

**The Shift to Hybrid Pensions by U.S. Employers:
An Empirical Analysis of Actual Plan Conversions**

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Abstract

For nearly two decades, employers have been restructuring traditional defined benefit pension plans to look and operate more like defined contribution plans from participants' perspectives while retaining defined benefit funding characteristics. This shift to cash balance and pension equity plans has become controversial because some participants and outside analysts have concluded the shift to these new plan styles has been primarily motivated by the desire to cut pension costs and reduce benefits. This paper empirically documents the shift from traditional pension forms to these new hybrid forms for a sample of actual plan conversions. The analysis investigates the implications of the plan conversions on plan costs and the levels and distribution of benefits. It finds that some employers did indeed modify their plans to reduce costs but that, on average, cost savings from the shift to hybrid plans have been negligible. The paper documents that some workers will receive smaller benefits under the new plans than they would under the old but shows that most plan sponsors implemented substantial grandfathering or other transition protection to eliminate or limit the effect of the transitions on workers with substantial tenure or age at the time of conversion. The controversial "wear-away" is evaluated against provisions in the prior plans that provided subsidized benefits to early retirees and then reduced them if workers extended their career beyond early retirement eligibility. It finds that wear-away has actually been ameliorated in the shift to hybrid plans although shifted forward in the career in most cases. The paper shows that it is largely the elimination of these early retirement incentives that is at the heart of the shift to hybrid plans. This shift is resulting in new incentives to work beyond early retirement ages and is redistributing benefits more equitably across the total workforce than traditional pensions have done.

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Introduction¹

Over the past 15 to 20 years, many companies have converted their traditional defined benefit plans to hybrid-style plans, either cash balance or pension equity plans. In a cash balance plan, the worker's "account" is based on an annual contribution rate for each year of employment, plus accumulating interest on 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, as is typical for defined benefit plans. Although from the employees' perspective, these hybrid plans look somewhat like defined contribution plans, they are funded, administered, and regulated as defined benefit plans. So far, the shift toward hybrid pension plans has occurred primarily among larger employers. In several cases where corporate giants have switched to a hybrid plan, there has been considerable negative publicity about the conversions.

The Basic Characteristics of Hybrid Pensions

To a large extent, hybrid pensions are an attempt by employers to offer the more attractive features of both defined benefit and defined contribution plans in one plan, as shown in Table 1. In terms of contributions and participation, hybrid plans tend to resemble traditional defined benefit plans rather than self-directed defined contribution plans, in which employees decide whether to participate and select contribution rates. Hybrid plans largely eliminate penalties for workers who terminate employment before retirement, as is true with defined

contribution plans. The accumulation of accounts and provision of lump-sum benefits at termination facilitate communication and portability like 401(k) and similar plans.

Table 1 here

The new plans alleviate some — but not all — of the market risks of self-directed defined contribution plans. Account balances are credited with an annual rate of return equal to some specific rate such as the T-bill rate, thus reducing the investment risk faced by a typical defined contribution participant. Sponsors retain the investment risk with hybrid plans but typically guarantee an investment return to workers such that the expected return on plan assets should cover the cost of these risks. Workers retain some residual investment risk in that the benchmark rates used for return crediting of accounts can change over time, although they should be much less volatile than rates in many segments of the financial markets.² Participants also risk the possibility of a plan sponsors' changing the benchmark rates over time.

Hybrid plans tend to be more age neutral in their retirement incentives than traditional defined benefit plans, and so far virtually none offers early retirement incentives, although a hybrid plan can be structured to include the same sorts of incentives offered by most traditional pensions. As defined benefit plans under law, hybrid plans must offer an annuity as a benefit option, but the overwhelming majority of these plans also offer lump-sum benefits. Anecdotal evidence suggests that when offered a choice between an annuity and a lump sum, the overwhelming majority of workers choose the lump sum.

Issues Raised in the Shift to Hybrid Pensions

The shift to hybrid plans has been difficult to document, because there is not yet sufficient data to carefully track the changes adopted by employers. Bank of America implemented the first conversion — from a traditional pension to a cash balance plan — in 1985.

But the trend was slow to take off, and by the close of 1999, there were only about 400 hybrid plans in operation, according to one estimate (Clark and Schieber, 2000).

Despite the paucity of information documenting the shift to hybrid plans, there was plenty of adverse publicity suggesting motivations for these conversions. For example, a press release from Representative Bernie Sanders (D-VT) (2003) stated that, “Starting in the mid-1990s, companies sought big savings by converting their employees’ traditional defined benefit pension plans... to cash balance plans.” Richard Ippolito (2000) suggested another reason for the shift: “No one even pretends that these conversions to cash balance plans take place for any reason other than to avoid the reversion tax.” After writing a number of articles for the *Wall Street Journal* about plan conversions, Ellen Schulz (1999) concluded that, “Growing complaints about age discrimination in cash-balance plans put a spotlight on a fairly new phenomenon: employers saving money by reducing retirement benefits for older workers.”

Criticism of the shift to hybrid pensions has often suggested that plan sponsors are reducing benefits that people have earned under their former plans. While employers clearly are changing future accrual patterns, there is no evidence of plan sponsors having used a transition to hybrid plans to reduce benefits workers had already earned. In a study reviewing hybrid plan conversions, the Inspector General for the U.S. Department of Labor (DOL, 2002) stated that:

For the 60 plans in our sample, we concluded that the conversions from traditional defined benefit plans to cash balance plans adequately protected benefits from earlier plans. Plan sponsors either (1) converted accrued benefits from earlier plans into cash balance accounts using various present value factors or (2) kept the accrued benefit separate. In either situation, all sponsors ensured that benefits paid after plan conversion exceeded accrued benefits from earlier plans as required by ERISA.

Although benefits earned to date are not reduced by a shift to a hybrid plan, future accruals in the new plans may be reduced from what they would have been in the old plans, giving some workers the impression that they may lose benefits.

In almost all adoptions of hybrid pension plans, employers have replaced a traditional defined benefit plan. Because of the differences between hybrid and traditional plans, perceptions and results vary among different workers. Some perceive the shift from a traditional to a hybrid plan as a loss, while others consider it a significant gain.

A Perspective on Benefit Reductions in the Transition to Hybrid Plans

To see how a shift to a hybrid plan affects potential retirement benefits, consider the accrual of benefits for a worker hired at age 30 at a salary of \$40,000 under a traditional defined benefit plan versus under the replacement cash balance plan. The implications of this conversion, shown in Figure 1, assume that the worker was employed throughout his or her entire career under each plan, and that the differences in accrual patterns had no offsetting effects on the pay on which the pension benefits were based. The amounts shown in the figure are the present value of accrued benefits in each of the two plans, stated as a multiple of pay at various ages.

Figure 1 here

If this worker quit this job before age 55 or so, he or she would be better off under the cash balance plan than the traditional pension. At around age 46 or 47, the difference becomes greatest, amounting to nearly one-half year's pay. The advantage under the cash balance plan changes dramatically with early retirement eligibility under the traditional plan. By age 60, however, the traditional plan value exceeds that of the cash balance plan by nearly a half-year's pay. Whether the traditional or the hybrid plan is better for this worker depends on how long he or she works for the plan sponsor.

The implications of the shift in plan types vary considerably from employer to employer and from worker to worker. The overall level of generosity of the hybrid plan reflected in Figure 1 is represented by the slope of the accrual line. Sponsors that trim total benefits in the shift to a

hybrid plan will have flatter accruals under their hybrid plan relative to their former plan than reflected in the figure. Sponsors that increase the overall generosity of benefits will have a steeper accrual under the hybrid plan relative to their former plan. A hybrid plan can be structured to increase accruals with age or service by giving larger credits as age or service increases. Some plan sponsors increase credits with age so they can provide competitive benefits for mid-career hires, who otherwise would not receive the same relative benefit as young hires due to shorter periods of interest compounding. Some plan sponsors increase credits with service to mimic the accrual pattern of traditional defined benefit plans.

The comparison between traditional and hybrid pensions depicted in Figure 1 considers the outcomes for two similar workers under alternative plans. None of the controversy that surrounds conversions to hybrid plans is about the alternative scenarios depicted in the figure. The controversy is about what happens to workers who already have been covered for some time under a traditional plan when the sponsor shifts to the new plan.

Consider the case depicted in Figure 2 where a 50-year-old worker was covered under a traditional plan for 20 years before the transition to a new cash balance plan. If the worker's initial cash balance in the new plan equals the accrued benefit under the prior plan and benefits increase under the new accrual pattern, the initial benefit would be set at point B in the figure. Benefits would accrue going forward at the new plan rate, providing the worker with a benefit of value C at age 65, equivalent to two years pay. This worker would essentially get the worst of both the traditional and hybrid plan worlds. He or she would have been covered by the traditional plan in the early career years, when accruals are very low, but would have missed out on the higher accruals of the later career years.

Figure 2 here

To remedy situations like this, some plan sponsors create a starting balance for these workers as though they had participated in the hybrid plan all along, setting the initial benefit at point A and having future benefits accrue from that point forward under the new plan. While this vastly improves on the previous scenario for the mid-career worker, it still may not satisfy many workers caught in the transition to new plans. A 50-year-old worker with 20 years of service who anticipates retiring with a generous early retirement benefit in five years often receives a smaller benefit under the new formula than he or she would have received under the old plan.

Some employers have chosen to grandfather workers relatively close to retirement eligibility under the old plan, letting them finish out their career under its terms. Others have converted everyone to the new plan but have essentially grandfathered workers with long service or close to retirement by giving them a supplemental balance that makes up for benefits lost in the transition to the new plan. But grandfathering some workers and not all creates its own set of problems, requiring somewhat arbitrary decisions about the age and service cutoffs for staying in the old plan or being covered by the new. Under such provisions, variations of a day or two in age or service can result in workers receiving disparate benefits, which are hard to justify.

Some employers have allowed workers to choose between the old and new plans, but this approach does not always end well either. Assume the hypothetical worker in Figure 2 may choose between staying in the old plan or joining the new plan with an initial balance of A. Suppose she chooses to remain in the old plan but is then terminated in a downsizing or plant closing two years later. She based her choice on the assumption that she would continue employment under the old plan until her accumulated benefit exceeded that of the new plan, but in hindsight, she made the wrong choice and so will receive a lower benefit.

