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Forecasting Retirement Needs and Retirement Wealth

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Part III
Methodology and Data Issues in Empirical Retirement Research

Chapter 12
Evaluating Pension Entitlements

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Pension plans are a prominent pillar of most countries' retirement systems. In the United States, pensions are offered by employers on a voluntary basis, usually on top of the government social security system. Today about two-thirds of U.S. households on the verge of retirement have some employer-based pension entitlement benefit.[1] Not only do employer-sponsored plans cover a large number of employees in the United States; they are also the vehicles for substantial wealth accumulation. Private and state/local pension system assets amount to several trillion dollars at present, and are projected to grow as the baby boom ages. Pensions will constitute a substantial portion of retirement wealth for the majority of older Americans for the foreseeable future.

The rapid growth in pensions has been followed with interest by policymakers and researchers for several reasons. First, analysts concerned about poverty and income sufficiency acknowledge that pensions play a key role in wellbeing at older ages.[2] Second, researchers interested in modeling consumption, saving, retirement, and other aging-related behaviors understand that the special features of pension plans must be analyzed and incorporated into the next generation of behavioral models.[3] Finally, policy-makers concerned with social security policy recognize that any changes in government plans may have a powerful impact on employment-based pensions. For all these reasons, it is imperative to develop a better understanding of how pensions influence work and retirement, saving and consumption, and wellbeing in old age.

In the present chapter we describe how a new dataset on older Americans and their pensions will help address many of these issues. Specifically, we describe the creation of pension entitlement values needed for a range of research and policy questions using the Health and Retirement Study, a nationally representative survey on older Americans. After describing our

methodology, we report on the resulting estimates and indicate how pension wealth varies by several key characteristics.

Methodological Overview[4]

Pension coverage rises with age and time on the job, such that well over half all U.S. workers in their 50s anticipate a future pension (Gustman et al., forthcoming). Most workers with pensions are covered by one of two main types of pension plans: defined benefit (DB) plans, or defined contribution (DC) plans. In a defined benefit pension, the benefit formula is specified by the plan sponsor, usually as a function of pay, years of service, and the worker's retirement age. After an initial vesting period (frequently 5 years), the worker gains a legal right to an eventual pension benefit at the plan's retirement age. A DB formula might, for example, grant an age-65 retiree a benefit worth 1.5 percent of final average pay multiplied by years of service; typically such plans will cap the amount of pay "counted," and will generally reduce the benefit amount for retirement prior to the so-called normal retirement age (age 65 in this example). Generally a DB plan will be financed by employer (pre-tax) contributions, though in some sectors, the worker will also pay into the plan. By contrast, a DC plan does not specify the retirement benefit; rather it determines how much will be contributed into the account each year the worker remains with the plan. Then the benefit payout is set at retirement, as a function of how much is accumulated in the worker's account — the result of lifelong contributions plus (or minus) investment earnings. Some plans have elements of both a DB and DC plan, and at some establishments workers have more than one plan — say, both a conventional DB pension and also a 401(k) defined contribution account (McGill et al. 1997).

Several different types of pension-related variables are of interest to policymakers and researchers focusing on the types of questions identified at the outset. One is *pension wealth*, which reflects the expected present value of pension benefits available to the respondent when he or she reaches a given retirement age. This measure is of most interest to analysts seeking to examine the adequacy of older Americans' retirement wealth accumulations, and perhaps to financial advisers seeking to counsel those making retirement plans. A second type of pension variable that interests analysts focused on labor market issues refers to the change in pension wealth when a worker delays retirement by one year. Termed the *pension accrual*, this pension metric is typically not a simple one, inasmuch as it varies with the worker's age, years of service, and pay, and it often is quite nonlinear. For instance, employees with a DB pension may find that an additional year of service is rewarded by greater retirement benefits up to the firm's early retirement age; after that point, the benefit accrual profile may level off —

and even become negative — if retirement is delayed further. Defined contribution pensions, by contrast, tend to reward delayed retirement more monotonically, inasmuch as they tend to be actuarially neutral with regard to the retirement age.

It has long been acknowledged that pensions contribute substantially to retirement wealth, and they also powerfully influence older workers' incentives to stay or leave the job. However, many previous studies have not been able to develop a rich and complete picture of the role of pensions, since these prior data usually fell short in several regards. One problem is that prior *worker-based* surveys have often been unable to capture detailed information on respondents' pensions. This is the case, for instance, for national Census and Current Population Survey files as well as some of the important longitudinal studies such as the Retirement History Survey.[5] This problem arises when individual workers are asked detailed questions regarding their company-provided pension plan rules, but unless they are nearing retirement the chance is remote that they have much knowledge of how their pension plan works (Mitchell 1988). Another problem is that although a few *firm-based* datasets are available containing high quality data on pensions, these datasets are not necessarily representative of the American workforce. This was a drawback of the Employee Benefit Survey, for instance, and other studies that rely on a single firm to model pension entitlements.[6] Finally, previous surveys have typically not combined good pension data on a nationally representative sample of workers nearing retirement. Even the old Retirement History Survey, extensively used by retirement researchers during the 1980's, did not contain good pension information, thus limiting the usefulness of that study for many purposes.

