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Abstract

Using data from the 1992, 1998, 2004, and 2010 waves of the *Health and Retirement Study* (HRS), this paper compares pension participation, pension wealth, projected retirement income, and replacement rates attributable to past service, by pension type for households ages 51-56. The analysis includes workers' pension coverage during both current and past jobs. Defined contribution (DC) wealth is simply the current account balance. DC income is calculated by projecting current plan balances to retirement, assuming no further contributions, and assuming that households then annuitize. Defined benefit (DB) wealth and income are calculated by apportioning projected benefits to past and future service.

This paper found that:

- Overall participation is significantly lower in 2010 than in previous waves; the increase in DC participation has not offset the decline in DB participation.
- Both mean and median pension wealth in 2010 were larger than in 1992, but lower than in 1998 and 2004.
- DC wealth is more skewed towards the top quartile than DB wealth. In 2010, the top quartile held 35 percent of DB compared to 52 percent of DC wealth.
- Because DC participants must purchase an actuarially unfair annuity and faced low annuity rates from falling interest rates, the shift to DC plans has produced a decline in the ratio of income to wealth.
- The decline in the income-to-wealth ratio would have been even greater if expected retirement ages had not increased.
- But, despite later retirement, the ratio of projected retirement income to the highest five years of 51-56 earnings declined substantially from 1998-2010 because earnings have risen.

The policy implications of this paper are:

- Employer-sponsored plans are providing less today than in the past, so policymakers should consider ways to improve coverage and outcomes.
- When restoring balance to Social Security finances, policymakers need to recognize that future retirees will be more dependent on Social Security than those in the past.

Introduction

Employer-sponsored retirement plans have shifted dramatically in recent decades from defined benefit (DB) to defined contribution (DC) plans. Although theoretical calculations show that participants in 401(k) and other DC plans who stay the course can accumulate substantial account balances, many studies have documented how such plans often fall short. This shortfall reflects a failure to participate, inadequate contribution rates, leakages, poor investment choices, and subpar market returns (Ellis, Munnell, and Eschtruth, 2014). On the other hand, while DB plans provide generous benefits for workers who spend most of their career with a single employer, the pensions of job-hoppers are eroded by inflation and those who separate prior to vesting receive nothing. Therefore, the net effect of the shift from DB to DC plans on retirement wealth and income is unclear.

This paper uses the *Health and Retirement Study* (HRS) to document pension wealth and income for households whose heads were ages 51-56 in 1992, 1998, 2004, and 2010. The first question is whether workers in 2010, when DC plans predominated, had more or less retirement wealth from employer-sponsored plans than their counterparts in 1992, when DB plans predominated. The question is not just the total amount of wealth but also who holds it, so the distribution of retirement wealth by educational quartile is important. Income, however, not wealth is the variable of ultimate interest, and, for any given retirement age, DB plans with actuarially fair annuities provide more income per dollar of wealth than DC plans where annuities must be purchased on the open market. Finally, income levels by themselves tell only part of the story because stable levels of income with rising wages will lead to declining replacement rates. Thus, the analysis covers pension wealth, the distribution of pension wealth, the amount of income produced by DB and DC wealth, and finally the pattern of replacement rates over the period 1992-2010.

The remainder of the paper proceeds as follows: the next section reviews previous research. The third section discusses the calculation of pension wealth and shows how the levels of wealth have changed over time. It also describes the shifting distribution of pension wealth. The fourth section describes assumptions used to calculate pension income and presents the pattern over time. It also calculates replacement rates and presents those results. The final section concludes with four observations. First, retirement wealth has been steady or declining, depending on whether the starting year is 1992 or 1998. Second, DC wealth is more

concentrated in the top quartile than DB wealth, and this concentration will show up in the aggregate wealth measure as the shift from DB to DC evolves. Third, the shift from DB to DC has also caused a reduction in retirement income per dollar of pension wealth because DC participants must purchase an actuarially unfair annuity and annuity rates fell as interest rates dropped. Fourth, even with later retirement, steady pension income combined with rising wages has produced declining replacement rates. Thus, pension income from employer plans has been contracting just as Social Security replacement rates have started to decline due to the increase in the Full Retirement Age.

Previous Research

The most comprehensive study of pension participation and wealth is Gustman, Steinmeier, and Tabatabai (2010) – the “Bible.” Using self-reported data from the HRS, they report pension plan participation of individuals ages 51-56 in 1992, 1998 and 2004.¹ They find that although overall participation rates were relatively stable, participation rates declined somewhat among blacks, and substantially among those with less than a high school education. In terms of pension wealth, they report pension wealth at the above dates at both the individual and household level. DC wealth is simply the self-reported account balance. To convert DB flows into a stock, they follow Ippolito (1986) by time apportioning benefits to past and projected service and then discount projected benefits back to 1992, 1998, or 2004 as appropriate, using survival probabilities and a rate of interest.²

Sorokina, Webb, and Muldoon (2008) conduct a similar analysis of the 1992, 1998, and 2004 HRS data. Their focus is on household-level replacement rates. They project DC wealth to retirement and assume it is then annuitized. They report a 5.9-percentage-point decline in replacement rates between 1992 and 2004.