The Perspective on Frozen Benefits in Pension Conversions

Another concern about the transition to hybrid plans is where a worker is converted to the new plan with an opening balance that remains frozen for some period. This is commonly referred to as "wear-away" of earned benefits. There are essentially two situations under which wear-away occurs.

The first arises where employers significantly curtail the generosity of their pension plan in adopting the hybrid plan. In conversions to pension equity plans, initial balances in the new plan are often set by treating workers as though they were covered under it for the full duration of their employment with the plan sponsor. If the new formula results in benefits that are less than the accrued benefits under the old plan, a worker with substantial service under the old plan may work for some period without accruing added benefits because the accumulated benefit in the new plan has to catch up with the frozen benefit in the old one.

In conversions to cash balance plans, initial balances are typically set on the basis of workers' age and service under the prior plan at the point of conversion. If the plan sponsor uses a higher interest rate in calculating the value of initial benefits in the new plan than in determining the present value of the accrued benefit of the prior plan, initial benefits in the new plan would be less than accrued benefits in the prior plan. Participants would have to work without earning a benefit for some time simply to allow the lump-sum benefit under the new plan to catch up to the benefit already accrued under the old plan. This problem of initial account balances in new plans being set below accrued benefits in prior plans in conversions to hybrid plans appears to have been largely resolved by the 1994 Uruguay Round of the General Agreement on Tariffs and Trade (GATT). GATT changed the rates plan sponsors could use for determining lump-sum benefits (Brown et al., 2000).

The second wear-away situation arises where the plan sponsor does not provide a benefit in the new plan that was offered in the old one, as depicted in Figure 3. In this case, the worker has already reached early retirement age under the previous plan and receives an initial credit under the new plan equal to the value A, his accrued benefit under the old formula. Assume that under the new plan, the initial benefit is reflected at level B in the figure. This situation could arise in converting to a pension equity plan because the formula results in a benefit accrual pattern shown by the solid line in the figure. The new plan eliminates the early retirement subsidy and simply provides a lower accrual at age 56. This situation could arise in a conversion to a cash balance plan because the benefit value in the new plan is the lump-sum value of the accrued benefit. ERISA does not require that plan sponsors "vest" the value of early retirement subsidies if retirees take their benefits in the form of a lump sum.

Figure 3 here

In this case, the credited value of the benefit under the new plan, at point B, for the worker in Figure 3 would be less than his accrued benefit earned under the prior plan. While ERISA does not permit an employer to reduce a worker's accrued benefit, the employer may freeze the benefit. The wear-away in this situation arises because plan sponsors have frozen benefits for these workers until the benefit in the new plan catches up with the accrued benefit under the old plan.

Given the widespread prevalence of early retirement incentives in traditional plans, this second wear-away situation could potentially occur in almost all conversions to hybrid plans. Yet in many plan conversions, wear-away has not occurred at all or occurred only in a very limited number of cases. The reason is that many plan sponsors chose to sweeten the benefit under the new plan. For example, plan sponsors might give workers some added credits under the new

plan, or calculate the initial balance in the new plan using a lower interest rate than was used to calculate the accrued benefit in the old plan.

Technically, if the plan sponsor has enhanced the initial benefit in the hybrid plan, the benefit could be frozen for some period of time, thus creating a wear-away period. It would not make much sense, however, for a plan sponsor to enhance an initial benefit and then freeze it. In fact, when an employer enhances the initial benefit for workers on the cusp of retirement, it often improves the pension accrual levels for broad cross sections of the covered workforce. To the extent that any wear-away conditions might arise in such plan conversions, sponsors will generally adopt other transition provisions that will hold workers close to retirement age whole under the prior plan's provisions.

Another situation sometimes arises in the transition to hybrid plans that may be perceived as creating wear-away, due to variations in interest rates used to establish plan balances at the time of conversion. Under GATT, plans use 30-year Treasury rates in determining lump-sum values of benefits. While a plan can use the most recent month's closing rate, it can also use a closing quarterly, semiannual, or annual rate. To show how this may create the perception of wear-away, consider a plan that traditionally used the closing September rate from the prior year in calculating lump-sum benefits. A sponsor transitioning to a hybrid plan on December 31, 1999, would have used an interest rate of 5.20 percent to calculate initial balances. One transitioning on January 1, 2000, would have used a 6.07 percent rate. In this case, converting on the later of the two days would have significantly reduced the value of initial benefits. This would require workers to work some period under their new plan to get back to the value of benefits in their old plan just before the transition, which is often thought of as wear-away. In fact, the value of accrued benefits in the old plan would have dropped just as much on January 1,

2000, due to the shift in interest rates, as they did in the conversion to the new plan because of the chosen methodology for calculating accrued benefits. In this case, something totally extraneous to the plan conversion creates the reduction in accrued benefits.

Sorting Out the Implications of Hybrid Plan Conversions

The shift to hybrid pension plans has been explained in terms of employers' desire to reduce costs, to avoid tax obligations from shifting to defined contribution plans, to cut benefits for older workers, and so forth. All these theories have some credibility in the public arena. None of these criticisms, however, captures the scope or nuance of the shift to these new plans. In early 2000, Kyle Brown and several of his colleagues published an analysis of the shift to hybrid plans that focused on the pre- and post-conversion characteristics of 78 plans for which they had detailed plan characteristics. At that time, the authors estimated their sample of plans included nearly one-quarter of all plans converted to a hybrid form. About 60 percent of the plans were cash balance plans and the rest were pension equity plans. Subsequently, Robert Clark and Sylvester Schieber used 77 of these plans to extend the analysis of the implications of the shift to hybrid plans (Clark and Schieber, 2000, 2002, forthcoming).

In the following discussion, we rely on the 77 plans included mutually in the various analyses undertaken by Brown et al. and Clark and Schieber. Of these conversions, 46 were to cash balance plans and 31 were to pension equity plans. All plan conversions are treated as though they occurred in 1999, to allow comparisons of the implications of the transitions for workers of given characteristics in any given year.

Analysis of the Changes to Pension Costs in the Shift to Hybrid Plans

One element of the analysis of the shift to hybrid plans undertaken by Brown and his colleagues was a set of actuarial expense calculations to see how the shift affected plan sponsors'

accounting costs. Their analyses did not directly replicate the actual changes in costs these plan sponsors incurred and reported on their financial statements.

In analyzing the effects of shifting to hybrid plans on pension costs, Brown et al used a synthetic workforce of 10,000 workers to value each plan before the shift to a hybrid plan and afterwards, rather than the actual workforces. This synthetic workforce was a randomly selected sample of workers drawn from a combined pool of roughly 165,000 workers from 15 of Watson Wyatt's larger clients. For each worker, the authors had his or her date of birth, date of hire, and pay level. They used turnover assumptions consistent with patterns at large firms offering a defined benefit plan. They did not use plan-specific turnover experience, although they applied higher turnover rates to health and hospital employer plans than to other employer plans, because turnover in that sector is typically somewhat higher than in other economic sectors where pension plans are prevalent.

In reporting their results, the authors (Brown et al., 2000) segregated the plans into three groups. In the first group, the shift to a hybrid plan reduced pension costs. In the second group, the shift was cost-neutral. In the third group, the shift actually increased pension costs. If the shift increased or decreased costs by 5 percent or less, it was considered cost-neutral. Of the defined benefit plans alone, 56.4 percent of the plans reduced pension costs, 20.5 percent were cost-neutral, and 23.1 percent increased pension costs. Overall, the shift to hybrid plans reduced average costs by 10.3 percent on a projected unit cost basis. The authors surmised that part of the rationale for the cost shifts was that plan sponsors were attempting to more closely align their accrued benefit obligation (ABO) and projected benefit obligation (PBO) used for accounting purposes.

The analysis suggests that most plans reduced costs in the shift to hybrid plans with a net aggregate reduction occurring across all plans. Further analysis, however, found that many plan sponsors reduced pension costs but enhanced their defined contribution plan at the same time. Putting more money into a defined contribution plan at the same time as adopting a hybrid plan would be consistent with a strategy of redesigning a retirement system to more closely align the ABO and PBO. Under defined contribution plans, the employer's accrued and projected expenses are identical.

After recalculating the cost analysis to factor in the effect of the defined contribution plan enhancements and assuming that workers take full advantage of the enhancements, the results were very different. In this case, 44.9 percent of the plan sponsors reduced their pension costs, 17.9 percent spent approximately the same amount, and 37.2 increased their pension costs. Overall, average plan costs were reduced by 1.4 percent (Brown et al., 2000). In other words, the average change in retirement plan costs was so negligible in aggregate that the shift in plan designs can be characterized as essentially cost-neutral, though of course this may not be the case for specific employers.

Analysis of the Funding Status of Plans Converted to Hybrid Forms

If an employer has an overfunded, traditional pension plan and decides to shift toward a defined contribution approach, today's regulatory environment strongly encourages sponsors to adopt a hybrid plan as opposed to a defined contribution plan. This is why some people conclude that the shift to hybrid plans has been largely driven by tax considerations. There are two factors that support this conclusion.

The first is that shifting from a defined benefit to a defined contribution plan requires the plan sponsor to terminate its defined benefit plan and purchase annuities for the plan's accrued

benefits through the insurance markets, which introduces extra costs. The second is the excise tax levied on excess assets left in the terminated defined benefit plan after all plan obligations have been paid off, which is virtually expropriative.

If an employer terminates a defined benefit plan, substitutes a defined contribution plan, and has remaining assets, the employer can avoid the excise tax by allocating a pro-rata distribution of assets across the participant population at the point of conversion, subject to annual contribution limits. Employers seldom do this because it provides tremendous windfall benefits to plan participants. Another alternative is for a sponsor with excess assets in a terminating defined benefit plan to reduce the excise tax obligation by transferring 20 percent of the excess to increase termination benefits across the board. For sponsors that choose this option, both excise and income taxes are assessed on only 80 percent of the excess assets in the plan and the excise tax rate drops to 20 percent. Yet a third alternative allows the sponsor to transfer 25 percent of excise taxes into a suspense account, which can then be allocated to workers' defined contribution accounts over seven years. In this option, the excise and income tax applies to only 75 percent of excess assets and the excise tax rate is reduced to 20 percent. Finally, a fourth variant allows the sponsor to transfer all the excess assets into a suspense account that can then be allocated to workers' defined contribution accounts over seven years. In this case, there is no income tax obligation on the excess assets and a 20 percent excise tax is applied to only 75 percent of excess assets.

