ESTIMATING PENSION WEALTH OF ELSA RESPONDENTS

James Banks
Carl Emmerson
Gemma Tetlow
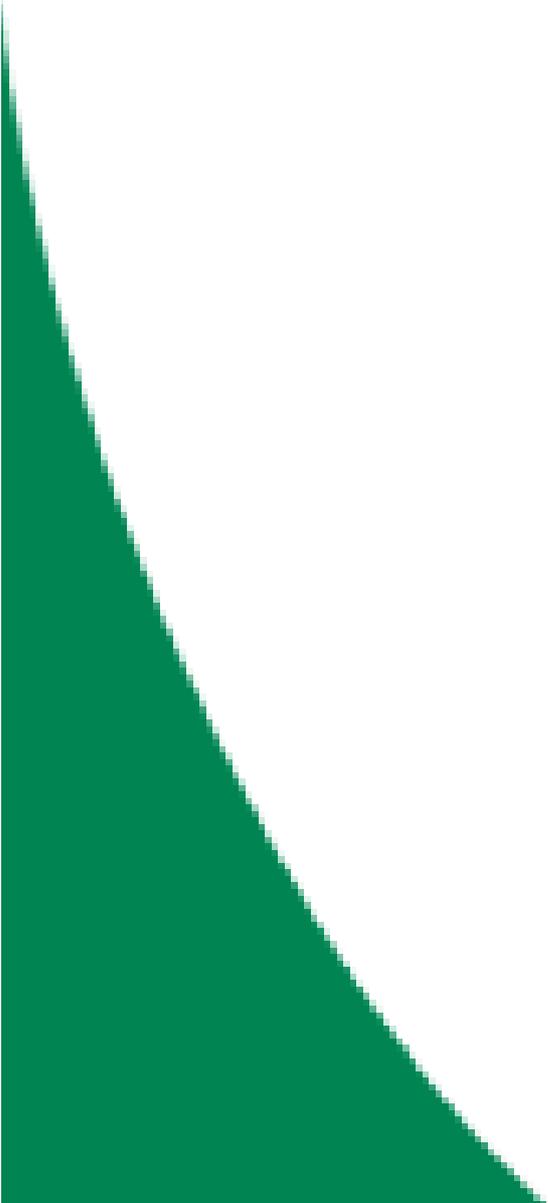
Estimating Pension Wealth of ELSA Respondents

James Banks*, Carl Emmerson° and Gemma Tetlow°

* Institute for Fiscal Studies and University College London
° Institute for Fiscal Studies

April 2005

Abstract

This paper explains the methodology used for calculating pension wealth for all individuals in the first wave of the English Longitudinal Study of Ageing (ELSA). We focus on the pension wealth of individuals aged between 50 and the state pension age. Both state and private pension wealth has been calculated and each has been calculated both on the basis of immediate retirement in 2002 and on the basis of retirement at the state pension age. Sensitivity analysis of our assumptions is also presented, which shows that the distribution of pension wealth is sensitive to our assumptions about the discount rate and contracting out histories but insensitive to assumptions about future earnings growth, future annuity rates and future asset returns.

1. Introduction

The English Longitudinal Study of Ageing (ELSA) is a multi-disciplinary survey that covers all aspects of ageing including pension arrangements. The sample consists of individuals aged 50 and over. The first wave of ELSA was collected between March 2002 and March 2003, with the intention of collecting further waves of data every two years. For further information on ELSA see Marmot et al (2003). This paper explains how information on pension arrangements from the first wave of ELSA was used to estimate the pension wealth of each individual. Three measures of pension wealth are produced for each individual – individual private pension wealth, individual state pension wealth and total individual pension wealth (which is the sum of the first two). These are all calculated both on the basis of immediate retirement in 2002 and on the basis of retirement at the SPA.

Throughout this paper we focus on the group of individuals aged between 50 and the state pension age (SPA). ELSA only samples individuals aged 50 and over. From the point of view of looking at pension wealth, individuals much younger than 50 may well change their pension saving behaviour significantly before they actually reach retirement, making predictions of pension wealth based on current behaviour less meaningful. The reason for focussing here on individuals aged under the SPA is that for individuals who have already retired, a far better indication of their pension wealth would simply be to look at their income. All statistics, except where specifically stated, are given for the 50 to SPA population.

This paper assumes that readers have a basic knowledge of the UK pensions system, both state and private. Whilst we discuss significant changes within the system that affect the individuals we study, we will not explain in great detail the basic pensions framework in the UK. For more information on the UK pensions system please refer to, for example, Budd and Campbell (1998), Emmerson and Johnson (2001) or Clark and Emmerson (2003).

The calculation of pension wealth required us to make various assumptions about both past and future behaviour. Table 1 gives a summary of the key assumptions we have made and where each of these is discussed. Sensitivity analysis is conducted for many of these assumptions. We test the effect of changing the discount rate, future earnings growth, the contracting-out assumptions, the annuity rate and the return on assets.

Section 2 explains how wealth from state pensions has been calculated and outlines the assumptions we have made in calculating state pension wealth. Section 3 shows how wealth from private pensions (both current and past schemes) was calculated, assuming either immediate retirement or retirement at some future date. Figures for the distribution of total pension wealth as well as private and state pension wealth separately are given in section 4. All these figures are given at the individual level. Since it is possible that our results are sensitive to the assumptions that we have made, section 5 shows how the distribution of pension wealth (assuming retirement at the SPA) changes when we change some of our key assumptions. We find that, in fact, the distribution of pension wealth is insensitive to many of our assumptions. Finally, section 6 presents some validation of our results by comparing the actual pension income of the cohort aged just

over the SPA with the pension income we predict the cohort aged just under the SPA will receive when they reach the SPA.

Table 1. Summary of Assumptions

	Assumption	Section it is discussed in	Sensitivity analysis done
Discount rate	2.5%		✓
Past employment	In full-time employment between leaving education and date left last job (also assume that those currently self-employed have always been self-employed)	Section 2.1	✗
Earnings history 1978-2002	Assumed to stay at the same multiple of group median earnings from FES data	Section 2.2.1	✗
Future earnings growth	No real earnings growth	Section 2.2.1	✓
Contracting out	Assume contracted-in in all years in current scheme unless know they are contracted out. Assume contracted out in all years when in a past pension.	Section 2.2.2	✓
Annuity rates	Second best quoted by FSA in January 2005	Section 3.1	✓
Real return on assets	2.5%	Section 3.1.2	✓
Future DC contributions	Constant fraction of earnings	Section 3.1.2	✗
Earnings growth 1962-1978	National average real earnings growth	Section 3.3.1	✗
Earnings growth pre-1962	2% real earnings growth	Section 3.3.1	✗
Real return to pension funds pre-2002	Assume mean economy-wide pension fund return	Section 3.3.1	✗

2. Estimating state pension wealth

There are two main types of state pension provision. The first is the Basic State Pension (BSP). Individuals are entitled to some part of the BSP if they have made National Insurance contributions for at least 25% of their working lives (i.e. from 16 to the state pension age). The other type of state pension provision is second tier state provision (either the State Earnings Related Pension Scheme, SERPS, or the State Second Pension, S2P). Entitlement to this is based on an individual's earnings and employment history. In the ELSA data we do not yet have National Insurance contribution histories. As a result, certain assumptions have to be made when calculating both basic state pension and second tier state pension entitlements. Sections 2.1 and 2.2 discuss the calculation of wealth from the BSP and SERPS/S2P respectively.

In addition to these two types of state pension provision there is also the Graduated Retirement Scheme. This was introduced in 1961 and continued until 1975. We do not model wealth from this state pension scheme in our calculations because the income available from this source is small. For example, the average weekly benefit from the Graduated Retirement Scheme amongst recipients for the tax year 2002/03 was only £3.82 for men and £1.24 for women[1]. Weekly income is likely to be even lower for future pensioners because they will have accrued less entitlement under the scheme.

2.1 Basic State Pension entitlement

To calculate entitlement to BSP for those who are currently in work, we assume that they have been in work, earning above the Lower Earnings Limit (LEL) since they left fulltime education. Anyone who said they left fulltime education after their nineteenth birthday is assumed to have left education at age 21. For those who were not in work in 2002 we assume that they were in work (earning above the LEL) for all years between leaving education and finishing their last job. 2.0% of respondents aged 50 to the SPA (or 6.3% of those aged 50 to the SPA who were not in work in 2002) did not report when they left their last job. For these people, we imputed the age at which they last worked by randomly selecting someone else with matching characteristics (gender and marital status[2], education and five-year age cohorts, and whose age at which they last worked did not exceed the current age of the person with the missing value), for whom we knew at what age they last worked, and assumed the person with missing information last worked at the same age as this matched person. This is known as a conditional hotdeck.

Prior to 1978, married women could opt to pay reduced rate NI contributions in exchange for not accruing their own entitlement to the BSP. We know which women in the ELSA sample have at some time chosen to do this. For these women, we assume they chose to pay reduced rate NI in all years when they were in employment. Therefore, these women are assumed to accrue no entitlement to the BSP.

---

[1] Pensions Policy Institute (2004), *The Pensions Primer*, p.25

[2] The sample was split into three gender and marital status groups – men, single women and married women.

Additionally, all individuals are credited with accrual when they were aged 16, 17 or 18. This estimate of the number of years in employment (plus additional years credited for when they were aged between 16 and 18) was then divided by 49 (or 44 for women[3]) to give the fraction of the BSP to which an individual is entitled in 2002. Individuals who received child benefit for children aged under 16 but who were not earning above the LEL in any year were eligible for Home Responsibilities Protection (HRP). This essentially reduces the denominator used when calculating the proportion of BSP to which the individual is entitled. Therefore, if a woman in the ELSA data is assumed to be out of work in any year when one of her children was aged less than 16 years, we credit her with HRP[4]. The denominator cannot be reduced below 20 years, however.

Men with at least 44 years of contributions and women with at least 39[5] years are entitled to the full BSP. Anyone with a fraction below 25% is not entitled to any part of the BSP. We also assume that the value of the BSP rises in line with inflation (2.5%) in all future years.