These shortcomings are rectified in several important ways by the new Health and Retirement Study (HRS), as described in Chapter 1. In what follows, we offer an overview of the steps involved in creating pension variables for the HRS dataset, and then go on to illustrate with concrete examples how pension wealth and pension accruals behave for a nationally representative sample of older Americans.

The HRS-Pension Provider Link

The Health and Retirement Study is a longitudinal database following a nationally representative sample of older Americans along with their spouses as they reach and then cross the retirement threshold. The original sample included 7,607 households about whom data were gathered on demographic factors, health, housing, family structure, work history and current employment, disability, retirement plans, net worth, income, and health and life insurance.[7] A total of 9,825 respondents were age 51 to 61 years of age in 1992, for the first wave of the study, and are termed the "age eligible" sample.

The same people, along with their spouses, were re-surveyed in 1994, 1996, and 1998, and follow-on funding will be requested through the year 2008 (and probably beyond).

The HRS included several questions in addition to the conventional sorts of social and economic questions typically asked in national surveys, for the benefit of researchers who seek better to understand the role of pensions in the retirement context.[8] Of particular interest to pension experts is the fact that HRS respondents who indicated that they had a pension from their current employer were asked the name and address of that employer. Subsequently, ISR interviewers contacted each named employer to obtain a copy of that firm's pension plan Summary Plan Description (SPD). If an employer did not send a pension SPD, publicly available pension records at the Department of Labor were searched and missing documents obtained where possible.[9] To preserve respondent confidentiality, in no case was the individual employee's name revealed to the firm, nor is the employer identification information made available to researchers.[10] In addition, pension SPDs were gathered for people having a pension from a past employer.[11]

A Synopsis of What the Pension Software Does

Evaluating workers' entitlements under these pension plans requires a multi-step method of attack. First, the plans were coded into a standard format called the Pension Provider Survey (PPS) and entered into a computer-readable file containing approximately 12,000 variables. Second, it was necessary to develop specialized computer software to manipulate these pension plan variables to determine pension entitlements for each individual worker (Curtain 1997).[12] After reading the pension variables coded for each plan, the PPS program converts these into systems of equations that represent the benefit formulas, vesting rules, retirement restrictions, and all other payment provisions for each pension plan. Next the program requests from the researcher a set of assumptions including (1) economic and demographic assumptions needed to compute future benefits, and (2) work and earning profiles for each respondent for whom pension entitlements will be created. These are then combined with the pension algorithms to produce a set of pension entitlement variables for each individual in each plan, in a standard format output data file. Finally, a researcher can link these pension entitlement files with other data on HRS respondents for analysis.[13]

An especially useful feature of the PPS software is that the researcher can specify a wide range of assumptions and input data, thus allowing a wide range of simulation scenarios. For instance, one can compute several types of retirement benefits permitted under a pension plan, including vested terminated payments, early and normal benefits, disability benefits, and others. The researcher can also compute benefits payable as of a particular quit age, or alternatively, the benefits payable as of all possible retirement

ages. Benefit streams for each quit or retirement age until death are converted into an expected present value, discounting the future cash flows at a rate supplied by the user.[14]

For defined benefit (DB) plans, the employer-provided plan descriptions make it possible to calculate benefit amounts quite accurately. The asset value of the DB pension is therefore defined as the discounted value of the DB plan benefits from some retirement age until death, based on past earnings and years of service. In our analysis below, we express all values in 1992 dollars (even if the date of initial benefit receipt is some future date). For example, a 60-year-old worker who had been with his company for 20 years as of 1992 might be eligible to retire immediately. In that firm, though, the worker might not receive his full benefit since he had not attained the "normal" retirement age, i.e. age 65. If his benefit formula paid 2 percent of final earnings times years of service, his annual early retirement benefit (as of age 60) would then amount to 40 percent of his last earnings, reduced by an actuarial factor (e.g., 20 percent) in recognition of the fact that he would be receiving his benefit for a longer period of time. Should the worker wait to retire until age 65, the program would recognize that the retirement benefit formula would no longer require the early retirement penalty, and benefits that began at age 65 would be expressed in 1992 dollars when the worker was age 60.[15]

In each case, the specific pension plan rules are combined with the worker's individual past service and earnings to determine benefits he is currently entitled to. Benefits accrued by continued work would make use of projected service and earnings, extrapolating using a wage growth assumption provided by the researcher. Having computed a current as well as a future pension wealth, one would then difference them to compute the pension accrual with continued work. If the pension accrual with continued work is positive, it would be concluded that the pension plan rewards delayed retirement (conversely, some plans penalize deferred retirement).

