker depicted in Figure 3, 70 percent is related to the loss of early retirement subsidies. The

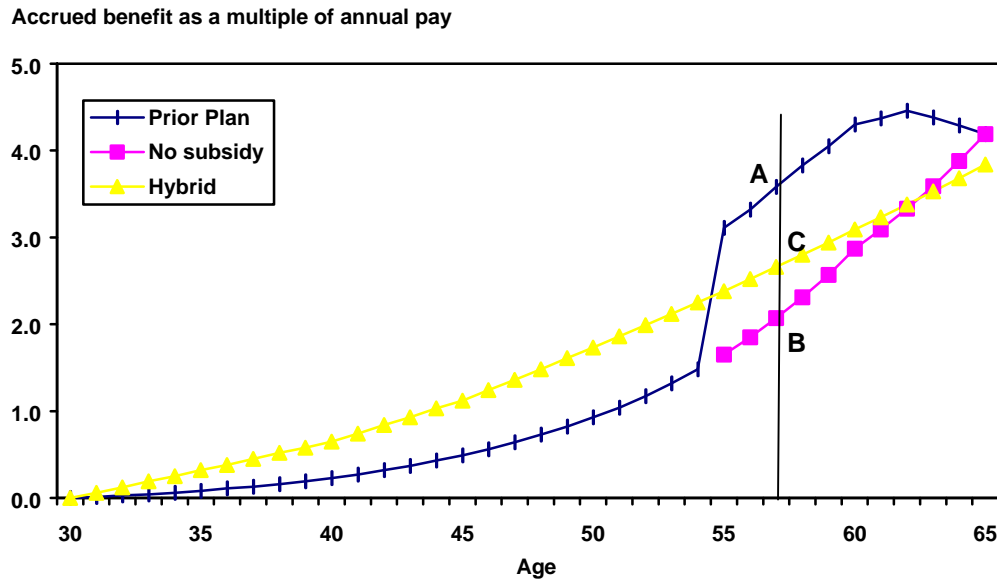
remainder is related to added benefit cutbacks made in the shift to the new style of plan. It is clear from the figure that the workers who lose significantly in this type of shift are workers who stay for extended tenures and those who stay beyond early retirement eligibility under the prior plan formulas. While workers with short tenures come out slightly better off under the new plan in these cases, the magnitude of their gains are often relatively moderate. For the very long tenured worker, benefits under the new plan will never reach an equivalent value to the prior plan benefit under any reasonable career extensions for most workers.

The benefit adjustments by the second group of employers are graphically depicted by Figure 4. In this case, the accrued benefit at age 57 for the worker under the old plan, Point A, would have been worth 3.58 times pay. Elimination of the early retirement subsidy would have reduced the value of this benefit, Point B, to 2.07 times pay. But the value of the benefit provided by the new formula, Point C, would be 2.66 times pay. In other words, this employer took some of the savings from eliminating the early retirement subsidy and plowed it back into plan.

In this case, it is clear that workers who leave with relatively short tenures or prior to early retirement eligibility will be significantly better off under the new plan. This particular plan is the same one depicted in Figure 2, and from the picture there it is clear the implication of the shift in this case will also benefit workers who extend their career under this plan beyond the normal retirement age in the old plan. We noted earlier in the discussion surrounding Figure 2, that our hypothetical worker would be better off under the hybrid plan relative to the prior plan if he or she worked to age 66 or beyond. This

situation arises because many traditional plans have service or accrual caps in their plans but the overwhelming majority of hybrid plans do not.

Figure 4: The Relative Role of the Elimination of Early Retirement Subsidies in the Total Reduction in Benefits in the Shift to a Hybrid Pension in Scenario 2



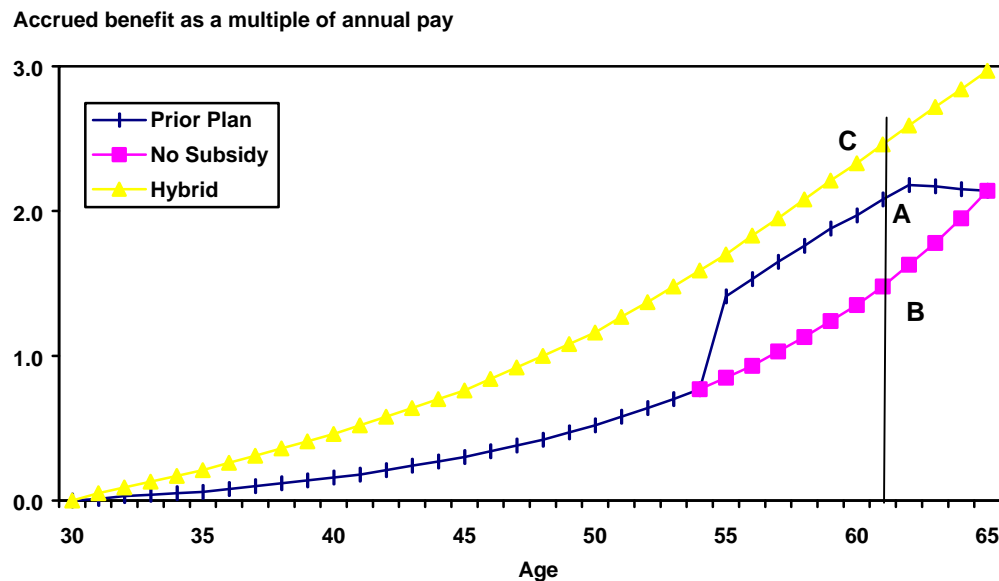
Source: Authors' computation from data provided by Watson Wyatt Worldwide.

Once an employee reaches the maximum tenure on which service credits are given under a pension plan, only increases in pensionable compensation can drive up benefits. Thus, when a worker reaches a service cap, a year of added work will generally result in little increase in annual pension benefits. But the failure to take a benefit during a year of eligibility reduces by one year the period over which the pension can be drawn. As a result, given typical wage growth patterns late in workers' careers once such service caps are reached it is common that the present value of benefits actually declines for additional years of work under traditional plans as reflected in the example depicted in Figure 2. Among the plan conversions under study here, 42.9 percent of the original plans had service caps that would have come into play for our hypothetical worker by the

time he or she reached age 60. At age 65, 55.8 percent of the plans had caps that would have limited benefits. In all, 64.9 percent of these plans had service caps.