Both Gustman, Steinmeier, and Tabatabai (2010) and Sorokina, Webb, and Muldoon (2008) report considerably greater average wealth and income for participants in DB than in DC plans. This pattern reflects differences in average duration of participation, as well as the effect

¹ Gustman, Steinmeier, and Tabatabai (2010), Tables 5.1 and 6.2. Their study only extends to 2004. But they subsequently calculated pension wealth for 2010 and made pension wealth data for all four years available for download from the HRS website (see Gustman, Steinmeier, and Tabatabai 2014).

² Gustman, Steinmeier, and Tabatabai (2010) discount projected benefits using a 5.8-percent nominal interest rate in all waves. They use Social Security Administration cohort mortality tables.

of 401(k) plan leakages and fees. When Poterba et al. (2007) randomly assign HRS participants to pension plans, they conclude that individuals who participate in a DC plan for their entire career ought to have greater pension wealth by retirement, even after controlling for differences in risk characteristics of DB and DC plans.

To determine whether aggregate retirement saving has increased or declined, Munnell, Aubry, and Crawford (2015) took advantage of the introduction of defined benefit plan accrual data in the National Income and Product Accounts to explore the patterns of retirement saving in DB and DC plans over the last 30 years. They concluded that the accumulation of retirement assets has not declined as a result of the shift from DB to DC plans. The findings suggest that the ratio of pension wealth to income should be relatively constant but that retirement income should be declining as a result of the shift from actuarially fair to unfair annuities associated with DC plans.

Some studies address factors that could affect the distribution of DB and DC wealth. DC pension plans expose participants to investment risk that increases the dispersion of pension wealth. DB participants are largely protected from these risks, but face the impact of earnings shocks, job-change, and premature retirement (Bodie, Marcus, and Merton, 1988). The final salary benefit formula used in many DB plans disproportionately benefits the higher paid, whose earnings increase more rapidly with age. But participation rates in DC plans are also higher for high earners. In contrast to participants in DB plans, DC participants can cash out on job-change. Low-income participants are more likely to cash out (Munnell and Sundén, 2004), potentially further increasing DC wealth inequality.

Gustman, Steinmeier, and Tabatabai (2010) provide limited information on the distribution of pension wealth, reporting the difference between the 10th and 90th percentile of the distribution of pension wealth for each pension type, and reporting the average for each type of wealth by socioeconomic characteristics.³ Socioeconomic disparities in DC wealth, measured by the ratio of the 10th to the 90th percentile of pension wealth, appear to be much greater than those in DB wealth.

Papers that study trends in socioeconomic disparities in pension wealth include Karamcheva and Sanzenbacher (2010) and Devlin-Foltz, Henriques, and Sabelhaus (2015a and 2015b). Karamcheva and Sanzenbacher (2010) show that, over the period 1997-2008, declines

³ Gustman, Steinmeier, and Tabatabai (2010), Tables 9.2C, 9.2D, 9.3, 9.4, 9.5, and 9.6.

in pension participation rates were concentrated among workers in the bottom income tercile, a trend that would accentuate income-related pension inequalities.⁴ Using *Survey of Consumer Finances* (SCF) data, Devlin-Foltz, Henriques, and Sabelhaus (2015b) reported a decline in pension plan participation among younger and lower-income workers subsequent to 2007. They also found that DC wealth was more concentrated than DB wealth among the top percentiles of wealth holders. They conclude that the displacement of DB by DC pensions modestly increased the concentration of total wealth.

The upshot of previous research is that pension wealth has held fairly steady from 1992 to 2004 and that DC holdings are more concentrated than DB. The question is what happens when the data are updated to 2010 and the focus shifts from wealth to income.

Retirement Wealth 1992-2010

The data for this analysis come from the 1992, 1998, 2004, and 2010 waves of the *Health and Retirement Study* (HRS), a nationally representative survey of older Americans. We include both single individuals ages 51-56 and couples where at least one spouse was age 51-56. This yields samples of 4,599, 2,753, 2,779, and 3,984 households in the four waves.

The analysis is based on self-reported data.⁵ In each wave, each spouse is asked about pension income and wealth from current and past jobs. Participants are asked to report plan details differently depending on whether they report having a DB or a DC plan. Participants reporting an entitlement to DB benefits from a current job, last job, or any significant job that lasted more than five years can report benefits as an 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 1.1-percent real wage growth rate. The assumption is that people do not take into account inflation in reporting their final pay and future benefits. Hence the benefit

⁴ Johnson, Sambamoorthi, and Crystal (1999) document a substantial gender gap in pension wealth that has likely declined as women's employment experiences have come to more closely resemble those of men.