Pension values for workers with defined contribution (DC) plans can also be computed with the help of the pension software. Computing the DC pension entitlement requires adding to the pension accumulation from the employer plus the employee contributions each year, crediting the accumulations with a real rate of interest. If employee contributions are mandatory, these are recorded in the pension SPD and used by the software. If voluntary contributions are allowed (e.g. to obtain employer matching funds), the software allows the user to specify what the worker will contribute.

Not only do HRS workers report current pensions — that is, a pension plan at their current place of employment — but there are also people in the HRS who indicate they are entitled to a pension based on a previous job.[16] In this instance, the pension software computes pension wealth for these "prior pensions" using similar inputs and in a similar output format.

One other issue has to do with the fact that some people have more than

one pension plan on their current job, while others have a pension plan that has elements of both a defined benefit and a defined contribution pension. In the analysis below, we separately distinguish these cases from the simple DB and DC cases by listing them as combination plans.

Characteristics of Pension-Covered Respondents in the HRS

Key characteristics of HRS respondents with a pension plan document linked to their respondent records are recorded in Table 1. There are 2,396 age-eligible people for whom a pension link is available from their current job: of these 1,160 (48 percent) have a defined benefit plan, 499 (21 percent) have a defined contribution plan, and 737 (31 percent) have some sort of combination of pension plans. Of those who do not have a link to a current job pension plan, 1,082 people have matched "prior pensions" from previous jobs; some of these people are retired and receiving a benefit, while others are vested terminated workers entitled to a future pension. Overall, therefore, 35 percent of the age-eligible HRS sample have a pension document, and 6347 respondents have no pension document.[17] The huge number of prior pensions detected and collected for the survey respondents suggests that pensions acquired during middle age — before reaching age 60 — are important in financing retirement consumption.

Table 1 also shows how workers' nonpension wealth levels vary by pension plan type. (All dollar figures presented are in 1992 dollars throughout this paper.) Nonpension wealth includes net home equity, financial assets, own businesses, and Individual Retirement Accounts, but excludes pensions and social security wealth. The results show that people with both plan types on their current jobs have similar levels of nonpension wealth, about $131,000 at the median. Having had a pension previously is also associated with similar wealth levels. By contrast, people with no pension link have accumulated 23 percent less nonpension wealth, a median of $101,000, compared to their counterparts with a pension. This could imply that pension-covered jobs are more remunerative than those without, but may also suggest that workers with pensions are more likely to be savers outside their plans as well (Gustman and Steinmeier 1998).

Assumptions Used in Computing Pension Wealth

When computing pension wealth using the PPS program, two types of input files are required.[18] The first, called the parameter (INPARM) file, pertains to economic and other factors assumed to hold across all individuals in any given simulation run. These include the real interest and earnings growth rate, the rate of inflation and the extent to which pension benefits keep up with inflation after retirement, and several user-supplied social security vari-

TABLE 1: HRS Respondents With and Without a Pension Link

	Number	Mean Wealth ($000) Excluding Pensions	Median Wealth ($000) Exluding Pensions
Respondents with linked pension plan			
From current job			
DB pension	1160	$213	$131
DC pension	499	215	131
Combination plan	737	225	124
Total	2396	217	129
From previous job	1082	275	143
Respondents with no linked pension plan			
No pension link	6347	$279	$101

Source: Authors' calculations, 1992 HRS.
Notes: Having a linked pension indicates that a pension Summary Plan Description in the Pension Provider Survey is available for the HRS respondent. All figures other than sample size are weighted by HRS person weights.

ables including the level of the social security taxable earnings ceiling and its rate of change over time. In the analysis below, we adopt the long-term intermediate assumptions proposed by the Social Security Administration (Board of Trustees, 1995), consistent with our earlier work valuing social security wealth.[19] In particular, the cost of living is assumed to rise at 4 percent annually, earnings grow at 1 percent in real terms, and the real interest rate is set at 2.3 percent. In future work we will explore how sensitive our pension wealth computations are to the underlying economic assumptions, using the social security pessimistic and optimistic assumptions.[20]

PPS program options are also available concerning the quit age (or date) range, permitting the user to indicate at which age the worker is assumed to leave the firm. In the analysis here, we compute all pension wealth entitlements assuming retirement occurs at age 62.[21] The model in all cases assumes that after retirement, defined benefit pension benefits rise at half the rate of inflation. In addition, the PPS program caps the maximum pension benefit payable from a DB plan in 1992 at $112,200 per year assuming retirement at 65; this amount is actuarially reduced to $44,000 for a quit age of 55 following the rules for qualified pension plans described in McGill et al. (1997). Both caps are automatically indexed to the inflation rate in the program as specified in the law.[22]

A second type of input file required by the pension software program contains parameters set by the researcher pertaining to each participant (the INDATA file). For the present analysis, we take as given each worker's 1991 earnings (for his current job if working, or last earnings if not working), and then we project earnings forward as well as backward using a 5

percent nominal (1 percent real) real wage growth rate per year. In practice, the pension software permits users to explore other many options for allowing individual-specific wage growth rates in alternative simulations.

