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13 Pension Wealth, Age-Wealth Profiles, and the Distribution of Net Worth

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13.1 Introduction

The primary objective of this study is to develop improved estimates of pension wealth. This will help determine how large pension wealth is relative to other components of wealth and how consideration of pension wealth affects measures of the distribution of income and wealth. Data limitations have prevented a comprehensive investigation of pension wealth relative to other components of household wealth. The 1983 Survey of Consumer Finance (SCF) provides a unique opportunity to examine this issue because it contains detailed information on household finances and both nonpension wealth, obtained from household interviews, and pension wealth, which can be calculated from pension plan parameters obtained from employers.

We present two sets of estimates reflecting different models of the pension contract. Under the implicit contract model of Ippolito (1985), mean pension wealth is approximately $100,000, which represents 42.7 percent of mean net worth of households with pension coverage. Under the explicit contract model of Bulow (1982), the estimates of

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pension wealth are much lower; however, mean pension wealth is still approximately $50,000. When pension wealth is incorporated into estimates of the distribution of total wealth, measured inequality is reduced.

The next section of the paper defines pension wealth for defined contribution and defined benefit plans, the latter valued by both the legal and the projected earnings methods. Section 13.3 defines pension saving. Section 13.4 asks which method should be chosen to measure pension wealth. Section 13.5 reports estimates of pension wealth and saving from the SCF. Section 13.6 examines the relations among wealth, pension wealth, and age. Section 13.7 looks at the effect of including pension wealth in the distribution of wealth. Section 13.8 compares these results with those of other studies and draws some conclusions.

13.2 What Is Pension Wealth?

A worker covered by a defined benefit pension plan exchanges labor services for current earnings and the promise of future income in the form of pension benefits. The value of future pension benefits depends on the nature of the labor contract, survival probabilities, market interest rates, and government regulations. Two methods of calculating pension wealth have been proposed. These are the legal method developed by Bulow (1982) and the projected earnings method outlined in Ippolito (1985). This section defines pension wealth and examines the life-cycle pattern of pension wealth implied by pension coverage when wealth is calculated using these methods. The final part of this section describes pension wealth for workers covered by defined contribution plans, under which there is less ambiguity about the nature of the pension contract.

13.2.1 Legal Method of Calculating Pension Wealth: Defined Benefit Plans

Under the legal method of determining pension wealth, the employment contract is assumed to be valid for a single period. Of course, the contract may be renewed, but the worker acts as if he will be terminated at the end of each period. Therefore, he is willing to pay for only those pension benefits that the firm is legally required to pay if the worker leaves the firm at the end of the current period.

For any specific worker, pension wealth is calculated by finding the annual benefit that a worker would receive if he left the firm today. This benefit depends on the plan benefit formula, the extent to which the worker is vested in the plan, and, for most plans, the worker's current years of service and earnings history. Despite leaving the firm, the worker must wait until he has reached the retirement age specified

in the plan actually to receive any benefits. Once started, benefits usually continue for the remainder of the worker's life. Thus, the wealth value of these benefits is found by determining the expected discounted value of a life annuity beginning at the retirement age. Pension wealth is illiquid in the sense that it cannot be sold in total or in part, but individuals may be able to borrow against this asset.

Even in this strict legal interpretation of the pension contract, there is some uncertainty as to whether the worker will receive the full value of his pension wealth. The worker could die prior to reaching the retirement age and receive no pension benefits. If the worker is married, the surviving spouse may be eligible for survivorship benefits based on the vested benefits of the worker. The firm could terminate the plan due to financial difficulties. The federally established insurance system, the Pension Benefit Guaranty Corporation, does not fully guarantee vested benefits. Finally, the real value of these future benefits depends on the rate of inflation and any postretirement increases in benefits. Despite these risks associated with the determination of legal pension wealth, we believe that pension wealth calculated in this manner should be a useful, approximate lower-bound estimate of true pension wealth.

Coverage by a pension plan produces a predictable pattern of pension wealth accumulation over the life of an individual. The magnitude of pension wealth depends on plan generosity and worker characteristics and, therefore, will vary across workers. Using the legal method, pension wealth is very low during the early working years because workers have lower earnings and little credited service and must wait many years to receive benefits. However, pension wealth rises rapidly as long as the worker remains with the firm. The growth in pension wealth is due to increased years of service, higher earnings, and a reduction in the number of years until retirement. Each of these factors accelerates the growth rate of pension wealth over time, and, as a result, the rate of growth of pension wealth will exceed the rate of growth of earnings as job tenure increases. This continues until the worker reaches the age of eligibility for retirement benefits.

If the worker remains on the job past the normal retirement age, his pension wealth in most plans will decline with continued work, and the rate of decline will accelerate with advancing age (Clark and McDermed 1986; Kotlikoff and Wise 1985). This results from the fact that most firms do not provide an actuarial increase in benefits with postponed retirement. In addition, approximately half of all pension participants are in plans that cease to credit wage and service accruals after the normal retirement age. Thus, the annual benefit may be frozen at the normal retirement age, and, with continued employment, the worker will have fewer years to receive benefits producing the decline in pension wealth.

We have constructed a simulation model to illustrate this life-cycle pattern of wealth accumulation for a worker covered by a pension plan. The worker is assumed to have been hired at age twenty-five with total compensation equaling $20,000. Total compensation, which is divided into earnings and pension compensation, grows at a rate of 5.5 percent per year. This is based on an assumed real rate of growth of 1.5 percent per year and an inflation of 4 percent per year. Pension compensation, the growth in pension wealth associated with the employment contract, is the change in pension wealth with additional service and higher earnings. It does not include the change in pension wealth associated with aging that is independent of the employment contract.

The normal retirement age is sixty-five, and the plan offers no early retirement benefits. There are no postretirement adjustments in benefits, and the plan has immediate and full vesting. The plan continues to credit fully increases in earnings and service as long as the worker remains with the firm. The benefit is determined by multiplying 0.015 times years of service times average earnings in the last five years. The market interest rate is 6 percent, and workers are assumed to face mortality probabilities as shown in the 1981 U.S. Life Table for white men (U.S. Department of Commerce 1984).

The results of the simulations are shown in table 13.1. Starting with zero pension wealth at age twenty-five, the worker's wealth rises slowly at first and reaches $13,945 at age forty. At this age, pension wealth represents about one-third of annual earnings. Between the ages of forty and sixty-five, pension wealth grows by over 100 percent per five years of work. The rate of growth of pension wealth declines slightly with age during this time. At age sixty-five, pension wealth totals $613,518, or 3.7 times annual earnings. Deflating this value to age twenty-five dollars indicates a real pension wealth at age sixty-five of $128,000. In this example, increases in earnings and service continue to raise pension wealth after age sixty-five but at a rate slower than prior to the worker reaching the age of eligibility for full pension benefits.

Several additional points need to be emphasized concerning the life-cycle pattern of pension wealth. First, a vested worker leaving a firm does not lose any of his accumulated pension wealth. However, if earnings do not rise with the job change, the worker will accumulate less additional pension wealth with the new employer than if he had remained on his initial job. Even if the worker has the same earnings and both employers have the same pension plan, wealth accumulation will be slower for the job changer because years of service at the previous job will not be credited in the pension at the new job. Second, after the worker retires, pension wealth falls systematically with advancing age due to declines in life expectancy. Unanticipated increases in the rate of inflation will also lower the pension wealth of retirees.

Table 13.1 **Employee Compensation and Pension Wealth: Legal Method**

Age	Tenure (years)	Earnings ($)	Pension Compensation ($)	Pension Compensation as Percentage of Total Compensation	Pension Benefit ($)	Pension Wealth ($)	Pension Savings ($)
25	0	19,959	41	.21	0	0	0
30	5	25,737	402	1.54	1,654	1,530	630
35	10	33,318	845	2.47	4,293	5,340	1,045
40	15	42,946	1,704	3.82	8,323	13,945	2,294
45	20	55,016	3,339	5.72	14,269	32,325	4,833
50	25	69,873	6,395	8.39	22,772	70,361	9,922
55	30	87,684	11,995	12.03	34,543	147,571	20,035
60	35	108,267	22,010	16.89	50,251	302,288	40,040
64	39	126,191	35,199	21.81	65,945	532,487	70,231
65	40	164,680	5,586	3.28	70,304	613,518	81,030
70	45	246,141	−23,610	−10.61	127,045	934,312	75,257

Source: Data are based on a simulation of compensation for a male worker who remains with a firm throughout his work life. He is assumed to have been hired at age 25 with total annual compensation (earnings plus pension compensation) equal to $20,000. Total compensation grows at 5.5 percent per year. The worker is covered by a pension with a normal retirement age of 65 and a benefit formula of .015 times average earnings in last five years times years of service. The market interest rate is 6 percent.

13.2.2 Projected Earnings Method of Determining Pension Wealth: Defined Benefit Plans

An alternative method of calculating pension wealth assumes that the worker and the firm enter into a long-term, implicit contract. The worker promises to remain with the firm until retirement and to perform at the agreed level of effort. The firm promises to continue to employ the worker as long as he fulfills the terms of the contract. To enforce the contract, a firm requires that workers pay for a pension value that is conditional on their remaining with the firm. The "stay pension" exceeds the pension to which workers are legally entitled, which we will call the "leave pension." Firm reputation in the labor market is assumed to be sufficient to keep the firm from reneging on its obligations.

In this model of the labor contract, workers are paid total compensation equal to their value of marginal product in each period. Compensation consists of earnings and pension compensation. The difference between this model and the legal method is that pension compensation is based on pension wealth that is conditional on the worker remaining with the firm until retirement. In each period, pension wealth is based on the plan benefit formula, current years of service, and projected earnings in the final working years just prior to retirement.

Since projected future earnings are typically greater than current earnings, the "stay pension" wealth based on projected earnings will exceed the "leave pension" wealth, which is the value derived using the legal method. Under an implicit contract, workers pay for the stay pension, but, if they quit their jobs or are laid off, they receive only the leave pension. This difference represents a capital loss in pension wealth associated with termination of employment. Thus, pension wealth based on the projected earnings method entails an additional form of risk for the worker, that is, the risk of job termination. This estimate of pension wealth should be an upper-bound estimate of the worker's true pension wealth.