Figure 5 reflects the implications of the elimination of early retirement incentives by the third group of plans. In this case it is unambiguous that the cost of the hybrid plan will be greater than the old plan even with its early retirement subsidies. For the most part, this sort of plan conversion has not been controversial, although the retirement wealth implications of these shifts are not as clear as the figure suggests. A large majority of the shifts of this type include adjustments to retiree health benefits. It appears that some employers are increasing their pension costs at the same time they are reducing their direct funding for retiree health plans. These changes can be viewed as an effort by companies to restructure their retirement package so that workers accumulate funds in individual accounts to pay for access to the company medical plans after retirement.

Figure 5: The Relative Role of the Elimination of Early Retirement Subsidies in the Total Reduction in Benefits in the Shift to a Hybrid Pension in Scenario 3



Source: Authors' computation from data provided Watson Wyatt Worldwide.

Since employers cannot tax-effectively pre-fund retiree health insurance plans, the benefits lead to the creation of significant liabilities for the sponsors. But employers can effectively fund extra retirement income through added pension accumulations in hybrid plans or enhanced 401(k) plans that retirees can use to purchase health insurance. Such plans allow retirees to use their tax-deferred savings plans to pay insurance premiums required to stay in employers' health plans. This approach eliminates the liabilities created under the old approach for plan sponsors even though they continue to offer an efficient means of securing retiree health insurance for former workers.

Figures 3 through 5 tell two stories about the shift to hybrid plans. One is that different groups of employers did very different things with the cost savings realized from eliminating early retirement subsidies in their old plans. The second is that the change in pension plans can result in benefit reductions for certain workers even in cases where the savings realized from eliminating early retirement benefits is plowed back into the plan. Indeed, there are some cases where employers actually increased costs significantly where some workers will still come out worse off under their new plan than they would have been under the prior one. This result occurs because the shift to a hybrid plan is, at least in part, a redistribution of pension benefits across a work force over time.

Table 2 shows the effects of the shift to hybrid plans for three hypothetical workers and the extent to which each of the three scenarios depicted above came into play. In every case reflected in the table, the majority of the hybrid plans reduced benefits for the prototypical workers by less than the amount of the reduction that would have occurred if they had simply eliminated their early retirement subsidies. For any of the cases where the worker is assumed to retire at age 55, less than a fifth of the plans

would reduce benefits by more than the elimination of the early retirement subsidies. For these workers retiring at age 55, 39 to 64 percent of the plans would actually enhance benefits relative to the old plan even though they had eliminated the subsidies related to early retirement. While the reductions in benefits that have occurred in the shift to hybrid plans is not purely about eliminating early retirement subsidies, it is largely about eliminating these plan provisions. To the extent that it goes beyond that, it is about the general reduction in retirement benefits. That is something plan sponsors can do whether they do it in correspondence with the shift to a hybrid plan or they do it within the context of the existing defined benefit plan.

Table 2: Benefit Reductions Attributable to the Elimination of Early Retirement Subsidies in the Shift from Traditional Pensions to Hybrid Plans

	At age 55	At age 60	At age 62
	(Percent of plans)		
New hire at age 30 at a beginning salary of \$40,000			
Benefit cut exceeds subsidy	15.6	41.6	49.4
Benefit cut less than subsidy	42.9	27.3	22.1
Benefit maintained or increased	41.6	31.2	28.6
Worker at age 40 with 10 years of service earning \$50,000 at transition to new plan			
Benefit cut exceeds subsidy	15.6	39.0	48.1
Benefit cut less than subsidy	45.5	28.6	19.5
Benefit maintained or increased	39.0	32.5	32.5
Worker at age 50 with 20 years of service earning \$60,000 at transition to new plan			
Benefit cut exceeds subsidy	13.0	27.3	37.7
Benefit cut less than subsidy	23.4	27.3	20.8
Benefit maintained or increased	63.6	45.5	41.6

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

Effects of Plan Changes on Existing Workers

The pattern of benefit adjustments in Table 2 suggests that older workers or workers with some tenure at the point of conversion to hybrid plans fared differently in some of the conversions than other workers. In 88 percent of the 77 plans that we have been able to gather detailed information on benefit formulas prior to and after the shift to hybrid plans, the plan sponsor has provided some form of transition benefit for some workers affected. The nature of these transition benefits varies across plan sponsors and for workers based on their age and tenure under the prior plan at the point of conversion. Table 3 shows the potential effect that hybrid plan conversions would have had on workers who were 50 years old at the time of conversion with 25 years of service under their old plan if no special provisions were made for them. The table also shows the distribution of their benefits including the transition provisions that were provided to them. The table shows benefits as a percent of prior benefits that would have been payable at various ages under the pre-conversion plans.

Table 3: Benefits under Hybrid Plans Relative to Prior Plans for Workers Aged 50 with 25 Years of Service with Salary of \$60,000 at Conversion
(Note: Benefit changes include marginal improvements in defined contribution plans)

Hybrid and transition benefit as percentage of prior plan benefit	Percentage of plans					
	At age 55		At age 60		At age 65	
	Hybrid benefit only	Including transition	Hybrid benefit only	Including transition	Hybrid benefit only	Including transition
Less than 50 percent	18.2	3.9	20.8	6.5	15.6	6.5
50 to 74.9 percent	31.2	14.3	33.7	19.5	35.1	19.5
75 to 99.9 percent	28.6	15.6	27.3	24.7	23.4	23.4
100 to 124.9 percent	15.6	51.9	13.0	41.6	16.9	39.0
125 to 149.9 percent	5.2	11.7	5.2	7.8	7.8	9.1
150 or more	1.3	2.6	0.0	0.0	1.3	2.6

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

The transition benefits provided in the shift to hybrid plans helped to significantly ameliorate the adverse effects of the plan changes. For example, a worker with this set of characteristics who retired at age 55 under the new set of plans without any transition provisions, 49.4 percent of the plans would provide a benefit that was less than 75 percent of the benefit they would have received under their prior plan. Seventy-eight percent of the plans would have provided a smaller benefit than the prior plan. When transition benefits are considered, however, only 18.2 percent of the plans would pay a benefit less than three-quarters the benefit in the prior plan. Only about one-third of the plans would have paid less than the prior benefit level for such a worker retiring at age 55. The implications of transition benefits were similar for workers who continued to work until later ages including up until age 65.