⁵ It is infeasible to use employer reported data because those data are not available for 2010. Gustman, Steinmeier, and Tabatabai (2010) compare self-reported with employer-reported plan type. Their comparison reveals substantial misreporting, but little evidence of systematic biases. When reporting group averages, misreporting only matters to the extent that the misreporting results in systematic biases. In terms of amounts, Gustman and Steinmeier (1999) found that mean employer-reported DC wealth considerably exceeds mean self-reported wealth. But Cunningham, Engelhardt, and Kumar (2007) identify ways in which the HRS pension estimation program used to analyze employer pension data overstates DC wealth so that the self-reported DC data may be much closer to the truth than indicated by the Gustman and Steinmeier (1999) analysis.

amounts calculated in this step are in nominal dollars of the reporting year. For past jobs, the self-reported value of final pay is used.

We define a household as having pension coverage if one or both spouses is currently receiving DB benefits, is covered by a DB pension or participating in a DC pension on a current job, has deferred DB benefits, or a 401(k) balance from a past job.⁶ With this definition, 68.0 percent, 70.3 percent, 69.8 percent, and 63.1 percent of households report entitlement to a pension from a current or previous job in the 1992, 1998, 2004, and 2010 waves, respectively (see Table 1).⁷

The next step is to calculate DC and DB wealth. For DC plans, pension wealth is simply the current balance in the account. For DB pension wealth, the first step is to calculate the expected present value of future benefits and then to apportion that amount to past and future service.

Calculation of DC Wealth

DC pension wealth may be held within a 401(k) plan from a past or current job or within an IRA. Household 401(k) 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 balances transferred from past employer-sponsored defined contribution plans. Defined contribution wealth is estimated both without and with excluding the top and bottom 1 percent to reduce the impact of reporting errors on mean values.⁸

Calculation of DB Wealth

DB pensions provide benefits in the form of a lifetime annuity that is usually fixed in nominal terms. The amount of the pension is typically a function of final salary and years of service. Benefits typically vest after five years. Vested participants who quit their jobs prior to the plan's early retirement age are entitled to a deferred pension based on their salary at the date

⁶ IRAs can be employment based (SEP and SIMPLE) plans, or non-employment based. Non-employment-based plans can be funded with direct contributions and rollovers from 401(k) plans.

⁷ These coverage percentages are lower than those reported in Table 5.12 in Gustman, Steinmeier, and Tabatabai (2010) because our estimates exclude cashed-out or lost pensions. Coverage as calculated in this paper is based on the expectation of future retirement income and therefore on having pension wealth at ages 51-56.

⁸ Missing values, don't know, or refuse response values are imputed for plans from both current and past jobs.

of leaving, rather than on the higher salary they would have earned had they remained with the employer.

DB wealth is based upon self-reported estimates of pension income at the participant's expected retirement age. The paper follows previous research by calculating the expected present value of lifetime benefits, discounting using annual survival probabilities and a rate of interest, and assuming that the employee does not separate prior to retirement. It then time apportions those benefits between past and projected service, based on self-reported years of tenure for past service and years from current age to expected retirement age for future service (Mitchell and Moore, 1997, Gustman, Steinmeier, and Tabatabai, 2010). This approach assumes that DB participants will work for their current employer until retirement.⁹ For consistency with Gustman, Steinmeier, and Tabatabai (2010), the nominal interest rate is assumed to be 5.8 percent, the sum of a 3-percent real interest rate and 2.8-percent inflation.¹⁰

DC and DB Wealth

Table 2 shows mean and median values of pension wealth for those households with current or past pensions. In 2010, for households 51-56, the median pension wealth in 2014 dollars accumulated to date was \$316,500, and the median was \$162,850. In both cases, the pattern is unusual in that the 2010 figure was higher than that in 1992, but lower than in 1998 and 2004. Given that pension coverage in 2010 was only 63.1 percent, compared to 68.0 percent in 1992, at best, one could characterize pension accumulations over time as "flat."

Table 3 separates pension wealth by type and presents the pattern over time. Several points are relevant. First, DB wealth in all years is higher than DC wealth. Second, DB wealth amounts are roughly constant over time. Third, DC wealth amounts have nearly doubled between 1992 and 2010. Combine these patterns with the shift in the percentage of households with a plan from 80 percent with a DB and 56 percent with a DC in 1992 to 57 percent with a

⁹ Another alternative would be to calculate the annual percentage of salary contribution rate that would be sufficient to fund the projected benefit and to then calculate the amount these contributions would have grown to by the employee's current age. This annual contribution rate is referred to by actuaries as the "normal cost." If the rate of return earned by the DB plan equals the rate of wage growth, this measure of pension wealth will equal that obtained by discounting and time apportioning. If, as will typically be the case, the rate of return exceeds the rate of wage growth, discounting and time apportioning will yield a smaller measure of DB wealth.

¹⁰ Using a constant interest rate controls for the impact of interest rates on DB wealth, important in a cross-wave comparison of DB wealth. Using current interest rates permits a comparison between DB and DC wealth of the same wave.

DB and 80 percent with a DC in 2010 (see Table 4 and Figure 2) and the result is relatively level pension wealth over time.

Stable aggregate pension wealth does not necessarily imply that households today are as well prepared for retirement as those in 1992. Preparedness depends on how pension wealth is distributed, how much income that pension wealth produces, and how that pension income relates to pre-retirement wages. Note that all these metrics abstract from the fact that investment and mortality risk is shifting from the employer to the employee.