Pension wealth based on the projected earnings method of calculation also follows a predictable life-cycle pattern. As long as the worker remains with a single firm, wealth rises until the age of eligibility for benefits. Compared to pension wealth based on the legal method, wealth is higher early in the work life because it is based on projected final earnings rather than actual earnings but rises more slowly with job tenure because projected final earnings do not change over time. Pension compensation drops sharply at the normal retirement age and may become negative if the worker remains with the firm. The decline after the normal retirement age is due to the ending of the implicit, long-term contract. The worker may remain with the firm after this date but is assumed to be covered by an explicit, year-by-year contract. This

results in benefits and pension compensation based on the legal method and actual earnings received after the termination of the implicit contract.

If the worker leaves a job, his pension wealth drops sharply from the stay pension to the leave pension. The magnitude of this capital loss rises during the initial working years, peaks in the late forties or early fifties, and then declines. Of course, at the normal retirement age, there is no loss from leaving because the worker has completed the terms of the contract.

A simulation example can be used to illustrate the life-cycle pattern of wealth accumulation using the projected earnings method. Using the same pension and worker characteristics as described above, pension wealth at various ages is shown in table 13.2. After completing one year of work, pension wealth is $2,822. This value rises with additional years of work, and the rate of increase rises slightly with job tenure. Pension wealth is more than one year of earnings by age forty, when wealth is $51,752. Pension wealth grows by about 70 percent per five years of employment, growing to $690,677 at age sixty-five. Even though the two simulations assume that the worker has the same total compensation in each year, pension wealth at age sixty-five differs slightly. This result is from the small difference in annual earnings between the ages of sixty and sixty-four. Annual earnings are endogenously determined by the algorithm and differ throughout the work life.

Also shown in table 13.2 is the capital loss associated with leaving the job. This loss in pension wealth rises from $21,346 at age thirty-five to $105,082 at age fifty-five. The loss in pension wealth associated with job termination declines to zero at age sixty-five. A series of simulations illustrating the potential capital loss over the work life for various industry, occupation, and plan size groups are shown in Allen, Clark, and McDermed (1986).

13.2.3 Pension Wealth in Defined Contribution Plans

Pension wealth for workers covered by a defined contribution plan is equal to the value of the funds in their accounts. Each pay period, a firm using a defined contribution plan contributes a specified sum into a pension account for its workers. Employer contributions may be augmented by contributions by the employee. The funds are invested and increase over time with additional contributions and the compounding of rate of return on the funds. Future benefits are determined entirely by the magnitude of the pension fund at retirement. The firm's liability ends each period with the contribution. Thus, pension wealth at each age is equal to the value of the pension fund. Calculation of current pension wealth does not require any projection of future earnings or rates of inflation. This value is not affected by potential job

Table 13.2 **Employee Compensation and Pension Wealth: Projected Earnings Method**

Age	Tenure (years)	Earnings ($)	Pension Compensation ($)	Pension Compensation as Percentage of Total Compensation	Pension Benefit ($)	Pension Wealth ($)	Capital Loss ($)
25	0	18,670	1,330	6.65	0	1,330	1,330
30	5	24,353	1,786	6.83	1,562	10,717	9,272
35	10	31,762	2,401	7.03	4,074	26,414	21,346
40	15	41,415	3,234	7.24	7,969	51,752	38,399
45	20	53,982	4,373	7.49	13,853	91,835	60,452
50	25	70,303	5,964	7.82	22,564	155,076	85,357
55	30	91,432	8,247	8.27	35,245	255,654	105,082
60	35	118,664	11,612	8.91	53,434	418,048	96,610
64	39	145,802	15,587	9.66	73,290	623,494	31,700
65	40	173,397	−3,130	−1.84	79,146	690,677	0
70	45	253,590	−31,059	−13.96	134,412	988,489	0

Source: Data are based on a simulation of compensation for a male worker who remains with a firm throughout his work life. He is assumed to have been hired at age 25 with total annual compensation (earnings plus pension compensation) equal to $20,000. Total compensation grows at 5.5 percent per year. The worker is covered by a pension with a normal retirement age of 65 and a benefit of .015 times average earnings in last five years times years of service. The market interest rate is 6 percent.

changes. As such, the wealth of the worker is not subject to risks concerning job change, but the worker does bear all rate of return risks.

13.3 What Is Pension Saving?

Pension saving is the change in pension wealth from one year to the next. It includes pension compensation as well as the change in pension wealth resulting from aging. The two methods of calculating pension wealth predict somewhat different patterns of savings. Using the legal method, the dollar value of pension saving rises rapidly with increased job tenure. In addition, prior to the normal retirement age, the ratio of pension saving to total compensation also rises rapidly. Table 13.1 shows that, in our simulation example, pension savings rise from $1,045 at age thirty-five to $81,030 at age sixty-five. Using the projected earnings method, the dollar value of pension saving and the ratio of pension saving to total compensation increase with job tenure but at a slower rate than that implied by the legal method. For example, pension saving at age thirty-five is $3,435 and rises to $67,183 at age sixty-five (results are not shown in table 13.2).

13.4 Which Method Should Be Used to Measure Pension Wealth?

Both the legal and the projected earnings methods have been proposed as the appropriate procedure for estimating pension wealth. Which method best captures the nature of the pension contract? Because they yield different predictions concerning labor market behavior, the competing hypotheses can be tested. Primarily, these different predictions concern the rate of growth of earnings and the propensity of workers covered by pensions to quit. The predictions of the projected earnings method seem to conform to the reality of observed labor market influences of pensions.

Under the projected earnings method, workers stand to lose pension wealth if they leave their current employers, which is consistent with the lower quit rates observed for workers covered by pensions (Mitchell 1982; Allen, Clark, and McDermed 1986; Ippolito 1987). The legal method predicts that the growth rate of earnings for workers covered by pensions should be lower than that for other workers, whereas the projected earnings method predicts that pension coverage has no effect on the growth of earnings. The evidence (Ippolito 1985; Clark and McDermed 1988) is consistent with the latter interpretation. Another implication of the legal method is that there should be large decreases in earnings when workers become vested or become eligible for early retirement (Kotlikoff and Wise 1985). There is no evidence of such

earnings behavior. In addition, many firms provide ad hoc postretirement benefit increases that can be justified only in terms of an implicit labor contract (Allen, Clark, and Sumner 1986).

Despite this tentative conclusion that the available evidence tends to support the implicit contracting theory of pension, we have calculated pension wealth using both the methods described in this paper. The legal method provides an approximate lower-bound estimate of pension wealth, and the projected earnings method provides an upper bound. By comparing the range of these estimates, we should have a reasonable estimate of the true magnitude of pension wealth.

13.5 Household Wealth and the SCF

The 1983 SCF is the latest in a series of surveys sponsored by the Federal Reserve Board (FRB) to measure the wealth holdings of households in the United States. The survey contains comprehensive data on the assets and liabilities of a representative sample of U.S. households. Additional personal and employment characteristics are included in the survey (Avery, Elliehausen, and Canner 1984a, 1984b). These data are sufficient to construct employment histories for most respondents and their spouses. The actual data tape used in this study is an early copy provided by the FRB. In addition to the household responses to the SCF, this tape also contains a series of variables constructed by the researchers at the FRB. Our analysis relies on their estimate of nonpension net wealth as well as their imputations for missing responses.

The SCF consists of two samples: a representative cross-sectional sample consisting of 3,665 usable households and a special high-income sample containing 438 households. In this paper, we report results based on the combined samples and employ weights provided by the FRB that convert the combined sample to a representation of the U.S. household population as measured by the 1980 census.

The 1983 SCF sought to gather sufficient data to allow analysts to construct the first accurate measures of pension wealth. To this end, there are numerous questions on the survey pertaining to the type and level of pension benefits. Respondents were asked whether they were covered by a pension and, if so, whether it was a defined benefit or defined contribution plan. They were asked the expected future value of benefits from a defined benefit plan and the date when they expected to begin receiving them. For defined contribution plans, they were asked the current value of their accounts. Respondents were asked about other types of thrift and profit-sharing plans. They were also asked about any pensions on past jobs from which they expected to receive a benefit. People currently receiving pension benefits were asked the annual value of their benefits. From these questions alone, a mea-

sure of pension wealth can be constructed. This approach has been used to estimate pension wealth from the Retirement History Study by Quinn (1985) and from the President's Commission on Pension Policy by Cartwright and Friedland (1985).

The distinctive feature of the SCF, however, is that data were also gathered from the pension plan sponsor concerning the plan characteristics. These data were separately coded onto a pension-provider tape, which we received from the Survey Research Center of the University of Michigan in conjunction with a Department of Labor contract. These data consist of detailed plan characteristics on the normal benefit formulas and how they apply to various types of workers. Formulas for deferred vested participants, maximum benefits, and social security offsets were also included.

To determine the value of pension benefits on respondents' and spouses' present jobs, we used these specific benefit formulas in conjunction with required respondent characteristics. The methodology used to calculate pension benefits and pension wealth is described below. This methodology is used only for persons covered by a defined benefit plan on their current jobs. The treatment of defined contribution plans on current jobs and the value of benefits on past jobs is described in a separate section.

13.5.1 Calculation of Pensions Benefits from Defined Benefit Plans on Current Jobs

The calculation of pension benefits for defined benefit plans from the pension-provider data required that the benefit formulas as coded in the data be converted to computational algorithms. Most plans had several normal retirement and deferred vesting formulas that applied to different types of workers or applied to different periods of employment. These formulas were often linear combinations and frequently required one to assess relative values from alternative combinations of formulas. Eight of the plans had formulas that were integrated with formulas from other plans. These plans were eliminated from the analysis.

The next step was to apply the algorithms to particular individuals. Work and salary histories were constructed from the household data. The value of years of service used in the algorithms was determined from current job tenure as reported by respondents. Salary histories and earnings projections were based on two alternative assumptions about real earnings growth: a constant 5.5 percent annual growth rate, reflecting 1.5 percent economy-wide real wage growth and 4 percent inflation (CGE), and the FRB estimate of expected annual occupation-specific real wage growth controlled for industry, age, race, and sex (FGE). The FRB estimate also assumes that earnings grow 5.5 percent

per year in addition to the occupation-specific component. Specifically, each person was assigned age-related earnings growth rates for ages younger than thirty-five, thirty-five to fifty-four, and fifty-five and over. These rates vary across the sample by race, sex, industry, and occupation. FRB estimates of these occupation-specific rates were not available for the high-income sample.