Regardless of which option a plan sponsor chooses, the shift from a defined benefit plan with excess assets to a defined contribution plan entails extra taxes or benefit-allocation implications that most employers would rather avoid. Employers that convert a traditional defined benefit plan with excess assets to a hybrid plan do not incur any excise taxes. The excess

assets in the original plan simply roll over to the modified plan. It would not be farfetched to make a case that a business manager with substantial excess funding in a traditional pension would be violating his or her fiduciary responsibility to the business owners by shifting to a defined contribution plan. Taking on unnecessary tax obligations when there is an alternative that avoids those tax consequences could be viewed as a failure on the part of management to properly protect the interest of stockholders.

In order to determine the relative funding status of hybrid versus ongoing traditional defined benefit plans, Clark and Schieber compared the relationship between plan assets and current liability obligation under the law. In a plan termination, the plan sponsor must immediately vest all benefits. Thus, a reasonable measure of plan liability includes all vested and non-vested benefits as of a particular date. Clark and Schieber found that plans that were converted to hybrid plans were more likely to have funding levels between 90 and 130 percent of their current liability than all defined benefit plans — 65 versus 53 percent. At the tails of the funding distribution, hybrid plans were somewhat less represented compared to all defined benefit plans. The data do not support the contention that all plans were overfunded, as nearly one-quarter of the converted plans had assets of less than their current liability.

Even though the current liability that Clark and Schieber used suggests that hybrid plans are somewhat better funded than ongoing traditional plans, their analysis does not suggest that most of these plans would have realized substantial excess assets in a plan termination. In shutting down a plan, the plan sponsor must purchase annuities for the accrued benefits of all plan participants. A Pension Benefit Guaranty Corporation analysis (PBGC, 1995) of 10 large plans with assets in excess of 125 percent of current liability estimated that their average assets would cover only 95 percent of the level needed to terminate the plans.

There is a strong likelihood that plan sponsors' desire to avoid the inefficiency of going to commercial annuity markets to shut down their plans was as important a motivator to stick with their defined benefit plan structures as the desire to protect assets against excise taxes. Many if not most of the plans were simply not sufficiently over funded to have been exposed to significant asset losses from the excise taxes imposed on asset reversions. Among the converting plans that Clark and Schieber linked to Form 5500 data, 56 percent had assets of less than 120 percent of current liability, and 72 percent had assets of less than 130 percent of current liability at the end of their 1996 plan year. For some of them, assets may have appreciated in subsequent years given financial market performance, but with falling interest rates annuity conversions would have become somewhat more costly as well. Some plans that were converted to hybrid plans undoubtedly held excess assets at the point of conversion, but Clark and Schieber concluded that the data do not support any notion that the shift to hybrid plans is simply a mechanism by which overfunded plans avoid excise taxes. This is not to say that an employer with an overfunded pension plan who wants to adopt a plan with defined contribution characteristics does not have good reasons to go the hybrid plan route.

The Shift to Hybrid Plans and the Elimination of Early Retirement Subsidies

Figures 1 through 3 clearly show that accrual patterns in the plans reflected in them were different in the hybrid plan compared to the traditional pension it replaced. A significant element of the difference is related to the treatment of early retirement under the respective plans. This analysis begins with two hypothetical workers to show how benefits changed across a range of plan conversions. The first worker is hired at age 30 for \$25,000 per year. Here, the benefits under the hybrid plan in each of the 77 conversion cases are compared with the benefits that would have been provided under the prior plan at two different points in this worker's career. The

first comparison is when the worker is 40-years-old and has ten years of service. The second is 20 years later, when the worker is 60-years-old and has put in 30 years of service.

The second worker is 50-years-old, earns \$50,000 per year and has put in 20 years of service under the traditional pension plan at the time of conversion. The analysis compares the benefits provided by the hybrid to those under the prior plans at two points in time. The first comparison is at the point of transition to the new plan. As the earlier discussion intimated, some workers fairly advanced in age and service might realize immediate gains or apparent losses at the point of conversion to the new plan. The second point of comparison is ten years later, when the worker is age 60 with 30 years of service. The analysis compares the benefits actually provided under the new regime with those that would have been provided had the prior plan remained in effect until the worker reached age 60.³ The results of this analysis are presented in Table 2.

Table 2 here

The overwhelming majority of the plan conversions increased benefits for the young new hires who terminate their employment after ten years with the employer. Only one hybrid plan in the entire sample of 77 plans reduced benefits for these workers relative to the prior plan. If the worker remains with the firm until age 60, however, the vast majority of plans would pay a reduced benefit relative to the prior plan. Only 22 percent of plans would match or increase the benefit for this worker at age 60 relative to the prior plan.

For the 50-year-old worker 20 years into a career at the point of transition, the story is somewhat similar to that of the new hire. If the worker leaves almost immediately after the transition to the new plan, he or she would be as well or better off under the hybrid plan than under the former plan in 94 percent of cases.⁴ If this worker stayed with the firm until age 60,

however, he or she would be worse off after the conversion in 55 percent of cases. The potentially adverse consequences of plan conversions on older, long-tenured workers described earlier appear to be borne out in most shifts to hybrid plans. However, this is far from the whole story of the shift to hybrid plans for older workers.

Table 3 is similar to Table 2, except that it shows the distribution of benefits under pension equity and cash balance plans relative to the prior plan for the 30-year-old worker used in developing Table 2. Here the focus is on the worker who is 30-years-old at the time of transition, because the differences in the results at each termination age reflect the true differences in the two types of plans. Table 3 suggests that pension equity and cash balance plans are quite similar in their treatment of workers relative to the plans they replaced. It does not appear that employers have favored one type of hybrid over the other in the interest of cutting or expanding benefits. In almost all cases, both types of hybrid plans have increased benefits to young workers who terminate relatively early in their careers with vested benefits. In most cases, the hybrid plans deliver fewer benefits to the long-career, 60-year-old worker than he or she would receive under the old plan.

Table 3 here

While not shown separately here, some conversions to both types of hybrid plans ultimately reduced benefits for workers with some tenure at transition who terminate employment at ages where they would have qualified for immediate retirement benefits, especially early retirement benefits, under the prior plan. This phenomenon is so important that it deserves deeper exploration.

In the figures discussed here thus far, the early retirement incentives embedded in traditional defined benefit plans are shown by the marked increase in benefits at age 55. In

contrast, virtually all the hybrid plans we have seen share the general pattern of benefit accrual shown for hybrid plans in Figures 1 to 3. The actual accrual pattern in a specific plan may be steeper, flatter, or more concave, but very few of these plans include the type of actuarial early retirement subsidies featured in the overwhelming majority of traditional pensions. This does not mean early retirement subsidies cannot be added to hybrid plans. But the fact that employers convert traditional pension plans that feature early retirement subsidies to hybrid plans without such subsidies suggests that employers are deliberately eliminating the early retirement incentives so popular with employers since the 1960s or 1970s.

Earlier we noted that Brown and his colleagues had separated the conversion of traditional pension to hybrid plans into three groups: cost reducers, cost-neutral shifters, and cost increasers. Clark and Schieber similarly grouped plans by their cost adjustments but did so by comparing cost outcomes to the savings realized by eliminating early retirement incentives. In the shift to a hybrid plan, the first group reduced plan costs by more than the cost of the early retirement subsidies. The second group reduced plan costs, but by less than they would have by simply eliminating early retirement subsidies. The third group increased plan costs.

The nature of the shift in benefits in the first group of plans is reflected in Figure 4. The vertical line in the figure helps sort out the benefit adjustments in the plan shift, in this case for a 58-year-old worker. 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 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. But under the newly adopted hybrid plan, the accrued benefit is only worth 1.31 times pay, reflected by point C.

Figure 4 here

Of the total reduction in benefits in the shift to a hybrid plan for the worker depicted in Figure 4, 70 percent relates to the loss of early retirement subsidies. The remainder is due to additional benefit cutbacks made in the shift to the hybrid plan. In this situation, for workers who stay longer into their career, the total reduction in benefit will become larger and more of it will be due to general benefit reductions as opposed to curtailment of early retirement incentives. As is clear from the figure, the losers in this type of shift are workers with extended tenures and those who continue working beyond early retirement eligibility under the prior plan formulas. Workers with short tenures emerge slightly better off under the new plan, but their gains are often relatively moderate. For the very long-tenured worker, benefits under the new plan will never equal the prior plan benefit under any reasonable career extensions.

The benefit adjustments by the second group of employers are depicted by Figure 5. 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 annual pay. In other words, this employer took some of the savings from eliminating the early retirement subsidy and plowed them back into the plan.

Figure 5 here

Here it is clear workers who leave with relatively short tenures or before early retirement eligibility will be better off in the new plan. This is the same plan as depicted in Figure 3. It indicates that the shift will also benefit workers who work beyond the normal retirement age in the old plan. This is because many traditional plans have service caps, but hybrid plans hardly ever have such limits.

Once an employee reaches the maximum tenure on which service credits are given under a pension plan, a pay increase is the only factor that can drive up benefits. Thus, when a worker reaches a service cap, working an extra year generally does little to increase annual pension benefits. But failing to take a benefit during a year of eligibility reduces the period over which the pension can be drawn. Given typical wage growth patterns late in workers' careers, failing to take the pension once a worker reaches the service cap often means that the present value of benefits actually declines under traditional plans. Among the plan conversions studied 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 6 reflects the implications of the elimination of early retirement incentives by the third group of plans. In this case, it is unambiguous that the hybrid plan will cost more than the old plan even with its early retirement subsidies. Generally, 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. Most of these shifts appear to include adjustments to retiree health benefits, suggesting that some employers have increased their pension costs at the same time they reduced their direct funding for retiree health plans. These changes may represent an effort by employers to restructure retirement packages so that workers accumulate funds in individual accounts to pay for access to the company medical plans after retirement.