Distribution of DC and DB Wealth

Tables 5 and 6 report the distribution of DB and DC wealth by educational quartile. The focus is on quartiles rather than educational levels because those with less than a high school education have become an increasingly select group over time. The Box describes the procedure for redefining educational attainment.

Box. Reassigning Educational Attainment

The process used to reassign the educational attainments of household heads is designed so that an equal number of heads in each birth cohort falls into each quartile. For a detailed description, see Sanzenbacher et al. (2015).

The first step is to estimate the following ordered logit model on household heads in each cohort:

$$y^* = x\beta + e \quad (1)$$

where $y = 0$ if $y^* \leq \alpha_1$ (the exact but unobserved dependent variable) $\leq \alpha_1$, the dividing line between less than high school and high school education, $y = 1$ if $\alpha_1 < y^* \leq \alpha_2$, the dividing line between high school and some college, $y = 2$ if $\alpha_2 < y^* \leq \alpha_3$, the dividing line between some college and college graduates, and $y = 3$ if $\alpha_3 < y^*$, and x is a vector of correlates of educational attainment.¹¹

Using these regression coefficients, we reassign households to different educational attainment groups until we have equalized the proportions in each group. People with a higher

¹¹ For couples, the head of household was assumed to be the male.

predicted probability of being in a particular group will have a higher chance of getting moved into it. For example, if we have too few households with less than a high school education in the 2010 cohort, we need to reassign some individuals from “high school” to “less than high school.” We first estimate the predicted probabilities of having less than a high school education for the 2010 cohort. We then make repeated random draws and reassign these individuals into the “less than high school” group based on these probabilities, until a sufficient number have been reassigned. We then reassign people across other education groups until the group sizes are equal.

Tables 5 and 6 show that the percentage of DC wealth held by the most educated has consistently been greater than the percentage of DB wealth.¹² That is, DC wealth is more skewed toward those with more education and higher earnings. In 2010, the top quartile held 51.6 percent of total DC wealth compared to 35.1 percent of DB wealth. This skewness, however, is only now becoming evident in the distribution of total pension wealth (see Table 7), as DC wealth begins to exceed DB wealth (see Figure 1).

The real question, however, is not the level and distribution of retirement wealth for households in their 50s but how much income they will have when they get to retirement.

Trends in DB and DC Income

The task is to project retirement income at the individual’s projected retirement age based on DB and DC wealth at ages 51-56. Household retirement income is then the total of each individual’s employer plan income plus income from IRAs, which are reported only on a household basis. Then the next step, to get some idea of the extent to which retirement income will contribute towards household retirement security, is to relate projected retirement income to a measure of pre-retirement earnings.

Calculation of DC Income and DB Income

The first step in the calculation of DC income is to project current plan balances (including IRAs) to the individual’s expected retirement age, assuming no further contributions. For consistency with DB plans, the assumption is that DC assets earn 5.8 percent over the

¹² The educational quartiles are constructed based on all households in each wave.

projection period. At retirement, participants are assumed to purchase a single-life immediate annuity with their DC holdings. Although few households voluntarily annuitize their DC plan balances, annuities act as a proxy for a sustainable withdrawal rate. The annuity calculation is based on historical data from Annuity Shopper.¹³

DB income is derived from DB wealth as follows. DB wealth is projected to grow at 5.8 percent until the individual's expected retirement age. At that point, the wealth is annuitized using Social Security's mortality table and an assumed interest rate of 5.8 percent. In essence, these steps reverse the process used to convert reported DB income into DB wealth, but the estimated income will be less than reported income because it is based only on accruals until ages 51-56. A similar process is used for any previous DB plan.

Many people have both a DB and DC plan. In these cases, the assumption is that they annuitize their DC wealth at the age they expect to start receiving income from their DB plan. Projected individual income is then aggregated to a household basis and added to projected income from IRAs.¹⁴

DB and DC Income

Mean and median projected retirement income from all plans and for DB and DC separately are shown in Tables 8 and 9. In 2010, the median projected income was \$20,800, and the mean was \$37,000. The pattern reflects that of wealth, with 2010 relatively similar to 1992, but significantly lower than 1998 and 2004. Similarly, by type of plan, DB income was consistently higher than DC income over the period 1992-2010, but DC income increased substantially while DB income remained relatively flat. In 2010, median DC income was projected to be \$10,700 and DB income \$19,200. The corresponding means were \$29,500 and \$24,400.

¹³ Annuity Shopper (2015) reports average male and female single life annuity rates for ages 60, 65, 70, and 75 at six-month intervals from 1986. We linearly interpolate to obtain rates at other ages.

¹⁴ The retirement age assumptions for calculating retirement income from IRAs are as follows. For a single person who has a current DC plan, his IRA age is his current DC plan age. For a single person, who does not have current a DC plan, his IRA age is median age of current DC plans in that wave. For a couple, where one or both of the spouses have a current DC plan, the IRA age is the highest expected DC retirement age in the household. For a couple, where neither spouse has a current DC plan, the IRA age is equal to median age of current DC plans in that wave.