Table 4 shows the effects of 77 plan conversions on a set of hypothetical workers based on their age and service when their employer adopted a hybrid plan. The pattern in the table is fairly clear. The closer a worker was to retirement and the longer period of service prior to the plan conversion, the greater the transition protection that was offered. Nearly two-thirds of workers who were age 50 with 25 years of service were fully grandfathered in their old plan benefit if they retire at age 55 under their new plan. If they wait until age 65, however, the share drops to less than half, 46.7 percent. Workers age 50 at the time of transition to the new plan in these cases, were more likely to be grandfathered or to receive higher benefits the more years of service they had at conversion. Just over half, 54.5 percent, of those aged 50 with 10 years of service at conversion were fully grandfathered for retirement age 55. Only about one-third of

workers at this age and service would be grandfathered in their old plan benefit if they wait to retire at age 65.

Table 4: Effects of Adoption of Hybrid Pensions on Benefit Levels of Hypothetical Workers Based on Their Age and Tenure at the Time of Plan Conversion

(Note: Benefit changes do not include marginal improvements in defined contribution plans)

Age at termination of employment

Age and service at time of conversion	Age at termination of employment			
	At age 55	At age 60	At age 62	At age 65
	(percent of plans)			
Age 50 with 25 years of service and \$60,000 annual salary				
No transition benefit & total benefits fall	3.9	7.8	9.1	15.6
Transition benefit but total benefits fall	32.5	42.9	41.6	37.7
Fully grandfathered or benefits increase	63.6	49.3	49.3	46.7
Age 50 with 20 years of service and \$60,000 annual salary				
No transition benefit & total benefits fall	6.5	13.0	14.3	18.2
Transition benefit but total benefits fall	31.2	42.9	45.5	39.0
Fully grandfathered or benefits increase	62.3	44.1	40.2	42.8
Age 50 with 15 years of service and \$60,000 annual salary				
No transition benefit & total benefits fall	9.1	16.9	18.2	19.5
Transition benefit but total benefits fall	29.9	40.3	44.2	41.6
Fully grandfathered or benefits increase	61.0	42.8	37.6	38.9
Age 50 with 10 years of service and \$60,000 annual salary				
No transition benefit & total benefits fall	19.5	27.3	31.2	31.2
Transition benefit but total benefits fall	26.0	33.8	35.1	35.1
Fully grandfathered or benefits increase	54.5	38.9	33.7	33.7
	At age 50	At age 55	At age 60	At age 65
Age 40 with 10 years of service and \$50,000 annual salary				
No transition benefit & total benefits fall	9.1	49.4	54.5	55.8
Transition benefit but total benefits fall	3.9	14.3	16.9	16.9
Fully grandfathered or benefits increase	87.0	36.4	28.6	27.3

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

The bottom panel in the table shows the benefits for a worker aged 40 with 10 years of service at the time of plan conversion. Note the benefits are shown for a slightly different set of attained ages than those shown for the 50-year-old workers in the table. For the younger workers in this table, the pattern of benefits under a hybrid plan for those

who terminate employment prior to early retirement age under traditional plans tends to be extremely favorable. Even workers fairly far along into a career with some substantial tenure will benefit from the shift to hybrid plans if they terminate employment prior to typical retirement ages in traditional plans. For these younger workers with relatively short tenures at the time of plan conversion, grandfathering of benefits at early and normal retirement ages is not as generous as it was for their older counterparts. While only more than two-thirds of the 50-year-olds with 10 years of service who would received some grandfather protection or actually come out better off under the new plan, less than half the 40-year-olds would fare so well if they delayed retirement to age 60.

Table 5 provides somewhat more detail on two of the workers included in Table 4. In each case we are assuming the 50-year-old worker has an annual salary of \$60,000 per year. In the first and second panels of Table 5, the worker has 25 years of service and in the third and fourth 10 years of service. The first and third panels in the table reflect only changes to the defined benefit plan in the transition. The second and fourth panels include enhancements that were made to defined contribution plans in conjunction with the shift to a hybrid plan. These have some potential to ameliorate the potential adverse effects of such a shift. Of the 77 plans under analysis here, 24 of them introduced some enhancement to their defined contribution plan in conjunction with the adoption of a hybrid plan. In doing the calculations of the effects of the defined contribution changes, we assumed workers would take full advantage of the enhanced benefits provided by their employers. The added benefits reflect only the added employer contributions. The effects of adding in defined contribution plan changes in this case are quite moderate, especially for individuals affected late in their career.

Table 5: Effects of Adoption of Hybrid Pensions on Benefit Levels of Hypothetical Workers Based on Their Age and Tenure at the Time of Plan Conversion

	At age 55	At age 60	At age 62	At age 65
Age 50 with 25 years of service, including only the DB changes				
No transition benefit & total benefits fall	3.9	7.8	9.1	15.6
Transition benefit but total benefits fall	32.5	42.9	41.6	37.7
Fully grandfathered in old benefit	31.2	20.8	20.8	20.8
No transition benefit & total benefits rise	14.3	11.7	13.0	13.0
Transition benefit & total benefits rise	18.2	16.9	15.6	13.0
Age 50 with 25 years of service, including DB & DC changes				
No transition benefit & total benefits fall	3.9	6.5	9.1	13.0
Transition benefit but total benefits fall	28.6	42.9	41.6	35.1
Fully grandfathered in old benefit	24.7	16.9	15.6	15.6
No transition benefit & total benefits rise	14.3	13.0	13.0	15.6
Transition benefit & total benefits rise	28.6	20.8	20.8	20.8
Age 50 with 10 years of service, including only the DB changes				
No transition benefit & total benefits fall	19.5	27.3	31.2	31.2
Transition benefit but total benefits fall	26.0	33.8	35.1	35.1
Fully grandfathered in old benefit	20.8	15.6	14.3	14.3
No transition benefit & total benefits rise	18.2	15.6	14.3	14.3
Transition benefit & total benefits rise	15.6	7.8	5.2	5.2
Age 50 with 10 years of service, including DB and DC changes				
No transition benefit & total benefits fall	19.5	27.3	31.2	28.6
Transition benefit but total benefits fall	20.8	31.2	33.8	32.5
Fully grandfathered in old benefit	22.1	15.6	11.7	11.7
No transition benefit & total benefits rise	18.2	15.6	14.3	16.9
Transition benefit & total benefits rise	19.5	10.4	9.1	10.4

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

Table 6 is similar to Table 5 except that it includes workers who were relatively early in their employment status with employers converting to hybrid plans at the time of the shift. At pre-retirement ages, most of these workers are better off under the new plans than the prior ones, although that situation is not universal. Clearly fewer of these workers are eligible for transition benefits than for their older counterparts discussed

above. Still substantial numbers of plans did provide transition benefits of some sort even for relatively young workers employed prior to the shift to hybrid plans.