Some pension plans are integrated with social security, in that their contributions and/or their benefits are linked to the social security taxable earnings base or benefits received. For these plans, a social security algorithm was used that calculates benefit amounts for early and normal retirement ages, single and/or joint, etc. Therefore the computed pension benefits depend on each respondent's wage profile.[23]

Occasionally a worker in the HRS sample indicated that he or she had a pension plan from either a current or past job, but a pension document could not be obtained for that plan. This occurred when an employee refused to provide the name and address of the company, or if the pension plan document simply was unavailable. In the results discussed below, no pension entitlements were computed in the event of a missing pension. Rather, the pension-covered individual was simply excluded from the sample of people with a pension data link.[24]

The Process of Producing Pension Entitlement Estimates

The pension software[25] produces estimated pension entitlements with one participant per plan per line.[26] A household's total pension wealth, therefore, can be obtained by adding the entitlements across all plans covering the respondent and spouse. In what follows we focus on individuals rather than households to track specific wealth and accrual paths, but naturally a researcher can merge pensions using the household record IDs.

There are three types of simulation exercises that can be carried out with the PPS program; each run generates somewhat different output data files, useful for specific purposes (Curtin 1997). Runtype 1 produces pension entitlements tailored to individual quit dates for a given pension plan. It generates each worker's initial benefit amount, his pension benefit as a fraction of final earnings, and the expected present value of the lifetime pension benefit stream for that quit date. By contrast, Runtype 3 produces information on initial benefit amount for all possible quit dates within a range, and for a variety of benefit conditions (e.g., disability, early, normal, late retirement, etc.). This simulation also yields present values as of each quit date. Finally, Runtype 2 uses simulated participant data, running a given person through all plans for a range of quit dates. Below we report results derived from runs of various types, to illustrate how benefit levels and accruals are calculated for both hypothetical and real workers.[27]

Practically speaking, the PPS uses a two-step sequence. The first set of programs reads in the pension plan dataset and creates pension procedures based on these variables. One procedure is created for each plan, by reading the variables from each coded pension document using a variable diction-

ary supplied with the software. The second set of programs incorporates these procedures into code that calculates pension entitlements, when combined with economic assumptions and information on the pension-covered workers. This second step can be re-run using alternative economic input parameters and data on workers, so that users may flexibly simulate pension entitlements under a wide range of circumstances. It is in this second stage of the program that users select the desired run type, whether only respondent or respondent and spouse benefits are to be modeled, whether annuities or present values will be generated, and so forth. To illustrate some of the types of information generated by the software, we next turn to a summary of results from two specific simulations.

Levels of Pension Wealth in the HRS

Many analysts using the HRS require a comprehensive measure of pension wealth to include as an empirical control variable in analysis of a range of behaviors from consumption, to saving, to *inter vivos* transfers, to bequests. Others seek to understand how the distribution of wealth varies by household characteristics, and will similarly need a measure of pension wealth to include as a component of the overall distribution. Experts interested in the adequacy of retirement wealth need a good measure of expected pension income to determine whether people seem to be saving enough, and if not, why not.

To satisfy these purposes, we have generated a measure of the present value of pension benefits using the long-term intermediate social security assumptions described above. Results appear in Table 2, which is constructed to correspond to categories of respondents described in Table 1.[28]

The top panel of Table 2 reports the present value of expected pension benefits for all HRS respondents with a linked pension on their current job. One finding is that the median worker in our sample covered by a DC pension appears to have accumulated less pension wealth than the median DB-covered employee. This is not surprising, given the relative newness of DC pensions, and the shorter time most employees have contributed to these plans. Another finding is that mean pension wealth values exceed medians. For those with a DB plan quitting work at age 62, for instance, mean pension wealth totals $114,000 while median wealth is a third lower at $75,000. The pattern is similar for those having combination plans. Pension wealth for DC-covered workers has a means of $48,000 and a median half that amount at $24,000. The fact that pension wealth is skewed is evident in the small bottom-to-top quartile ratio.