Table 10 shows projected pension income as a percentage of current pension wealth. As expected, the yield on DB wealth is higher than that on DC wealth and the gap between the yield on DB and DC wealth is increasing over time, leading to a decline in the total wealth-to-income ratio. These patterns are consistent with the fact that over the period 1992-2010 the ratio of DC wealth to total pension wealth increased from 35 percent in 1992 to 62 percent in 2010 and DC participants face two disadvantages relative to DB participants when turning wealth into income. First, whereas DB participants face actuarially fair annuities, DC participants have to buy annuities in the marketplace where marketing and other costs reduce annuity factors by about 15 percent to 20 percent.¹⁵ Second, the interest rate used in the calculation of commercial annuity rates has declined sharply since 1992, while the interest rate assumption for DB annuities is a steady 5.8 percent (see Figure 3).

In fact, given the growth of DC wealth and the disadvantages of annuitizing that wealth, one might have expected an even greater decline in the ratio of pension income to current pension wealth. The main reason the ratio did not decline more is retirement ages. Overall retirement ages have been increasing, and the difference in the retirement age for those in DC plans and those in DB has been getting larger (see Figure 4). Later retirement ages, all else equal, produce more annuity income per dollar of retirement savings. Thus, the increase in the expected retirement ages explains why the overall income-to-wealth ratio has not declined as much as one would have expected. Indeed, if the assumption were made that everyone retired at 62 over the entire period, the ratio of income to wealth would have declined much more sharply (see Table 11).

“Replacement Rates”

While the previous section looked at the yield from pension wealth, the important question for those concerned about retirement security is the ratio of pension benefits to earnings. In order to minimize the number of required assumptions, the “replacement rate” reported here is the already-calculated income at the projected retirement ages divided by the highest five years of reported earnings between 51 and 56 for those with plans.¹⁶

¹⁵ An annuity is actuarially unfair if the expected present value of benefits is less than the premium paid. Actuarial unfairness reflects adverse selection and sales and administrative costs. Our calculations of DB wealth implicitly assume actuarial fairness.

¹⁶ We follow Goss et al. (2014) in defining earnings in excess of \$100 a year as significant. If the household has substantial earnings in less than five years, the average is based on the number of years available.

The earnings data come from W-2 forms linked to the HRS records. For two-earner couples, separate earnings histories are provided for each individual. Approximately 75 percent of the sample has given permission to link the information. Researchers have concluded that the HRS earnings sample is reasonably representative of the larger sample (Haider and Salon, 2000). The results for this subsample show that, at least between 1998 and 2010, the “replacement rate” has declined more than income-to-wealth ratio because earnings at ages 51-56 have increased over time (see Figure 5).

Conclusion

With increases in the Social Security Full Retirement Age (equivalent to a replacement rate cut for those who do not delay retirement), increases in Medicare premiums and out-of-pocket health care costs, and increased longevity, households will require ever larger private pension replacement rates if they are to maintain their standard of living in retirement. To see whether tomorrow’s retirees will enjoy increases in replacement rates, this paper uses data from the 1992, 1998, 2004, and 2010 waves of the HRS to compare for households ages 51-56 participation, pension wealth, projected retirement income, and replacement rates attributable to past service, by pension type.

The findings show that although retirees will need more from employer-sponsored plans, they will receive less. Consistent with data from the *Current Population Survey* and other government surveys, overall participation in employer-sponsored plans has declined. The percentage of households 51-56 with a participant in either a DB or DC plan dropped from 68 percent in 1992 to 63 percent in 2010.

Overall pension wealth can at best be characterized as “flat” from 1992 to 2010. Mean and median retirement wealth in 2010 was larger than in 1992, but lower than in 1998 and 2004. Moreover, DC wealth is more skewed towards the top quartile than DB wealth. In 2010, the top quartile held 35 percent of DB wealth, compared to 52 percent of DC wealth. This pattern is beginning to show up in the total wealth data as DC plans overtake DB plans as a percentage of the total.

In terms of pension income, the shift from DB to DC plans, with actuarially unfair annuities and declining interest rates, has resulted in a decline in the income-to-wealth ratio. The decline in the ratio would have been even greater if retirement ages had not been increasing

for all participants. Despite later retirement, however, the ratio of projected retirement income to the highest five years of 51-56 earnings has been declining steadily because of rising earnings.

The bottom line is that employer-sponsored plans are providing less today than in the past. This outcome could be improved by: 1) making 401(k) plans work better through auto-enrollment, auto-escalation of default contribution rates, and reduced leakages; and 2) expanding coverage to those whose employers do not offer a plan. Without significant changes, however, future retirees will be much more dependent on Social Security than those in the past, which is problematic given the decline in replacement rates due the increase in the Full Retirement Age and the need to close the 75-year funding gap.

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Table 1. *Percent of Households (51-56) with a Retirement Plan, 1992-2010*

	1992	1998	2004	2010
Pension participation	68.0%	70.3%	69.8%	63.1%

Source: Authors' calculations from the HRS.