Legal pension wealth based on an explicit labor contract is calculated from benefits the worker would receive if the worker left the firm today. Workers who are vested and leave a job are legally entitled to receive a benefit based on the deferred vested benefit formulas rather than on the normal benefit formulas. Thus, all benefits using the legal method of determining pension wealth are based on the deferred vested benefit data and assume that the person begins benefits at the worker's expected retirement age. Vesting status was determined from worker characteristics provided in the respondent data and vesting requirements reported in the pension-provider data. For salary-based formulas, earnings histories of the appropriate length were constructed for each of the assumptions described above. Service years were current job tenure in 1983. Workers who were not currently vested were assumed to have zero legal pension wealth.

For the projected earnings method, workers were assumed to remain with their current employers until their expected retirement ages as given in the respondent interviews. Therefore, projected earnings wealth was based on the normal retirement formulas provided by the firm. If the worker was not eligible for normal benefits at the reported retirement age, the worker was assumed to retire at the earliest age of eligibility for normal benefits. Benefits in this method were based on earnings projected to retirement and current years of service. Projected earnings wealth was calculated under each of the two assumptions about earnings growth.

Each plan was checked to see if it had a maximum benefit formula or was integrated with social security. If the plan had a maximum benefit, then the benefit as calculated was restricted to this maximum. Social security integration is done either by excess formulas that pay a higher fraction of earnings above the social security wage base than for earnings below it or by reducing the pension benefit by some fraction of the social security benefit.

For the excess method, we projected the social security maximum taxable earnings to grow at 5.5 percent per year (this is the assumption used in the intermediate projections of the Social Security Administration). We then calculated the average wage base that firms can legally use in conjunction with the excess method. The plan formula indicates whether this level or some other level will be used. We assumed that the excess formula will not be revised during the respondent's work life.

The offset plans required us to calculate the social security benefit that the worker expects to receive at retirement. Social security reductions were based on projected social security benefits at the expected retirement age. We assumed that the current social security offsets in the pension benefit formulas would apply when the worker retired. Using the two growth assumptions, earnings were projected to rise from their current level until retirement. This work history was then used to calculate the worker's social security primary insurance amount (PIA).

We assumed that the social security benefit formula would not be revised but that, as in 1983, the bend points of the formula would rise with the rate of growth of taxable earnings. Earnings prior to age sixty were indexed by the maximum taxable earnings at age sixty-two, while earnings after age sixty-two were indexed by the rate of growth of prices. The social security benefit calculated by this method was then introduced into the benefit formula. In most plans, the offset is some fraction of the social security benefit that varies with earnings or years of service subject to a maximum offset. In this analysis, we have ignored the future changes in social security that were adopted in 1983.

13.5.2 Calculation of Pension Benefits for Defined Contribution Plans and for Past Jobs

In defined contribution plans, the firm and/or the employee contribute a specified amount each pay period into an employee account. Benefits at retirement are based on the amount of funds in the account. At any point in time, pension wealth is the value of the employee's account. While there are data on the pension-provider tape for defined contribution plans, this information is less useful in determining future pension benefits. We could have used these data along with assumptions concerning past contribution rates, rates of growth of earnings, and rates of return to the pension fund to estimate the current value of the pension account.

Instead, we relied on answers to questions on the respondent tape concerning the current value of the pension account. It is likely that most of the people covered by defined contribution plans receive some type of annual statement concerning the current value of their pension accounts. The estimate of this form of pension wealth requires only this knowledge; it specifically does not require the respondent to forecast future rates of growth in wages and prices; nor does it necessitate any evaluation of the prospects of leaving the firm. Therefore, we take the respondent's own evaluation of current pension wealth as the best estimate of its true value. All missing values concerning the funds in the defined contribution accounts were imputed by researchers at the FRB. Since we are interested in pension wealth, we did not convert the value of the pension account into any implied future benefit.

Many respondents and their spouses expect to receive benefits from pensions on previous jobs. For the most part, the pension-provider tape does not contain information on the plan characteristics of pensions on past jobs. However, individuals were asked about the pension benefits they expected to receive from past jobs. We assumed that the respondents gave the value of benefits that they expected to receive at retirement. For past jobs, this may be a reasonably accurate estimate. Having already left the job, the nominal benefit at retirement will not be affected by any further work; nor will it be influenced by future earnings or inflation. Departing workers may also have been told the benefit to expect in their exit interviews with the firm. If respondents answered that they were covered by a pension on their current jobs but did not know either coverage or expected benefits from past jobs, we assigned them their pension wealth from their current job alone.

13.5.3 Missing Values for Pension Benefits

Some respondents reported that either they or their spouse were covered by a pension on their current jobs, but there are no data for these plans on the pension-provider tape. For these workers, we imputed the value of their pension benefit. A pension benefit equation was estimated for persons covered by a pension on their present job and for whom we had calculated a benefit using the procedure described above. The results from four regression equations are shown in table 13.3. The equations are for two benefits using the legal method and

Table 13.3 **Pension Benefit Equations for Persons Currently Working and Covered by a Defined Benefit Plan**

	Legal		Projected	
Variable	CGE[a]	FGE[b]	CGE[c]	FGE[d]
Intercept	−9.44***	−6.89***	1.61	1.72
	(1.51)	(2.11)	(1.11)	(1.37)
Construction	.43	.31	−1.11***	−1.13***
	(.91)	(1.11)	(.35)	(.41)
Manufacturing	−.45	−.63	−.51**	−.43*
	(.33)	(.41)	(.21)	(.23)
Transportation, communications	−.49	−.58	−.37	−.18
	(.36)	(.45)	(.23)	(.27)
Wholesale and retail trade	−1.04***	−.90*	−.07	.14
	(.41)	(.50)	(.26)	(.30)
Finance, insurance, real estate	−1.57***	−1.48***	−.50*	−.52
	(.42)	(.55)	(.28)	(.33)

Table 13.3 (continued)

	Legal		Projected	
Variable	CGE[a]	FGE[b]	CGE[c]	FGE[d]
Personal and repair services	−.52 (.60)	−.79 (.76)	−.80 (.31)	−.63 (.36)
Professional services	−.09 (.35)	−.21 (.44)	.07 (.22)	.24 (.24)
Public administration	.06 (.36)	.02 (.45)	.11 (.23)	.26 (.25)
Managers, administrators	−.35* (.18)	−.67*** (.23)	.19 (.15)	.07 (.17)
Sales and clerical	−.19 (.17)	−.39* (.22)	−.15 (.13)	−.20 (.15)
Craftsmen, protective services	−.33* (.19)	−.33 (.23)	−.22 (.15)	−.15 (.17)
Operatives, laborers	−.32* (.19)	−.54** (.24)	−.64*** (.13)	−.52*** (.15)
Log (age)	.76*** (.27)	.74** (.35)	−1.37*** (.18)	−1.17*** (.21)
Log (tenure)	.97*** (.13)	1.03*** (.17)	.87*** (.05)	.90*** (.06)
Log (salary)	1.26*** (.11)	1.02*** (.16)	1.05*** (.09)	.92*** (.11)
R^2	.63	.53	.52	.46

Source: Benefit data are from the pension-provider portion of the SCF for all persons covered by a defined benefit plan on their current job. Other variables for each individual are from the household portion of the SCF.

Note: Dependent variable is the natural logarithm of pension benefit as calculated by each of two methods using one of two earnings growth assumptions. The omitted industrial group is agriculture, forestry, fishing, and mining. The omitted occupational group is professional, technical, and kindred workers. Standard errors are in parentheses.

[a]Pension benefit is calculated using the legal method assuming a constant 5.5 percent growth in annual earnings.

[b]Pension benefit is calculated using the legal method assuming the individual specific growth rate in earnings derived by the FRB.

[c]Pension benefit is calculated using the projected earnings method assuming a constant 5.5 percent growth in annual earnings.

[d]Pension benefit is calculated using the projected earnings method assuming the individual specific growth rate in earnings derived by the FRB.

*Coefficient is statistically significant at the 10 percent confidence level.

**Coefficient is statistically significant at the 5 percent confidence level.

***Coefficient is statistically significant at the 1 percent confidence level.

two benefits using the projected earnings method. The benefits for each method are based on our two assumptions concerning the rate of growth of earnings. The FGE benefit equations are estimated using respondents only from the cross-sectional sample since salary projections were not made by the FRB for the high-income sample.

These benefit equations are interesting in their own right. To our knowledge, they are the first estimates of pension benefits based on a large sample of data combining actual worker and plan characteristics. Explanatory variables include a series of industry and occupational dichotomous variables along with age, job tenure, and salary. The relatively few statistically significant differences among the industry and occupational coefficients is somewhat surprising; however, it should be remembered that we controlled for salary and tenure differences.

When benefits are estimated using a constant 5.5 percent per year growth in earnings (CGE), the elasticity of benefits with respect to job tenure is slightly less than one, while the elasticity of benefits with respect to salary is slightly greater than one. These values hold for both the legal and the projected methods of calculating benefits. The relative values of these two elasticities is reversed in the equations that are based on the FRB earnings growth assumptions; however, all eight of the estimates for these two variables are relatively close to one. Only the parameter estimate for salary in the legal CGE equation and the parameter estimate for tenure in the projected earnings CGE equation are statistically significantly different from one at the .05 level of significance.

If the benefit formula were a simple multiplicative, earnings-based formula, then both the tenure and the salary elasticities should be one. The existence of social security offsets tends to make benefits rise by more than a proportional percentage in response to salary increases, while maximum benefits would tend to make the tenure and salary elasticities less than one. The negative age elasticities in the equations for projected benefits follow from the construction of the benefit. Holding salary and tenure constant, the projected benefit will be lower for older workers as long as the growth rate of earnings is positive.

Benefits from defined benefit pensions on the current job for persons with missing values were imputed from these regression equations and the individual and firm characteristics. Persons with missing data concerning the value of benefits from past jobs are given the mean value of this type of pension benefit for similar types of workers.

13.5.4 Summary of Pension Benefit Data

There are 2,304 households in the sample who are covered by a pension on a current or past job. This represents 56.2 percent of the unweighted households and 54.8 percent of the weighted households.

