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PENSION WEALTH AND INCOME: 1992, 1998, AND 2004

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Introduction

What is the impact of the shift from defined benefit to defined contribution plans on the pension wealth of households approaching retirement? Using data from the *Health and Retirement Study,* this *brief* documents this shift and compares employer-sponsored pension wealth across households with heads age 51-56 in 1992, 1998, and 2004. The results show that, for the average household, both pension wealth and replacement rates — the ratio of annual benefits to pre-retirement earnings — fell between 1992 and 2004.

Increasing Importance of Employer-Sponsored Plans

In the near future, households will increasingly have to rely on their savings and employer-sponsored pensions for retirement income. While Social Security currently replaces around 40 percent of pre-retirement income for the average household, its role is declining for three reasons.[1]

First, the increase in Social Security's Full Retirement Age from 65 to 67 will result in a reduction of benefits relative to pre-retirement earnings. Second, Medicare premiums, which are deducted before the Social Security check goes in the mail, are slated to rise dramatically. Finally, a greater share of benefits will be taxable under the personal income tax because the threshold levels above which benefits become taxable are not indexed for inflation or wage growth.

As the contribution of Social Security to retirement income declines, it becomes ever more important that households have adequate employer-sponsored pensions, especially since most households save very little outside of these plans.[2] While the proportion of households with pension coverage has remained stable since the 1970s, the structure of the plans has changed substantially. In the past, pension coverage in the private sector was dominated by defined benefit plans. In recent years, however, defined contribution plans have begun to replace defined benefit plans.

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The structures of these two types of plans are very different and both have their own advantages. In defined benefit plans, benefits are paid in the form of a guaranteed lifetime income based on tenure and pre-retirement earnings. Hence, they provide a predictable benefit payable for life. On the downside, workers who change jobs frequently are unlikely to accumulate significant defined benefit wealth. In contrast, with defined contribution plans, workers are able to transfer their account balances to new plans or roll them over into an Individual Retirement Account (IRA) when they change jobs. However, participants assume all investment and longevity risk in defined contribution plans. Most importantly, participation is generally voluntary. If employees fail to enroll in the plan, they accrue no benefits.

Trends in Pension Coverage

This section examines changes in types of employer-sponsored pension coverage between 1992 and 2004 using self-reported data from three cohorts of the *Health and Retirement Study* (HRS).[3] In 1992, the original HRS collected data on individuals born between 1931 and 1941, and their spouses. In 1998, those born between 1942 and 1947, and in 2004 those born between 1948 and 1953 were added. In order to make comparisons across cohorts, this study focuses on households with heads age 51 to 56 in 1992, 1998, and 2004 (see Appendix A).

Consistent with findings from other data sources, the HRS documents stable pension coverage over this twelve-year period (see Table 1).[4] Coverage is measured as pension coverage on current job. Most surveys present such information for individuals and report numbers around 50 percent. The numbers reported below are for households where the head works and therefore are somewhat higher.[5] The message, however, is the same: overall private pension coverage changed very little over this period. In 1992, 62 percent of households were covered by an employer-sponsored plan. In 2004, the number was 66 percent.

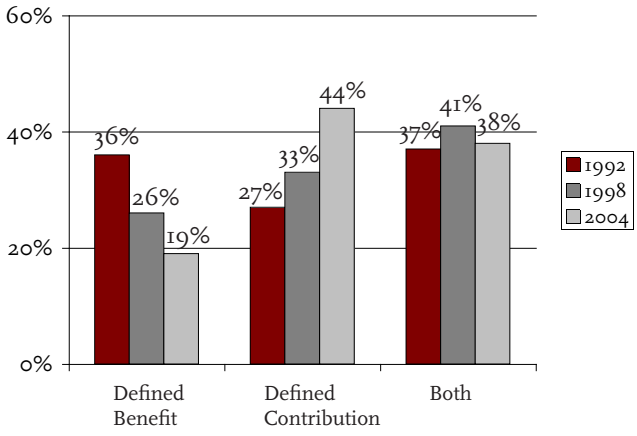
Table 1. Private Pension Coverage, Households with Heads Age 51 to 56 Working for Pay, 1992, 1998, and 2004

	HRS cohort		
	1992	1998	2004
Percent with pension coverage	62.2%	68.6%	65.9%

Source: Authors' calculations from University of Michigan, *Health and Retirement Study* (HRS), 1992, 1998, and 2004.