Figure 6 here

Since employers cannot tax-effectively prefund retiree health insurance plans, the benefits create 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 in their employers' health plans. This eliminates the liabilities created under the old approach while enabling plan sponsors to offer former workers an efficient means of securing retiree health insurance.

Figures 4 through 6 tell two stories about the shift to hybrid plans. One is that different groups of employers did very different things with the money they saved by eliminating early retirement subsidies. The second is that the shift to a hybrid plan can reduce benefits for certain workers over the remainder of their working careers, even when the savings from eliminating early retirement benefits are plowed back into the plan. Indeed, even when employers significantly increased their pension costs, some workers will be worse off under their new plan than they would have been under the old one. This occurs because the shift to a hybrid plan is, at least in part, a redistribution of pension benefits across a workforce over time.

Table 4 shows the effects of the shift to hybrid plans for three hypothetical workers and the extent to which the three scenarios depicted above came into play. In every case reflected in the table, most of the hybrid plans reduced benefits for the prototypical workers by less than would have occurred had they simply eliminated early retirement subsidies. For cases where the worker is assumed to retire at age 55, less than one-fifth of the plans would reduce benefits by more than the elimination of the early retirement subsidies. For these workers, 39 to 64 percent of the plans would actually enhance benefits relative to the old plan despite having eliminated the early retirement subsidies.

Table 4 here

While the elimination of early retirement subsidies does not account for all reductions in benefits in the shift to hybrid plans, it plays the largest part. The other cause is a general

reduction in retirement benefits. Plan sponsors are free to reduce retirement benefits, whether as part of a shift to a hybrid plan or within an existing defined benefit plan.

The reduction of benefits for selected workers occurs in a relative rather than an absolute context. No worker ends up with smaller benefits than he or she had earned at the point of plan conversion. Rather, these workers receive smaller benefits at retirement under the hybrid plan than they would have earned under the old plan. Brown and his colleagues analyzed the implications of the shift to a hybrid plan by simulating their synthetic workforce through a plan conversion. In developing their analysis, the authors focused on a cost-neutral plan conversion. The distributions of winners and losers in a sample cost-neutral cash balance conversion taken from Brown and his colleagues' analysis are shown in Table 5.

Table 5 here

The benefits distribution pattern reflected in Table 5 could suggest that certain age groups are particularly disadvantaged by the shift to the new plans. For example, of all workers who experience reductions, workers in their 40s or early 50s generally face larger reductions than either younger or older workers. Of all those who profit from the shift to a cash balance plan, the benefit increases tend to be largest for workers in their 20s or 30s and for short-tenured workers. Although those observations reflect the implications of the shift to a cash balance plan in this instance, they ignore the starting place from which the shift originated.

Many people fail to realize that under a traditional defined benefit plan, a disproportionate share of benefits accrues to a relatively small number of participants, namely those who stay with the employer until they retire. This is not terribly surprising given that, at least in part, these plans were originally set up to reward workers who stayed with the plan

sponsor. In many cases, the shift to a hybrid plan counteracts — but does not completely eliminate — this disproportionate distribution of benefits.

Table 6 shows future accrual of pension value stated as a percentage of pay for supposed winners and losers in this shift to a cash balance plan. To derive this, the present value of benefits that would be paid at termination for each worker was calculated and compared to the present value of the accrued benefit at the time of the shift. The difference in the two is the additional amount each worker earns between the point of transition and his or her departure from the company. This difference is divided by the present value of 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.

Table 6 here

The top section of Table 6 reflects the accrual rate for workers who would be better off under the cash balance plan than under the prior plan, and the bottom reflects those who would be worse off. In every age and service category at transition, the “losers” will continue to accrue pension value at a higher rate than the “winners.” Table 5 may suggest that this conversion was unfair to the 20 percent or so of workers who were worse off after the transition. But Table 6 suggests that this employer has simply introduced a more equitable allocation of pension benefits among all workers — those who remain with the employer until retirement age and those who terminate employment before then.

In fact, as shown in Figure 7, at the point of conversion the median hybrid plan was significantly better than the plan it replaced for many long-service workers. This is true even for workers at age 50 with 20 years of service at the time of conversion. The new median benefit

level is 1.48 times larger than the median benefit level for the old traditional plan, refuting the contention that hybrid plans are always less favorable for long-service employees. Under any common understanding of what constitutes a long period of service, a worker with 20 years of service with the same employer would be considered a long-service employee.

Figure 7 here

In addition to providing an average benefit that is 50 percent larger than the benefit from the previous traditional plan, almost 85 percent of the hybrid plans provide a benefit at least as valuable as the prior plan benefit for long-service workers. Despite the results shown in Figure 7, some long-service workers are convinced that they are adversely affected by the transition from a traditional pension to a hybrid plan. This is because the probabilities of continuing employment with the same employer until age 55 are very different for these workers than for 30-year-old new hires. Many older workers caught in the conversion to hybrid plans were looking forward to the early-retirement bonanza under their prior plan, and so are disappointed when plan sponsors eliminate or reduce early retirement subsidies. But plan sponsors did a number of things to ameliorate the effects of the transitions on older workers, some of which led to other perceived problems.

The Duration and Changing Nature of Wear-away in the Shift to Hybrid Plans

One of the most controversial aspects of the transition to hybrid plans has been the phenomenon known as “wear-away” of benefits earned under prior plans as workers are transitioned to new plans. Wear-away is often characterized in nominal dollars. In the analysis that follows, wear-away is characterized relative to a worker's earnings at the point that it arises, thus allowing it to be considered more symmetrically with the accrual of benefits in both the prior and the replacement plans. It also allows comparison of the phenomenon that arises in the

shift to hybrid plans with equivalent economic treatment of early retirement subsidies for workers who remain employed under traditional plans beyond early-retirement eligibility. Table 7 shows the percentage of workers with varying years of service where the transition to a hybrid plan resulted in some period of wear-away.

Table 7 here

In developing Table 7, we looked at workers ages 50 and 54 with 10, 15, and 25 years of service at transition. Finally we looked at each worker at two pay levels at the point of transition to the new plans: \$50,000 and \$80,000. For each of the workers, we calculated benefits at transition and in subsequent years until age 65. Wear-away years were those where the balance at the end of the year in the new plan did not exceed the accrued benefit payable under the old plan. The accrued benefit under the old plan was the benefit accrued at the time of transition, adjusted for early retirement subsidies earned after the transition. If the previous plan had an early retirement subsidy that took effect at age 55, a 54-year-old worker who remained with the plan sponsor to age 55 would have a share of the prior plan's early retirement subsidy protected. The protected value is the present value of the early retirement subsidy that had been earned by the worker at the point of transition to the new plan.

In this analysis, we looked at workers age 54 at the time of transition to the new plan, because under most traditional plans such workers were right on the cusp of early retirement eligibility. As we noted earlier, for many workers in this situation, the wear-away phenomenon arises because early retirement subsidies earned under the old plan must be protected in the shift to the new plan. Among those generally not already eligible to receive early retirement subsidies, 54-year-old workers would have accrued the largest early retirement benefits and thus would

have had the largest exposure to wear-away. We looked at 50-year-old workers to show how workers further away from early retirement eligibility were affected.

In one of their papers on the hybrid pension phenomenon, Clark and Schieber (2002) argued that most traditional plans already included a phenomenon that is economically equivalent to the wear-away that occurs in the transition to hybrid plans. Consider a plan that provides a worker an actuarially subsidized benefit at age 62, where the value of the subsidy is equivalent to 1.5 years of pay. Most plans eliminate the subsidy provided at early retirement eligibility age by the time the worker reaches age 65. Economically, the gradual elimination of the early retirement subsidy is virtually identical to wear-away in the transition to hybrid plans. In the case posited here, it is the equivalent of a tax on earnings for a worker who continues to work between the ages of 62 and 65. Eliminating a subsidy worth 1.5 year's pay over three years would be equivalent to a tax of roughly 50 percent of the worker's earnings during those years.

Of the 77 firms analyzed here, all but two of the prior plans featured early retirement subsidies. Among the 75 plans with such subsidies, long-service workers faced the prospect of reduced subsidies from working beyond some age or age and service combination. For example, in 37.7 percent of the plans, a worker with 25 years of service at age 55 would have realized some erosion of the age-55, early retirement subsidy if he or she continued working until age 60. The subsidies would have been reduced in 72.8 percent of the plans for employees who continued to work from ages 60 to 62. And the subsidies in 96.2 percent of the plans would have been reduced for continued work between the ages of 62 and 65.

Table 8 compares the wear-away periods for long-career workers in the transition to their new hybrid plans with those under their former traditional plans. Because there is little difference by salary level, we focus on a worker earning \$50,000. The two workers affected by the

transition to a hybrid plan are taken from Table 7. The right-hand column in Table 8 presents the prospects for a worker just turning age 55 with 30 years of service under the prior plans. This age and service combination is likely to have faced the largest potential early retirement subsidies across the range of plans and would thus have faced the largest potential wear-away of these subsidies.

Table 8 here

For all three of the workers in Table 8, we look at the potential wear-away periods they would encounter by working up to ten additional years. In most cases, the duration of wear-away was less than five years in the transition to hybrid plans. For the older workers in the examples, the early retirement subsidy was granted at transition, but its value eroded over time. In a plan that states benefit values in terms of an accumulated amount, the erosion of the subsidy becomes very apparent because the value of the account remains constant.

A small number of plans had extended periods of wear-away for the three workers in Table 8 during the transition. For the most part, plans with more than six years of wear-away were adopted more than a decade ago. In a couple of cases, the protracted period of wear-away amounted to the equivalent of freezing the old plan. In most cases with protracted wear-away, the plan sponsor reduced plan costs significantly in the shift from a traditional to a hybrid plan. An example is the case depicted earlier in Figure 4. In a couple of cases like this, what created the extended wear-away was using a high interest rate to calculate the initial balance in cash balance plans. This phenomenon was generally eliminated with the 1994 passage of GATT.