Of these households, 1,592 have at least one family member who is a participant in a defined benefit plan on his current job. We were able to derive pension benefits using the plan-specific data for 889 of these households. Therefore, we imputed pension benefits for 703 households. Pension-provider data were not available for these households because the interviewers were unable to locate the firm, there were no summary plan descriptions available, or for some other reason the firm interview was not completed.

Pension wealth from defined contribution plans was determined for 236 households, and pension wealth from past jobs was derived for 740 households. A household could, of course, have wealth from one or more of these sources. Persons with thrift plans or profit-sharing plans are not included in these counts; however, the value in these accounts as given by the respondents is included in pension wealth.

13.5.5 Calculation of Pension Wealth

For defined benefit plans, we converted the value of the pension benefit into a wealth value calculating the value of a life annuity beginning at the age of expected retirement as indicated by the respondent. Benefits were assumed to remain fixed in nominal terms, and the interest (or discount) rate was set at 6 percent. The 1981 mortality rates by race and sex were used to determine survival probabilities. Pensions were assumed to have no death benefits. As noted above, respondents with defined contribution plans were assumed to have accurately reported their pension wealth. Pension wealth is the sum of all defined contribution and defined benefit values from current and past jobs as well as withdrawable amounts in thrift-type accounts.

13.5.6 Calculation of Pension Savings

Pension savings is calculated only for persons who are currently working on a job and are participating in a defined benefit pension plan. For these workers, pension savings was calculated by estimating current pension wealth as described above and subtracting this value from pension wealth one year later. Pension wealth in the succeeding year was calculated by increasing job tenure by one year and increasing the salary average based on the two estimates of earnings growth. This method combines the gain in wealth attributable to an additional year of work (pension compensation) and the gain in wealth due to surviving an extra year and being closer to retirement age. We have not calculated similar values for persons covered by defined contribution plans. For these workers, savings equal new contributions and the return to the pension fund. Neither have we calculated savings for persons with pensions on past jobs. Savings from a pension on a past job is solely

attributable to surviving an extra year and being closer to the retirement age.

13.6 Wealth, Pension Wealth, and Age

Since the early development of life-cycle saving theory, economists have predicted that household wealth will tend to be relatively low early in life, rise during the middle years, and then decline during the final years of life. Evidence on the life-cycle accumulation of wealth has typically been from cross-sectional data and has focused exclusively on nonpension wealth. In this section, we present a comprehensive assessment of pension wealth along with nonpension wealth using data from the 1983 SCF. It is important to remember that these data represent wealth at a particular point in time for different cohorts of households and are not a true measure of the effect of aging for a single cohort.

13.6.1 Nonpension Wealth

Our measure of nonpension wealth is a variable that was created by researchers at the FRB. It represents the net value of all paper and other financial assets, equity in the respondent's home and other property, the net value of vehicles and boats, and net worth of any businesses or farms. This measure is compiled by examining the response to numerous questions concerning family assets and liabilities and is intended to represent the standard concept of net household wealth.

Estimates of nonpension net wealth are shown in table 13.4 for all households in the SCF along with separate estimates for households with pension wealth and those without pension wealth. For all three

Table 13.4 **Mean Nonpension Wealth by Age and Pension Status (dollars)**

Age	All Households	Households with Pensions	Households without Pensions
Younger than 25	6,342	10,292	4,842
25–34	31,735	29,731	34,412
35–44	82,181	75,993	94,179
45–54	188,503	188,170	189,122
55–64	196,492	208,896	177,111
65–74	222,514	293,829	163,652
Older than 74	119,639	200,270	87,220
All households	118,419	132,047	101,862
Number of households in sample	4,103	2,304	1,799

Source: Weighted household wealth data from the SCF.

samples, mean nonpension wealth is less than $10,300 for households with respondents under the age of twenty-five. It rises to $30,000 and above for households aged twenty-five to thirty-four. Nonpension wealth then more than doubles across each of the next two ten-year age groups. This form of wealth continues to increase slightly across the next two groups before declining sharply for the oldest age group. For all age groups except those aged forty-five to fifty-four, these estimates are between fifty and seventy-eight percent higher than estimates of net worth presented by Avery, Elliehausen, and Canner (1984b), which estimates excluded the value of consumer durables such as automobiles and home furnishings, the cash value of life insurance, and equity in small businesses and farms.

Studies by Munnell (1974, 1976) and Feldstein (1974, 1982) initiated a debate on the effect of social security and private pensions on the magnitude of private savings. A number of studies followed these early papers, but, to date, this literature has produced no clear picture concerning the elasticity of private savings with respect to pension savings. The data that we have constructed from the SCF will provide a useful new source for testing these hypotheses. As of yet, we have not attempted to estimate savings response to pension coverage and pension savings. The data in table 13.4 indicate that the mean nonpension wealth of persons with pension wealth is not lower than that of persons with no such wealth. In fact, nonpension wealth is considerably higher for households with pension wealth than for those without pension wealth for all ages over fifty-five; however, Z-statistics indicate that nonpension wealth for households covered by a pension is not statistically different for any of the age groups from the wealth of those not covered by a pension.

13.6.2 Pension Wealth and Total Net Wealth: Legal Method

Estimates of legal pension wealth using the two earnings growth assumptions are presented in table 13.5. At all ages, the two estimates are very similar. Holding constant the interest rate, it seems reasonable to conclude that legal pension wealth is relatively insensitive to the earnings growth rate assumption within a fairly wide range of growth rates. This is due to two effects. First, some pension wealth is from past jobs or defined contribution plans, and therefore our earnings assumption, does not enter into the calculation of pension wealth. Second, most plans use relatively few years of earnings to determine the salary average in the benefit calculation. Thus, the earnings histories based on the different growth assumptions are not very different.

As expected, legal pension wealth is quite small early in life, rises rapidly during the working years, and declines with advancing age. For workers younger than twenty-five, mean pension wealth is approximately

Table 13.5 **Wealth Estimates: Legal Method (dollars)**

Age	Pension Wealth Households with Pensions		Net Worth					Percentage of Households with Pension
			All Households		Households without Pensions	Households with Pensions		
	CGE	FGE	CGE	FGE		CGE	FGE	
Younger than 25	1,951	2,007	6,879	6,894	4,842	12,243	12,299	27.5
25–34	6,899	6,850	35,612	35,584	34,412	36,659	36,609	57.2
35–44	20,383	24,481	98,924	98,329	94,179	101,371	100,469	66.0
45–54	70,764	63,451	230,128	225,362	189,122	258,934	251,621	65.0
55–64	121,183	116,498	270,380	267,523	177,111	330,079	325,395	61.0
65–74	55,060	55,066	247,411	247,413	163,652	348,888	348,894	45.2
Older than 74	25,522	25,651	126,958	126,995	87,220	225,792	225,921	28.7
All households	47,541	45,180	143,837	142,541	100,261	179,642	177,281	54.8

Source: Weighted pension wealth data derived for households in the SCF and weighted nonpension wealth from the household portion of the SCF.

$2,000. Wealth triples across each of the next two ten-year age groups, to stand at over $60,000 for the cohort aged forty-five to fifty-four. Pension wealth then almost doubles for the next cohort so that wealth is over $115,000 for the cohort aged fifty-five to sixty-four. After sixty-five, pension wealth declines sharply.

Net worth is the sum of nonpension and pension wealth for each household, and the mean values are shown in the last five columns of table 13.5. The middle of these columns represents net worth for households without pensions. For these families, total net worth is identical to nonpension wealth. Net worth is also presented for all households and for households with some pension wealth. Net worth for households with some pension wealth exceeds the net wealth of the no pension households at all ages. Between the ages of fifty-five and seventy-four, wealth of the pension households is almost twice that of the nonpension households.

13.6.3 Pension Wealth and Net Worth: Projected Earnings Method

Pension wealth under the projected earnings method is shown in table 13.6. The CGE pension wealth is over $14,000 for households with heads younger than age twenty-five using the projected earnings method, compared to only $1,900 with the legal method. Instead of tripling across the first two age groups, the projected pension wealth only doubles. Slower growth is also observed across the middle working years. Wealth for the oldest age groups is virtually identical for the two methods. This follows from the fact that most of these households are currently receiving benefits and are not still working.

There are greater differences between the CGE and the FGE estimates under the implicit contracting model than were observed with legal pension wealth. This follows from the longer forward projection of earnings in the implicit contract model as compared to the relatively short backward projections done in conjunction with the legal method. These differences vary between 22 and 28 percent for households under the age of forty-five but are less than 4 percent for households aged fifty-five to sixty-four. Since most people are retired after the age of sixty-five, the wealth estimates for these two assumptions are approximately equal at these older ages.

Since pension wealth is higher using the projected earnings method, net worth is also higher with this method, compared to the legal method. The CGE wealth for all households rises from $10,000 for households under the age of twenty-five to approximately $120,000 for those aged thirty-five to forty-four. Net worth peaks for households aged fifty-five to sixty-four at about $358,000 and then declines for the older households. The implicit contract method of evaluating pension wealth results

Table 13.6 **Wealth Estimates: Projected Earnings Method (dollars)**

Age	Pension Wealth, Households with Pensions		Net Worth				
			All Households		Households without Pensions	Households with Pensions	
	CGE	FGE	CGE	FGE		CGE	FGE
Younger than 25	14,862	12,177	10,432	9,693	4,842	25,154	22,469
25–34	22,923	17,785	44,792	41,848	34,412	52,683	47,544
35–44	57,083	44,530	119,837	111,555	94,179	133,072	120,519
45–54	152,315	79,684	283,277	235,941	189,122	340,485	267,853
55–64	264,702	255,286	357,887	352,146	177,111	473,598	464,183
65–74	54,344	53,249	247,087	246,592	163,652	348,173	347,078
Older than 74	24,122	23,631	126,556	126,415	87,220	224,392	223,901
All households	98,291	78,792	171,696	160,992	100,261	230,392	210,893

Source: Weighted pension wealth data derived for households in the SCF and weighted nonpension wealth from the household portion of the SCF.

in much higher net worth for persons with pension wealth at all ages compared to households with no pension wealth.