Table 6: Effects of Adoption of Hybrid Pensions on Benefit Levels of Hypothetical Workers Based on Their Age and Tenure at the Time of Plan Conversion

	At age 50	At age 55	At age 60	At age 65
Age 40 with 10 years of service, including only the DB changes				
No transition benefit & total benefits fall	9.1	49.4	54.5	55.8
Transition benefit but total benefits fall	3.9	14.3	16.9	16.9
Fully grandfathered in old benefit	5.2	7.8	7.8	10.4
No transition benefit & total benefits rise	64.9	19.5	13.0	11.7
Transition benefit & total benefits rise	16.9	9.1	7.8	5.2
Age 40 with 10 years of service, including DB & DC changes				
No transition benefit & total benefits fall	7.8	48.1	50.6	49.4
Transition benefit but total benefits fall	2.6	13.0	16.9	14.3
Fully grandfathered in old benefit	5.2	9.1	6.5	7.8
No transition benefit & total benefits rise	66.2	18.2	16.9	18.2
Transition benefit & total benefits rise	18.2	11.7	9.1	10.4
Age 30 with 5 years of service, including only the DB changes				
No transition benefit & total benefits fall	14.3	53.2	58.4	54.5
Transition benefit but total benefits fall	3.9	7.8	10.4	5.2
Fully grandfathered in old benefit	1.3	5.2	5.2	6.5
No transition benefit & total benefits rise	70.1	29.9	22.1	28.6
Transition benefit & total benefits rise	10.4	3.9	3.9	5.2
Age 30 with 5 years of service, including DB and DC changes				
No transition benefit & total benefits fall	6.5	42.9	48.1	41.6
Transition benefit but total benefits fall	3.9	7.8	7.8	3.9
Fully grandfathered in old benefit	1.3	5.2	6.5	5.2
No transition benefit & total benefits rise	80.5	40.3	32.5	42.9
Transition benefit & total benefits rise	7.8	3.9	5.2	6.5

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

The Mechanics of Winning or Losing in the Shift to a Hybrid Plan

Throughout much of this discussion, we have talked about benefit reductions that some workers incur in the shift from traditional defined benefit plans to hybrid plans. We have looked at the overall magnitude of these reductions, the extent to which they can be

explained by the elimination of early retirement subsidies, and the extent to which transition benefits ameliorated the reductions. We do not want to downplay the importance of the findings presented here, but it is important to put them in an objective context. The benefit reductions that we have been documenting are reductions against prior plans. While any changes to the compensation package raises certain equity questions, there have been questions about the fairness of traditional defined benefit pension accrual patterns for years. Specifically, it is well known that these plans favor workers with longer job tenure compared to workers who change jobs more frequently. Hybrid plans do not typically provide the same relative advantage to workers with long tenures leading up to retirement compared to those with shorter tenures or those who leave prior to retirement eligibility. Hybrid plans tend to distribute benefits more evenly than traditional plans.

To explore this issue somewhat further, we developed a case study of one of the plan conversions from the larger sample of 77 plans described earlier. We chose a plan where the plan sponsor shifted to a cash balance plan and the shift in plan design was relatively cost neutral, with the projected unit credit cost of the new plan being about 3 percent less than the old one. We drew a synthesized workforce of 30,000 workers and simulated them through the remainder of their careers under the traditional and hybrid plans in this case. In the prior discussion, we have gone to considerable length in showing the effects of the elimination of early retirement incentives in the shift to hybrid plans. In this case, we have chosen one of the two cases out of the 77 plan conversions analyzed here where the prior pension did not have an early retirement subsidy. We chose this plan because, in rough terms, total benefits in the two plans will be equivalent

and because we did not want the effects of eliminating an early retirement subsidy to confuse another aspect of the shift to hybrid plans that we wish to highlight here.

The sample of 30,000 workers used in this simulation was randomly drawn from workforces of 15 large pension clients of Watson Wyatt Worldwide. In simulating the workers through the remainder of their careers we used turnover rates developed in a study for the Society of Actuaries under a sample of defined benefit plans (Kopp, 1997). This study estimated turnover rates in these plans for the purposes of valuing defined benefit pension plans in cases where the actuary does not have turnover experience measures on the actual workforce covered under the individual plans.

At the beginning of the simulation we started with a workforce with a varied set of age, service, and pay characteristics. We simulated each worker through the remainder of his or her employment under the selected plans. We then calculated the effect the shift in plans had for each worker by comparing various aspects of pension participation under each of the plans.

We began our analysis by calculating the present value of benefits under the pre-conversion plan. We then simulated each worker through the remainder of his or her career and determined the ultimate pension benefit that would be paid and calculated the present value of the ultimate benefit at the point of termination of active employment under the plan. The difference is the expected value of additional pension that would be earned through continued service under the plan for each worker. From this we estimated an average accrual rate under the prior plan as though it continued to operate. The accrual rate is derived by dividing the added increment in pension value that each worker would earn from the beginning date of the simulation until employment termination by

the present value of his or her future earnings while still with the employer. The result is what actuaries refer to as the aggregate normal cost, reflecting the accrual of future benefits as a constant percentage of pay over the remainder of workers' careers with the employer.

In Table 7, we show the future average accrual of pension benefits for various groups of workers distributed by their age and service at the time of conversion to the new plan. But the accruals shown there reflect what these workers' average future accruals would have been if they had stayed in their prior plan. The workers in this case are split into two groups. The top section of Table 7 reflects the accrual rates for workers who would be as well off or better off under the cash balance plan as they would be under the prior plan. The bottom portion of the table reflects those who would be better off staying under the old plan. The accrual rates in Table 7 generally reflect that the workers in the bottom half of the table would accrue benefits over the remainder of their careers under the prior plan at about twice the rates of those in the top half of the table except at very advanced levels of age and service. This simply reflects the fact that traditional defined benefit plans provide disproportionate benefits to a subset of workers, namely those who will ultimately work under the plan until they are eligible for immediate benefits upon their termination.