Married women are entitled to receive BSP income equal to 60% of their husband's entitlement even if they do not (in their own right) qualify for this level of BSP income (this is known as a Category B pension). Therefore, married women in the sample, who qualify for less than 60% of their husband's BSP entitlement, are given BSP income equal to this level (instead of what they would receive in their own right) for all years when both partners are above the SPA.

This entitlement to a category B pension will be extended to men in the future. To qualify, a man must have a wife who reaches the SPA after 2009 (i.e. born in 1950 or later) and have a personal entitlement to BSP that is less than 60% of his wife's entitlement. However, a man with a wife born before 1950 does not qualify for any BSP income above the level to which he is personally entitled, even if his own entitlement is less than 60% of his wife's entitlement.

Finally, when one spouse dies, the surviving spouse inherits the deceased spouse's BSP entitlement (in place of his own) if his spouse's entitlement exceeded his own.

The category B pension received and the spouse's entitlement that is inherited (where relevant) do, of course, depend on when the individual's spouse retires. Therefore, throughout these calculations we assume that the spouse retires in the same year as the individual is assumed to retire. The exception to this is when we calculate figures for retirement at the SPA. In this case, we assume that the individual's spouse also retires at their SPA, which will probably be in a different year. The reason for this is that it may be interesting to examine family pension wealth if both partners work until the SPA. In this case we would want to add together the pension wealth (assuming retirement at the SPA)

---

[3] For women born in 1955 or later, the SPA is 65 and therefore these women have a denominator of 49 when calculating BSP entitlement. For women born between 1950 and 1955, the denominator increases gradually from 44 to 49 as the SPA increases.

[4] HRP is available to the main Child Benefit payee, who may be a man or a woman but, in practice, the vast majority are women. Therefore, we only credit women with HRP.

[5] This numerator increases gradually as the SPA for women increases and eventually equalises with the SPA for men.

of both partners. In order to do this consistently, the calculation of each individual's pension wealth must assume his spouse retires at the SPA as well.

2.1.1. *Retirement in 2002*

When calculating the BSP wealth of an individual who retires in 2002, we assume that he stops working in 2002 (i.e. accrues no more years of entitlement) and starts drawing his BSP at the SPA. To calculate the net present value (in 2002) of the flow of BSP income between the state pension age and death[6], nominal BSP income in all future years is discounted back to 2002 (using a 5% nominal annual discount rate). Throughout all the calculations of pension wealth, we assume that everyone dies at his life expectancy. The life expectancies used are gender and age-specific on a cohort basis[7]. As a result of discounting the stream of income from the BSP back to 2002, the present value of the BSP to, say, a 64 year-old man is higher than the value of the same flow of income to a 50 year-old man, since the stream of income for the latter is discounted over fourteen more years.

The total amount of income received between age 65 and death for a man with full BSP entitlement is about £78,000 in 2002 prices. The corresponding figure for the income of a woman with full BSP entitlement between age 60 and death is about £105,000. However, discounting of this income stream means that the total wealth from receipt of a full BSP is lower than this. Figures 2.1 and 2.2 show how the discounted present value of wealth from receipt of a full BSP varies by age in 2002 for men and women respectively. The dark blue line shows the discounted present value (in 2002) of the stream of BSP between the SPA and death for individuals of each age, assuming that they will qualify for a full BSP. The light blue line shows the discounted present value (in 2002) of the stream of BSP income from the SPA to death assuming the individual accrues no further BSP entitlement after 2002[8]. The discounted present value of a full BSP is about £63,000 to a man aged 65 in 2002 and about £81,000 to a woman aged 60 in 2002[9]. The steep increase in the solid line in figure 2.1 at age 28 is due to the fact that if an individual has accrued less than 25% entitlement to the BSP, he receives nothing. The second steep increase in figure 2.1 at age 60 occurs because once a man has accumulated about 90%[10] of full BSP entitlement he automatically qualifies for the full BSP. Similar increases occur in figure 2.2 at ages 28 and 55. The second of these steep increases is at a younger age in figure 2.2 because women of this age in 2002 have a SPA of 60, compared to 65 for men.

---

[6] Income is counted every 1/10th of a year since life expectancies are known to the nearest 1/10th of a year. For example, someone with a life expectancy of 10.3 years will have 103 periods of income receipt before death.

[7] Government Actuary's Department website, http://www.gad.gov.uk/Life_Tables/Period_and_cohort_eol.htm

[8] The individuals illustrated here are assumed to have worked in every year from the age of 16 onwards.

[9] These figures assume that the individual lives to his or her life expectancy.

[10] The exact number of years of contributions required to receive a full BSP is 44 out of 49 for a man and 39 out of 44 for a woman.

Figure 2.1 - Discounted present value of BSP wealth for men of different ages in 2002
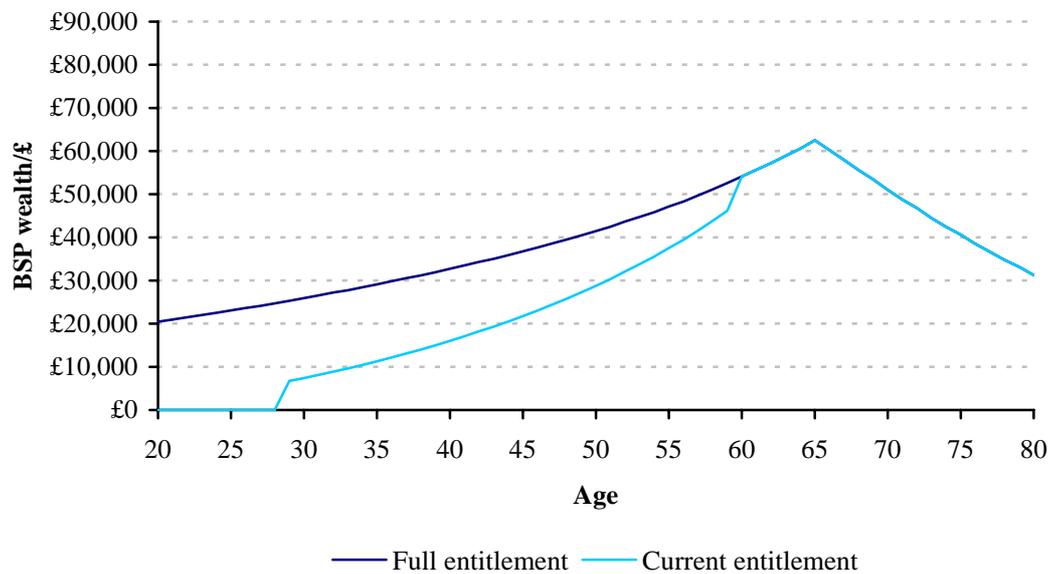
Source: Authors' calculations

Figure 2.2 - Discounted present value of BSP wealth for women of different ages in 2002
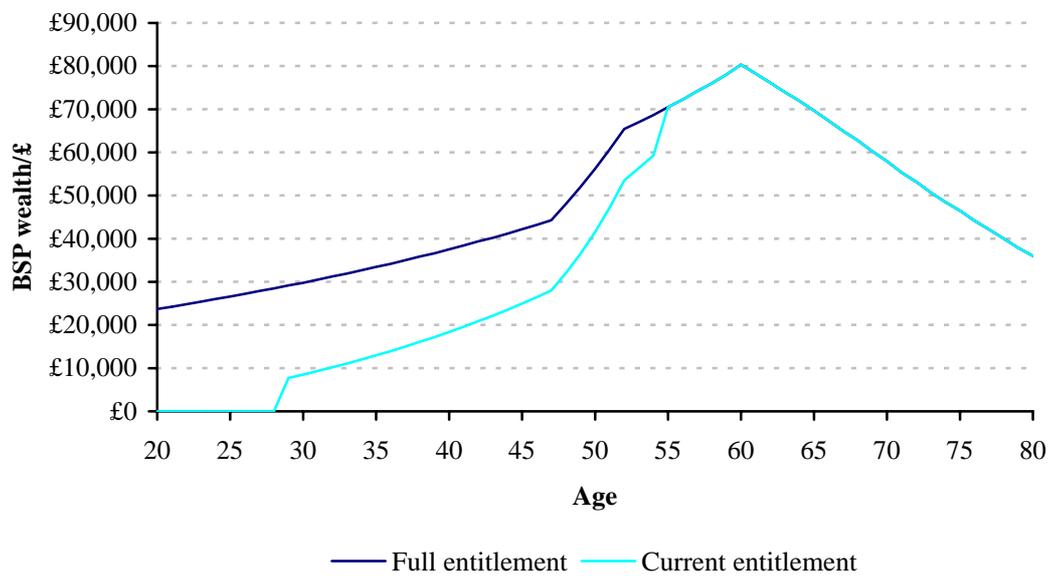
Source: Authors' calculations
Note: The steep increase in the present value of BSP wealth for women aged 47 to 52 in 2002 is due to the change in the SPA for women from 60 to 65, which is gradually phased in for women born between 1950 and 1955. Younger women, whose SPA is 65, will have peak BSP wealth at age 65, rather than 60

2.1.2. Future retirements

Also of interest is the pension wealth of an individual in future years (for example, of particular interest might be the wealth of an individual when he reaches the state pension age). In order to calculate the BSP to which an individual is entitled if he retires in some future year, we assume he works in all years between 2002 and the year of retirement[11] (i.e. accrues more years of entitlement), then retires and then starts drawing his BSP at the SPA. Figures 2.1 and 2.2 show both the present value of BSP wealth assuming retirement in 2002 (the light blue line, the calculation of which is described in Section 2.1.1) and the present value of BSP wealth assuming retirement at the SPA (the dark blue line, the calculation of which is described in this section).

To calculate the BSP wealth of an individual retiring at some future date we simply take the flow of all remaining BSP income as of a particular year and discount it back (again using a 5% discount rate) to the year of interest. This then gives the nominal value of wealth from the stream of BSP income in each year going forwards. This figure is then discounted back to 2002 using a 5% nominal discount rate to get the net present value of BSP income if an individual continues to work until that year.