The duration of wear-away is only one of its dimensions; the other is magnitude. Referring back to Figure 3, suppose that the accrued and protected benefit from the prior plan was larger than the initial formula balance in the new hybrid plan by one-half year's pay at

transition for a hypothetical worker. Further, assume that in this particular case, the sponsor froze the accrued benefit from the prior plan until the balance under the new plan formula caught up to it. Finally, assume that it took the hypothetical worker four additional years of work under the new plan until the balance equaled the frozen benefit from the old plan. The cumulative value that would be worn away in this case is one-half year's pay. The wear-away rate would be 0.125 percent per year for up to four years (i.e., $0.50 \text{ year's pay} \div 4 \text{ years} = 0.125$) if the worker continued employment under the new plan. In Table 9, we show the wear-away rates in the transition to hybrid plans for the same workers as were used to construct Table 7. The rates are stated as a percentage of the annual wage for a prototypical worker at the time of the transition to the hybrid plan.

Table 9 here

The top panel of the table considers workers transitioned to hybrid plans at two different age and pay levels. It is clear from the table that workers further away from early retirement eligibility were not hit as hard by the wear-away phenomenon as those right at early retirement age in the prior plans. There are some slight differences in the wear-away rates for the workers at the two different earnings levels, but these are relatively minor compared to the differences based on age at transition. Although nearly half the plans imposed no wear-away for the 54-year-old worker, and 83 percent imposed no wear-away for 50-year-old workers, the marginal wear-away rates in a small number of plans were quite high, reaching more than 50 percent of annual pay in a couple of cases. Looking at these rates on an annual basis does give rise to equity issues when one considers that workers are paying payroll taxes, income taxes and incurring work-related expenses. Adding a pension wear-away that costs the equivalent of 30 to 50 percent of pay makes the marginal rewards for work rather paltry.

Comparing the wear-away rates for the workers in the top part of Table 9 with those in the bottom shows that workers with less tenure at the time of transition to the new plans were less affected by wear-away than those with longer service. A larger share of the workers at the 15-year tenure level were not hit at all by wear-away, and those who were generally had lower wear-away rates than their longer-tenured counterparts. Given that wear-away had its largest impact for folks right at early retirement eligibility in most cases, it is not surprising that wear-away has generated such adverse employee reactions. But again, the wear-away in the transition to hybrid plans should be considered in relation to the magnitude of wear-away in the workers' previous plans.

Table 10 shows the rates at which early retirement subsidies were worn away in the prior traditional plans. As in the case of the hybrid plans, the rates in Table 10 are stated as a percentage of the annual wage for a prototypical worker. In this case, we considered a worker with 30 years of service at age 55 because that age and service combination poses the maximum wear-away exposure under most traditional pensions plans.

Table 10 here

The first observation in comparing the wear-away rates in Tables 9 and 10 is that the wear-away rates created by the transition to hybrid plans were no higher than those in the prior plans. This observation, however, obscures the specific plan changes adopted by individual employers. Two of the plan sponsors had no early retirement subsidies in their prior plans and did not create any wear-away in their conversion to hybrid plans. Another 47 percent of the plans did have early retirement subsidies in their original plans but their conversions did not create wear-away. In the traditional plans, the average value of the early retirement subsidies at their peak was 1.09 times one year's pay. On average, the wear-away period for these subsidies was

6.8 years. In these cases, the shift to hybrid plans appears to have largely eliminated an extremely widespread wear-away phenomenon.

The concern about wear-away focuses on the 51 percent of plans that had some period of wear-away for certain workers. But all the prior plans featured in this part of the analysis had early retirement incentives in their prior plans, so they already had wear-away features embedded in them. Table 11 compares the wear-away for the prior plans with that in the replacement plans. The plans have been grouped by the duration over which the retirement subsidies in the original plans were worn away by continued employment beyond the point at which the early retirement subsidy peaked. Comparing the average duration of wear-away in the hybrid plans with that in the original plans indicates that in most cases, the shift to a hybrid plan shortened the period of wear-away. The one exception is where wear-away of the early retirement subsidy occurred in less than five years. This is partly driven by one extreme outlier: a plan that was effectively frozen for many workers in the transition to a hybrid plan. After eliminating the outlier, the average duration of wear-away in the transition to hybrid plans is five years.

Table 11 here

The other element of Table 11 for comparison is the average peak retirement subsidies under the original plans compared to the cumulative wear-away in the hybrid plans, reflecting the maximum cumulative wear-away that workers would face in the two plans. Again, in the first category, the average went up substantially. In the other cases, with one exception, they generally declined moderately. The exception was the single plan where the early retirement subsidy in the original plan was worn away over a nine-year period, and the increase was less than one-quarter's year of pay. Three of the four plans in the first line of the table represent plan conversions that were coupled with significant cutbacks in plan costs. One was a plan conversion

by a company struggling to avoid bankruptcy. Another was a hospital also struggling to remain economically viable.

Overall, our evidence suggests that the shift to hybrid plans did more to reduce the wear-away phenomenon than to create or exacerbate it, with some possible exceptions in cases where the plan sponsor set out to reduce costs. However, comparing Tables 9 and 10 indicates that where wear-away was part of the transition to a hybrid plan, workers in their late 50s faced higher wear-away rates in the conversion to the new plan than they would have faced under their old plans up until age 60 or so. Wear-away rates were at or under 25 percent of annual pay for workers between the ages of 55 and 60 in the prior traditional plans, but were more than 25 percent of annual pay in nearly one-fifth of the transitions to hybrid plans.

But comparing the wear-away rates for workers who were age 54 when their plans were converted with the rates they would have faced under their old plans beyond age 60 gives a very different picture. The traditional plans had marginally higher wear-away patterns for workers between the ages of 60 and 62 — and much higher rates for those between the ages of 62 and 65 — than the rates embedded in the hybrid plan transitions. It appears that the conversions to hybrid plans tended to front load the wear-away phenomenon, which was usually more heavily back loaded in traditional plans.

Undoubtedly shifting the wear-away forward in workers' lifetimes had something to do with the outcry against it. But the more noticeable presence of wear-away in hybrid plans almost certainly fueled the negative reactions. Under the old plans, the erosion of the early retirement subsidies would have been less explicit, because the benefit is typically stated as an annuity rather than as an accumulated balance. In traditional plans, the annual benefit payable at retirement may continue to increase even as early retirement subsidies are eliminated, even

though the present value of the subsidy and in some cases even the present value of the annuity declines with continued work. In plans where the benefit is stated as a lump sum, its failure to increase with additional service is unequivocally obvious.

Table 11 shows the cumulative potential exposure to wear-away for workers right at early retirement where wear-away was a phenomenon both before and after the transition to a hybrid form. Workers would incur the full brunt of this wear-away only if they worked all the way through the wear-away period. The timing and incidence would vary somewhat from plan to plan, depending on the specific plan characteristics. In nearly half the cases, employers structured the new plans to make the wear-away issue moot. In the remaining plans, the cumulative wear-away was generally less in the replacement plans than in the prior plans.

A significant element of wear-away ties back to the discussion about eliminating early retirement subsidies in traditional pensions in the shift to hybrid plans. Many U.S. large employers are moving away from policies put in place to encourage workers to terminate employment somewhere between the ages of 55 and 60. In doing so, they have moved the wear-away periods in their traditional pensions forward in their shift to hybrid plans. But the vast majority of plan sponsors have taken measures to ameliorate the effects of moving the wear-away periods forward as discussed in the following section. In addition, after the transition to these new plans is complete, it will mark the end of the wear-away phenomenon that has been widespread in U.S. defined benefit plans for the last 30 to 40 years.

Transition Benefits Provided to Existing Workers in the Shift to Hybrid Plans

The pattern of benefit adjustments in Table 4 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. Also the discussion about wear-away suggests that many sponsors provided transition benefits so that workers would not experience wear-away periods.

In 88 percent of the plans in this study, the plan sponsor provided some form of transition benefit for affected workers. The nature of the transition benefits varied across plan sponsors and for workers based on their age and tenure under the prior plan at the point of conversion. Table 12 shows how conversions to hybrid plans would have affected workers who were age 50 at the time of conversion with 25 years of service under their old plan if no special provisions had been made. The table indicates the distribution of benefits, including the transition provisions. It also shows benefits as a percent of prior benefits that would have been payable at various ages under the pre-conversion plans.

The transition benefits significantly ameliorated the adverse effects of the plan changes. Without transition benefits, in 49.5 percent of the hybrid plans, 50-year-old workers with 25 years of service who retired at age 55 would have received less than 75 percent of the benefit they would have received under their prior plan. Fully 78 percent of the plans would have provided a smaller benefit than the prior plan. With transition benefits factored in, however, only 18.2 percent of the plans paid a benefit less than three-quarters of the benefit in the prior plan. Only about one-third of the plans paid less than the prior benefit level for the worker described above. The implications of transition benefits were similar for workers who continued to work until later ages, up until age 65.

Table 12 here

Table 13 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 clear. The closer a worker was to retirement and the longer the period of service before the plan

conversion, the greater the transition protection offered by the plan sponsor. Nearly two-thirds of 50-year-old workers with 25 years of service were fully grandfathered in their old plan benefit if they retire at age 55 under their new plan. For those who wait until age 65, however, the share of grandfathered workers drops to less than half, 46.7 percent. For workers age 50 at the time of conversion, the likelihood of being grandfathered or receiving higher benefits rose with years of service. Just over half, 54.5 percent, of workers aged 50 with 10 years of service at conversion were fully grandfathered for retirement at age 55. Only about one-third of workers at this age and service would be grandfathered in their old plan benefit if they wait until age 65 to retire.

Table 13 here

The bottom panel in the table shows the benefits for a 40-year-old worker with 10 years of service at the time of plan conversion. Note the benefits are shown for a slightly different set of ages than those for the 50-year-old workers in the table. For the younger workers, the pattern of benefits under a hybrid plan for those who terminate employment before 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 before 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 was not as generous as it was for their older counterparts. Slightly more than two-thirds of the 50-year-olds with 10 years of service received some grandfather protection or actually came out better off under the new plan. Only half the 40-year-olds will fare so well if they delay retirement to age 60.