In the conversion to a cash balance plan, the plan sponsor has to establish an initial value of benefit for workers covered under the new plan. This is typically the value of the benefit payable at age 65 discounted back to the present time. The value of the benefit that seeds the beginning cash balance in the conversion to the new plan is often not equivalent to the present value of the accrued benefit under the prior plan

because of different interest rates used in deriving the two amounts. For example, at the time the traditional plan analyzed here was converted, plans were typically using 7 percent interest rate assumptions in valuing pension expense. Initial cash balances in this particular plan were determined using a 5.5 percent interest rate probably reflecting a conscious decision on the part of the plan sponsor to subsidize initial balances in the new plan.

Table 7: Simulated Future Pension Accruals as a Percentage of Pay under a Prior Traditional Pension Plan for Workers Converted to a Hybrid Plan

Tenure at the time of conversion	Age at time of conversion to a hybrid plan					
	20 to 29.9	30 to 39.9	40 to 49.9	50 to 54.9	55 to 59.9	60 to 65
Future pension accrual rate as a percent of pay for those winning or held harmless						
0 to 4.9	1.10	2.01	3.50	5.07	6.24	7.58
5 to 9.9	1.36	2.23	3.79	5.65	6.70	8.32
10 to 14.9	1.85	2.68	4.14	5.97	7.02	10.18
15 to 19.9		2.80	4.13	6.08	7.02	9.77
20 to 24.9		3.03	4.14	6.06	6.88	10.01
25 to 29.9			4.60	6.12	6.99	10.60
30 +			5.12	6.34	7.58	10.53
Future pension accrual rate as a percent of pay for losers						
0 to 4.9	5.06	6.07	8.43	9.14	11.02	12.52
5 to 9.9	5.09	6.35	8.71	10.29	11.39	14.78
10 to 14.9		6.57	8.83	11.19	12.81	14.98
15 to 19.9		6.65	8.78	11.49	12.91	15.63
20 to 24.9		6.50	8.54	11.56	12.47	15.74
25 to 29.9			9.49	11.52	12.84	15.05
30 +			10.05	11.42	13.20	15.53

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

Table 8 shows the net effect of the different discount rates for determining the present value of accrued benefits under the prior plan and that used for setting the initial balance in the replacement cash balance plan in this case. The top two panels of the table include workers who ultimately prove to gain in the shift to the cash balance plan and the

bottom two panels include those who ultimately lose in the shift. The first and third panels show the average present value of accrued benefit of workers in each of these two

Table 8: Present Value of Accrued Benefits under Prior Pension Plan and Increment in the Value of Cash Balance at Conversion to Hybrid Plan

Tenure at time of conversion	Age at the time of conversion to a hybrid plan					
	20 to 29.9	30 to 39.9	40 to 49.9	50 to 54.9	55 to 59.9	60 to 65
Workers who ultimately gain benefits in the shift to a cash balance plan						
Present value of accrued benefit (PVAB) at transition						
0 to 4.9	\$ 504	\$ 982	\$ 2,225	\$ 3,331	\$ 4,930	\$ 10,152
5 to 9.9	1,221	2,887	6,424	11,287	15,275	19,136
10 to 14.9	2,452	4,889	10,417	18,397	23,688	27,668
15 to 19.9		6,069	10,595	21,766	24,148	37,360
20 to 24.9		4,698	10,062	17,698	21,334	30,144
25 to 29.9			12,687	18,974	30,105	48,484
30 +			10,716	18,645	26,924	52,724
Net wealth gain in the transition as percentage of PVAB						
0 to 4.9	126.5	86.9	63.9	46.6	36.5	24.9
5 to 9.9	98.9	77.9	55.6	40.0	30.6	21.9
10 to 14.9	91.5	74.1	54.3	38.7	29.2	20.1
15 to 19.9		69.6	54.4	38.5	29.3	19.5
20 to 24.9		67.3	52.7	38.5	29.8	20.8
25 to 29.9			48.1	38.7	29.3	20.1
30 +			44.8	37.7	28.7	19.6
Workers who ultimately lose benefits in the shift to a cash balance plan						
Present value of accrued benefit (PVAB) at transition						
0 to 4.9	\$1,806	\$ 1,294	\$ 3,669	\$ 7,232	\$ 28,177	\$ 28,020
5 to 9.9	3,183	4,475	9,771	18,153	21,196	75,509
10 to 14.9	3,563	7,892	15,219	23,725	44,356	45,734
15 to 19.9		8,672	15,611	32,016	49,580	62,600
20 to 24.9		4,979	13,354	24,247	27,790	99,871
25 to 29.9			12,773	27,066	35,853	58,684
30 +			11,541	21,232	35,644	105,331
Net wealth gain in the transition as percentage of PVAB						
0 to 4.9	110.9	84.1	63.5	46.6	33.2	25.6
5 to 9.9	93.7	74.3	54.6	40.3	31.1	22.6
10 to 14.9	91.0	70.6	54.6	38.3	30.0	22.0
15 to 19.9		68.5	53.9	38.0	29.7	21.8
20 to 24.9		67.0	51.0	38.7	29.6	21.9
25 to 29.9			48.6	37.9	29.3	22.3
30 +			45.3	37.6	28.3	21.8

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

groups under their old plan just before the transition to the new plan. Comparing the accrued benefits in each age and service cell, it is clear that the accrued benefits under the old plan are larger for the ultimate losers in the shift to a hybrid plan than they are for the winners. The reason for this is that in each cell, the losers will tend to have longer tenure, and thus larger pension accumulations under the plan. This simply reflects the phenomenon that at any given age, workers with long tenures typically are more likely to ultimately reach retirement age under a pension plan than workers with short tenures.

The second and fourth panels in Table 8 show the percentage increase in average pension wealth as the present value of accrued benefits under the old pension is converted into an initial cash balance under the new plan. In this case, there is a relatively close correspondence between the two groups of workers. This simply reflects that the average age of workers within each age and service cell will be similar for each of the two groups of workers. It is a worker's age that determines how many years are left until retirement which determines the discounting period for calculating both the present value of accrued benefits under the prior plan and the cash balance in the new plan. The longer this period, the greater the relative wealth increment that will be realized from the differential in the two discounting rates.