While overall pension coverage remained stable, the proportion of older households with pensions relying solely on a defined benefit plan declined from 36 percent in 1992 to 19 percent in 2004 (see Figure 1). In 1992, 27 percent of households depended only on defined contribution plans for retirement income and 37 percent had both defined contribution and defined benefit plans. By 2004, 44 percent of households had a defined contribution plan as their only pension, and 38 percent had both types. These changes in coverage demonstrate that, throughout the 1990s and early 2000s, defined contribution plans have become much more prevalent as employers have generally shifted away from defined benefit plans.

Figure 1. Households 51-56 with Pension Coverage, by Pension Type, 1992, 1998, and 2004



Source: Authors' calculations from the 1992, 1998, and 2004 HRS.

Changes in Household Pension Wealth

It is evident that pension coverage has shifted towards defined contribution plans, but how did this shift affect pension wealth? To answer this question, the current values of household pension wealth are compared across the three HRS cohorts.[6] Along with total pension wealth, pension wealth accumulated in defined benefit and defined contribution plans is considered separately. This study includes IRAs in calculations of defined contribution plan balances. Although IRAs are not employer sponsored, the bulk of IRA balances are rollovers from defined contribution plans from previous employers and therefore should be included in calculations of pension wealth.

Defined benefit "wealth" is defined as the present value of the stream of benefits that a household will receive from the date of expected retirement until death, discounted by an interest rate and annual survival probabilities. In the HRS, individuals have an option to report expected benefits either as dollar amounts or as a percentage of their final pay. When benefits are reported as a percentage of final pay, annual benefit payments are estimated using the employee's expected years of service and projected earnings. Expected years of service are calculated based on the assumption that respondents start receiving benefits at age 62.[7] Projected earnings are estimated as current earnings increased by 1 percent per year in real terms through the expected date of retirement. Benefits expressed in dollar terms are assumed to increase at the same rate as current earnings under the assumption that individuals do not incorporate earnings growth into their estimates of projected pension income. Some individuals expect to receive defined benefit pensions from more than one employer. Unless individuals report that benefits were lost when they changed employers, benefits from current and previous employers are included in the calculation.[8]

Anticipated annual benefits are first discounted back to age 62 by a rate of interest and annual survival probabilities. To prevent changes in real interest rates and inflation expectations from distorting trends in defined benefit wealth, we calculate 1992, 1998, and 2004 wealth projections at age 62 at a discount rate equal to the 1992 yield on the 10-year Treasury bond (see Appendix B). This assumption, however, understates the value of defined benefit wealth in 1998 and 2004 relative to 1992 since inflation is lower and defined benefit wealth is more valuable.

Two further adjustments are made in order to make the measure of defined benefit wealth comparable with current balances in defined contribution plans. First, wealth at age 62 is further discounted to the current date, using the 1992 real interest rate. Second, discounted expected wealth is prorated to reflect the fact that workers have not finished their careers and are still accumulating benefits. Take the case of a 52-year-old with ten years of service who expects defined benefit wealth of $100,000 at age 62. Discounted to the current date, these benefits are worth approximately $75,000. This worker has worked for the company since age 42, and therefore has completed only 50 percent of his 20-year tenure (62 years minus 42 years). So, the $75,000 expected benefit is multiplied by 50 percent to reflect benefits earned to date, producing a value of $37,500.

Table 2 shows median pension wealth in 2006 dollars for households with pension coverage from a particular source. Two facts emerge from the results. First, pension wealth, conditional on having a particular type of pension, held steady or increased. Defined benefit wealth hovered around $115,000, while defined contribution/IRA balances and pension balances of households with both types of coverage increased by $7,000 and $9,000 respectively.[9] Second, even in 2004, the average defined contribution plan balance was still substantially less than average defined benefit wealth. If defined contribution plans are displacing defined benefit plans, and if defined contribution plans are, on average, less valuable, it is entirely possible for average pension wealth to be declining, even when the average balance held in each type of plan is increasing.

Table 2. Median Prorated Pension Wealth for Households Age 51-56 Expecting Pension from Source, 1992, 1998, and 2004 (2006 dollars)

Pension asset	HRS cohort		
	1992	1998	2004
Defined Benefit	$115,302	$111,960	$114,609
Defined Contribution/IRA	$43,107	$37,104	$49,626
Both	$233,090	$239,806	$241,805

Source: Authors' calculations from the 1992, 1998, and 2004 HRS. See Appendix C for a detailed description of the calculations.

Table 3 shows that this potential outcome is exactly what has happened. It presents average pension wealth by plan type for working households in the middle quintile of the earnings distribution.[10] The key finding from this analysis is that the typical household saw a decline in pension wealth from $127,000 in 1992 to $114,000 in 2004. An increase in defined contribution and IRA wealth from $35,000 in 1992 to $48,000 in 2004 was not enough to offset a decline in defined benefit wealth from $92,000 to $66,000.[11] The pattern mirrors the decrease in defined benefit pension coverage and increase in defined contribution coverage.