Focusing on the next segment of Table 2, here we report both current and previous pension plan entitlements for workers having a current job-linked pension; thus prior pensions are included as well. Here, not surprisingly, the net present value of pension wealth rises, since additional "old

TABLE 2: Pension Wealth Levels ($000) for HRS Respondents With Pension Link
(with SSA Intermediate Assumptions)

	Mean	Median	Std. Dev	25th %-ile	75th %-ile
Pension wealth for repondents with linked pension from current job					
Current plan only					
DB only	$114	$75	$125	$31	$152
DC only	48	24	61	9	62
Combination	129	77	190	35	164
Total	105	61	142	24	135
All pension plans (in PPS)					
Pension wealth, DB only	120	79	132	33	164
Pension wealth, DC only	56	28	87	10	75
Pension wealth, comb	136	82	193	37	168
Total	112	68	149	26	144
Pension Wealth for respondents having a linked pension from prior job only					
Pension wealth	107	47	137	102	164
Pension wealth for respondents with any linked pension					
Pension wealth	110	62	145	21	151

Source: Authors' calculations, 1992 HRS, using version 6.0 of the PPS software.
Notes: Having a linked pension indicates that a Pension Summary Plan Description in the
Pension Provider Survey is available for the HRS respondent. All figures other than sample size
are weighted by HRS person weights and assume retirement is at age 62.

plans" are added in. But for older workers with a pension plan on their
current jobs, their "old" pension wealth is not enormous, worth around 5
percent of total pension wealth.

The second panel of Table 2 depicts pension wealth for respondents who
only have a linked pension from a previous job, but no current plan. It is
interesting to see that mean pension wealth for this group totals about $107
thousand, or about 5 percent lower than people with linked pensions on
their current jobs; however, the median is 31 percent lower. In any event, the
fact that median pension wealth from a prior plan is around $47,000 under-
scores the importance of gathering previous pension information over time
to not "lose" major components of people's pension entitlements.

The final panel of Table 2 uses the most inclusive definition of "having
a pension link," that is, counting people with either a current or a past
pension (or both). Mean (median) pension accumulations of $110,000
($62,000) are similar to those accumulated on the current job ($105,000
and $61,000 respectively).[29]

In sum, the results suggest that pension accumulations for older workers
on their current jobs are substantial, totaling around $75,000 for the aver-
age covered worker with a DB, and about $24,000 for those with a DC plan

only. Overall, the median pension entitlement for any worker with a pension link on his current job stood at $68,000 in present value. Pensions earned on previous jobs are also quantitatively important for older workers, boosting median total pension entitlements to around $79,000 (for the DB case) and $28,000 (for the DC case). Respondents with only a prior pension had a median pension entitlement of $47,000.

Pension Accruals in the HRS

Researchers concerned with pensions also seek to understand how plan wealth changes for a worker considering whether to remain employed an additional year or retire immediately. Accordingly, we have computed pension accruals for the sample, defined as the difference between a worker's pension wealth if he worked another year and then stopped work, as compared to leaving now and investing the contributions at the real interest rate. All figures are given in 1992 dollars.

One way to understand how plan accrual profiles work is to focus on a single illustrative pension plan. To this end, we develop a hypothetical 40-year old worker with earnings equal to the HRS average in 1992. This annual earnings level is then extrapolated forward and backward from 1992 using the real 1 percent wage growth rate assumed throughout the analysis. The average age at hire in the HRS sample was about 38, so the hypothetical worker is assumed to have joined the 1992 employer at that age and remained at that job until retirement. We then simulate how this worker's pension entitlement would change through time in the given pension plan; the plan was selected to illustrate some of the interesting features peculiar to actual defined benefit pensions.[30]

The results of this exercise appear in Figure 1. The jagged or spiked line, which is read using the right-hand scale, refers to the change in the hypothetical worker's DB pension wealth as he moves up in seniority with the firm. The first spike, at age 42, occurs with vesting, at which point the worker gains a legal right to an eventual retirement benefit. It will be noted that the present value of vesting in the plan is only a few thousand dollars. Accruals over the next decade are virtually nil, and the next spike coincides with the company's early retirement age at 54.[31] In that year, the worker's DB pension accrual is approximately $40,000. Subsequent accruals are small but positive until the worker reaches age 62, at which time he becomes eligible for a more generous benefit formula. After this age, pension accruals for continued work are negative. This type of pattern is not uncommon in defined benefit plans where the firm wants to encourage older workers to leave.[32]