The final important element of the shift to a hybrid plan is how workers benefit for future service under the new pension formula. In this case we simulated each worker through the remainder of his or her career as before and determined the ultimate pension benefit that would be paid under the new plan. Here we calculated the present value of the ultimate benefit at the point of termination of active employment under the hybrid plan and compared that to the beginning cash balance that was established at transition to

it. Once again, the difference is the expected value of continued service under the plan for each worker. As in the case of the original plan, we estimated an average accrual rate under the new plan by dividing the added increment in pension value that each worker earns during the remainder of his or her career by the present value of future earnings.

The results of this analysis are shown in Table 9. When the accrual rates for workers who benefit from the shift to a cash balance plan are compared with those who lose in the transition, while controlling for age and service, those identified as losers still accrue benefits more rapidly over the remainder of their careers than the winners. But the differential in the accrual rates under the modified plan is much smaller than it was in the traditional plan as documented in Table 7.

Table 9: Simulated Future Pension Accruals as a Percentage of Pay for Workers Shifted into a Hybrid Plan with the Same Cost as the Prior Plan

Tenure at time of conversion	Age at time of conversion to a hybrid plan					
	20 to 29.9	30 to 39.9	40 to 49.9	50 to 54.9	55 to 59.9	60 to 65
	Future pension accrual rate as % of pay for those winning or held harmless					
0 to 4.9	1.98	3.26	4.80	6.42	6.43	6.60
5 to 9.9	2.17	3.24	4.75	6.19	7.02	7.41
10 to 14.9	2.57	3.37	4.52	5.81	6.70	7.74
15 to 19.9		3.49	4.51	6.16	6.48	7.75
20 to 24.9		4.13	4.62	6.01	6.98	7.32
25 to 29.9			4.95	6.26	5.78	7.61
30 +			5.51	5.84	6.29	6.55
	Future pension accrual rate as % of pay for losers					
0 to 4.9	4.27	5.31	6.30	7.76	8.36	9.01
5 to 9.9	4.80	5.29	6.25	7.71	8.43	9.08
10 to 14.9		5.33	6.25	7.71	8.47	9.13
15 to 19.9		5.40	6.24	7.59	8.50	9.14
20 to 24.9		5.39	6.30	7.60	8.53	9.13
25 to 29.9			6.68	7.62	8.53	9.14
30 +			7.12	7.69	8.54	9.13

Source: Authors' computation from data provided by Watson Wyatt Worldwide.

If we had used a plan with an early retirement subsidy to develop this analysis, the results would have been even more pronounced than they are here. The differential in the accrual rates in the prior plan would have been larger than they are in Table 7 for a plan with an early retirement subsidy. The larger the early retirement subsidy, the larger would be the differential accrual rates for winners and losers and the greater would have been the effects of the leveling of accrual rates reflected in Table 9.

In a number of highly publicized cases, certain workers who have experienced a shift to a hybrid pension have been highly vocal about the inequity of the shift to the new plan. The reason is that they understand that their ultimate accrual of benefits under their new plan will be inferior to what they would have received had they continued under their prior plan. From that perspective it is easy to understand why the affected workers are upset. Traditional defined benefit plans have generally provided a tremendous advantage to a relatively small number of workers relative to others. While it appears that some advantage prevails under the new hybrid plans for workers who stay to retirement age, much of the differential relative to workers departing prior to early retirement eligibility is eliminated under hybrid plans. If one focuses only on the erosion of benefits for the previous big winners under traditional plans the conclusion that some workers have been wronged is understandable. But if one focuses on the total distribution of benefits under the hybrid plan the perspective can be entirely different. One can only make that case that those adversely affected in the shift to hybrid plans is unfair if one agrees that the accrual pattern in Table 7 was fair to begin with.

Worker Preferences and Plan Choices

Workers' attitudes concerning the type of pensions they prefer are influenced by their age, expected length of service, rate of growth of earnings, and various risk preferences concerning investment, mobility, and inflation. If given a choice of pension plans at the time of employment, some workers would select to enroll in a traditional defined benefit plan while others would prefer a retirement plan with a more portable cash value. Although the evidence here is limited, the evidence that does exist suggests that individuals make pension choices that conform to expectations based on economic theory. Workers hired at older ages and those who are more likely to remain with the firm until retirement prefer defined benefit plans while younger, more mobile workers tend to opt for defined contribution or hybrid pension plans.

Over the past two decades, many employers have converted traditional defined benefit plans to defined contribution plans or hybrid pension plans. In most of these plan conversions, workers are required to move from the old plan to the new plan. Are such changes embraced by workers as an improvement in compensation or do workers feel that they are being adversely affected by the elimination of the old defined benefit plan?

Reading about plan conversions in the popular press over the past year would lead one to believe that workers generally are opposed to changes in their retirement plans and the intensity of their attitudes towards the elimination of the defined benefit plan is very strong. This view is highlighted in a series of articles in the *Wall Street Journal* by Ellen Schultz. In general, the press reporting has been based on a small number of interviews with senior workers who were very angry about conversions to cash balance plans.

In contrast to these anecdotal accounts, other more comprehensive studies of worker attitudes reveal a different and more complex story. We briefly review the findings from a national survey and several case studies of worker attitudes concerning actual plan conversions. These studies indicate that many workers have very positive attitudes towards the new pension plans and believe that they will have greater retirement income due to the change in pension plans. However, the findings also show that older, senior workers are more likely to have a negative view of plan conversions.

Third Millennium conducted a telephone poll of 800 Americans ages 21 and older. The poll revealed that many workers expected to leave their current employer prior to retirement and that the portability of pension benefits was very important. For example, only half of the respondents thought that they would remain with their current employer for ten years. High rates of job change increase the desire for more portable pension benefits.

Relatively few of the current workers were familiar with cash balance pension plans; only 21 percent of workers indicated that they understood what these plans were. However, among those with some knowledge of cash balance plans, 47 percent had a positive view and only 20 percent expressed a negative view of the plans. Compared to the attributes of a traditional plan, the key characteristics of a cash balance plan were preferred by virtually all workers. Almost 90 percent of respondents thought that it was important to be able to take the cash value of pension benefits with them when they changed jobs and 88 percent believed that it was important to know the current value of their retirement benefits.