Table 3. Mean Pension Wealth of Households Age 51-56 in Middle Quintile of Earnings Distribution, 1992, 1998, and 2004 (2006 dollars)

Pension asset	HRS cohort		
	1992	1998	2004
Defined Benefit	$92,008		$65,605
Defined Contribution/IRA	$35,239	$44,581	$48,194
Total		$125,498	$113,799

Source: Authors' calculations from the 1992, 1998, and 2004 HRS.

Changes in Replacement Rates

In assessing changes in pension replacement rates for the average household from 1992 to 2004, several factors must be taken into account. First, over the twelve years, the life expectancy of an average 65-year old increased by about one year so that annuity rates would have declined, even if interest rates had remained at 1992 levels.[12] Second, nominal long-term interest rates (the yield on 10-year Treasury Bonds) declined from 7.0 percent to 4.7 percent, reflecting declines in both inflation expectations and real interest rates. This decrease in the nominal interest rate further reduced the annuity payments that a 2004 household could expect at retirement from defined contribution/IRA account balances relative to a comparable household in 1992. Third, over this period the real household earnings of those age 51-56 in the middle quintile of the earnings distribution increased by about 5 percent, from $50,000 to $52,300, so that a given amount of retirement income replaced a smaller proportion of pre-retirement earnings in 2004 than in 1992.[13]

Table 4 reports projected pension income as a percent of current household earnings for households age 51-56 in the middle quintile of the distribution of households with earnings. It is based on current defined contribution balances and defined benefit pension entitlements accrued to date and therefore measures a household's progress towards achieving a sustainable replacement rate in retirement and is easily comparable across years.[14]

Between 1992 and 2004, the defined benefit income that the average household could expect at retirement decreased by almost a third from $11,100 to $8,000, reflecting the displacement of defined benefit by defined contribution plans. At the same time though, projected annual income from defined contribution plans/IRAs increased only modestly, from $4,900 to $5,700. The bottom line is that projected income from employer-sponsored plans decreased over the period from $16,100 to $13,700 while household earnings increased from $50,000 to $52,300.[15] These changes account for the noticeable decline in household replacement rates from 32 percent in 1992 to 26 percent in 2004.

Replacement rates calculated in this fashion do not reflect the final replacement rates that households will realize at retirement. They do not take into ac-

Table 4. Replacement Rates, Annual Benefits, and Earnings for Households Age 51-56 in Middle Quintile of Earnings Distribution (2006 Dollars)[16]

Item	HRS cohort		
	1992	1998	2004
Replacement rates	32.1%	29.7%	26.2%
Defined Benefit income	$11,137	$9,912	$8,039
Defined Contribution income	$4,921	$5,763	$5,683
Total	$16,058	$15,675	$13,722
Earnings	$50,013	$54,483	$52,281

Source: Authors' calculations from the 1992, 1998, and 2004 HRS.

count future contributions to defined contribution plans or continued accruals under defined benefit plans. This exclusion is important, as projections of plan balances are very sensitive to such assumptions.[17]

Conclusion

It is clear that both pension wealth and its composition have changed over the period 1992-2004. The typical household with a head age 51-56 had about $114,000 in pension wealth in 2004, about 11 percent less than its counterpart in 1992. Defined benefit plan coverage and wealth declined, but defined contribution plan participation and plan balances increased. These increases, however, were not enough to maintain average household benefits and replacement rates at their 1992 levels. Between 1992 and 2004, the ratio of expected benefits to total current earnings of households declined from 32 percent to 26 percent, indicating that the typical household was less prepared for retirement in 2004 than in 1992. These results are just one more indication that the retirement landscape is becoming more challenging for America's workers.

Endnotes

1 Munnell (2003).

2 Munnell, Golub-Sass, and Varani (2005).

3 While this study relies on self-reported information, a number of studies have used employer-provided pension plan description information and/or Social Security earnings histories, which can be obtained as a part of the HRS restricted data. For example, see Gustman et al. (1997); Moore and Mitchell (1997); Johnson, Sambamoorthi, and Crystal (2000); Engelhardt and Kumar (2006); Cunningham, Engelhardt, and Kumar (2006) and Poterba et al. (2006). Cunningham, Engelhardt, and Kumar (2006) also create a new program which incorporates and allows for a much more flexible set of economic assumptions when estimating defined contribution wealth.

4 Sanzenbacher (2006) examined long-term individual pension coverage using several different datasets. He found that private pension coverage has been fairly stable over the past twelve to fifteen years.