The second line of Figure 1, plotted against the left scale, reflects the level of pension wealth to which the worker is entitled as his length of service with the firm increases. The sharp spike in the accrual at 54 is reflected in the
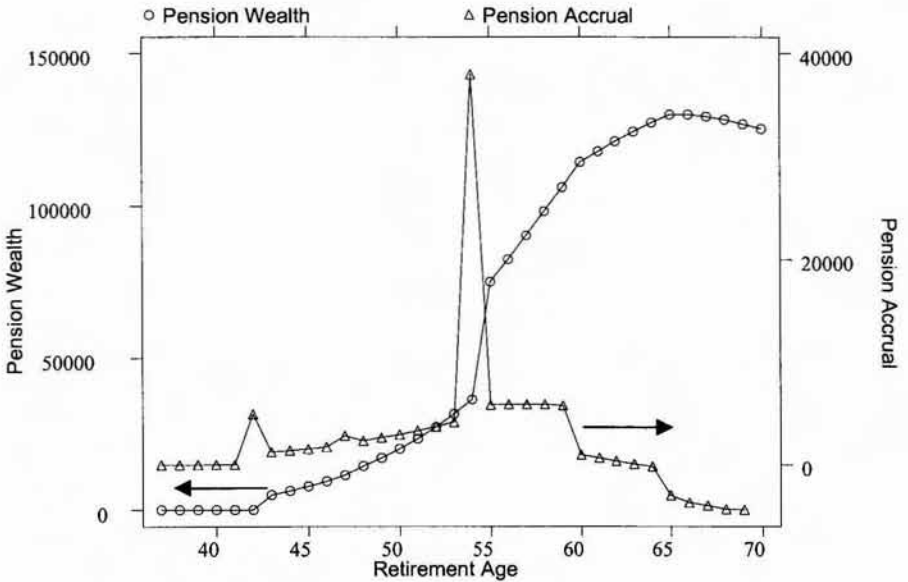
Figure 1. Illustrative defined benefit plan: pension accrual and wealth profiles for a hypothetical individual. Source: Authors' calculations.
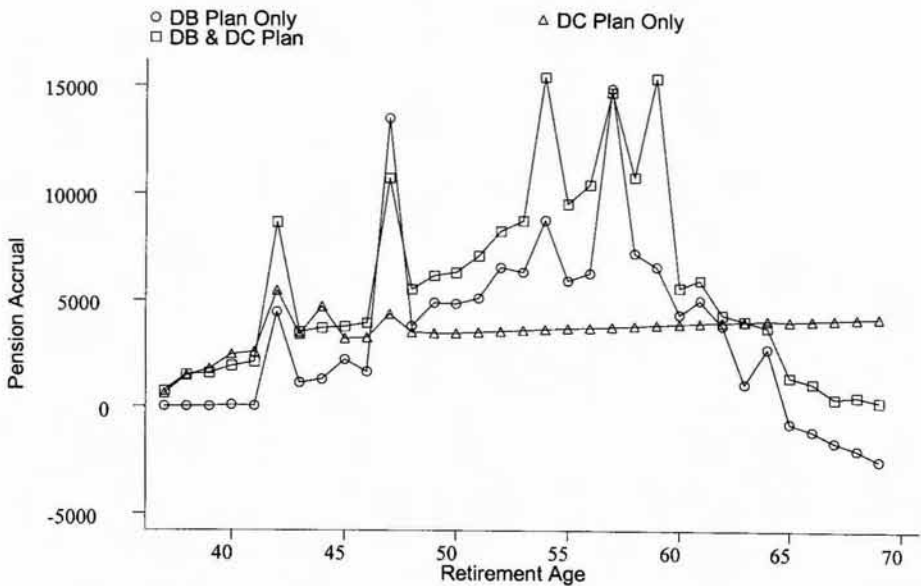

Figure 2. Cross-pension average: pension wealth profiles for a hypothetical individual. Source: Authors' calculations.

TABLE 3: Current Job Pension Accruals as Fraction of Last Wage: HRS Respondents
With Pension Link (Using SSA Intermediate Assumptions)

	Current DB Only		Current DC Only		Combination	
Age	N	Median (%)	N	Median (%)	N	Median (%)
50	67	18.38	26	9.72	53	18.28
51	118	15.27	40	7.46	101	21.92
52	144	19.34	51	5.92	60	18.17
53	131	16.36	64	10.23	94	20.29
54	113	23.42	43	5.92	65	30.22
55	87	14.16	62	9.21	65	21.69
56	128	14.69	49	10.76	65	22.53
57	96	13.36	39	10.76	63	24.66
58	75	13.29	44	10.23	54	22.35
59	75	16.02	39	7.16	57	23.38
60	87	11.53	28	5.63	42	13.53
61	39	7.93	14	n.a.	18	n.a.
Total		15.81		8.80		21.26

Notes: See Table 2. n.a. = not available for N ≤ 20.

upward shift in the total pension level function at age 55, with the slope of
the function flattening thereafter with age.