13.6.4 Pension Wealth as a Percentage of Total Wealth

The data presented in tables 13.4–13.6 illustrate that pension wealth is relatively small early in life and grows until the retirement years. This pattern of wealth accumulation is similar to that for nonpension wealth. Table 13.7 shows the mean value for pension wealth as a percentage of mean total wealth by the age of the household head. The first part of the table shows that, for all households younger than twenty-five, legal pension wealth is about 8 percent of total wealth, as compared to over 34 percent for the projected earnings method. Legal pension wealth as a percent of total wealth rises with age until the fifty-five to sixty-four age group, for which pension wealth represents 27 percent of total wealth. For the projected earnings method, pension wealth varies between 22 and 35 percent of total net worth

Table 13.7 Pension Wealth as a Percentage of Total Wealth

	All Households			
	Legal		Projected	
Age	CGE	FGE	CGE	FGE
Younger than 25	7.8	8.0	39.2	34.6
25–34	11.1	11.0	29.3	24.3
35–44	16.9	16.4	31.4	26.3
45–54	20.0	18.3	35.0	22.0
55–64	27.3	26.6	45.1	44.2
65–74	10.1	10.1	9.9	9.8
Older than 74	5.8	5.8	5.5	5.4
All households	18.1	17.4	31.4	26.9
	Households with Pensions			
Younger than 25	15.9	16.3	59.1	54.2
25–34	18.8	18.7	43.5	37.4
35–44	25.0	24.4	42.9	36.9
45–54	27.3	25.2	44.7	29.7
55–64	36.7	35.8	55.9	55.0
65–74	15.8	15.8	15.6	15.3
Older than 74	11.3	11.4	10.8	10.6
All households	26.5	25.5	42.7	37.4

Source: Weighted pension wealth data derived for households in the SCF and weighted nonpension wealth from the household portion of the SCF.

for all ages prior to fifty-five and increases to over 44 percent of total net worth for the fifty-five to sixty-four group.

Looking only at households with pensions, pension wealth is, of course, a larger proportion of total net worth. In these households, the fraction of wealth that is due to pension wealth is about 16 percent for the youngest households for the legal method. This ratio rises with household age until the fifty-five to sixty-four age group, for which the proportion of wealth due to pensions reaches approximately 37 percent. The fraction of total net worth due to pension wealth using the projected earnings method is more variable. The ratio drops from 59 percent for the youngest households to 54 percent for households aged forty-five to fifty-four before rising slightly for those aged fifty-five to sixty-four.

13.6.5 Pension Savings

These data also permitted us to calculate pension savings or the change in pension wealth. This was done only for persons who were currently working and covered by a defined benefit plan. Pension savings was calculated by finding the change in pension wealth from last year to this year. These values are reported in table 13.8 for both the earnings growth assumptions and both the legal and projected earnings methods of evaluating pension wealth. Legal pension savings are very low at the youngest ages and rise steeply until retirement. Savings under the implicit contract model are larger at all ages, but they increase at a slower rate across the age groups.

In summary, both of these methods of calculating pension wealth clearly indicate that pension wealth is an important component of total wealth. Ignoring pension wealth substantially understates total wealth

Table 13.8 **Pension Savings among Households Participating in a Defined Benefit Plan (dollars)**

	Legal		Projected	
Age	CGE	FGE	CGE	FGE
Younger than 25	244	284	2,658	1,881
25–34	303	321	1,972	1,420
35–44	1,044	1,060	5,997	4,570
45–54	2,224	2,263	5,340	4,372
55–64	4,747	4,888	6,940	5,738
65–74	4,623	4,451	3,829	3,210
Older than 74	0	0	0	0
All households	1,994	2,017	4,512	3,573

Source: Pension savings data as derived using pension wealth from the pension-provider portion of the SCF.

and can lead to incorrect inferences concerning the distribution of wealth. This latter point is examined in the next section.

13.7 Distribution of Wealth

The preceding sections have described the magnitude of pension wealth by age of the head of household. This analysis indicated that pension wealth is a major component of the net worth of households, with slightly over half the households having some pension coverage. The effect of including pension wealth in an analysis of the distribution of household wealth is an unresolved question. Tables 13.9–13.17 present income distribution data for nonpension wealth, pension wealth, and net worth. These tables show the wealth value at various percentile rankings for each distribution by age of the head of household. For example, the zeroth percentile represents the minimum value in the wealth distribution, the fiftieth percentile is median wealth, and the hundredth percentile is the maximum wealth value. We present distributions for both the legal and the projected earning methods of calculating pension wealth, using the CGE assumptions.

Table 13.9 shows the nonpension wealth for all households by age groups. These data indicate that the median nonpension wealth in the United States in 1983 was $38,300. The values at the various percentiles illustrate the same age-wealth pattern as observed for the mean wealth values in table 13.4.

Tables 13.10 and 13.11 show the nonpension wealth distribution for households with and without pension coverage. These data, along with the mean values shown in table 13.4, indicate that median households with pension coverage have more nonpension wealth than median households with no pension coverage. Median nonpension wealth for all households with pension coverage is $51,600 but is only $18,000 for households without pension coverage. The wealth distribution of households with pensions is more compact, as indicated by the range of the distributions. Households with pensions have higher minimum values and lower maximum values of wealth than do households without pensions. On balance, households with pension coverage have greater nonpension wealth, and this wealth seems to be more equally distributed than the wealth of households without pension coverage.

Tables 13.12 and 13.13 show the distribution of pension wealth for households with pension coverage as estimated using the CGE assumptions. Using the legal method, household pension wealth is zero for unvested workers on current jobs and without pension wealth from other jobs. Over 10 percent of all households and 25 percent of the younger households are in this category. Using the projected earnings method, pension wealth is zero only during the first year of employment.

Table 13.9 **Nonpension Wealth Distribution by Age: All Households (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−23.2	−3.7	−.7	.2	5.7	33.2	167.4
25–34	−52.0	−2.5	.0	7.1	33.8	148.0	15,497.0
35–44	−44.8	−.2	7.9	41.2	104.4	809.6	53,572.5
45–54	−9.9	.1	21.1	63.0	205.3	2,689.7	71,993.0
55–64	−73.4	1.0	27.8	88.7	409.5	5,149.5	86,820.5
65–74	−40.0	2.9	25.6	78.4	370.2	4,729.8	51,079.0
Older than 74	−2.7	.2	7.3	44.3	137.5	4,594.4	35,033.1
All households	−73.4	−.4	3.1	38.3	123.0	2,231.7	86,820.5

Source: Weighted household wealth data from the SCF.

Table 13.10 **Nonpension Wealth Distribution by Age: Households with Pensions (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−23.2	−4.3	−1.4	1.8	16.2	33.2	167.4
25–34	−52.0	−2.6	.0	11.7	35.9	110.7	2,632.9
35–44	−44.8	.3	12.9	45.3	101.8	704.6	6,471.8
45–54	−9.9	3.4	30.6	74.1	212.0	3,484.6	58,690.6
55–64	−6.0	13.1	48.2	104.9	554.8	5,418.2	32,142.3
65–74	−3.3	15.7	47.0	114.0	687.9	5,165.8	51,079.0
Older than 74	−2.7	8.7	36.8	90.1	210.3	7,279.7	25,127.3
All households	−52.0	.0	12.8	51.6	145.4	2,764.0	58,690.6

Source: Weighted household wealth data from the SCF.

Table 13.11 **Nonpension Wealth Distribution by Age: Households without Pensions (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−11.0	−3.7	−.6	.1	3.3	35.2	132.9
25–34	−39.9	−2.4	−.1	2.0	30.3	192.0	15,497.0
35–44	−11.8	−.9	.1	30.4	120.5	1,366.6	53,572.5
45–54	−7.9	.0	2.6	42.1	203.8	1,997.6	71,993.0
55–64	−73.4	.0	5.4	51.2	260.1	4,397.1	86,820.5
65–74	−40.0	.5	12.0	56.2	225.7	2,654.6	41,530.2
Older than 74	−1.7	.0	3.2	29.9	91.2	2,926.8	35,033.1
All households	−73.4	−.7	.1	18.0	92.0	1,563.4	86,820.5

Source: Weighted household wealth data from the SCF.

Table 13.12 **Pension Wealth Distribution by Age: Households with Pensions, Legal CGE (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	.0	.0	.0	.2	2.0	9.0	29.1
25–34	.0	.0	.0	1.8	7.3	35.8	141.9
35–44	.0	.0	2.0	11.6	29.2	152.0	1,158.8
45–54	.0	.0	12.4	39.8	114.3	492.8	5,338.2
55–64	.0	7.3	33.0	80.7	195.3	879.1	17,289.3
65–74	.7	7.0	19.5	44.3	122.6	552.6	3,564.7
Older than 74	.8	2.6	6.3	20.9	42.1	245.7	900.0
All households	.0	.0	2.2	17.7	66.6	383.2	17,289.3

Source: Weighted pension wealth data derived from the pension-provider portion of the SCF.

Table 13.13 **Pension Wealth Distribution by Age: Households with Pensions Projected Earnings CGE (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	.0	.0	.7	3.0	6.7	109.2	270.9
25–34	.0	.9	3.5	9.1	24.2	104.1	330.3
35–44	.0	2.5	8.9	25.5	73.1	300.5	5,941.1
45–54	.0	4.0	19.8	59.4	162.1	905.0	94,079.9
55–64	.0	10.2	32.4	86.9	230.7	1,261.4	44,678.6
65–74	.7	7.0	19.6	44.8	116.1	560.2	5,381.7
Older than 74	.8	2.6	6.3	20.9	42.1	245.7	900.0
All households	.0	2.1	8.7	30.6	100.3	486.2	94,079.9

Source: Weighted pension wealth data derived from the pension-provider portion of the SCF.

Table 13.14 **Net Worth Distribution by Age: All Households, Legal CGE (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−21.7	−3.6	−.6	.3	6.3	34.5	169.4
25–34	−51.2	−1.9	.0	9.6	39.6	165.8	15,497.0
35–44	−44.6	.0	13.2	51.3	130.7	1,013.2	53,572.5
45–54	−7.9	2.5	33.7	103.0	292.3	3,039.6	71,993.0
55–64	−73.4	5.5	51.7	160.8	572.6	5,896.7	86,820.5
65–74	−40.0	8.1	34.6	98.2	414.8	5,162.2	51,627.4
Older than 74	−1.9	.2	8.5	52.0	143.6	4,594.4	35,033.1
All households	−73.4	.0	6.6	49.8	169.2	2,463.2	86,820.5

Source: Weighted pension and nonpension wealth data derived from the SCF.