The poll indicated that worker preferences were generally supportive of pensions that included individual accounts, that did not penalize mobility, and that were easy to understand. At the same time, workers were concerned about the impact of plan conversions and potential adverse impact on the retirement income workers who had worked for many years under a previous pension plan.

Clark and Munzenmaier (2001 forthcoming) conducted a detailed examination of several plan conversions. In two cases, they were allowed to survey workers concerning their attitudes about the change from a traditional defined benefit plan to an individual account plan. In a third case, a county government, all workers were given a choice of whether to remain in the old plan or switch to the new plan. Employment records of this organization were examined to determine which workers chose to change plans.

Workers in both companies were generally pleased with the plan conversion process giving the company relatively high marks for managing the conversion and providing adequate communication about the change in pension plans. Employees were mixed in their assessment of the impact of the conversion on them. Attitudes varied substantially by length of service and age. In both of these plan conversions, the company made higher contributions into the new individual accounts for older more senior workers. Still these workers were less satisfied with the conversion than younger workers. Thus, one would expect that such workers would be less likely to voluntarily move to the new plan if given a choice.

This is exactly what happened in a county level government plan where a traditional defined benefit plan was being replaced. The county government established a defined contribution plan in 1995 and required all new employees to enroll in this plan.

All current workers were given the choice of remaining in the old defined benefit plan. If they chose to go into the new plan, they were given an initial balance equal to the present value of their accrued benefit under the prior plan calculated with a 7.5 percent discounting factor. They then had to make a choice to participate in the new defined contribution under one of two options. The first resulted in a 6 percent of pay contribution per year by the employer with no required employee contributions. In the second option, the employer made a 6 percent contribution plus a 100 percent match of an employee contribution of 3 percent of pay. Given this choice of pension plans, one third of the employees elected to move to the new plan while two-thirds decided to remain in the defined benefit plan. The willingness to switch to the new plan was directly related to the age of workers and their years of service with the county. No transitional benefits were offered to the senior workers. When given such a choice, older, more senior workers were significantly less likely to switch to the new plan.

In summary, it is important to remember that workers differ in their pension preferences and their attitudes are highly correlated with age and years of service. Older, more senior workers are more likely to be adversely affected by plan conversions and therefore, are more likely to oppose terminating a traditional defined benefit plan while younger more mobile workers are demanding plans with individual accounts and greater portability than traditional defined benefit plans offer. Hybrid plans and defined contribution plans are likely to be helpful in attracting new workers who tend to prefer plans with an individual account.

Policy Considerations Raised by the Shift to Hybrid Plans

The conversion of traditional defined benefit plans to hybrid plans or defined contribution plans alters the age-tenure patterns of benefit accruals. Plan conversions increase the expected retirement benefits for most shorter-tenured workers although long-tenured workers in many cases will suffer a reduction in expected future benefits, especially if they retire at early retirement ages in traditional plans. In some instances continued employment to normal retirement age or beyond will result in higher benefits under the new plans under plans that reduce benefits for early retirees.

Our analysis shows that a large majority of workers who leave a firm prior to the early retirement age will accumulate larger benefits under a hybrid plan than under the old defined benefit plan that preceded it. Despite the decline in expected benefits, workers with long service with the same firm continue to have higher benefit accruals under the new hybrid plan compared to younger workers. Although the evidence available from surveys and case studies is limited, it shows that the characteristics of hybrid plans such as account balances, lump sum options, and portability are highly popular with workers. For the most part, workers favor the conversion to plans with these characteristics.

It is clear that some workers lose expected retirement benefits with the conversion to hybrid plans. The vast majority of firms have attempted to address these losses in whole or in part through the adoption of transition benefits. Some firms adopt policies that attempt to keep expected retirement benefits for workers unchanged by offering the choice to remain in the old plan or by granting larger pension credits to a wide range of existing workers. In these companies, the transition to hybrid plans has caused little

outry from workers. Other companies have offered transitional benefits to a much smaller class of workers or ignored potential losses altogether. These companies have been the target of widespread criticism from their senior employees and been subject to considerable review by the press and by Congressional hearings.

Three issues have dominated the policy discussion on plan conversions. The first is whether firms should have the right to alter the employment contract by changing a final pay defined benefit plan to a hybrid pension. Presently, firms have the legal right to terminate defined benefit plans completely. Thousands of defined benefit plans have been terminated in the past two decades. In many cases, the firms have replaced the defined benefit plans with defined contribution plans. In some cases, sponsors have not replaced their prior defined benefit plan with any other retirement plan. Firms also have the right to alter benefit formulas and retirement ages in defined benefit plans. In plan terminations or changes in benefit formulas, plan sponsors must provide employees with the value of their retirement benefits accrued prior to the plan change.

Employers in the United States have not been constrained by government mandates limiting the ability of firms to alter future compensation and there does not seem to be movement toward imposing such limits in the future. If public policymakers are consistent, this would imply that Congress will not adopt laws that prohibit firms from changing or terminating pension plans in the future. Similar logic would suggest that laws will not be adopted that require firms to give all current workers the choice of staying in a terminated plan after a company decides to change its pension plan. This is not to say that Congress will not mandate new disclosure requirements for employers to

assure that workers fully understand the implications of pension plans modifications and their options under choices offered them during their adoption.

Given that firms have the right to change their pension plan, the second issue is how to determine initial account balances in the hybrid plan. This policy issue involves two important elements. One element is the discount rate used to value the retirement benefit under the current plan and that used to establish the opening account balance in the new plan. Differences in these interest rates can produce immediate gains or losses in the present value of retirement benefits at the time of plan conversions (although they appear to create gains in the majority of cases) and affect the subsequent rate of benefit accrual. The other element is whether workers should be credited with the value of the early retirement benefit that they could receive or whether the initial balance should be based on the normal retirement benefit.