Next, we put the same hypothetical worker with HRS-average earnings and
service through the entire set of plans covering HRS respondents on their
current jobs; the results are displayed in Figure 2. Once again, the worker is
aged from 40 to age 70, so as to depict differences in accrual patterns by plan
type. The cross-pension plan averages reveal that DB plans, as a group,
present a spiked profile, with accruals rising sharply at vesting, and after ten
years of service. Pension accruals again rise sharply for early retirement
which varies in this sample from age 55 to 60. After the normal retirement
date, which for these plans ranges between age 60 and 65, workers typically
pay a penalty through a declining and eventually negative pension accrual.
By sharp contrast, the accrual profile for defined contribution pension plans
confirms that there is a smooth accrual path with virtually no retirement
inducement. Combination plans look more like DB than DC plans.

To determine whether and how these observations on simulated workers
generalize to *actual* workers, we have carried out the same simulations using
actual pension accruals for the HRS respondents covered by these plans.
Here we focus only on plan accruals for current plans, computing the
changes in pension wealth as retirement is deferred. Table 3 shows that DB
and combination plans behave fairly similarly overall, with a pronounced
early retirement peak around the mid-50s, and another, smaller hump for
workers reaching their late 50s. DC plan accruals are relatively flat for this
population, as a result of the fact that contributions are accounting for the
change in plan value with age.[33] In sum, pension accruals are large and

highly nonlinear for DB as well as combination plans, but are small and quite linear for DC pensions. Analysts interested in ways that pensions influence retirement saving patterns will clearly need to pay close attention to these differential incentives.

Conclusion

Designers of the Health and Retirement Study sought to collect data and make available to researchers the best possible estimates of pension wealth and pension accruals. The goal of this chapter is to introduce users to this valuable new information on pension wealth levels and pension accruals, and to describe baseline information about these data. These variables are available to researchers (with some restrictions) through the University of Michigan's Institute for Social Research. It is anticipated that many — perhaps most — HRS researchers will find the pension entitlement variables created here sufficient for their analytic purposes. A handful of users will, however, seek to conduct their own simulations, perhaps changing economic assumptions or computing pension entitlements for different retirement ages or different retirement circumstances than the ones developed here. This should now be possible with the information provided in Curtin (1997) and the pension files provided.

In any event, we are certain that the evidence here will only whet researchers' appetite for new pension knowledge. The richness of the pension plan information in the HRS is unsurpassed by any other public or private nationally representative data source. Further, the fact that the HRS respondents (and spouses) are being resurveyed every two years makes the longitudinal study an invaluable information base with which to track work and retirement patterns, saving and consumption profiles, and the paths of wealth and wellbeing in old age.

Notes

1. For a discussion of pension coverage statistics in the population at large see Hinz and Turner (1998), Gustman et al. (forthcoming), and Kennickell and Sunden (1997).

2. For instance see Levine, Mitchell, and Moore (this volume).

3. Gustman and Mitchell (1992) and Lumsdaine and Mitchell (forthcoming) review a range of behavioral models in which pensions play a key role.

4. This section draws on Gustman et al. (forthcoming).

5. Two recent exceptions are the Survey of Consumer Finances and the Mature Women survey associated with the National Longitudinal Survey.

6. For a review of data sources on pensions see Gustman and Mitchell (1992) and Lumsdaine and Mitchell (forthcoming).

7. Interested researchers are invited to examine the HRS website located at www.umich.edu/~hrswww.

8. In addition, administrative data on respondents' earnings and benefits histories were collected in collaboration with the Social Security Administration. Access to rounded SSA information, and the employer data, is restricted to a limited set of users who must have their research and data security plans approved by the ISR, and who maintain the strictest confidentiality regarding HRS respondents.

9. A pension provider could also have been a multiemployer (joint labor-management) plan.

10. The research is supported by a cooperative agreement between the NIA and the University of Michigan with additional funding from the Social Security Administration, the U.S. DOL (Pension and Welfare Benefit Administration), and the U.S. Department of Health and Human Services (Assistant Secretary for Planning and Evaluation). Two other national surveys have also collected pension plan descriptions from employers besides the HRS, namely the Survey of Consumer Finances (SCF) and the National Longitudinal Survey of Mature Women (NLS-MW). The HRS, however, is the only large nationally representative study of Americans on the verge of retirement.

11. As pointed out in Gustman et al. (forthcoming), pension documents could be matched proportionally more highly for employees of large firms, and also for those covered by a defined benefit rather than a defined contribution plan. For example, a worker who reported having a DB or combination plan and worked at a company with more than 500 employees had a 77 percent chance of a pension match. Someone covered by a DC plan only, but in an equivalent sized company, had two-thirds chance of a pension link. A worker with a DB or combination plan, employed at a firm with 24–99 employees, had only a 52 percent chance of having his employer plan document linked with his case, while a person with only a DC plan in the same size firm had a probability of only 32 percent.

12. The original version of the software was written by Richard Curtin at the University of Michigan's ISR; it was subsequently updated by Robert Petticolas and Jody Lamkin with input from Mel Stephens, Thomas Steinmeier, and Andrew Samwick.