Table 13.15 **Net Worth Distribution by Age: All Households, Projected Earnings CGE (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−21.7	−2.8	−.5	.4	8.5	49.7	269.0
25–34	−51.3	−1.1	.7	15.3	52.6	206.0	15,497.0
35–44	−44.6	.5	20.2	67.7	164.4	1,063.5	53,572.5
45–54	−7.9	3.2	40.3	116.1	353.2	3,553.8	95,071.3
55–64	−73.4	7.0	51.9	161.0	595.9	6,184.7	86,820.5
65–74	−40.0	8.1	34.6	100.0	408.3	4,923.3	51,627.4
Older than 74	−1.9	.2	8.5	52.0	143.6	4,594.4	35,033.1
All households	−73.4	.0	9.6	57.9	195.9	2,557.6	95,071.3

Source: Weighted pension and nonpension wealth data derived from the SCF.

Table 13.16 **Net Worth Distribution by Age: Households with Pension, Legal CGE (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−21.7	−3.6	−2.2	3.8	19.2	34.3	169.4
25–34	−51.3	−1.4	3.0	18.3	45.6	152.1	2,703.4
35–44	−44.6	6.1	25.5	63.5	133.2	796.4	7,630.6
45–54	−2.2	23.1	57.3	128.9	343.2	3,904.3	58,919.7
55–64	−.8	48.8	102.3	234.0	882.6	6,418.9	34,586.7
65–74	9.4	38.7	79.1	158.3	827.4	5,570.5	51,627.4
Older than 74	−1.9	20.3	57.6	115.4	230.0	7,537.2	25,544.3
All households	−51.3	4.0	24.8	84.5	229.5	3,214.0	58,919.8

Source: Weighted pension and nonpension wealth data derived from the SCF.

Table 13.17 **Net Worth Distribution by Age: Households with Pensions, Projected Earnings CGE (thousands of dollars)**

Age	0 Percent	10 Percent	25 Percent	50 Percent	75 Percent	95 Percent	100 Percent
Younger than 25	−21.7	−1.6	.4	7.7	27.8	156.4	269.0
25–34	−51.3	1.9	8.9	27.4	66.4	207.0	2,731.8
35–44	−44.6	12.3	35.1	87.9	181.0	920.4	12,412.9
45–54	−3.6	30.5	76.4	144.1	436.2	4,008.2	95,071.3
55–64	.3	50.3	107.8	270.0	926.7	6,667.0	44,699.2
65–74	9.4	38.7	79.1	159.0	827.4	5,968.5	51,627.4
Older than 74	−1.9	20.3	57.6	115.4	230.0	7,537.2	25,544.3
All households	−51.3	9.1	33.8	99.2	277.3	3,340.3	95,071.3

Source: Weighted pension and nonpension wealth data derived from the SCF.

Therefore, only a small proportion of households will have no pension wealth under this criterion.

Median legal pension wealth for all households with pension coverage is $17,700, and the wealth at the ninety-fifth percentile is $383,200. This compares to a median projected earnings pension wealth of $30,600 and a value of $486,200 at the ninety-fifth percentile. These numbers indicate that approximately 42 percent of the pension wealth of a household at the middle of the wealth distribution is contingent on continued employment at the present job. The wealth loss associated with job termination is $12,900 out of the $30,600 in pension wealth shown by the projected earnings method.

Tables 13.14 and 13.15 give the distribution of total net worth for households using the legal and projected earnings methods of determining pension wealth. Adding legal pension wealth to other wealth raises the median net worth for all families from $38,300 (table 13.9) to $49,800 (table 13.14). Using the projected earnings method, median net worth increases to $57,900. Including pension wealth in the analysis primarily raises the wealth of households between the twenty-fifth and the ninety-fifth percentiles of the nonpension wealth distribution. For the most part, very poor and very rich households have relatively little pension wealth.

Tables 13.16 and 13.17 show the net worth distribution for households with pension coverage. These data can be compared to the distribution in table 13.10 to assess the effect of pension wealth on the wealth distribution of only those households with pension coverage. Median wealth for these households is raised from $51,600 ignoring pension wealth to $84,500 using the legal method and $99,200 with the projected earnings method. The effect of including pension wealth has similar effects on the distribution of wealth by age as described above for all households.

These preceding analyses clearly indicate the importance of pension wealth as a component of net worth. Tables 13.9–13.17 show the increased wealth at various percentiles of the wealth distribution. These numbers seem to indicate that most pension wealth accrues to wealth holders between the twenty-fifth and the ninety-fifth percentile. If true, the inclusion of pension wealth in an examination of the distribution of net worth should decrease the degree of inequality in the wealth distribution.

Table 13.18 shows this effect by reporting the proportion of nonpension wealth and net worth that is held by the top 5 percent and the top 1 percent of the wealth distribution. The top 5 percent of all households own 57.9 percent of nonpension wealth but only 52.5 percent of net worth when pensions are evaluated using the legal method and 55.0 percent of net worth using the projected earning

Table 13.18 **Measurement of Wealth Distribution**

	Nonpension Wealth			Net Worth: Legal CGE			Net Worth: Projected CGE		
	Percentage of Wealth Held By:			Percentage of Net Worth Held By:			Percentage of Net Worth Held By:		
Age	Top 5 Percent	Top 1 Percent	Gini Coefficient	Top 5 Percent	Top 1 Percent	Gini Coefficient	Top 5 Percent	Top 1 Percent	Gini Coefficient
Younger than 25	55.5	25.4	.891	53.3	23.6	.875	53.7	25.3	.860
25–34	47.8	22.5	.799	43.5	20.2	.769	39.1	17.1	.730
35–44	41.9	20.3	.706	37.7	18.8	.688	34.5	16.2	.646
45–54	62.2	40.3	.800	54.6	34.3	.739	57.4	40.2	.761
55–64	50.7	27.2	.745	43.6	23.3	.686	55.2	38.2	.751
65–74	56.1	35.0	.782	52.5	32.6	.749	52.7	32.9	.749
Older than 74	50.9	35.7	.763	49.3	34.0	.750	49.1	34.1	.749
All households	57.9	35.5	.806	52.5	31.1	.777	55.0	36.2	.783

Source: Weighted pension and nonpension wealth data derived from the SCF.

method. Similar declines in the relative holdings of the wealthiest 5 percent of households occur for each age group shown in the table.

Using the legal method, the relative wealth of the top 1 percent drops from 35.5 percent of wealth excluding pensions to 31.1 percent of net worth when pension wealth is included in the analysis. By contrast, when pension wealth is evaluated using the projected earnings method, the inclusion of pension wealth actually increases the proportion of total wealth held by the wealthiest 1 percent of households.

The overall effect of including pensions in the wealth distribution is shown in table 13.18 and figures 13.1 and 13.2. The Lorenz curves are constructed by plotting the cumulative wealth holdings of the population. We restrict the values of the curve to be equal to or greater than zero. Thus, the Lorenz curve coincides with the axis until cumulative positive wealth is greater than the total negative wealth of the poorest households. This procedure maintains the traditional restriction on the Gini coefficient to range between zero and one.

The Gini coefficient for nonpension wealth for all households is 0.806. Including legal pension wealth lowers this value to 0.777, while the Gini coefficient for net worth including projected pension wealth is 0.783. These data confirm that including pension wealth tends to reduce measured inequality in the wealth distribution. This result is shown in the graphs of the Lorenz Curves in figures 13.1 and 13.2. In both figures, including pension wealth shifts the curve in toward the line of equity. Allowing the Lorenz curve to fall below the horizontal axis to reflect negative net worth raises the Gini coefficients but does not alter the conclusion that pension wealth reduces measured inequality.

13.8 Conclusions and Comparison to Earlier Studies

This paper has provided a detailed examination of the value of pension benefits. Two methods of calculating pension wealth were described and shown to bound the true value of pension wealth. Each method was applied to data from the 1983 SCF to derive pension wealth for the U.S. population. For all households with pension coverage, mean pension wealth under the projected earnings method was $98,291 and represented 43 percent of total net worth. At the median of the distribution, pensions represent 31 percent of net worth. Using the legal method of calculating pension wealth lowers these values so that mean pension wealth represents 26 percent of mean net worth while median pension wealth is 21 percent of median net worth.

There are very few studies against which these findings can be compared. The results of two such studies are reviewed below. Quinn (1985) estimated the combined pension and social security wealth for households in the Retirement History Survey (RHS) in 1973 and compared