5 A household is considered covered if at least one member is expecting or currently receiving benefits from a current employer. Higher household coverage rates are due to the fact that covered individuals are often married to those with no coverage.

6 While a number of studies have estimated pension wealth both at individual and household levels using the HRS, there are no HRS studies comparing the evolution of pension wealth between cohorts.

7 The age at which respondents report they expect to start receiving benefits is often missing. We assume that defined benefit plan holders start receiving benefits at age 61.8 and defined contribution plan holders start receiving benefits at age 64. These are average self-reported ages for the 1992 cohort and are consistent with other data; for example, see Friedberg and Webb (2005). In the text, age when defined benefit pension payments start is rounded to 62 years.

8 Inclusion of benefits from past employment may bias the estimates of pension wealth upwards when individuals report expecting benefits from plans that were discontinued. Gustman et al. (1997) use a conservative approach and drop benefits from all past jobs when the respondent expects benefits from a current job.

9 Gale and Philips (2006) use the HRS imputed benefit wealth data and report mean defined benefit household wealth at age 62 to be $103,796 in 1992 dollars ($149,147 in 2006 dollars). This number is higher than the value reported in Table 2 due to inclusion of older individuals, as Gale and Phillips focus on households with heads age 51 to 61. Benefits reported in Table 2 are also prorated and discounted to the current age while Gale and Phillips report them at age 62.

10 Total household earnings include wage or salary income from all jobs plus bonuses, overtime pay, commissions, and income from trade or professional practice.

11 The findings reported in Table 3 are comparable to those reported by Gustman et al. (1997). Focusing on the average household in 1992, Gustman et al. reported mean pension wealth of $60,102 in 1992 dollars ($86,362 in 2006 dollars). This number excludes IRA balances, underestimates pension wealth from past jobs, and includes households without earnings which explains why it is lower than the $127,248 reported in Table 3. Partly mitigating these effects, Gustman et al. use a lower nominal interest rate of 6.3 percent and focus on older individuals (age 51 to 61), which increases estimated wealth.

12 According to the Social Security Cohort Mortality Tables, life expectancy of an average 65-year-old man increased from 15.8 years in 1992 to 16.7 years in 2004 (U.S. Social Security Administration, 2004). During the same time period, life expectancy of an average 65-year-old woman increased from 19.2 to 19.8 years.

13 These numbers are similar to the total income reported by the *Current Population Survey* (CPS) and the *Survey of Consumer Finances* (SCF) for the same group of people. The CPS reports that the mean earnings of households in the middle quintile of the earnings distribution increased from $46,000 in 1992 to $50,000 in 2004. The SCF reports a bigger increase, from $53,000 to $62,000, possibly reflecting the relatively small sample of non-high income households.

14 Defined contribution income represents the annuitized value of defined contribution/IRA assets, assuming they grow at a real rate of return of 4.6 percent between the survey year and the expected retirement year. Cohort-specific annuitant mortality tables are used to determine the yields on the single life nominal annuities purchased with 401(k)/IRA balances. The annuity is assumed to have a money's worth of 85 percent to someone with population average mortality for the appropriate birth cohort, when the income is discounted at the 10-year Treasury bond interest rate for the appropriate year. Projected defined benefit income is pro-rated to account for future accruals. Returning to the previous example, an individual aged 52 with ten years of service who expected to retire at age 62 with pension income of $20,000 has an accrued benefit of $10,000.

15 Household earnings in 1998 are higher than in 2004, possibly reflecting variations in job tenure. Average job tenure for individuals 51 to 56 in the middle of the earnings distribution in the 1998 cohort is 15.5 years, compared to 13.5 years for the 1992 cohort and 12.5 years for the 2004 cohort.

16 Since nominal long-term interest rates used to annuitize defined contribution/IRA accounts declined between 1992 and 2004, the ratio of defined contribution/IRA income reported in Table 4 to defined contribution/IRA wealth reported in Table 3 declined as well. In contrast, the ratio of defined benefit income to defined benefit wealth remained relatively stable, reflecting only the effects of increases in life expectancy, because the same nominal interest rate of 7.01 percent is used to calculate the present discounted value of defined benefit pension wealth in all three years.

17 Cunningham, Engelhardt, and Kumar (2006) show that an assumption that employee contributions to defined contribution plans are time-invariant would historically have yielded biased estimates of defined contribution pension wealth.