Table 2. *Mean and Median Pension Wealth for Households (51-56) with Coverage, 1992-2010*

	1992	1998	2004	2010
Mean	\$268,236	\$335,370	\$350,543	\$316,497
Mean excluding top and bottom 1%	242,658	302,779	315,765	284,865
Median	139,590	178,915	187,584	162,852

Source: Authors' calculations from the HRS.

Table 3. *Pension Wealth for Households (51-56) with Coverage by Plan Type, 1992-2010*

Plan type	1992	1998	2004	2010
Defined benefit				
Mean	\$242,540	\$259,236	\$280,450	\$237,814
Mean ex. top and bottom 1%	219,125	232,632	241,468	200,795
Median	145,264	155,264	159,597	120,038
Defined contribution				
Mean	123,877	189,772	203,147	216,855
Mean ex. top and bottom 1%	98,833	160,777	172,595	189,633
Median	50,621	76,976	80,995	97,711

Source: Authors' calculations from the HRS.

Table 4. *Percent of Households with Coverage by Type of Plan, 1992-2010*

Pension type	1992	1998	2004	2010
DB	79.9%	76.4%	68.8%	57.4%
DC	56.2	65.5	74.0	80.1

Note: Some households may have both DB and DC.

Source: Authors' calculations from the HRS.

Table 5. *Distribution of DB Wealth by Educational Quartile, 1992-2010*

Education	1992	1998	2004	2010
Q1	10.9%	17.8%	16.1%	14.2%
Q2	21.7	20.7	19.0	20.9
Q3	27.1	23.5	23.5	29.7
Q4	40.3	38.0	41.5	35.1
Total	100%	100%	100%	100%

Source: Authors' calculations from the HRS.

Table 6. *Distribution of DC Wealth by Educational Quartile, 1992-2010*

Education	1992	1998	2004	2010
Q1	6.7%	16.3%	12.8%	11.3%
Q2	19.2	13.8	14.6	15.4
Q3	25.3	24.9	29.5	21.6
Q4	48.9	44.9	43.1	51.6
Total	100%	100%	100%	100%

Source: Authors' calculations from the HRS.

Table 7. *Distribution of Total DB and DC Wealth by Educational Quartile, 1992-2010*

Education	1992	1998	2004	2010
Q1	9.4%	17.1%	14.4%	12.4%
Q2	20.8	17.5	16.8	17.5
Q3	26.5	24.1	26.5	24.7
Q4	43.3	41.2	42.3	45.3
Total	100%	100%	100%	100%

Source: Authors' calculations from the HRS.

Table 8. *Mean and Median Retirement Income at Projected Retirement Age in 2014\$ for Households (51-56) with Coverage, 1992-2010*

	1992	1998	2004	2010
Mean	\$33,415	\$42,232	\$41,752	\$36,992
Mean excluding top and bottom 1%	30,234	37,685	37,729	33,378
Median	19,542	23,182	24,657	20,813

Source: Authors' calculations from the HRS.

Table 9. *Mean and Median Retirement Income at Projected Retirement Age in 2014 Dollars for Households (51-56) with Coverage by Plan Type, 1992-2010*

Plan type	1992	1998	2004	2010
Defined benefit				
Mean	\$29,414	\$32,641	\$34,960	\$29,533
Mean ex. top and bottom 1%	26,780	28,670	30,113	25,725
Median	20,531	20,897	23,133	19,201
Defined contribution				
Mean	16,186	23,900	23,073	24,369
Mean ex. top and bottom 1%	12,875	20,266	19,917	21,137
Median	6,465	9,754	9,705	10,698

Source: Authors' calculations from the HRS.

Table 10. *Household Retirement Income at Projected Retirement Age as a Percent of Retirement Wealth at 51-56, 1992-2010*

Pension type	1992	1998	2004	2010
Total	12.5%	12.6%	11.9%	11.7%
DB	12.1	12.6	12.5	12.4
DC	13.1	12.6	11.4	11.2

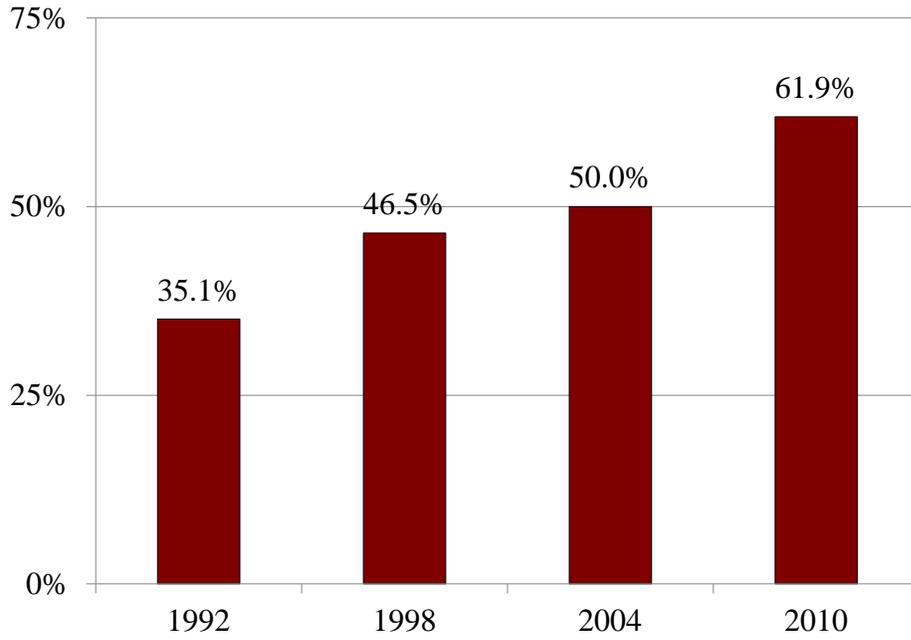
Source: Authors' calculations from the HRS.