2.2 Second Tier State Pension entitlement

An individual's entitlement to the second tier state pension depends on his employment and earnings history. Though the exact calculation of second tier pension entitlement has changed several times, essentially entitlement accrues in proportion to earnings between a lower earnings limit and an upper earnings limit in all years of a person's working life since 1978 (see section 2.2.2 for a detailed description of each system). Therefore, in order to calculate an individual's second tier pension entitlement we need individual earnings profiles back to 1978. This information is not available in wave 1 of ELSA. Instead a simulated earnings history for each ELSA respondent is used to calculate SERPS/S2P entitlement. These earnings profiles are simulated by matching ELSA respondents to earnings profiles from cross-section data, employing a method similar to that used by Blundell, Meghir and Smith (2002).

2.2.1. Estimating Earnings Histories

These earnings histories are based on current earnings so, as some ELSA respondents either did not know their exact earnings (6.6% of those under the SPA) or else were not in employment in 2002 (31% of those under the SPA), we firstly simulate earnings in 2002[12].

---

[11] We assume everyone works between 2002 and the future retirement date, including those who are currently out of work in 2002. For the currently unemployed, state pension wealth assuming retirement at the SPA offers an upper bound to true state pension wealth because it credits individuals with maximum future accrual of rights. State pension wealth assuming retirement in 2002 offers a lower bound because it assumes the individual is credited with no further accrual.

[12] Amongst those over the SPA, 90.0% were not in employment (and so had their earnings imputed using the median regression) while 1.7% did not know their earnings exactly and so had their earnings hotdecked.

In the case of those who did not know their earnings, respondents were asked to give a range in which their earnings fell. For these people, we imputed earnings using a hotdeck (conditional on age, gender, marital status and earnings in the range indicated)[13]. Whilst we could simply have used the median earnings of all those in the sample with matching characteristics, the advantage of the hotdeck is that it maintains the variance properties of the original sample.

In the case of those who were out of work in 2002, we used a quantile regression (using the median) across individuals (aged below the SPA) in employment in 2002 of log earnings on age, age[2] and education level for men and women separately[14]. This was then used to predict earnings for all those who still had missing earnings (including those aged over the SPA). The results of this regression are given in Table 2.1 for men and women.

Table 2.1 - Quantile (median) regression results for male and female earnings

	Men		Women	
	Coefficient	Standard Error	Coefficient	Standard Error
Age	0.201	0.049	0.068	0.063
Age^2	-0.002	0.000	-0.001	0.001
Education:				
A level	0.191	0.038	0.377	0.049
Degree	0.465	0.042	0.789	0.062
No. observations	1,951		1,918	

The earnings profile is based on data from consecutive waves of cross-sections from the Family Expenditure Survey (FES) from 1978 to 2002. A quantile regression on log earnings is performed to find median gross earnings for a specific group (based on year of birth, gender and education level) in all years between 1978 and 2002. The year of birth is grouped into three-year cohorts and three education groups are used (those who left full-time education at or before the compulsory school leaving age, those who left full-time education between the CSL and 18 and those who continued in full-time education past 18 years old). Interactions were allowed between education and gender and between education and cohort. However, interaction terms between gender and cohort and between all three variables together were not included.

The effect of imposing these limitations on the relationship between earnings, gender, education and cohort is as follows. First, the interaction term between education and gender allows for the effect on earnings of having a higher level of education to be different for men and women who were born in the same year. Second, the interaction

---

[13] In the case of self-employed people (7.3% of the sample), whose earnings were imputed from amongst other self-employed people only, the hotdeck was conditional only on education and the band within which their earnings lay. 32.8% of those who were self-employed did not know their exact earnings. However, only 20.7% of these people (or 6.8% of all self-employed) were unable or refused to provide a band within which their earnings lay.

[14] This method was also used to impute earnings for those self-employed people who reported making a loss or earning zero profit in 2002 (8.2% of those who were self-employed).

term between education and cohort allows for the effect of a higher level of education on earnings to differ for people born in different years. Third, the omission of the interaction term between gender and cohort means that the effect on earnings of being female relative to being male cannot differ for people born in different years but with the same level of education.

Finally, median earnings were calculated across three consecutive years of data. For example, median group earnings for 2000 were found by taking the median earnings for people in that group in 1999, 2000 and 2001 (where the earnings in 1999 and 2001 are inflated and deflated, respectively, using average earnings growth).

One final adjustment is made to the earnings profile. Those who are still in employment after the state pension age are unlikely to be representative of the rest of their cohort. Therefore, median earnings for those groups over the SPA in any year are replaced with their real median group earnings in the year before the SPA (assuming 2.5% inflation). Figures 2.3 and 2.4 show examples of two earnings profiles. Figure 2.3 is the median earnings profile for a man born in 1947, showing the different profiles for men with different education levels. Figure 2.4 shows the equivalent profiles for a woman born in 1947.

To get an earnings profile for each ELSA respondent, we use the earnings information available in the first wave of ELSA to calculate the ratio of actual earnings to group median earnings (from the FES) in 2002. We then assume that this individual effect is the same in every year from 1978 to 2001 as it was in 2002. The underlying assumption here is that any shocks affect individuals in the same group in the same way and so the ordering of individuals in each group does not change over time. So, for example, an individual who earns 20% more than their group median in 2002 is assumed to always earn 20% more than their group median.

To get earnings in years after 2002, we assume no real earnings growth in future years. Figure 2.5 shows the mean and median real earnings between 1978 and 2002 for men born in 1937 from the FES. Figure 2.6 shows the same data for women born in 1942[15]. The vertical lines in both these figures show the period between 50 and the SPA. It is not clear from these that these cohorts have experienced any systematic real earnings growth between 50 and the SPA. Furthermore, this data will be affected by the conditions in the economy during these years. For these reasons we assume no real earnings growth in the future. Section 5 discusses the effect of making alternative assumptions on future earnings growth.

---

[15] These two cohorts are chosen because they are the last cohorts for whom earnings between 50 and the SPA are observed in the FRS.

Figure 2.3 – Median earnings profiles for men born in 1947, by year and education, 1978-2002
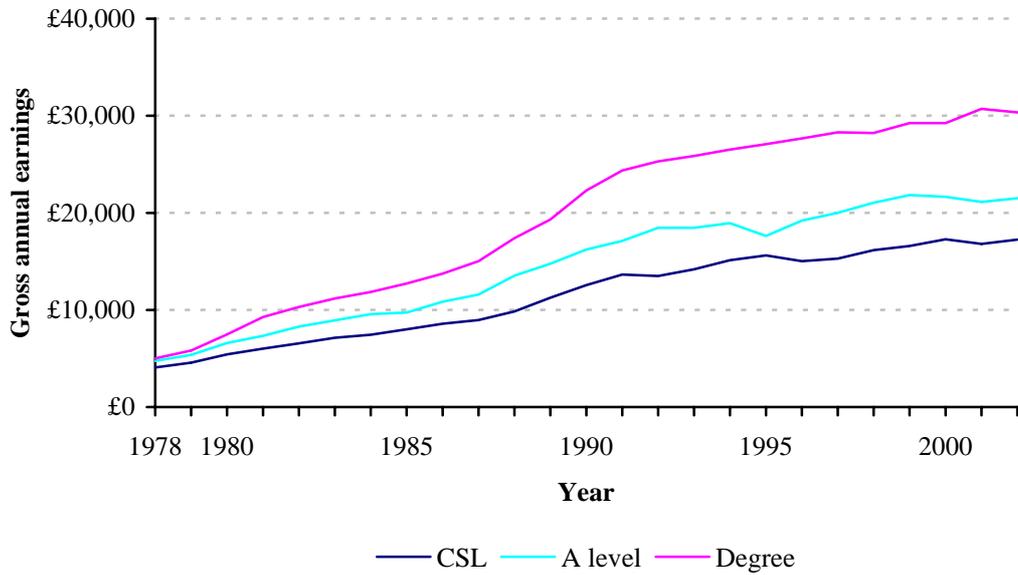
Source: Family Expenditure Survey (various years)

Figure 2.4 – Median earnings profiles for women born in 1947, by year and education, 1978-2002
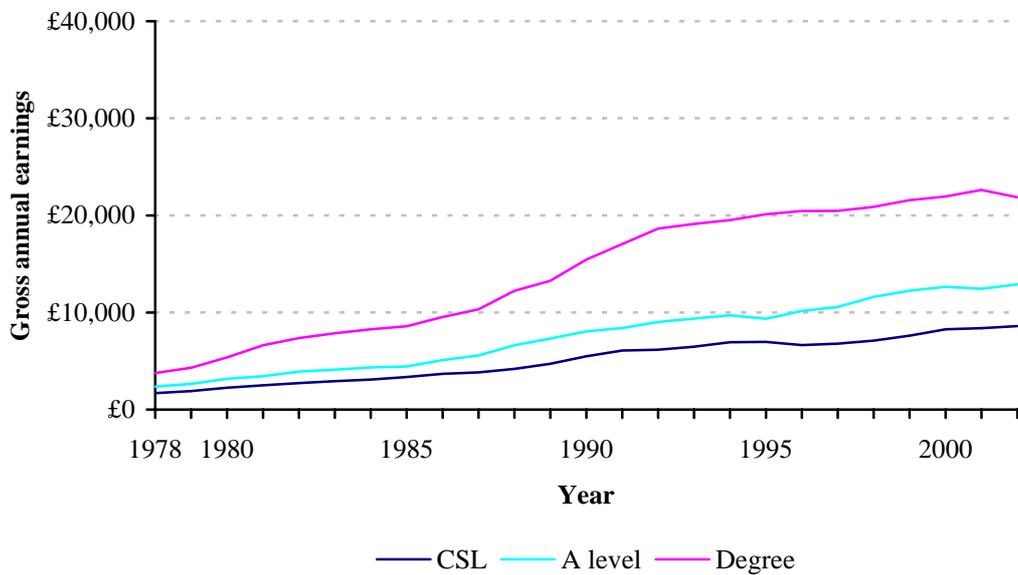
Source: Family Expenditure Survey (various years)