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APPENDICES

Appendix A. *Data*

The *Health and Retirement Study* (HRS) is a longitudinal survey conducted by the Institute for Social Research at the University of Michigan and made possible by funding from the National Institute on Aging. (See Juster and Suzman, 1995 for a detailed overview of the survey.) Interviews are conducted every two years, allowing researchers to track changes in employment status, pension plan participation and wealth. The initial panel included household heads age 51-61 in 1992 and their spouses. Every 6 years a new cohort is added to the study. To determine how private pension coverage changed between 1992 and 2004, this *brief* focuses on households that in 1992, 1998, and 2004 contained individuals aged 51 to 56 and at least one person working for pay. For 1998 and 2004, the sample is further limited to include only households first interviewed in these waves. The resulting sample sizes are 4,055 households in the 1992 cohort, 1,280 households in the 1998 cohort, and 1,738 households in the 2004 cohort.

Appendix B. *Economic Assumptions*

The 1992, 1998, and 2004 nominal interest rates equal the prevailing 10-year Treasury bond interest rate (see Table B.1). All values were restated to 2006 dollars using the CPI Index. The 1992 real interest rate was calculated by deducting the 3.6 percent 1992 long-term inflation rate predicted by the Federal Reserve Bank of Philadelphia from the 1992 long-term nominal interest rate.

Table B.1 Economic Assumptions

Year	Long-term nominal interest rate (10-year Treasury bond)	CPI Index (Relative to 2006)
1992	7.01	1.44
1998	5.51	1.24
2004	4.73	1.07

Sources: U.S. Board of Governors of the Federal Reserve System (2006); and Bureau of Labor Statistics, *Consumer Price Index for All Urban Consumers*, 1992, 1998, 2004, and 2006.

Appendix C. *Step-by-Step Calculation of Pension Wealth*

Defined Benefit Wealth

1) Utilize HRS self-reported information on benefits from the current job (if employed), last job (if unemployed), and any significant past job that lasted longer than 5 years. Respondents can report benefits from these plans in one of two possible ways — as a benefit amount or as a percentage of final pay. For respondents who report benefits as a percentage, benefit amounts are calculated using final pay. To determine the final pay for the current job, current pay is projected to the expected retirement age using an assumed 1 percent real wage growth rate. For past jobs, the self-reported value of final pay is used. Benefits reported as dollar amounts are assumed to grow at the same rate as wages. We assume that people do not take into account inflation in reporting the final pay and future benefits. Hence the benefit amounts calculated in this step are in nominal dollars of the reporting year (1992, 1998, or 2004).

2) When respondents report being covered by a defined benefit pension plan, but do not report any other information about the plan, benefits are imputed using a hot-decking procedure using earnings as a covariate.

3) To calculate total defined benefit wealth, benefits are summed up across all sources. Each source is first top-coded at 1 percent to correct for irregularities in self-reported data (e.g. reporting unusually high benefits).

4) The total expected benefits are converted to the dollars of the year when payments are expected to start using a nominal interest rate of 7.01 percent and survival probabilities taken from Social Security mortality tables for the appropriate birth cohort (U.S. Social Security Administration, 2004). In all years, people are assumed to start receiving benefits at age 61.8, the 1992 average (rounded to age 62 in the text). It is assumed that everyone in the sample survives until the age of 61 and that there are no survivor benefits.

5) To make defined benefit wealth comparable to defined contribution plan balances, the value of defined benefit wealth at the expected retirement age (age 61.8) is discounted back to the reporting year, using the same 7.01 percent nominal interest rate. The present discounted value of benefits is then prorated on the basis of tenure to date. Finally, the prorated discounted value of defined benefit wealth is converted to 2006 dollars using the CPI index to account for inflation between the reporting date and 2006 (see Economic Assumptions above).

6) As a last step, household defined benefit wealth is computed by summing across the head and spouse, where appropriate. Household weights are used to produce the final tables.

Defined Contribution and IRA Wealth

1) Defined contribution wealth includes self-reported balances in all employer-sponsored accounts from past and present jobs. In some instances, respondents report that they transferred the balance to an IRA or cashed out the benefits. In this case, the account balance is excluded from the calculation. Defined contribution wealth is top-coded at one percent to reduce the impact of reporting errors on mean values.

2) Missing information is imputed using hot-decking with earnings as a covariate. Imputations are only performed for plans from current jobs. Missing defined contribution account balances from past jobs are not imputed, as failure to report amounts is assumed to indicate that the respondent has transferred the balance into an IRA account.

3) Household defined contribution wealth is computed by summing across the head and spouse, where appropriate. Household IRA/Keogh wealth from the RAND file is added to arrive at total defined contribution pension balances. For most people, IRA accumulations are simply the balances transferred from past employer-sponsored defined contribution plans.

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