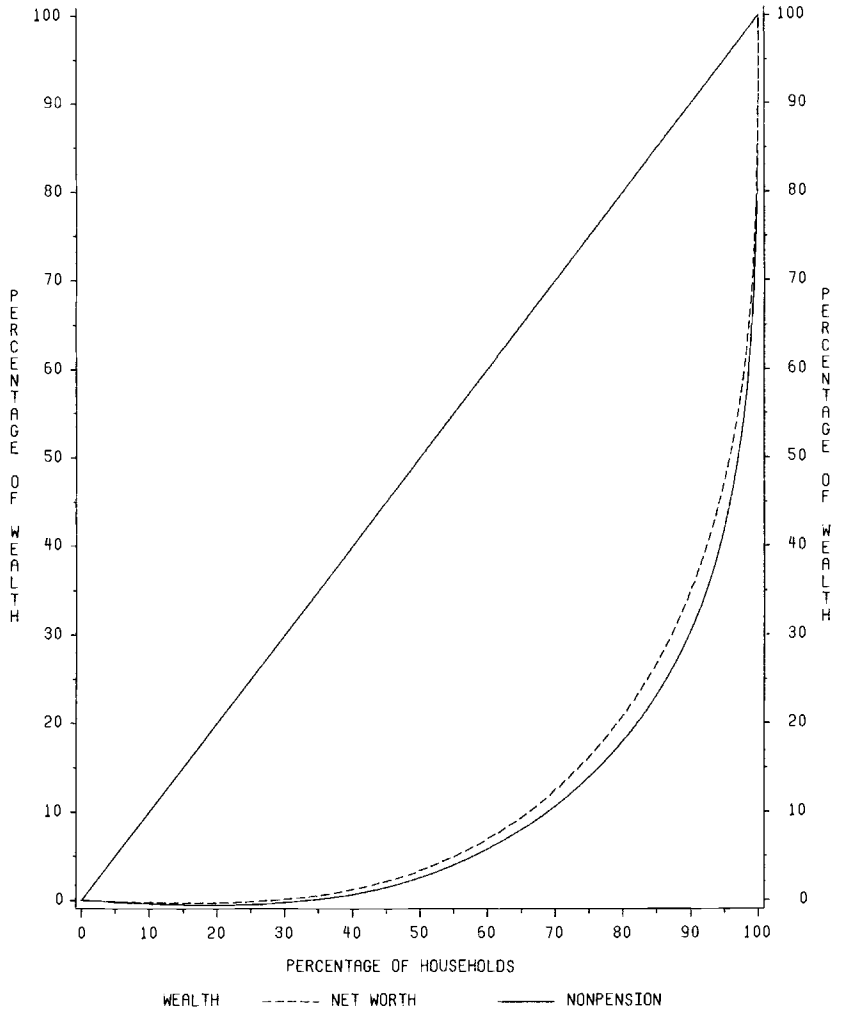

Fig. 13.1 Distribution of wealth: legal method

this to their total wealth. He assumed no postretirement adjustments and estimated pension and social security wealth under interest rate assumptions of 2, 5, and 10 percent. The results at the 5 percent assumption are most comparable to those reported in this study. His sample is limited to households whose head is between age sixty-two and sixty-seven. The RHS reports the expected pension benefit for each person covered by a pension. Quinn's estimate of pension wealth is the present value of this benefit starting at the earliest age of eligibility, adjusted for survival probabilities. Quinn's estimates are in-

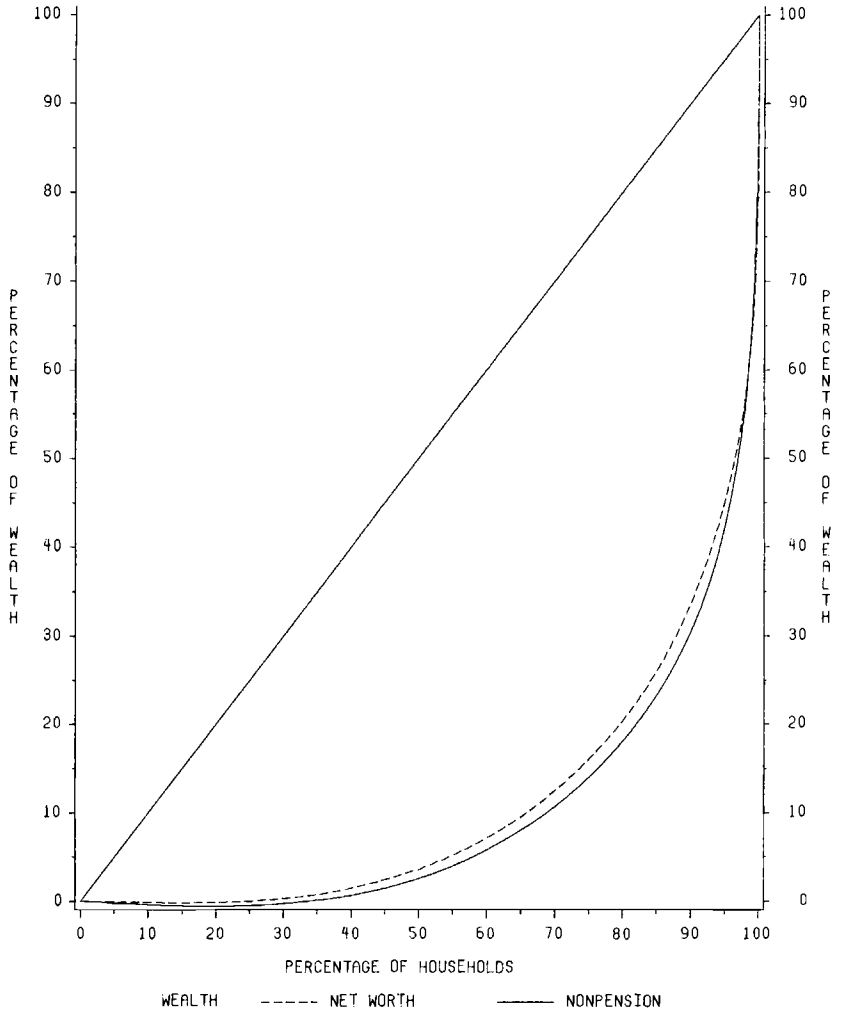

Fig. 13.2 Distribution of wealth: projected earnings

creased by 124 percent (the change in the consumer price index (CPI) and the return on three-month Treasury bills) to make them comparable to our 1983 data.

Quinn found that median wealth without social security and pensions in 1973 was $61,869 for married men, $21,056 for nonmarried men, and $12,790 for nonmarried women. At the 5 percent interest rate assumption, median wealth with social security and pensions was $238,762 for married men, $141,277 for nonmarried men, and $76,653 for nonmarried women. The proportion of this wealth in pension rights was roughly

12.9 percent for married men, 11.9 percent for nonmarried men, and 13.4 percent for nonmarried women (calculated from midpoints of the intervals in table 3 of Quinn 1985). Thus, pension wealth averaged $30,800 for married men, $16,811 for nonmarried men, and $10,286 for nonmarried women.

Mean nonpension wealth is considerably larger for the most comparable group in the SCF—$196,492 for the fifty-five to sixty-four age group. Pension wealth is also much larger using our derived values of wealth. Under the legal (CGE) method, mean pension wealth across all households aged fifty-five to sixty-four is $73,922; under the projected (CGE) earnings method, it is $161,468. These values are derived by multiplying mean pension wealth shown in tables 13.5 and 13.6 by the proportion of persons covered by a pension. Both estimates are much larger than Quinn's estimate for married men. This could be attributable to growth in pension coverage or more generous benefit formulas. Another possibility is that survey respondents systematically underestimate their benefits.

We have not yet examined the data on expected benefits provided by the SCF respondents. Avery, Elliehausen, and Gustafson (1985) report a mean value of pension wealth (including thrift assets) of $43,511 for households with married heads fifty and over and of $27,985 for those with unmarried heads. In all but 8 percent of the households, the age of the head is sixty-five or lower, so the most comparable estimate in our results is once again for the fifty-five to sixty-four age group. Even under the legal method, our estimates are much higher than those obtained by Avery, Elliehausen, and Gustafson from the household responses, suggesting the possibility of significant underreporting.

Cartwright and Friedland (1985) used pension benefit data from a survey done for the President's Commission on Pension Policy in September 1979. Their estimates are largely based on individual responses to the questionnaire. When this information was not available, they imputed benefits from either the Department of Labor's EBS-1 forms or the employer survey. Private pensions were discounted at a rate of 7 percent (3 percent real, 4 percent inflation) and public pensions at a rate of 3 percent (all real). Individual retirement accounts, Keoghs, and annuities are included in the estimates. For nonvested workers, the probability of vesting was imputed from a cross-sectional logit equation. Their estimates are increased by 37.2 percent below to reflect the change in the CPI between 1979 and 1983.

The average household in the Pension Commission Survey had $4,503 of retirement assets, representing 6 percent of net worth. In contrast, our estimates of pension wealth for the average household under the CGE assumptions are $26,052 under the legal method and $53,863 under the projected earnings method. Mean retirement wealth (table 13.19)

Table 13.19 Retirement Wealth: Pension Commission Survey

Age	Mean Retirement Wealth ($)		Ratio of Households with Retirement Wealth	Ratio of Retirement Assets to Net Wealth
	All Households	Households with Retirement Wealth		All Households
Under 25	1,547	7,032	.22	.04
35–44	3,906	9,766	.40	.04
45–54	9,922	21,112	.47	.08
55–64	14,175	28,929	.49	.12
65 and over	1,858	30,975	.06	.02

Source: Cartwright and Friedland (1985).

varied by age group in a pattern that was very comparable to that observed in tables 13.5 and 13.6. To compare mean retirement wealth to those for households with pensions in tables 13.5 and 13.6, we divided the mean retirement wealth for all households by the ratio of households with retirement wealth. The corresponding estimates for households with retirement wealth are shown in the second column of table 13.19. Except for the under thirty-five group, the estimates in table 13.19 are much smaller than our estimates in tables 13.5 and 13.6. The gap between these two sets is largest (in relative terms) for the fifty-five to sixty-four age group. Shown in the last column of table 13.19 are ratios of retirement assets to net wealth estimated for each age group using table A8 in Cartwright and Friedland (1985). Again the ratios in table 13.19 are much lower for every age group than the corresponding estimates in table 13.7.

In conclusion, several key findings of this study should be indicated.

1. Pension wealth is a large and important component of household wealth. Pension wealth follows the expected life-cycle pattern of increasing with age up until retirement and then declines.

2. Our results are larger than those reported by Quinn (1985) or by Cartwright and Friedland (1985), both in terms of the absolute magnitude of pension wealth and the ratio of pension wealth to net worth.

3. Nonpension wealth of older households with pension coverage is considerably larger than the wealth of older households without pension coverage.

4. Pension wealth reduces measured inequality in the distribution of wealth.

5. A key omission of this study is social security wealth. Calculating social security wealth for these households is a research priority. Including social security wealth should further reduce wealth inequality. The distribution of social security wealth is an interesting issue in itself.

6. The inclusion of pension wealth into a measure of net worth will bring the life-cycle pattern of net worth more into conformity with the predictions of the life-cycle savings hypothesis. First, during the working years, the inclusion of pension wealth results in a more rapid rise in net worth between ages thirty-five and sixty-five. Second, during the retirement years, the inclusion of pension wealth will accelerate the decline in net worth. Consider the example of a household with $200,000 of nonpension wealth, along with a pension of $1,000 per month for the head, whose is age sixty-five. The wealth value of the pension is $101,370 at sixty-five but declines to $38,980 at eighty solely owing to the decline in life expectancy. Even if nonpension wealth remains constant, the decline in pension wealth lowers net worth from $301,310 to $238,986, or a decline of 21 percent in fifteen years.