Table 11. *Household Retirement Income at Age 62 as a Percent of Retirement Wealth at 51-56 by Plan Type, 1992-2010*

Pension type	1992	1998	2004	2010
Total	12.3%	12.4%	11.3%	10.5%
DB	12.1	12.6	11.9	11.2
DC	12.6	12.1	10.7	10.1

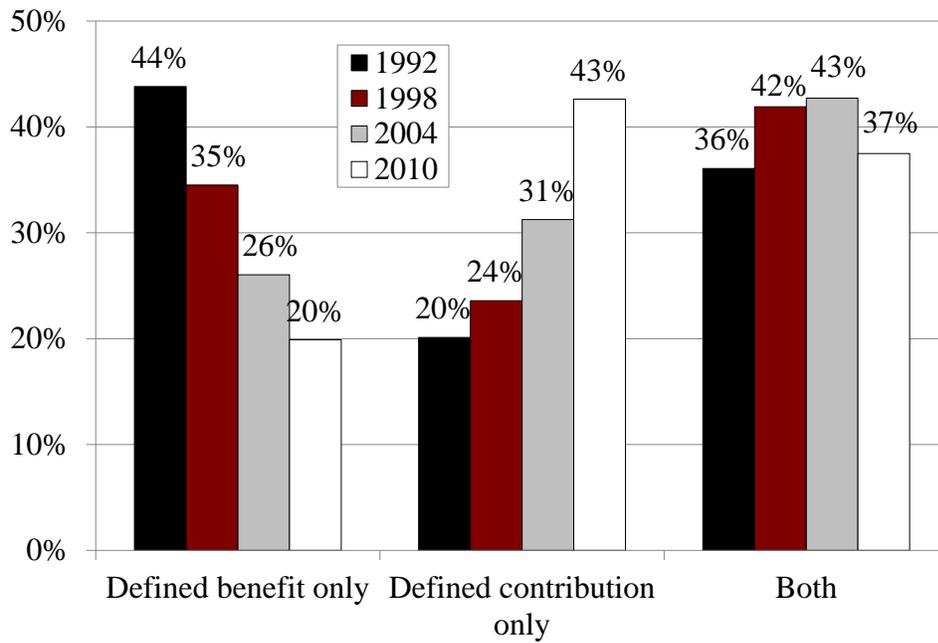
Note: The retirement age is changed only for the individual's current plan
Source: Authors' calculations from the HRS.

Figure 1. *Defined Contribution Wealth as a Percent of Total Retirement Wealth, 1992-2010*



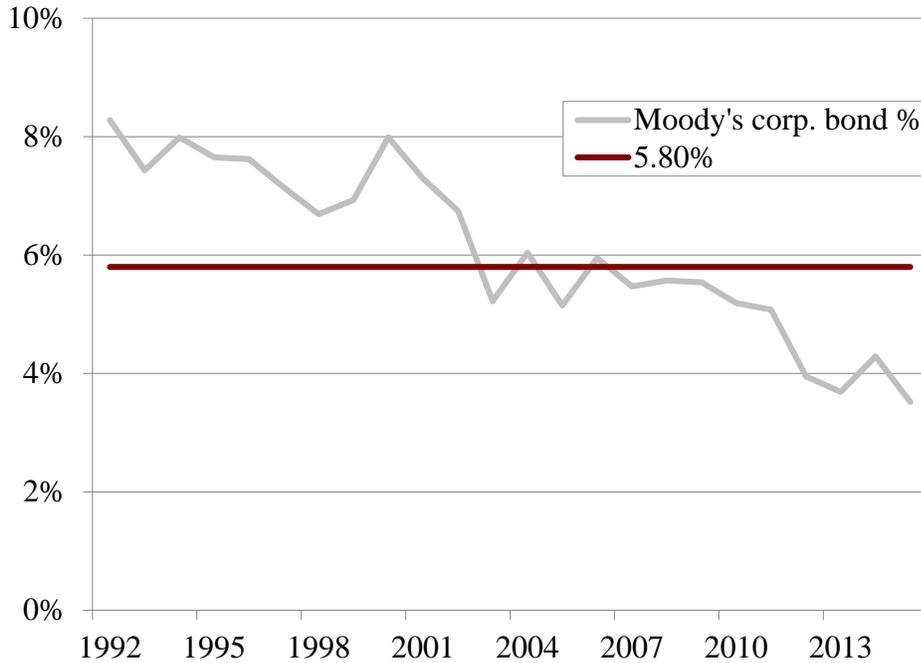
Source: Authors' calculations from the HRS.