Figure 2.5 - Mean and median earnings from the FES (men born in 1937), by age
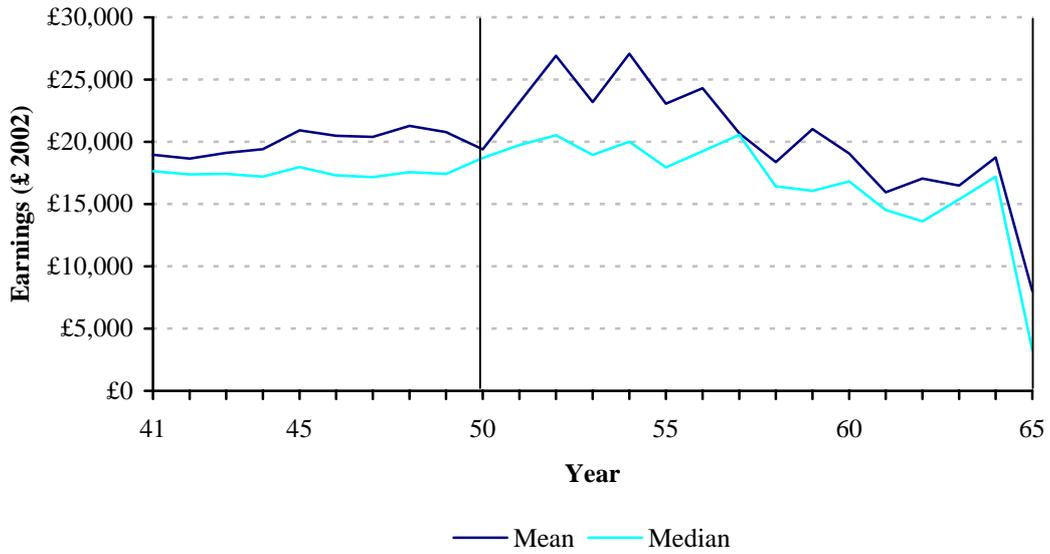
Figure 2.6 - Mean and median earnings from the FES (women born in 1942), by age
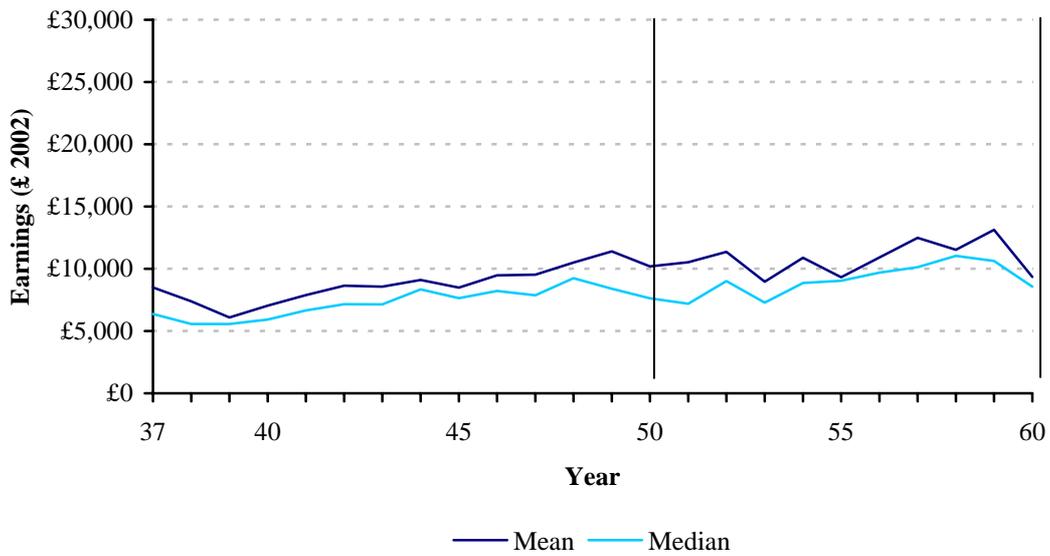
2.2.2. Calculating Second Tier State Pension Entitlement

Having simulated an earnings history for each individual in this way, it was possible to calculate SERPS and S2P accrual from 1978 to 2002, assuming that an individual was contracted-in in all these years. The rules for SERPS accrual changed twice between its introduction in 1978 and its replacement by S2P in 2002. There are, therefore, four different systems under which individuals accrue state second tier pension entitlement. The one that applies to a particular individual depends on when he reaches state pension age. For a detailed analysis of how these changes will effect state retirement incomes of current and future generations of pensioners see Disney and Emmerson (2004). Under all systems, only earnings below the UEL in that year are eligible to accrue entitlement.

Original SERPS System

Anyone who reached state pension age before 1998 accrued state second pension rights under the original SERPS system introduced in 1978. Under this system, an individual's rights were based on his earnings between the Lower Earnings Limit (LEL) and the Upper Earnings Limit (UEL) in the best twenty years of earnings between age 16 and the state pension age in all years from 1978 onwards. The accrual rate was 25%. Equation 1 shows how SERPS entitlement was calculated.

$$\left(\sum_{best\,20\,years} [(earnings \bullet \rho) - LEL] \bullet 0.25 \right) \Big/ 20 \qquad (1)$$

where ρ = revaluation factor
= average earnings growth between the year in which the income is earned and the year in which the individual reaches the state pension age

The LEL used in this calculation is the LEL in the year before the individual reaches the state pension age.

Post-1986 SERPS System

This system (introduced in the 1986 Social Security Act) applied to anyone who reached the state pension age in 1998. Two major changes were made under this system. The first was that the accrual rate was reduced from 25% to 20%. The exact accrual rate that applies to each individual depends on when they reach the state pension age, as shown in Table 2.2. These accrual rates only apply, however, to earnings from 1988 onwards (i.e. existing accruals were protected).

The second change was that earnings for all years between 16 and the SPA were used to calculate entitlement (including zero for years where earnings were below the LEL or the individual earned nothing). The overall effect of this was to reduce the generosity of SERPS considerably. Equation 2 summarises the calculation of SERPS entitlement under this system.

$$\sum_{age=16}^{SPA} [(earnings \bullet \rho) - LEL] \bullet accrual\_rate \Big/ (SPA - 16) \qquad (2)$$

The LEL used is the LEL in the year before the individual reaches the state pension age and the accrual rate is as shown in Table 2.2 for earnings after 1988 or 25% for earnings before 1988.

Table 2.2 - SERPS accrual rates applying to earnings in all years after 1988

Accrual rate	Date when contributor reaches SPA	Birth date if male	Birth date if female
25%	5/04/2000 or earlier	5/04/1935 or earlier	5/04/1940 or earlier
24.5%	6/04/2000 – 5/04/2001	6/04/1935 – 5/04/1936	6/04/1940 – 5/04/1941
24%	6/04/2001 – 5/04/2002	6/04/1936 – 5/04/1937	6/04/1941 – 5/04/1942
23.5%	6/04/2002 – 5/04/2003	6/04/1937 – 5/04/1938	6/04/1942 – 5/04/1943
23%	6/04/2003 – 5/04/2004	6/04/1938 – 5/04/1939	6/04/1943 – 5/04/1944
22.5%	6/04/2004 – 5/04/2005	6/04/1939 – 5/04/1940	6/04/1944 – 5/04/1945
22%	6/04/2005 – 5/04/2006	6/04/1941 – 5/04/1942	6/04/1945 – 5/04/1946
21.5%	6/04/2006 – 5/04/2007	6/04/1942 – 5/04/1943	6/04/1946 – 5/04/1947
21%	6/04/2007 – 5/04/2008	6/04/1943 – 5/04/1944	6/04/1947 – 5/04/1948
20.5%	6/04/2008 – 5/04/2009	6/04/1944 – 5/04/1945	6/04/1948 – 5/04/1949
20%	6/04/2009 or later	6/04/1945 or later	6/04/1949 or later

Post-1995 SERPS System

Two changes were made to the pension system in the 1995 Social Security Act. The first was that the state pension age for women was increased from 60 to 65 (this happens gradually for women reaching the SPA after 2010, eventually reaching 65 for women who reach the SPA in 2020). The effect this had on the SERPS calculation was that earnings were averaged over five extra years for women reaching the SPA after 2020 and, furthermore, that SERPS pension income would be received for five years less.

The second change was subtler but significantly reduced the generosity of SERPS. Rather than revaluing earnings below the UEL and then subtracting the LEL in the year before the individual reaches the SPA, under the post-1995 system the LEL is subtracted in the year earnings are received and then the earnings net of the LEL are revalued (using average earnings growth) to the SPA. The reason that this is less generous is because the LEL is increased each year in line with prices, whereas eligible earnings are revalued each year in line with average earnings growth. Equation 3 summarises the calculation of SERPS under the post-1995 system.

$$\sum_{age=16}^{SPA}(earnings - LEL)\bullet \rho \bullet accrual\_rate/(SPA-16) \qquad (3)$$

State Second Pension

The state second pension increased the generosity of the state second tier pension to low earners. Anyone earning between the LEL and a new Lower Earnings Threshold (LET) is credited with entitlement equal to 40% of the LET. Anyone earning between the LET and the Upper Earnings Threshold (UET) accrues additional entitlement equal to 10% of earnings in this range. Anyone earning between the UET and the UEL accrues further entitlement equal to 20% of earnings in this range. As before, earnings above the UEL do not accrue further entitlement. Figure 2.7 shows how S2P entitlement varies by weekly income, using the 2002 gross earnings thresholds, and how this compares to the post-1995 SERPS system.

Individuals who are caring for people who receive certain benefits or caring for children under 6 are also credited with minimum S2P contributions (as if they were earning at the LET). However, we have not included these in our calculations of pension entitlement in the future. This is for two reasons. Firstly, the number of people in the sample receiving Child Benefit for a child under 6 is likely to be extremely small. Secondly, we cannot know in the future whether individuals under the SPA will be receiving carer's allowance for time they spend caring for someone else.