Table 14 provides somewhat more detail on two of the workers in Table 13. In each case, we assume the 50-year-old worker earns \$60,000 per year. In the first and second panels of Table

14, the worker has 25 years of service, and in the third and fourth ten 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 made to defined contribution plans in conjunction with the shift to a hybrid plan, which can help ameliorate the potential adverse effects of such a shift. Of the 77 plans in the analysis, 24 introduced some enhancement to their defined contribution plan in conjunction with adopting a hybrid plan. In calculating 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 were quite moderate, especially for workers affected late in their careers.

Table 14 here

Table 15 is similar to Table 14, but it includes younger workers with fewer years of service at the time of the shift to a hybrid plan. At pre-retirement ages, most of these workers were better off under the new plans than the prior ones. Although fewer of these workers were eligible for transition benefits than their older counterparts, a substantial number of plans provided transition benefits of some sort even for these relatively young workers.

Table 15 here

Winning or Losing in the Shift to a Hybrid Plan

Throughout much of this discussion, we have talked about benefit reductions experienced by some workers 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 view them in an objective context. These benefit reductions are reductions against prior plans. While any change to workers' compensation packages raises certain equity questions, there have been questions about the fairness of accrual patterns in traditional pensions for years. Specifically, it is well known that these plans favor workers with longer job tenure over workers who change jobs more frequently. Hybrid plans typically do not provide the same relative advantage to workers with long tenures ending with retirement, compared to those with shorter tenures or who leave before retirement eligibility. Hybrid plans tend to distribute benefits more evenly than traditional plans.

In a number of highly publicized cases, some workers who have been shifted to a hybrid pension have been highly vocal about the inequity of the shift. In some cases, these workers will ultimately accrue less benefits under their new plan than they would have under the old, and from that perspective, it is easy to understand why they are upset. Traditional defined benefit plans have generally provided a tremendous advantage to a relatively small number of workers. While some advantage appears to prevail under the new hybrid plans for workers who stay to retirement age, hybrid plans eliminate much of the differential relative to workers departing before early retirement eligibility. If the focus is exclusively on those who were formerly big winners under traditional plans, the complaints are understandable. But focusing on the total distribution of benefits under the hybrid plans shifts the perspective considerably. One can only make the case for unfairness to those adversely affected in the shift to hybrid plans if one agrees that traditional pension plans were fair to begin with, and that the accrual reflected in Table 6 is somehow inequitable for long-service workers.

Table 1. Features of Alternative Employer-Sponsored Retirement Plans

Plan feature	Defined benefit plan	Defined contribution plan	Hybrid plan	Hybrid plan tendency
Employer contributes	Virtually always	Sometimes	Virtually always	DB
Employee contributes	Very rarely	Virtually always	Very rarely	DB
Participation	Automatic	Employee choice	Automatic	DB
Contribution level	Automatic	Employee choice	Automatic	DB
PBGC Insurance	Yes but capped	Not needed	Yes but capped	DB
Early departure penalty	Yes	No	No	DC
Benefits easily portable	No	Yes	Yes	DC
Annual communication	Benefit at end of career	Current balance	Current balance	DC
Retirement incentives	Occur at specific ages	Neutral	Most are neutral	DC
Accrual of benefits	Loaded to career end	Level over career	Level or back loaded	Mixed
Financial market risks	Employer bears	Employee bears	Shared	Mixed
Longevity insurance	Typically yes	Typically no	Not often taken	Mixed

Source: Developed by author.

Table 2. Benefits under Hybrid Plans Relative to Benefits under Prior Traditional Defined Benefit Plans for Selected Workers

Hybrid plan benefit as a percentage of prior plan's benefit	New hire age 30 at transition		Worker age 50 with 20 years service at transition	
	At age 40	At age 60	At age 50	At age 60
	Percent of plans	Percent of plans	Percent of plans	Percent of plans
25 to 49	0.0	10.4	0.0	7.8
50 to 74	1.3	41.6	1.3	23.4
75 to 99	0.0	26.0	5.2	23.4
100 exactly	2.6	5.2	20.8	24.7
100 to 124	3.9	9.1	20.8	18.2
125 to 149	5.2	6.5	19.5	2.6
150 to 199	23.4	1.3	16.9	0.0
200 to 299	41.6	0.0	14.3	0.0
300 to 399	15.6	0.0	1.3	0.0
400 or more	6.5	0.0	0.0	0.0
Minimum	68.5	25.4	68.4	37.4
Maximum	816.7	150.0	301.1	144.3
Mean	250.0	77.9	144.0	86.6
Standard deviation	126.3	28.3	50.9	23.0

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

Table 3. Benefits under Pension Equity and Cash Balance Plans Relative to Benefits under Prior Traditional Defined Benefit Plans for a Worker Hired at Age 30

Hybrid plan benefit as a percentage of prior plan's benefit	Benefits at age 40		Benefits at age 60	
	PEP plan	Cash balance plan	PEP plan	Cash balance plan
	Percent of plans	Percent of plans	Percent of plans	Percent of plans
25 to 49	0.0	0.0	10.4	8.7
50 to 74	0.0	2.2	41.6	47.8
75 to 99	0.0	0.0	26.0	19.6
100 exactly	3.2	2.2	5.2	4.3
100 to 124	6.5	2.2	9.1	10.9
125 to 149	6.5	4.3	6.5	6.5
150 to 199	25.8	21.7	1.3	2.2
200 to 299	38.7	43.5	0.0	0.0
300 to 399	12.9	17.5	0.0	0.0
400 or more	3.2	6.5	0.0	0.0
Minimum	100.0	68.5	25.4	29.9
Maximum	816.7	783.5	150.0	150.0
Mean	243.1	254.7	77.9	78.7
Standard deviation	133.6	122.4	28.3	29.2

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

Table 4. 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: Author's computation from data provided by Watson Wyatt Worldwide.

Table 5. Winners and Losers and Gains and Losses for Workers Shifted into a Hybrid Pension with the Same Cost as the Prior Plan

Tenure at time of conversion	Age at time of conversion to the 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	
	<i>Percentage of workers whose benefits increased or stayed the same</i>						
0 to 4.9	99.8	88.9	85.4	91.2	93.7	95.1	91.5
5 to 9.9	99.8	86.6	74.0	72.7	82.5	92.4	83.1
10 to 14.9	98.0	83.8	66.3	67.0	70.4	85.7	74.8
15 to 19.9		80.0	66.2	70.3	71.3	85.9	71.4
20 to 24.9		65.8	67.9	68.3	69.3	85.0	68.9
25 to 29.9			69.4	63.7	71.1	83.6	68.8
30 +			68.6	66.7	66.2	85.5	71.4
Total	99.7	85.8	71.9	70.3	72.7	87.0	79.4
	<i>Percentage increase in lifetime benefits for the above</i>						
0 to 4.9	22.5	26.6	25.0	20.8	16.8	12.5	21.7
5 to 9.9	23.3	22.4	21.7	19.1	14.7	9.8	18.9
10 to 14.9	24.3	18.4	20.2	16.7	14.8	9.3	18.0
15 to 19.9		20.0	20.0	17.9	16.5	9.7	16.7
20 to 24.9		21.4	19.4	17.0	14.8	8.1	15.8
25 to 29.9			17.9	17.3	14.4	10.0	14.5
30 +			17.0	15.7	14.6	8.3	13.1
	<i>Percentage of workers whose benefits decreased</i>						
0 to 4.9	0.2	11.1	14.6	8.8	6.3	4.9	8.5
5 to 9.9	0.2	13.4	26.0	27.3	17.5	7.6	16.9
10 to 14.9	2.0	16.2	33.7	33.0	29.6	14.3	25.2
15 to 19.9	0.0	20.0	33.8	29.7	28.7	14.1	28.6
20 to 24.9	0.0	34.2	32.1	31.7	30.7	15.0	31.1
25 to 29.9	0.0	0.0	30.6	36.3	28.9	16.4	31.2
30 +	0.0	0.0	31.4	33.3	33.8	14.5	28.6
Total	0.3	14.2	28.1	29.7	27.3	13.0	20.6
	<i>Percentage decrease in lifetime benefits for those whose benefits decreased</i>						
0 to 4.9	14.1	13.6	17.3	13.4	8.8	4.8	
5 to 9.9	10.2	14.5	21.0	18.2	11.7	4.1	
10 to 14.9	0.3	14.8	22.0	21.2	13.6	5.8	
15 to 19.9		12.5	23.0	20.4	15.9	6.2	
20 to 24.9		8.6	19.2	19.3	11.9	6.9	
25 to 29.9			20.9	19.1	14.4	4.8	
30 +			17.7	18.6	14.1	6.4	

Source: Brown et al., (2000).

Table 6. Future Pension Accruals as a Percentage of Pay for Workers Shifted into a Hybrid Plan with the Same Cost as the Prior Plan by Age and Service at Date of Shift

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
	<i>Future pension accrual rate as a percent of pay for those winning or held harmless</i>					
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
	<i>Future pension accrual rate as a percent of pay for losers</i>					
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: Brown et al., (2000).