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Comment

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McDermed, Clark, and Allen's goal in this paper is to add private pension wealth (but, it should be noted, not social security wealth) to household net worth and to show how this affects the distribution of net worth by age of the household head. It has been notoriously difficult to get good estimates of private pension wealth for individuals of all ages from household surveys because people usually do not know their pension benefits unless they are near retirement. (Indeed, one of the best predictors of propensity to retire in the next two-year period is ability to answer a question about the size of pension benefits.) These authors exploit a better source of information: the 1983 Survey of Consumer Finance (SCF). This survey asked pension providers for plan characteristics, enabling the authors to calculate expected pension benefits, and pension wealth, after making a number of assumptions.

My comments will discuss, first, these basic decisions the authors had to make; next, what is in the paper and some of their findings; and, finally, what is controversial about it. Some assumptions are necessary in order to estimate a person's expected future pension benefit stream and to convert this into an amount of pension wealth accrued to date.

For defined contribution plans (10 percent of those with pensions in the SCF sample), current pension wealth is simply the current value of the person's pension account. There is no need to calculate benefits or discount them. But, for defined benefit plans, the authors must estimate the expected benefits accrued so far, convert them to a life annuity beginning at retirement age, and discount the purchase back

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to the current year, allowing for mortality risk. (However, they do not discount for the risks of job termination, plan termination, or inflation after retirement.)

The problem of estimating the expected benefit accrued to date is a thorny one. Two key issues are highlighted in the paper. First, is the labor contract a one-period, renewable one or an implicit lifetime contract to age sixty-five? Second, how do earnings grow over time?

If the contract is for only one period at a time, the expected benefit is just what has actually accrued to date—what the employer is obligated to pay if the worker is terminated today. Under this "legal" method of calculating benefits, the benefit increases with each year on a job because of increasing years of service and higher earnings. If the contract is long term, on the other hand, the expected benefit is what the worker would get if he or she stayed with the firm until retirement. Since this typically depends on the earnings in the last few years before retirement, it is called the "projected earnings" method. There is still the question of how much of this ultimate total benefit accrues each year. The authors assume that pension wealth increases each year only because there is an additional year of service in the formula since there is no change in the final earnings figure used in the calculation. This in effect assumes that rights to the ultimate total benefit are acquired at a constant rate over the life of the contract. While arguing that the evidence about the relation of quits and earnings behavior to pension coverage and vesting favors the projected earnings method, the authors show results using both it and the legal method.

The second key issue is what growth rate of earnings to use in calculating either the past earnings history (for the legal method) or future earnings (for the projected earnings method). Again, McDermed, Clark, and Allen show results under two assumptions: a constant earnings growth rate (CGE) of 5.5 percent per year, due to economy-wide real wage growth of 1.5 percent and inflation of 4 percent, and the Federal Reserve Board's computed age-race-sex-industry-occupation-specific growth rates that are included in the SCF data tape (FGE). These FGE growth rates average 5.5 percent overall but decline with age. The CGE assumption implies a linear age-log earnings profile, while the FGE assumption conforms better to the observed concavity of age-log earnings profiles.

The FGE assumption about earnings growth yields lower pension wealth estimates than does the CGE assumption, under both assumptions about the nature of the labor contract. On the one hand, FGE assumes earnings have grown faster than 5.5 percent up to the current age. This yields lower average past earnings when benefits are calculated by the legal method. On the other hand, under the FGE assumption, earnings grow more slowly than 5.5 percent at later ages. This

results in lower final earnings when benefits are calculated by the projected earnings method.

In the paper, McDermed, Clark, and Allen first present simulations of life-cycle accumulation of pension wealth for a hypothetical individual under a one-period versus a long-term labor contract, assuming a constant 5.5 percent rate of growth of total compensation (i.e., earnings plus pension compensation). They then use the 1983 SCF to estimate actual pension wealth and total wealth of a cross section of households under the four combinations of assumptions: one-period versus long-term labor contract (i.e., legal vs. projected earnings method) and linear versus concave age-log earnings profile (i.e., CGE vs. FGE). Despite the effort to collect information from pension providers, 44 percent of the people with defined benefit plans on their current job had missing data on the plan's characteristics. The authors therefore estimated pension benefit regressions to impute the missing information, again using the four alternative assumptions about the labor contract and earnings growth rate.

These regressions may be one of the most useful parts of the paper to other researchers who need to impute pension benefits. Given data on age, job tenure, salary, industry, occupation, and plan type, one can use these regression equations to predict a person's pension benefit. (I only wish race and gender had been included, too.) These equations should be more accurate than those one can estimate from the National Longitudinal Survey (NLS) or the Retirement History Survey (RHS) because they are based on provider information about the plan rather than on the worker's guess and because the sample used to estimate the equations is not biased toward people who are about to retire.

Having estimated pension and total wealth, the authors show the cross-sectional distributions, by age of the household head, of nonpension wealth, pension wealth, total net worth, pension/net worth ratio, and annual pension savings, for households with and without pensions and for all households under all four assumptions. Comparison of these tables reveals the effect of including pension wealth on the wealth distribution. First, wealth is increased, of course, but primarily between the twenty-fifth and the ninety-fifth percentiles. Second, households with pensions have higher nonpension wealth than those without pensions. This would suggest that pensions increase inequality. But, third, including pension wealth reduces the Gini coefficient, which suggests just the opposite—that pensions reduce inequality. This apparent contradiction highlights an issue to which I return below: the inherent limitations of Lorenz curves and Gini coefficients in this type of analysis.

Fourth, as other researchers have found, the cross-cohort wealth distribution has a peak at age fifty-five to sixty-four. We should not too

easily conclude from this that the distribution of wealth over an individual's life cycle has a similar shape without knowing the effect of the shift in gender of household heads as age rises in the cross section owing to differential mortality of men and women. Perhaps the lower wealth of households with heads over age sixty-five reflects the increasing number of female heads and women's relative poverty rather than dissaving by the elderly.

The paper concludes with a comparison of these results with a few other studies of the distribution of pension wealth. McDermed, Clark, and Allen find much higher estimates of nonpension and pension wealth in the SCF than are reported in other studies that used the NLS or the RHS. The SCF is more thorough in asking about all types of assets, including life insurance and consumer durables, and includes provider information about pension plans. Apparently, people tend to underestimate their benefits when answering survey questions.

This paper is carefully done, uses better data than has hitherto been available, and gives a clear picture of the consequences of including private pensions in the distribution of household wealth, given the assumptions adopted by the authors. However, the paper is controversial in certain respects. I shall focus on three: the failure to discount adequately for risk, the assumed time path of pension accrual under an implicit lifetime labor contract, and the misleading use of Lorenz curves and Gini coefficients.

The first controversy involves a basic conceptual issue: how to assign a present value to a stream of future income that cannot be alienated from the recipient. We want to count pensions in household wealth because they presumably affect savings behavior and labor supply behavior and because they are an aspect of inequality of access to goods and services. But pensions are different from conventional assets and so may not have the same effects on either behavior or inequality. If all goes well and the person actually receives the anticipated real benefits, of course the pension is as good as a bond or a rental property. But all may not go well. In particular, their illiquidity and the types of risk to which they are subject mean that pensions are a much less valuable form of wealth than marketable assets yielding the same future income stream. Perhaps the right way to evaluate pension wealth is to imagine that a person could sell his or her pension rights and to ask what the market value would be. Does the fact that this would be a very low number—that in fact no such market has developed—suggest something about the discount factor for risk?

This line of reasoning concludes that pension wealth is seriously overestimated in this paper, even using the legal method and the FGE earnings growth rates. As the authors recognize, their pension wealth figures calculated by the projected earnings method are upper-bound

estimates because they discount only for mortality risk, not for the risks of job termination, plan termination, and unanticipated inflation after retirement. However, they consider the legal method estimates to be a lower bound. Surely, these too should be discounted for the risks of employer bankruptcy, plan termination, and inflation. The fact that pension rights are not marketable and that one cannot even borrow against them much before retirement suggests that the risk discount factor is quite large.

One could quibble with many of the other assumptions that the authors had to make, such as immediate vesting, no survivors' benefits, no early retirement benefits, no postretirement changes in benefits, a nominal interest rate of 6 percent, and an inflation rate of 4 percent. But this would hardly be fair since one inevitably must assume something about these matters and since these assumptions are as sensible as any. Some speculation about the way these assumptions affect the results would have been useful. But these are minor issues compared with the lack of discounting for risk.

The authors' implicit assumption about the accumulation path of pension wealth under the projected earnings method is also questionable. Under a lifetime labor contract, the expected pension will depend on final earnings and total years of service at retirement. If we take seriously the assumption of a lifetime labor contract, this final pension wealth fund could be built up from zero over the duration of the job by a variety of time patterns of accumulation, bounded from below by the time path of pension wealth as calculated by the legal method. The choice of any particular path is essentially arbitrary, yet the estimated age profile of pension wealth depends critically on this choice. In this paper, it is assumed without discussion that pension wealth grows in a straight line. But there could be other assumptions, which would alter the age distribution of pension wealth under the projected earnings method.

Next, there are the seemingly contradictory findings about the effect of pensions on the distribution of wealth. Apparently, pensions increase inequality, at least in the lower part of the distribution, since those households with low nonpension wealth do not have pensions either. But this is missed by the Lorenz curves and Gini coefficients, which show pension wealth reducing inequality. The problem is that many households have negative wealth; the lower tail of the wealth distribution is made up of these net debtors. Because Lorenz curves and Gini coefficients are completely insensitive to changes in the distribution of negative wealth, they cannot properly summarize or compare distributions that include net debtors. They could be used to depict the distribution of wealth among the subset of households that have nonnegative wealth, but, since including pensions changes

the composition of this subset, Gini coefficients cannot fully capture the effect of pensions on this distribution either. In any case, their use in this paper is misleading; we should not accept the conclusion that private pensions reduce the inequality of wealth.

Finally, I wish the authors had explored the gender difference in pension wealth and had shown the distributions by gender as well as age of household head. As noted above, this might shed some light on the peak at age fifty-five to sixty-four as well as on gender differences in wealth. I hope a future paper as careful, clear, and thorough as this one will investigate the effects of gender, too.