Figure 2.7 - Accrual of SERPS/S2P using 2002 gross earnings thresholds
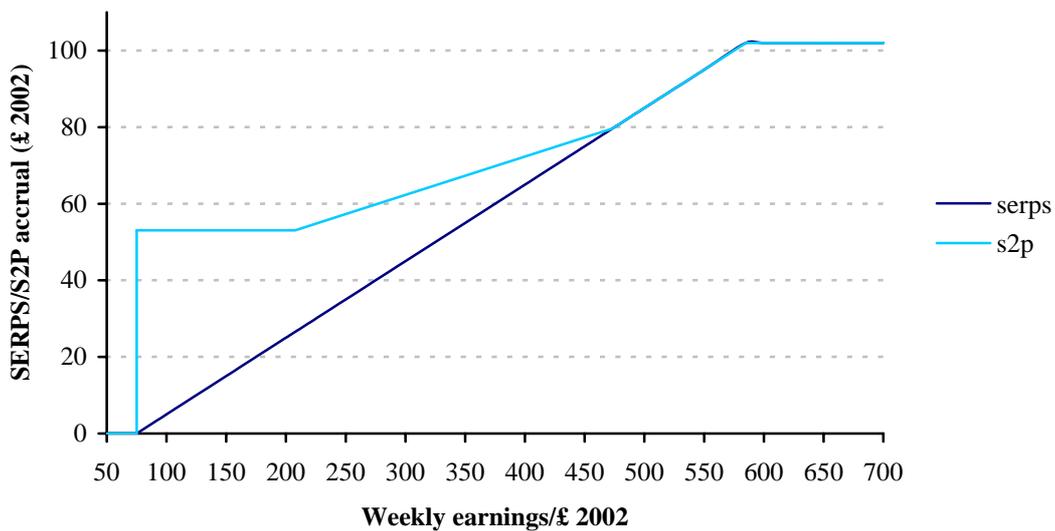
Contracting out

Those who were contracted out at any point do not accrue any entitlement in those years in which they are contracted out. Anyone who had a private pension in years between 1978 and 1988 is assumed to be contracted-out in these years. During these years, the

15

majority of employer provided DB schemes were contracted out – the condition being that they had to provide benefits at least as generous as those provided by SERPS. These were by far the majority of private pensions at the time. This is because prior to 1988 the only forms of private pension available were employer DB schemes, S226 schemes for the self-employed (who do not accrue SERPS/S2P entitlement) and retirement annuity plans.

In 2002, if a person had a DB pension, we assume they are contracted out. If a person had a DC pension and says they are contracted out, we assume they are contracted out[16]. Otherwise we assume they are contracted-in in 2002. For years between 1989 and 2001, if the individual was in the same pension scheme as he is a member of in 2002, we assume his contracting out status is the same. For any years between 1989 and 2001 when he was not in his current scheme, we know whether or not he was in any other private pension scheme for any of these years. If he was, we assume he was contracted out in those years. For all years after 2002, an individual's contracted-out status is the same as it was in 2002, unless he is over the SPA in which case he ceases to accrue SERPS or receive a contracting-out rebate, since anyone aged over the SPA no longer pays employee NI contributions.

Finally, any individual who is self-employed in 2002, are assumed to have always been self-employed and thus to have never accrued any SERPS/S2P entitlement during their working lives.

Once we had the contracting-out status in each year for each individual, using the rules of the schemes, an estimate was made of the income that would be received from the second tier state pension in all years from the SPA to death. Furthermore, for those who were not in work in 2002, we do not credit them with any SERPS/S2P accrual between the date they left their last job and 2002.

2.2.3. Retirement in 2002

Firstly, we calculated the value (in 2002) of the flow of SERPS/S2P income from the SPA to death, assuming the individual stops accruing SERPS rights in 2002 and starts receiving their second tier state pension at the SPA. This is done in the same way as BSP wealth was calculated - we find the net present value of second tier pension entitlement by discounting back to 2002 (using a 5% nominal discount rate) the income from SERPS/S2P income in all years from the SPA to death. However, recipients' spouses are also entitled to survivor benefits if they outlive their spouse. The surviving spouse inherits between 100% and 50% of the SERPS/S2P income. The percentage inherited depends on the date of birth of the deceased spouse. Table 2.3 shows how the proportion inherited varies with year of birth. We include this as wealth of the original individual. Therefore, we add the present value of the stream of income received by the spouse to the net present value of the stream of SERPS/S2P income received. This gives total individual wealth from the second tier state pension.

---

[16] Only people with employer schemes are asked if they are contracted out. Therefore, anyone in a non-employer DC scheme is assumed to be contracted in.

Table 2.3 - Percentage of SERPS entitlement inherited by a surviving spouse

% SERPS entitlement for surviving spouse	Date when contributor reaches SPA	Date of birth of contributor: Husband	Date of birth of contributor: Wife
100%	5/10/2002 or earlier	5/10/1937 or earlier	5/10/1942 or earlier
90%	6/10/2002 – 5/10/2004	6/10/1937 – 5/10/1939	6/10/1942 – 5/10/1944
80%	6/10/2004 – 5/10/2006	6/10/1939 – 5/10/1941	6/10/1944 – 5/10/1946
70%	6/10/2006 – 5/10/2008	6/10/1941 – 5/10/1943	6/10/1946 – 5/10/1948
60%	6/10/2008 – 5/10/2010	6/10/1943 – 5/10/1945	6/10/1948 – 5/10/1950
50%	6/10/2010 or later	6/10/1945 or later	6/10/1950 or later

Source: The Pension Service (2004)

Figure 2.8 shows how state second tier pension wealth differs between the different education groups. There are two points of particular interest in figure 2.8. First, individuals with a degree are more likely to be contracted out. This is obvious from the fact that a greater proportion of individuals with a degree have no pension wealth from SERPS/S2P. 43.1% of individuals with a degree have no SERPS/S2P wealth. This compares to 37.9% amongst those with A levels and 34.0% of those who left education at the CSL. Second, of those people who do have some non-zero SERPS pension wealth, those with a higher level of education have higher pension wealth. For example, whilst 92.9% of those without A levels have SERPS/S2P wealth below £50,000, only 81.8% of individuals with a degree have SERPS/S2P wealth below £50,000. This demonstrates that, as we would expect, individuals with higher education are more likely to contract out but, if they contract in, they accrue more wealth than individuals with low levels of education.

Figure 2.8 - Distribution of state second tier pension wealth for different education groups (all aged 50 to SPA)
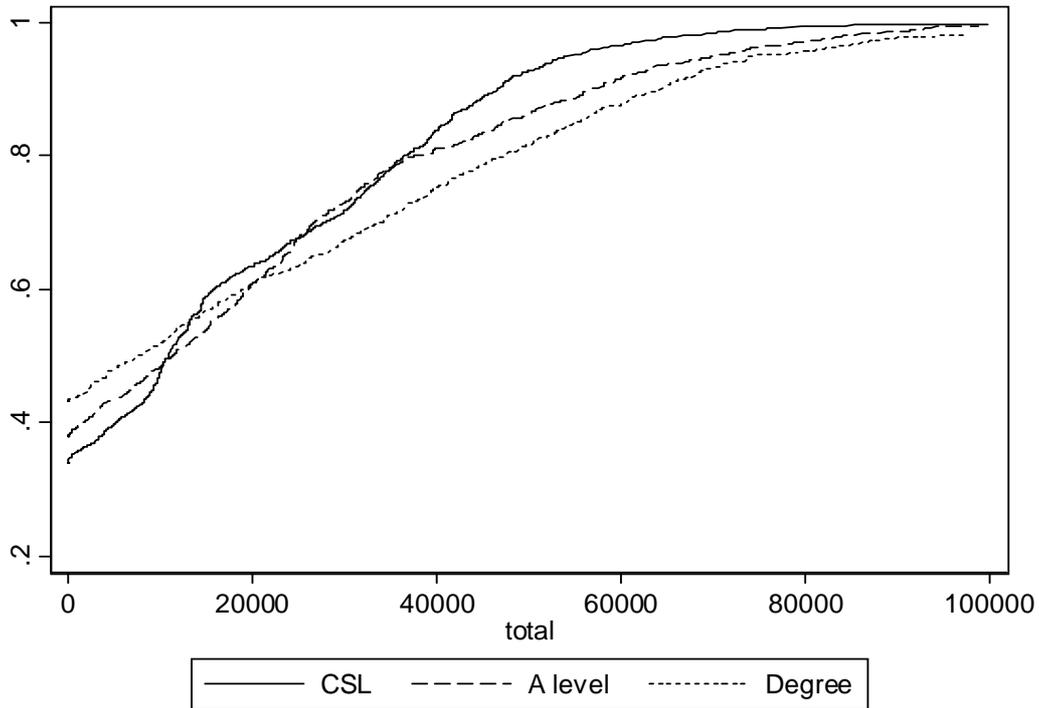
2.2.4. Future retirements

Similarly, to find the value of the SERPS/S2P income stream as of any year in the future, we assume an individual works and accrues entitlement from 2002 until that year[17]. This applies even to those who were out of work in 2002. In other words, we assume that unemployed people find work, at their simulated wage rate (as described in section 2.2.1) and work from 2002 until some future year and then retire. Entitlement is accrued in proportion to relevant earnings in future years. Once entitlement is known, we sum the income from all remaining years between the SPA and death and then the stream of survivor benefit income from the year of death of the recipient to the year of death of his spouse and discount these incomes back to the year of interest. This value is then discounted back to 2002.

Figure 2.9 shows how the discounted present value of SERPS/S2P wealth varies by age. The graph shows wealth for a man earning at the UEL in all years between age 16 and the SPA. In other words, this figure shows the maximum possible discounted present value of wealth for men of different ages in 2002. The blue line shows the level of wealth if the individual retires in 2002 (i.e. the wealth already accumulated). The pink line shows the discounted present value of wealth in 2002 assuming that the individual continues to earn at the UEL in all years until he reaches the SPA.