13. Access to the data is restricted to preserve respondent confidentiality. The conditions under which researchers may obtain restricted files are described at www.umich.edu/~hrswww.

14. Survival probabilities for future cash flows are taken from data kindly supplied by Felicitie Bell in the Social Security Administration's Office of the Actuary. A comparison of these data with the 1990 Vital Statistics figures shows that lower survival rates in the latter datasource would have resulted in lower pension wealth figures than those reported here. For summary statistics from these mortality data see Gustman et al. (forthcoming). Users of this software program should be aware that the survival rates and pension wealth variables calculated from them reflect population averages by sex and birth cohort; they are not available by race and income.

15. The pension software program correctly computes the present discounted

value of retirement benefits from retirement on by inflation, mortality, and a real discount rate. The issue is more complex if the worker terminates his employment prior to retirement and some time passes before he receives his first benefit. As of the present writing, the pension value from 1992 to the commencement of the benefit stream is discounted by inflation and a real discount rate, but not by mortality. This should have a relatively unimportant impact on simulated magnitudes given here, and a future version of the program should be able to incorporate this change.

16. This excludes people who indicate they have received a lump sum from a prior job's pension.

17. Some in the latter group could, of course, have a pension but they may have refused to permit the HRS to contact their employer, or no pension-matched SPD may have been found. In the future it is likely that obtaining pension SPDs will grow increasingly difficult, inasmuch as pension plans are no longer required to furnish their SPDs to the U.S. Department of Labor. This no doubt saves costs, but it also makes future analysis of company-sponsored pension plans much more difficult.

18. For an extensive discussion of each input file and variable description see Curtin as adapted (1997).

19. See Mitchell, Olson, and Steinmeier (this volume) and Gustman et al. (forthcoming).

20. The social security assumptions (%) for the three cases are as follows:

	Optimistic	Intermediate	Pessimistic
CPI change	3.0	4.0	5.0
Real wage growth	1.5	1.0	0.5
Real interest rate	3.0	2.3	1.5

For further discussion of these assumptions see Advisory Council (1997).

21. All entitlements are computed as of 1992 when Wave 1 of the HRS was fielded. In future work we will examine alternative retirement ages as well.

22. There are two aspects of inflation that the user has control over. The first is the cost of living adjustment (COLA) on the pension, which we set to half of observed inflation. This conforms to evidence in Gustman and Steinmeier (1994). This value is used for any DB plan that does not specify explicitly what its COLA rate was (the default does not override plan-provided information). The second is whether the nominal dollar amounts specified in the plan are indexed to inflation. For example, if the plan had a formula promising 1.5 percent of pay up to $40,000 and 1.25 percent of pay above that, we grow the $40,000 with inflation when computing benefit entitlements for retirement after 1992. The user is permitted to set this switch in the pension software, and in this paper we set the switch to index actual plan features if these are reported.

23. It should be noted that for the present paper we use earnings profiles derived for each individual, but we do not use the administrative records described in Mitchell, Olson, and Steinmeier (this volume).

24. Other analysts will devise their own hot-deck or imputation program to fill in missing values for these respondents. Since the choice of imputation routine will depend on each user's particular problem, we have chosen not to fill in missing data.

25. See Curtain (1997) for a full discussion of run and output options.

26. If a respondent has more than one plan, the INDATA file must enter each person as many times as he or she has pension plans.

27. We have generated an output database using the assumptions spelled out in the Data Appendix available to users interested in understanding more about the structure of the output database.

28. These results are the output of Runtype 1; see Curtin (1997).

29. To determine how sensitive these results are to the underlying economic assumptions used in creating the present values, we will simulate pension entitlements using the optimistic and the pessimistic SSA assumptions. These results show that results are not affected materially. This is because the optimistic scenario has a higher real wage growth rate which tends to increase benefits, but also uses a higher real interest rate which tends to decrease the present value of these streams.

30. The analysis assumes that DC plans requiring employee payments averaged 8.36 percent in annual employee contributions (the sample average), and DC assets earn 2.3 percent annual real returns.

31. Note that the spike in the accrual profile occurs at the age before pension wealth increases. In the case of vesting, the worker is first entitled to benefits if work continues until age 43 (five years after hire). Thus, the opportunity cost of leaving the firm at age 42 is high. Similarly, the plan's early retirement age is 55, so that there are strong disincentives to leave just prior to that age. This is reflected in the graph by a spike at age 54.

32. Such patterns have also been confirmed in earlier analysis of defined benefit pension accruals; see for instance the studies reviewed in Gustman, Mitchell, and Steinmeier (1994).

33. In this analysis all worker assets in DC plans are assumed to grow at 2.3 percent annually (equivalent to a 6.3 percent nominal rate) and then are discounted back to the computation date at the same real rate.

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