Table 7. Percentage of Plans with Wear-away for Selected Workers

Duration of wear-away phenomenon	Annual pay level			
	\$80,000 Age 54 at transition	\$50,000	\$80,000 Age 50 at transition	\$50,000
25 years of service				
None	49.3 %	49.3 %	83.1 %	85.7 %
1 year	7.8	9.1	3.9	2.6
2 years	7.8	6.5	1.3	2.6
3 years	7.8	9.1	1.3	0.0
4 years	15.6	14.3	2.6	3.9
5 years	2.6	3.9	1.3	0.0
6 years	3.9	2.6	0.0	0.0
7 to 9 years	2.6	2.6	2.6	2.6
10 years or more	2.6	2.6	3.9	2.6
15 years of service				
None	58.4	58.4	87.0	87.0
1 year	10.4	10.4	1.3	2.6
2 years	9.1	11.7	2.6	2.6
3 years	3.9	3.9	3.9	2.6
4 years	7.8	5.2	0.0	1.3
5 years	3.9	6.5	1.3	0.0
6 years	2.6	0.0	1.3	1.3
7 to 9 years	2.6	2.6	0.0	1.3
10 years or more	1.3	1.3	2.6	1.3
10 years of service				
None	57.1	56.1	87.0	88.3
1 year	14.3	16.9	3.9	2.6
2 years	9.1	10.4	1.3	2.6
3 years	7.8	5.2	2.6	1.3
4 years	5.2	5.2	2.6	1.3
5 years	1.3	1.3	0.0	1.3
6 years	2.6	1.3	0.0	0.0
7 to 9 years	1.3	1.3	1.3	0.0
10 years or more	1.3	2.6	1.3	2.6

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

Table 8. Periods of Wear-away in the Transition to Hybrid Plans Compared with Those in Prior Plans

Duration of wear-away phenomenon	Workers covered in hybrid plan		Worker in prior plan as of turning age 55
	Age 54 at transition	Age 50 at transition	
None	49.3 %	85.7 %	2.6 %
1 year	9.1	2.6	0.0
2 years	6.5	2.6	1.3
3 years	9.1	0	5.2
4 years	14.3	3.9	5.2
5 years	3.9	0	23.4
6 years	2.6	0	11.7
7 to 9 years	2.6	2.6	14.3
10 years or more	2.6	2.6	22.1

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

Table 9. Percentage of Plans with Specified Annual Wear-Away Rates in the Transition from Traditional Defined Benefit to Hybrid Plans, as a Percentage of Annual Earnings for Selected Workers

Wear-away rate as a percentage of annual pay	Annual pay level at transition			
	\$80,000 Age 54 at transition	\$50,000	\$80,000 Age 50 at transition	\$50,000
25 years of service at transition				
	49.3	49.3	83.1	
0 %	%	%	%	85.7 %
0.01 to 4.95	3.9	6.5	3.9	2.6
5.0 to 9.95	9.1	3.9	2.6	1.3
10.0 to				
14.95	5.2	10.4	3.9	3.9
15.0 to				
19.95	10.4	9.1	1.3	1.3
20.0 to				
24.95	1.3	6.5	1.3	2.6
25.0 to				
29.95	7.8	5.2	1.3	0.0
30.0 to				
34.95	5.2	3.9	0.0	1.3
35.0 to				
39.95	3.9	2.6	1.3	1.3
40.0 to				
44.95	0.0	0.0	1.3	0.0
45.0 to				
49.95	1.3	1.3	0.0	0.0
50.0 to				
54.95	2.6	1.3	0.0	0.0
15 years of service at transition				
0 %	58.4	59.7	88.3	87.0
0.01 to 4.95	9.1	7.8	1.3	1.3
5.0 to 9.95	7.8	7.8	6.5	7.8
10.0 to				
14.95	9.1	10.4	1.3	2.6
15.0 to				
19.95	9.1	10.4	2.6	1.3
20.0 to				
24.95	3.9	3.9		
25.0 to				
29.95	2.6			

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

Table 10. Annual Wear-Away Rates of Early Retirement Subsidies under Prior Traditional Defined Benefit Plans for Plans Converted to Hybrid Plans, as a Percentage of Annual Earnings for a Long-Service Worker

Wear-away rate	Ages 55 to 60	Ages 60 to 62	Ages 62 to 65
	(Percent of plans)		
0.0	48.1 %	24.7 %	3.9 %
0.05 to 4.95	29.9	18.2	7.8
5.0 to 9.95	13.0	19.5	18.2
10.0 to 14.95	0.0	9.1	9.1
15.0 to 19.95	7.8	7.8	9.1
20.0 to 24.95	1.3	3.9	9.1
25.0 to 29.95	0.0	5.2	7.8
30.0 to 34.95	0.0	5.2	9.1
35.0 to 39.95	0.0	5.2	13.0
40.0 to 49.95	0.0	1.3	11.7
50.0 to 54.9	0.0	0.0	1.3

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

Table 11. Comparison of the Magnitude and Duration of Wear-away in the Shift to a Hybrid Plan with that in Prior Plans for a Worker Age 54 with 25 Years of Service

Situation in prior traditional plans			Average for hybrid plans	
Duration of wear-away in years	Number of plans	Average peak retirement subsidy	Duration of wear-away	Cumulative wear-away
LT 5	4	0.97	6.75	2.26
5	10	1.04	3.30	0.94
6	5	1.05	4.00	1.03
7	4	0.95	2.75	0.48
8	6	1.62	4.67	1.56
9	1	1.83	6.00	2.06
10	9	0.73	2.78	0.43

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

Table 12. 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: Author's computation from data provided by Watson Wyatt Worldwide.

Table 13. Effects of Adoption of Hybrid Pensions on Benefit Levels of Hypothetical Workers Based on Age and Tenure at the Time of Plan Conversion (Note: Benefit changes do not include marginal improvements in defined contribution plans)

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: Author's computation from data provided by Watson Wyatt Worldwide.

Table 14. Effects of Adoption of Hybrid Pensions on Benefit Levels of Hypothetical Workers Based on Age and Tenure at the Time of Plan Conversion

	At age 55	At age 60	At age 62	At age 65
	(percent of plans)			
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

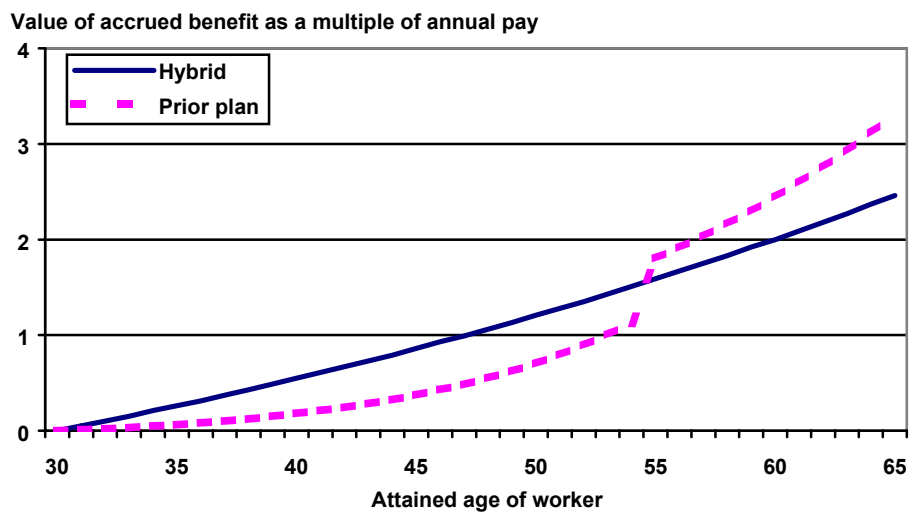
Source: Author's computation from data provided by Watson Wyatt Worldwide.

Table 15. Effects of Adoption of Hybrid Pensions on Benefit Levels of Hypothetical Workers Based on Age and Tenure at the Time of Plan Conversion

	At age 50	At age 55	At age 60	At age 65
	(percent of plans)			
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	77.9	40.3	32.5	42.9
Transition benefit & total benefits rise	10.4	3.9	5.2	6.5

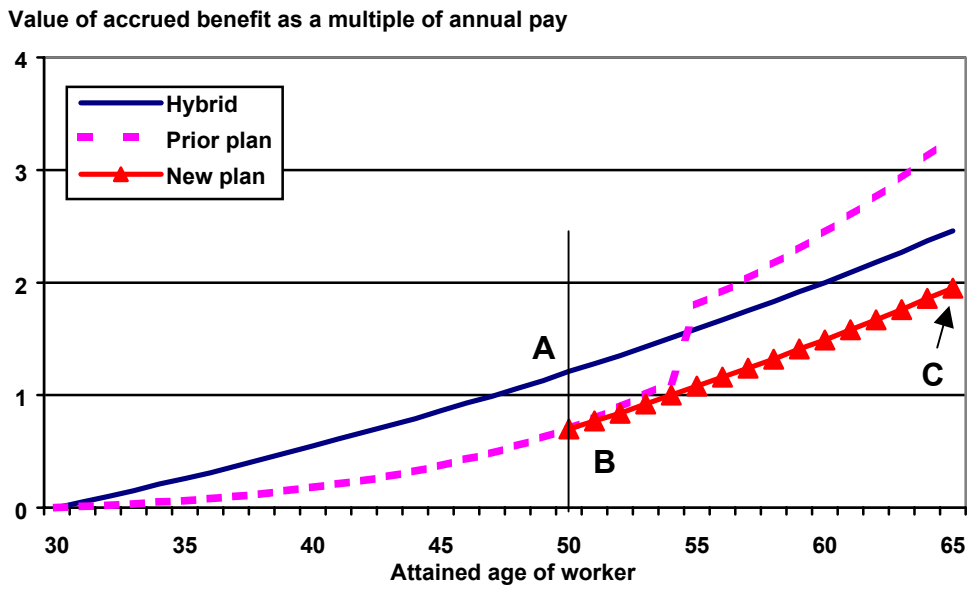
Source: Author's computation from data provided by Watson Wyatt Worldwide.

Figure 1. Value of Accrued Benefits as a Multiple of Annual Wage at Various Ages for a New Hire at Age 30 with a Starting Wage of \$40,000 under Alternative Plans



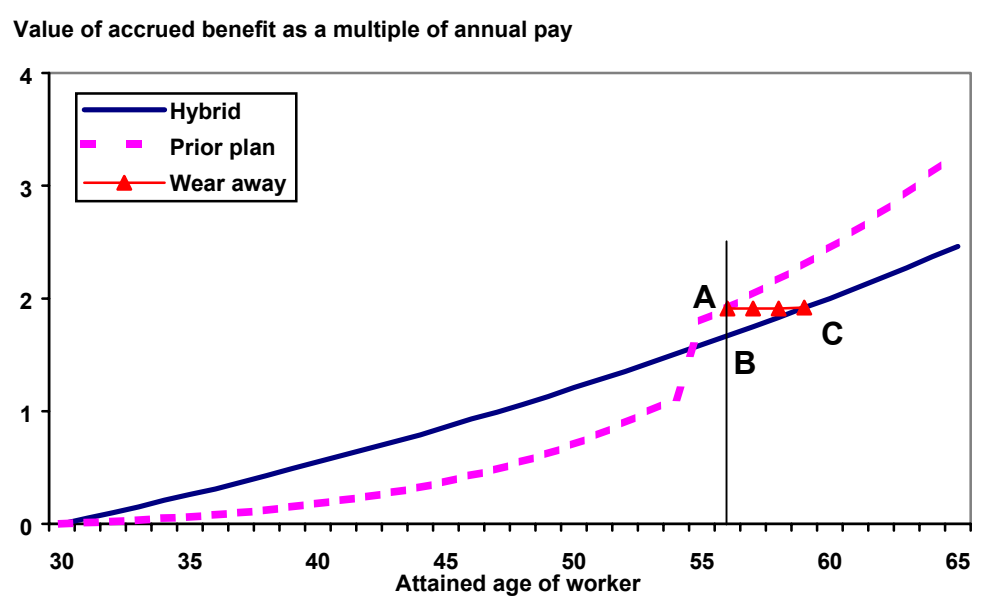
Source: Derived by the author.