From an economic perspective, the treatment of defined benefit early retirement subsidies under current law is inconsistent. A worker with long service under a plan who terminates employment prior to immediate retirement eligibility typically will not receive an early retirement subsidy. That benefit does not vest the way the normal retirement benefit does under the law. If a worker terminates employment upon achieving early retirement eligibility and commences the receipt of an annuity benefit under the plan, the early retirement subsidy in the plan must be paid to him or her. If the plan offers a lump sum benefit option, however, and the recipient chooses that form of benefit, the provision of the early retirement subsidy does not have to be provided as part of the lump-sum cash out from the plan. If a sponsor eliminates the early retirement subsidies in a plan but otherwise leaves the plan unchanged, the early retirement subsidies accrued up to the date

they are eliminated in the plan have to be provided to workers who have earned them. Once again, however, these earned subsidies are only paid if the worker actually works to early retirement eligibility and actually retires and takes them in the form of an annuity prior to normal retirement age.

There is considerable sentiment that plan sponsors who shift from traditional defined benefit pensions to hybrid plans should be required to provide affected workers with the full value of early retirement subsidies earned under the prior plan up to the time of transition to the new plan. In addition, there is a sense that these benefits should be fully vested at the time of transition. The problem with adopting such a provision is that it would provide early retirement subsidies protections in the transition to a hybrid plan that they do not have in the ongoing operation of a traditional plan.

A third issue has been at the forefront of the examination of plan conversions. Using current regulations, the initial account balance credited workers at the time of conversion may yield a starting balance that is greater than that which would be accrued under the new plan. For example, plan sponsors have often provided for the value of early retirement subsidies in setting the initial balance in the new plan but sometimes have frozen the initial balance until the new plan accrual without the subsidy overtakes the subsidized balance. In such cases, some firms have held the account balance constant until the benefit under the new plan reaches the initial balance credited to workers. This lack of new benefit accruals is often referred to as a “wear away.” From the workers’ perspective, they are not earning any new pension credits during this wear away period. This “wear away” phenomenon has created a great deal of adverse reaction. In fact, it is

no different economically than the various ways that early retirement subsidies can be eroded away under current law.

One of the endemic problems that any defined benefit plan sponsor faces in changing a plan that reduces benefits for some workers is the transition from the old plan to the new. Often sponsors try to smooth the transition by letting workers on the immediate cusp of retirement stay under the prior plan, but those slightly further from retirement have to be subject to some element of the new provisions or the new provisions will not create the desired results. In some regards, workers whose future accruals under hybrid pension plans are stalled for a period or slowed going forward are no different than the "notch babies" created by the 1977 Social Security Amendments.

In 1983, Congress legislated an increase in the normal retirement age under Social Security that is finally beginning to take effect in 2000. Despite the long lead time and the public discussion about this development, there is some evidence that the general public has remained largely oblivious of this development right up to the present time. Clearly, one of the reasons for raising Social Security's normal retirement age has been an attempt on the part of national policymakers to encourage workers to remain in the workforce longer. Not only have policymakers already adopted an increased retirement age for Social Security, some of them who have been particularly critical of the shift to hybrid pension plans have advocated that the normal retirement age under Social Security should be raised even further.

In abstract terms, one cannot help but wonder about the compatibility of Social Security policy that is trying to get workers to stay in the workforce longer and tax incentives for pensions that encourage them to retire much earlier than Social Security

eligibility ages. If employer-based pensions are going to provide any support to Social Security policy in encouraging workers to stay in the workforce longer, then the early retirement incentives in them will have to be curtailed in relatively short order. Full grandfathering of anyone already in the shadow of an early retirement incentive is likely to extend such benefits to the majority of workers down to age 40 who are covered by plans offering early retirement incentives today. If we exclude workers as young as 40 from the effects of reduced early retirement incentives, we might as well let all the baby boomers continue to enjoy them. It is the baby boomers that we have to entice to work longer if we are going to offer any practical relief to the financing problems that Social Security and Medicare are facing.

To the extent that employers are using the conversion away from traditional pension plans to an alternative as a mechanism to eliminate early retirement subsidies, some people who were expecting to get those subsidies are going to be aggrieved. Aggrieved people have a natural attraction and attractiveness to policymakers and reporters. At some juncture, however, policymakers are going to have to stand back from the anecdotal cases of people who have lost early retirement subsidies and decide what they want our retirement system to achieve in the future. A federal retirement policy that is increasing retirement age under the foundation of our retirement system, Social Security, but hamstringing employers who are attempting to align with the national system's goals is a schizophrenic policy that will serve neither the government or workers in the long term.

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ENDNOTES

¹ The PBGC (1999) reports that the proportion of the labor force covered by a defined benefit plan declined from 38 percent in 1980 to 23 percent in 1995. As a result, the proportion of pension participants with primary coverage in a defined benefit plan declined from 83 percent to 50 percent. The number of defined benefit plans with fewer than 1,000 workers dropped from 92,000 in 1980 to 38,000 in 1998 while there was a slight increase in the number of plans with over 1,000 employees and the number of active participants in plans of all sizes less than 10,000 participants declined sharply during this period.

² National policies aimed at prolonging work life include increasing the normal retirement age for Social Security benefits from 65 to 67, providing actuarial reductions for early Social Security benefits, and the elimination of mandatory retirement.

³ Other types of benefit formulas include those based on career average earnings and those that provide a uniform benefit per year of service.

⁴ To understand the implications of the calculation method used in the prior research, consider the case of a worker who was 55 years of age with 20 years of service in 1999. In each case, benefits were calculated under prior plans and the current hybrid plans based on age and service in 1999. For a plan that was modified in 1984, the worker would have been age 40 with 5 years of service when the shift occurred. Such a worker would not have been eligible for transition benefits in many plan conversions, although it is likely that workers who were 55 years old with 20 years of service at the time of conversion would have been covered under some sort of grandfathering provisions. Often plan sponsors shifting to a hybrid plan adopt transition provisions that cover workers who will reach retirement eligibility in the first five to ten years after the transition to the new plan. For the oldest hybrid plans, the transition provisions are likely to have expired for the older, longer-service workers that were considered in the prior analyses of these plans. Calculating comparison benefits in this fashion would result in smaller benefits under the hybrid transition arrangements than actually were provided for older workers in most cases. In that regard, the prior estimates of benefit reductions in the shift to hybrid plans for older workers exaggerate the effects on plan participants at the time of the conversions.

⁵ Throughout this example, earnings are assumed to grow at 4.0 percent per year. The discount and benefit conversion rates used throughout are 7.0 percent per year. We used the GAM83 mortality rates for males with a 3 year setback.