---

[17] An individual cannot accrue any further entitlement once he is over the SPA. Therefore, no additional entitlement is added after the SPA, even though we assume the individual works past this age.

18

Figure 2.9 - Discounted present value of SERPS/S2P wealth for men of different ages in 2002 earning at the UEL in all years between age 16 and the SPA (assuming immediate retirement and retirement at the SPA)

Note: Men aged 89 and over in 2002 had already reached the SPA in 1978 when SERPS was introduced. Therefore, they did not accrue any SERPS entitlement.

3. Estimating private pension wealth

There are four main sources of private pension wealth, which we deal with separately. First, there is wealth from defined contribution (DC) pensions which an individual is currently contributing to. Second, there is wealth from defined benefit (DB) schemes that an individual is currently contributing to. Third, there is wealth from pensions that an individual no longer contributes to but to which he has retained rights and from which he is not yet receiving income. Fourth, there is wealth from past pensions that an individual is already receiving income from. Table 3.1 shows the proportion of individuals with current pensions of different types, by gender and employment status.

Table 3.1 – Proportion of individuals with different current pension arrangements (all aged 50 to SPA)

			% with this current pension type		
			Men	**Women**	**All**
Employed					
	DB only[1]		26.5	30.5	28.3
	DC[2]				
		Employer DC only	12.9	9.1	11.2
		Individual DC only	25.5	12.5	19.7
		Both employer & individual DC	3.3	1.8	2.6
	Both DB & DC		2.3	2.8	2.5
Inactive					
	DB only		0.9	1.3	1.1
	DC				
		Employer DC only	0.0	0.0	0.0
		Individual DC only	7.0	4.8	6.0
		Both employer & individual DC	0.4	0.1	0.3
	Both DB & DC		0.0	0.0	0.0
All					
	DB only		17.3	20.3	18.6
	DC				
		Employer DC only	8.3	5.9	7.2
		Individual DC only	25.6	13.5	20.2
		Both employer & individual DC	2.2	1.2	1.8
	Both DB & DC		1.5	1.8	1.6

[1] These people only have a DB pension and do not have any kind of DC scheme.
[2] These people only have DC schemes and do not have a DB scheme.

Some private pensions are integrated with the state pension system. In other words, benefits from the private pension are reduced once the individuals begins drawing their

state pension, by some amount up to the level of state pension received. In other words, total pension income will be lower than the sum of income from such private schemes and state pension income. A question about whether or not an individual's pension scheme was integrated was piloted in ELSA. However, virtually no respondents knew the answer to this question and so it was dropped from the final survey. As a result we do not know whether private pensions are integrated or not. Therefore, we assume throughout that no schemes are integrated. This will have the effect of over-estimating pension wealth for individuals with integrated private schemes.

3.1 Current defined contribution pension wealth

The wealth from a DC pension fund depends on annuity rates at the time the individual annuitises their fund. An individual can annuitise their fund at any age between 50 and 74. Individuals can choose to have annuity income that is indexed to prices or one that is fixed in nominal terms. We use annuity rates that assume the latter option is chosen, as this is in practice what is most commonly bought.

3.1.1. Retirement in 2002

For all defined contribution schemes, ELSA respondents are asked to give the current value of their fund. This measure includes wealth from personal pensions, stakeholder pensions, S226 plans and additional voluntary contributions and freestanding additional voluntary contributions to (DB) schemes for the two most important current pensions. If the individual does not know any element of his fund he is asked to give a range in which it lies from various upper and lower bound options. If the individual does not know the fund value precisely, we hotdeck a value (conditional on the quartile of current earnings multiplied by pension tenure) from within the range the individual indicated. A variable is included in the data to indicate whether any element of the fund value was found using a hotdeck.

The fund value in 2002 assumes that the individual stops contributing to all his DC schemes in 2002. For anyone in 2002 aged between 50 and 74, we assume they retire in 2002 and annuitise their fund immediately. The annuity rate they receive was the second best age and gender specific single life annuity rate[18] quoted by the Financial Services Authority (FSA) in January 2005 assuming a £100,000 fund[19]. Different rates were used for smokers and non-smokers. These individuals then receive this annual income between 2002 and their life expectancy.

Partners of ELSA sample members are also given a full interview, even if they are aged under 50. These younger partners cannot immediately annuitise their fund. Therefore, they are assumed to retire and cease contributions to the fund in 2002 but leave it

---

[18] The part of the DC fund that comes from contracted out rebates will, in fact, have to be annuitised at a non-gender specific, joint-life annuity rate. However, since we do not know how much of the fund comes from contracted out rabtes, we cannot annuitise this part at a different rate.

[19] www.fsa.gov.uk/tables

accruing interest (at 5% a year) until they reach 50. When they reach 50 they annuitise their fund[20] and receive income from the annuity between age 50 and death.

Figure 3.1 shows how the discounted present value of wealth from annuitising a £100,000 pension fund varies by gender and by the age at which the individual annuitises it. The discounted present value is higher for women than it is for men at all ages. For women, wealth peaks at age 62 when the present value of wealth is just over £90,300. For men, wealth peaks at age 65 when the present value of wealth is just over £88,000. Finkelstein and Poterba (2002) outline three potential reasons why the discounted present value of wealth from annuitising a DC fund is less than the value of the fund. First, adverse selection means that the average purchaser has a longer life expectancy than the average for their age and gender. Second, there are administrative costs in providing an annuity. Third, annuity providers may exercise market power, which will depress annuity rates.

Figure 3.1 - Discounted present value of wealth from annuitising a £100,000 DC pension fund, by age and gender, for a non-smoker
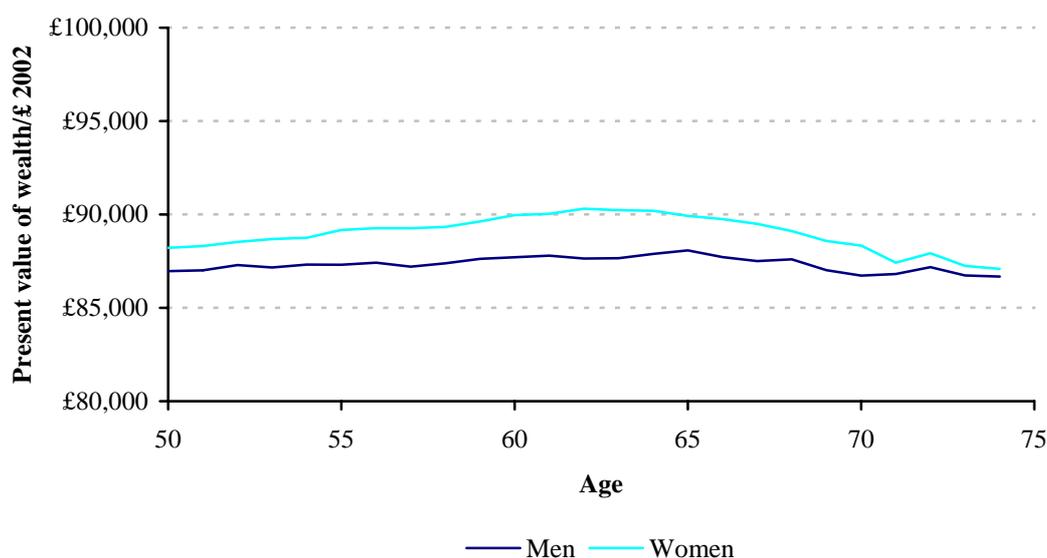
Source: Second best annuity rates quoted by the Financial Serves Authority in January 2005
Note: Assumes 2.5% real discount rate and average life expectancy

3.1.2. Future retirements

In order to calculate the DC pension wealth if the individual continues working into the future, we need to know not only at what rate the current fund will appreciate but also how much the individual will contribute to the fund in future years if he continues working. From ELSA we know the value of contributions in 2002. In future years, we assume that individuals contribute the same fraction of their salary as they did in 2002.

However, some individuals did not know what their contributions were to either their first or second DC pension. For those who did not know some or all elements of their

---

[20] The annuity rates available in the future are assumed to be the same as the rates in 2002 (see section 3.1.2).

contributions to their first pension scheme that was DC (23.4% of those aged 50 to the SPA with a first current scheme that is DC), we hotdeck a contribution level (as a percentage of current salary) conditional on gender and education level.

The same hotdeck procedure was carried out for those with a second current scheme that was DC who did not know their contribution level (8.9% of those aged 50 to the SPA with a second current scheme that is DC). However, in some cases the number of people who knew their contribution rate and had characteristics matching those of the people who did not was very small. If the matching group had less than 10 people in it (which was the case for 61.5% of those people whose second scheme contributions we tried to impute), we use one of two different methods.

Firstly, if the individual who did not know their second contribution level also had a first current scheme that was DC (60.6% of those we had not yet imputed a contribution level for), we assumed that their contribution level to their second scheme is 35% of their contribution level to their first scheme[21]. If the individual's first current pension scheme is not DC (the remaining 39.4% of those who we had not yet imputed a second contribution level for), we instead hotdeck a contribution level conditional on education level only.

Two indicator variables are included in the data: one shows if any element of personal contributions was unknown, the other shows if any element of employer contributions was unknown.

Evidence in favour of the assumption that individuals contribute the same proportion of their salary in each future year is shown in Figures 3.2 and 3.3. Figures 3.2 and 3.3 show how median contributions vary by age for men and women, respectively[22]. Since this is a cross-section of individuals, there will potentially be cohort effects that cause differing contribution rates between age groups. However, until further waves of ELSA data are available we cannot analyse how specific individual's contributions vary as they age. Bearing this in mind, Figure 3.2 shows that median contributions by men (as a percentage of salary) are fairly constant across the three age groups and so the assumption seems reasonable. Figure 3.3 shows that median contributions (as a percentage of salary) vary by age for women. However, those aged 60-64 are, in any case over the SPA and so their contributions are likely to be different from those of women under SPA. Therefore, focussing just on the two younger age groups, median contributions of these two groups are very similar (5.2% amongst 50-54 year olds compared to 6% among 55-59 year olds). Therefore, for women as well as men, the assumption of constant contributions (as a percentage of salary) at all ages does not seem particularly inappropriate.