Figure 2. *Percent of Households (51-61) with Coverage by Type of Plan from Current and Past Job, 1992-2010*



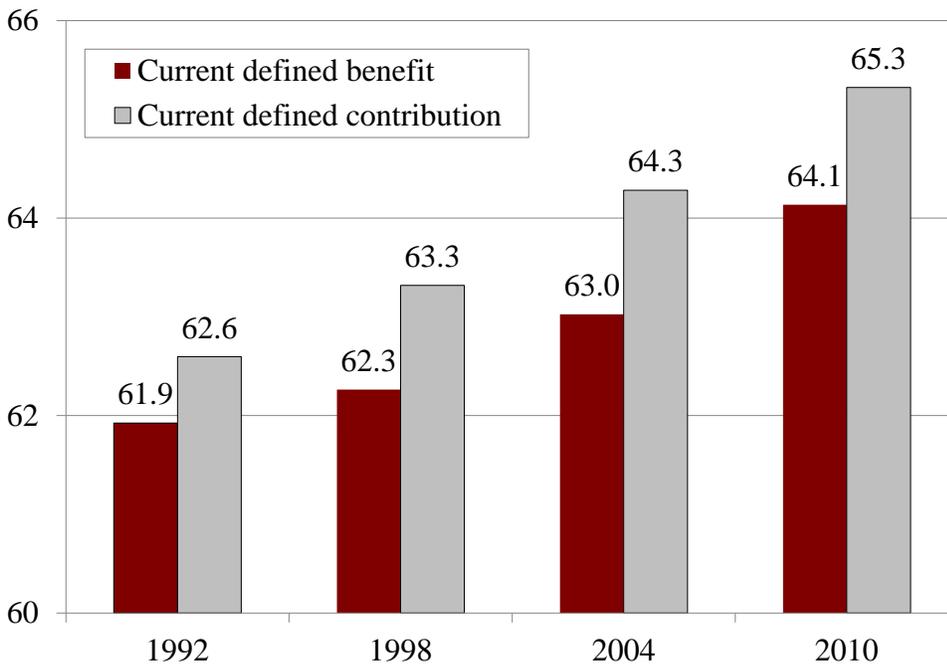
Source: Authors' calculations from the HRS.

Figure 3. *Moody's Seasoned AAA Corporate Bond Rate (30-year) Used for Commercial Annuities versus 5.8 Percent Assumed for Defined Benefit Annuities, 1992-2014*



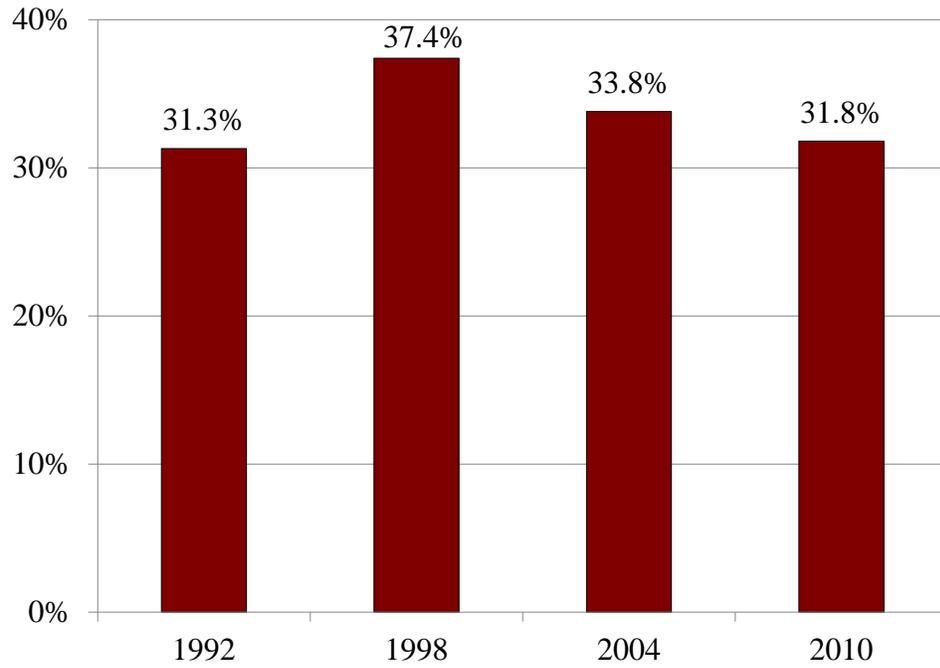
Source: Moody's Investor Services (2014).

Figure 4. *Average Expected Retirement Age for Current Defined Benefit and Defined Contribution Plan Participants in Households (51-56), 1992-2010*



Source: Authors' calculations from the HRS.

Figure 5. “Replacement Rate” for Households (51-56), 1992-2010



Source: Authors' calculations from the HRS.

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