Figure 2. Potential Benefit Accruals as a Multiple of Annual Wage for a Worker Age 50 with 20 Years Service at Conversion under Alternative Plans



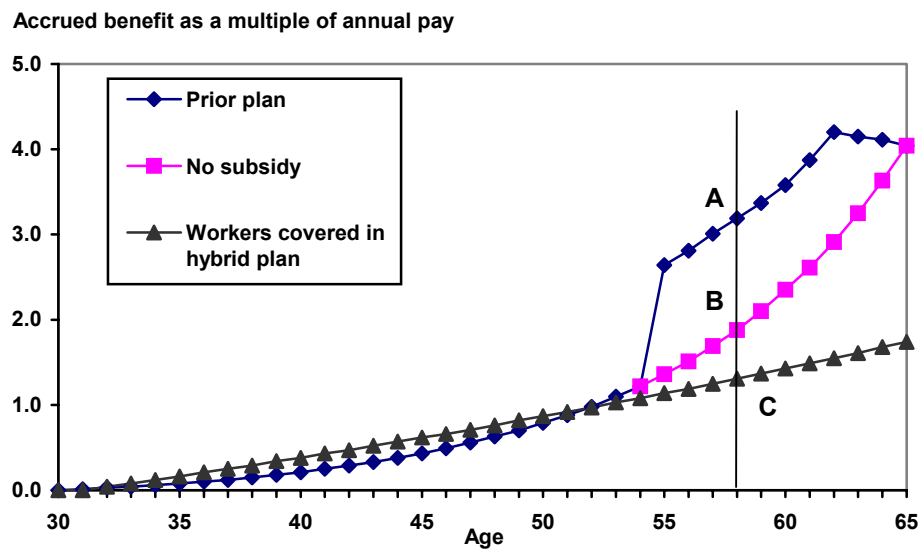
Source: Derived by the author.

Figure 3. Potential Benefit Accruals as a Multiple of Annual Wage for a Worker Age 56 with 31 Years of Service at Conversion under Alternative Plans



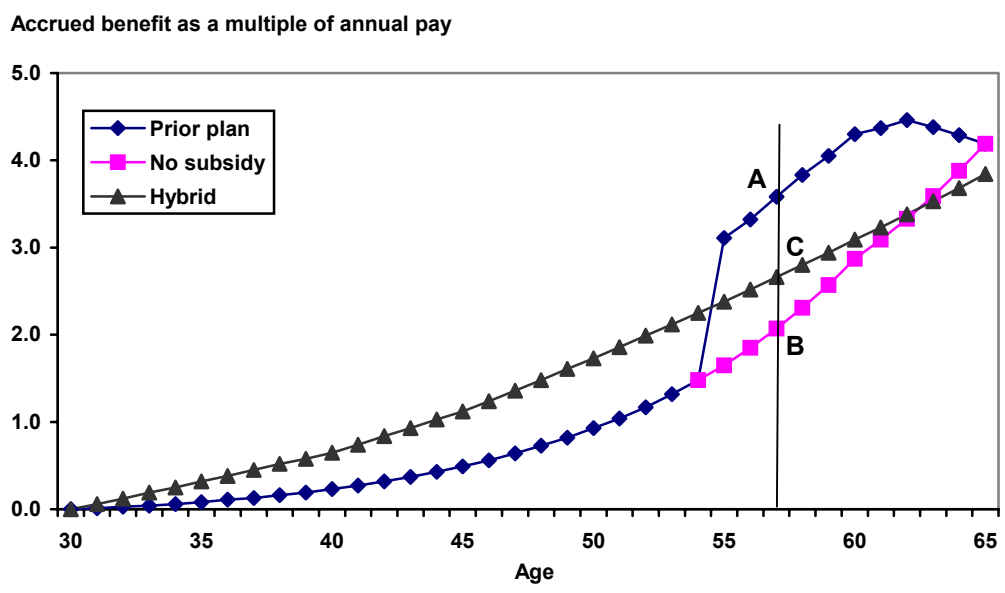
Source: Derived by the author.

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 1



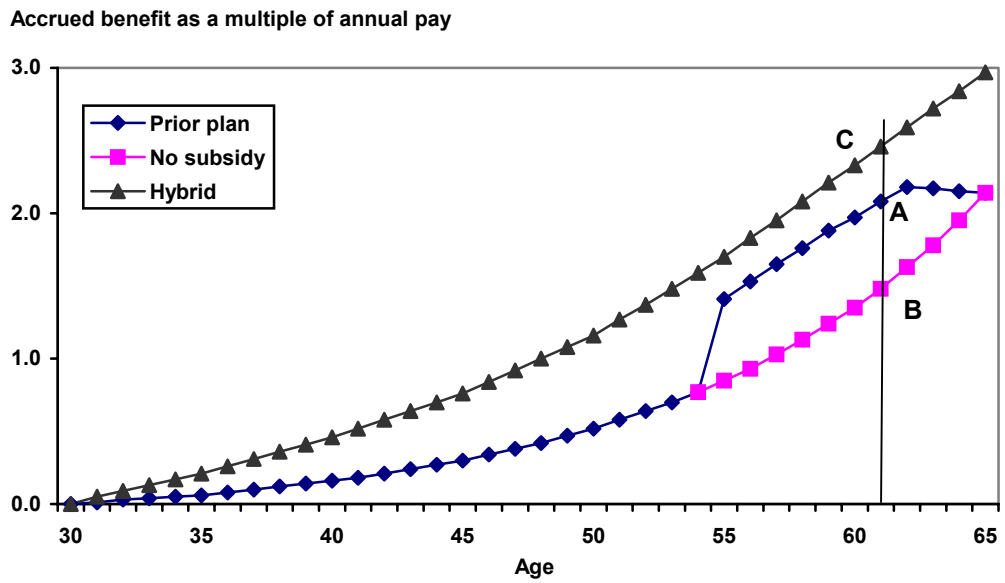
Source: Derived by the author.

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 2



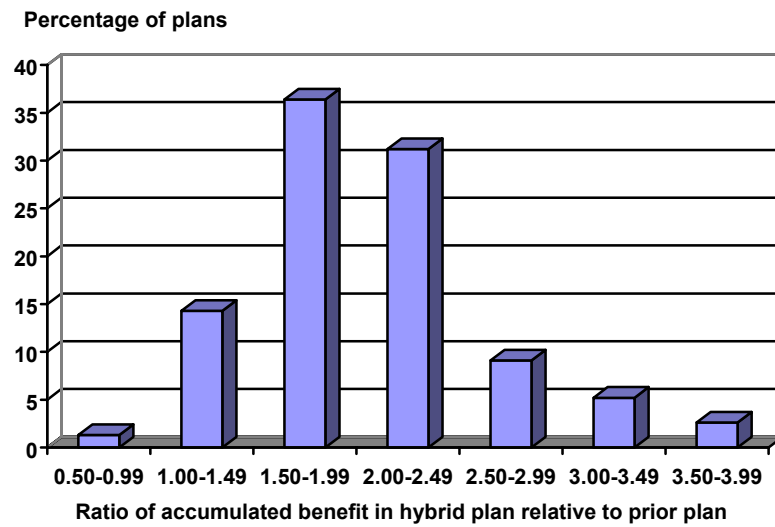
Source: Derived by the author.

Figure 6. 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: Derived by the author.

Figure 7. Distribution of Pension Values at Age 50 for a Worker with 20 Years of Service under Hybrid Plans Relative to Prior Traditional Pension Plans



Source: Brown et al., (2000).

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Endnotes

¹ The analysis in this chapter draws heavily on the prior work that the authors of this text have undertaken with a number of other authors. Most particularly, Professor Robert Clark from North Carolina State University must be mentioned for his work on several prior research efforts into hybrid pensions. In addition, Gordon P. Goodfellow, Tomeka Hill, Richard Joss, Richard Luss, and Lex Miller have contributed to the earlier studies. We cite the specific materials that we have drawn on at various appropriate places in the text.

² Some plans have recently begun to offer participants in cash balance plans returns keyed to a range of portfolio investment options, which would create the same investment risks as exist in defined contribution plans where asset investment is self-directed.

³ In making these comparisons we had to make certain assumptions about wage growth, returns on account balances and the like. We assumed each of the workers would realize steady wage growth of 4 percent per year over the calculation periods. For plans integrated with Social Security, we assumed the wage base would grow at a rate of 3.5 percent per year. In the case of cash balance plans, most of them credit interest to accumulating balances by linking to some index measure. For those that follow long-term Treasury yields, we credited accounts with 7 percent interest per year. For those that follow intermediate yields, we credited them at 6.5 percent per year. For those using short-term rates, the crediting rate used was 5.5 percent. For those with a stated percentage credit rate in their plan, we used the stated percentage for annual interest crediting. In estimating the lump-sum values of traditional plans, we used a 7 percent discount rate and the GAM-83 life table with a three-year setback

⁴ In order to comply with ERISA, the plan must provide the participant a benefit at least equal to the accrued benefit on date of conversion. The initial account balance, however, does not have to be at least the present value of the participant's accrued benefit.