We then assume a nominal annual return on the fund of 5%. Combining these two elements we can calculate the value of the fund in all future years, assuming the individual continues working and contributing until that year. For anyone in a future year

[21] 35% is the median ratio of second scheme contribution level to first scheme contribution level amongst the 210 people in the ELSA data who knew all elements of their first and second DC scheme contributions.

[22] These median contribution rates are for all those currently contributing to a DC pension scheme.

aged between 50 and 74, they are (as before) assumed to annuitise immediately. The annuity rates used are the same as were used for 2002. In other words, we assume that annuity rates remain constant over time. This is in line with our assumption that life expectancies do not increase over time either. In reality, longevity is increasing so younger individuals will have a longer life expectancy when they reach, for example, the SPA than individuals currently at the SPA do. Therefore, in the future, we would expect annuity rates to fall since the income will be received over a longer period. However, since we assume constant life expectancies, it is reasonable to also assume constant annuity rates.

The stream of annuity income they receive until death is then discounted back to 2002 using a 5% discount rate to find DC pension wealth in 2002 terms if the individual retires in some future year.

Figure 3.2 - Percentage of salary contributed to DC schemes (men)
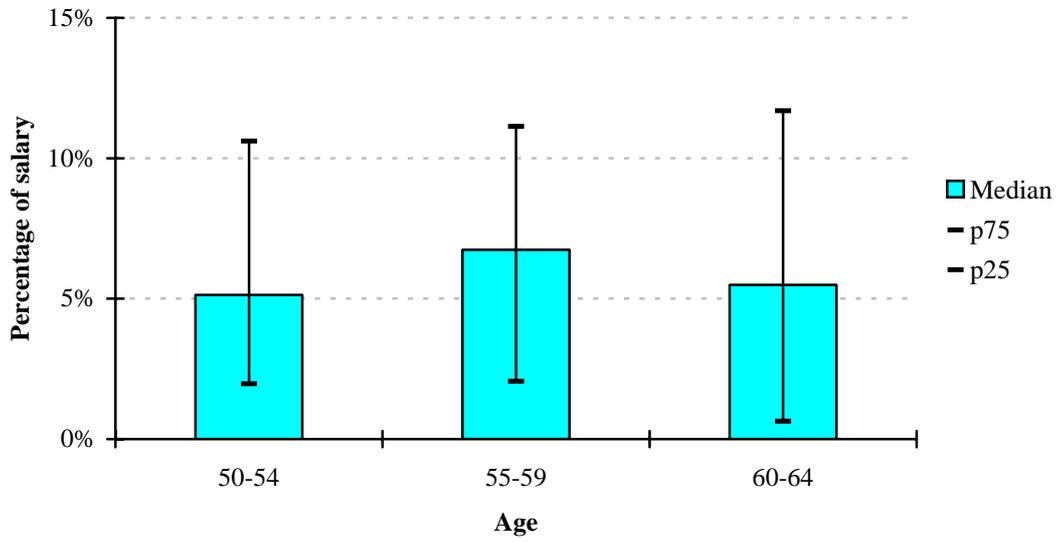

Figure 3.3 - Percentage of salary contributed to DC schemes (women)
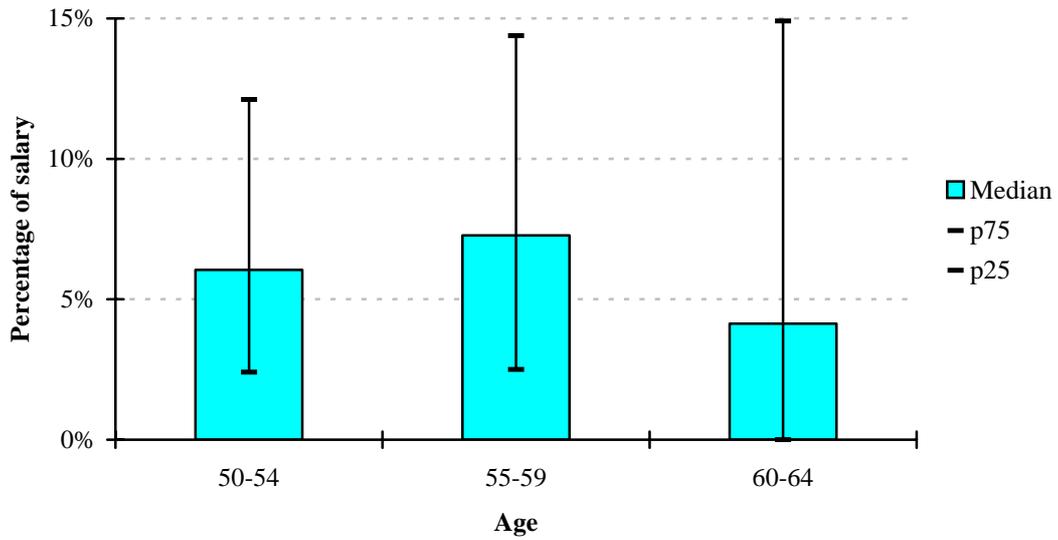
3.2 Current defined benefit pension wealth

The value of a defined benefit scheme depends on how income from the scheme is calculated. In general, this is done by multiplying the number of years in the scheme by an accrual rate and a measure of final salary[23]. These elements determine the income from the scheme in the first year of receipt. After this the actual income depends on the indexing rules of the scheme. Most schemes are indexed to inflation but some are indexed above inflation. The final element in determining the value of the pension is the one-off lump sum that is sometimes received on retirement.

We treat as defined benefit schemes any cases where the individual knows their employer scheme is DB and also any cases where the individual knows they have an employer scheme but does not know whether it is DB or DC.

3.2.1. Retirement in 2002

In order to calculate the value of the pension if the individual stops working and starts drawing the pension in 2002 there are five steps. Firstly, the number of years the individual has been in the scheme is known from responses in ELSA. However, in the case of 0.7% of respondents with DB pension schemes who did not know their pension tenure, we assume they have been in the scheme since they started their present job[24]. There was no one in a DB scheme who did not know or refused to give both their pension tenure and their job tenure. The total number of years of pension accrual is limited to 40. Therefore, if an individual is a member of a scheme for more than 40 years he ceases to accrue any additional years beyond 40.

Secondly, the final salary used is gross earnings from the main job in 2002. This measure of earnings is imputed for those for whom it is missing, as described in section 2.2.1. 7.0% of respondents aged 50 to the SPA with a DB pension scheme had missing earnings. Final salary for calculating pension entitlement has been subject to a cap since 1989. Table 3.2 shows the level of the earnings cap since 1989. Therefore, final salary is set to this cap if it exceeds this level and the individual joined the pension scheme after 1988[25].

Thirdly, the fraction of final salary accrued for each year the individual is in the scheme was taken from responses in ELSA. The most common accrual fraction was 1/80th (30.9% of those aged 50 to the SPA with a DB scheme) followed by 1/60th (16.5%).

---

[23] Part time workers accrue pension entitlement each year equivalent to the fraction of full time hours that they work. This fraction of a year's accrual is then multiplied by their fulltime-equivalised salary. For individuals who have always been part time workers, an equivalent calculation will be to assume they have accrued a full year for each year of part time employment but multiply the number of years by their annual part time salary, which is what we do. However, this method of calculating pension entitlement will over estimate pension income for individuals who used to work part time but now work fulltime, whilst it will underestimate pension income for individuals who used to work fulltime but have moved into part time employment.

[24] 34% of those who know their pension tenure joined the scheme when they started their current job. This is the modal response.

[25] When the individual joined the scheme is estimated using their current pension tenure.

However, 49.7% of respondents did not know what fraction they accrued[26]. For these people we imputed the fraction using a conditional hotdeck. The characteristics matched were gender, education and whether their scheme was broadly a public or private DB scheme. Once we knew the accrual fraction and how long the individual had been in the scheme, one final adjustment had to be made. Pension rules limit pension income to two-thirds of final pensionable salary. Therefore, if the number of years in the scheme multiplied by the accrual fraction exceeded two-thirds, it was reduced to two-thirds.

Fourthly, 44.9% of the sample aged 50 to the SPA knew that their pension income would not be indexed above inflation. For these people we index their pension income (once they start drawing it) to inflation of 2.5%. For the 22.9% of the sample who thought that their pension income would be indexed above inflation, we assume it is indexed to average earnings growth (4.5%). Lastly, 31.5% of the sample did not know whether or not their income would be indexed above inflation. For these people, we assume that it is just indexed to inflation.

Finally, respondents are asked what lump sum they expect to receive from their DB scheme when they retire. We assume that an individual expects to retire at the normal retirement age (NRA) for his scheme and then find the expected lump sum as a fraction of pension income in the first year of receipt (assuming that he continues to work until the NRA). We then calculate the lump sum that he will receive if he retires this year as this fraction times the pension income he receives this year. For respondents who did not know their lump sum (56.7% of those aged 50 to the SPA with a DB scheme) we used a conditional hotdeck, selecting from people in the same type of pension scheme (public or private) and with the same accrual fraction[27].

Variables are included in the data set to indicate whether any information about the DB scheme was imputed for each individual. One variable shows whether the individual was missing any information about the scheme rules (accrual fraction, lump sum or indexation) and a second variable shows whether the individual did not know or refused to give some information about themselves (current earnings or pension tenure).

---

[26] For a more detailed summary of accrual fractions in DB schemes amongst ELSA respondents see Banks, Emmerson and Oldfield (2004).

[27] Two categories of accrual fraction were used – 1/60th or greater and less than 1/60th.

Table 3.2 - Pension scheme earnings cap

Tax Year	Earnings Cap
1989/90	60,000
1990/91	64,800
1991/92	71,400
1992/93	75,000
1993/94	75,000
1994/95	76,800
1995/96	78,600
1996/97	82,200
1997/98	84,000
1998/99	87,600
1999/2000	90,600
2000/01	91,800
2001/02	95,400
2002/03	97,200

Source: *Pensions Pocket Book* (2003), p.68

Therefore, pension income in the first year of receipt is earnings in 2002 multiplied by the number of years in the pension scheme and the accrual fraction. For future years in receipt, pension income is the pension income in 2002 indexed accordingly. However, if an individual retires before the NRA, an actuarial reduction is usually applied to the income. The most common reduction is 4% for each year before the NRA that an individual retires[28]. Therefore, this reduction is applied to the pension income that an individual is entitled to if he retires before the NRA. This stream of income is then discounted back to 2002 to find the net present value.

Figure 3.4 shows how the annual income an example individual receives and the net present value of his wealth varies with his retirement age from 50 to the SPA. The NRA for this individual's scheme is 60. This means that a reduction is applied to annual pension income if the individual retires before 2012. Pension income increases for each additional year that the man works[29]. However, because by working an additional year the man receives his pension income for one less year, pension wealth does not necessarily increase if he works longer. Figure 3.4 shows that, before the NRA, the additional accrual of pension income entitlement offsets the fact that the income is received for one less year because of the 4% actuarial punishment for drawing the pension early. However, it is clear that for retirement after the NRA the additional income does not offset the fact that the income is received for a shorter period of time. This is because there is no corresponding actuarial "reward" to retiring after the NRA. So the net present value of the individual's pension wealth is greatest for retirement at the NRA.

---

[28] Government Actuary's Department (2003), p.32

[29] This individual is assumed to have been in his scheme since he was 25 years old. So if he stayed in the scheme past age 65, pension income would cease to increase as accrual is capped at 40 years.

Figure 3.4 - Pension wealth and nominal pension income of a representative individual for retirement between 50 and 65, assuming a 4% reduction applies to pension income for each year he retires before age 60
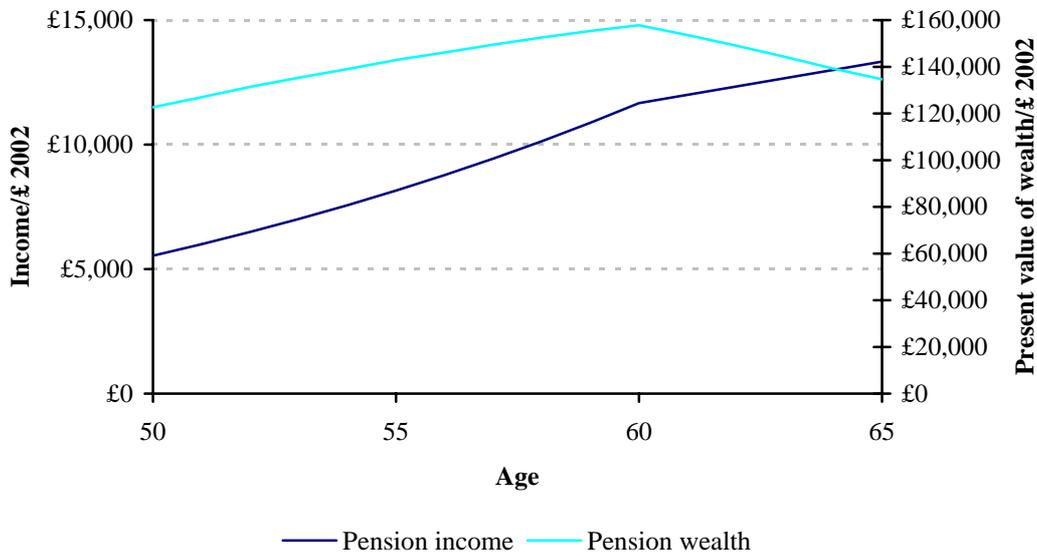
Note: Example man; joined scheme aged 25 in 1977; accrual rate = 1/60th; earnings = £20,000 p.a. in 2002 prices; pension income in payment indexed to prices; 4% actuarial reduction for each year the individual retires before the NRA

In addition, as with SERPS/S2P wealth, we assume that the recipient's spouse inherits 50% of the income after the recipient dies. Therefore, for all married DB scheme members, we add to their wealth the net present value of the stream of income that his spouse receives after he dies. Finally, the value of the lump sum is added. This gives the value of the DB pension in 2002 if the individual retires and starts drawing his pension immediately.

3.2.2. Future retirements

The final salary of an individual if he retires at some date in the future (from the earnings profiles described in section 2.2.1), combined with accordingly increased pension tenure and the same accrual fraction, gives the pension income an individual will receive if he continues to work and remains in the scheme into the future. Again, final salary is capped at the earnings cap (which is assumed to increase in line with the retail price index in future years[30]) and total accrual is capped at the lower of two-thirds of final salary or 40 years in the scheme. As before, if the individual is retiring before the NRA, a 4% per year reduction in income is applied. Also, we continue to assume the spouse inherits 50% of the entitlement.

The lump sum is the same fraction of first year's pension income as it was for retirement in 2002. The sum of the lump sum and the discounted stream of income from the year of

---

[30] Indexing to prices has been the normal practice since the earnings cap was introduced.

retirement to death (plus the income received by the surviving spouse), all discounted back to 2002, gives the net present value of the pension if the individual works until the year in question and then starts drawing his pension.

3.3 Past pensions yet to be received

We have information on up to three previous pensions which a respondent no longer contributes to but which he is not yet receiving income from. The individual could either have transferred the rights from this scheme into another scheme or received a lump sum payout or retained the rights in the original scheme. In the case of the first two, this wealth will be picked up elsewhere, as current pension wealth or other financial wealth, respectively. In the third case, we need to value the pension rights retained.

3.3.1. Retirement in 2002

Respondents are asked what income they expect to receive from these past schemes when they retire. However, we did not want to use personal expectations when calculating pension wealth. Therefore, we calculate the wealth from these pensions in two different ways depending on whether the scheme was a DB or a DC scheme.

Respondents are asked if their past schemes were employer schemes, personal pensions, group personal pensions, stakeholder pensions, S226 plans or retirement annuity pensions. Schemes that began before 1989 are assumed to be DB unless the respondent knew it was an S226 plan or retirement annuity pension, in which case it is treated as a DC scheme. Any employer schemes are assumed to be DB schemes. Any schemes beginning after 1988 and where the respondent said it was some form of non-employer DC scheme are treated as DC schemes.

For both types of calculation we need to know how long the individual was in the scheme and the year he left the scheme. Individuals are asked to give the date they joined the scheme and the date they left the scheme. However, some people did not know one or both of these pieces of information[31]. For those people who knew one of these pieces of information, we hotdecked the pension tenure conditional on the quartile of expected income from the scheme. For those people who knew neither the start nor the end date in the scheme, we matched them to someone in the same quartile of expected income (using a hotdeck) and assumed the original individual joined and left their scheme at the same time as the matched individual.

DB schemes

For DB schemes, we calculate pension income using the number of years in the scheme, the final salary and the accrual fraction. In other words, we take the salary in the year the individual left the scheme, uprate this in line with inflation to the year he reaches the

---

[31] 1.5% of people with a first past scheme did not know the start date, 0.3% did not know the end date and 4.8% did not know either. These figures were 0.8%, 0.8% and 7.8% respectively for the second past scheme and 0.8%, 0.8% and 7.5% for the third past scheme.

SPA[32] and then multiply this figure by pension tenure and some accrual fraction to find pension income. Since the respondent is not already receiving the pension, though in theory he could, we assume that he chooses not to draw the pension until the SPA.

Using the earnings profiles created above, we have an estimate of earnings in every year back to 1978[33]. For schemes that ended between 1963 and 1977, we get an estimate of final earnings by taking 1978 earnings and assuming that the individual experienced average earnings growth during this period. For any schemes ending prior to 1962, the final salary used is calculated by assuming individuals experienced 2% real earnings growth prior to 1962[34]. Schemes that started after 1988 have a cap on pensionable earnings for the purposes of calculating entitlement. These caps, dependent on the year in which an individual retires, are shown in Table 3.2. Therefore, for any past schemes commencing after 1988, we apply this earnings cap to final salary in the year the individual left the scheme[35]. This final salary is then inflated using the retail price index to find the nominal value in the year the individual reaches the SPA (i.e. the year he starts receiving his pension from this scheme)[36].

The length of time the individual contributed to the scheme is known but the accrual fraction is not. The accrual fraction is assumed to be 1/60th. These three elements give us pension income from this scheme if the individual starts drawing it at the SPA. This pension income is then indexed to inflation (2.5%) for all future years. This stream of pension income, from the SPA to death, plus the income received by the surviving spouse (50% of the original entitlement), is then discounted back to 2002 (at 5%) to find pension wealth.

For past pensions we assume that no lump sum is received. This is in line with assuming the more generous accrual rate of 1/60th for these past pensions.

DC schemes

For DC schemes, we assume that sufficient contributions were made to produce a fund that, if annuitised at the SPA at its real value in the year the individual left the scheme, would produce an income equal to that of a DB scheme that had been contributed to over the same period. In other words, the fund value upon leaving the scheme is calculated by taking the years in the scheme, the accrual fraction and the final salary, in the same way as was done for the DB schemes. This fund value is then uprated by

---

[32] The Social Security Act 1985 introduced revaluation of preserved benefits for leavers from January 1986 in line with the lower of retail prices or 5%. Therefore, we do not revalue the final salary for individuals who left their scheme before 1986 but we do revalue final salary for all individuals leaving schemes in 1986 or later.

[33] Median group earnings from the FES cannot be calculated before 1978 because there are no education measures before this time.

[34] This assumption has to be made because data on real earnings growth is not available prior to 1962.

[35] Schemes that began in 1987 or 1988 were also subject to final salary caps (which were higher than the caps that applied from 1989 onwards) but we have not included these.

[36] Pension schemes are not required to uprate pension entitlements for members who left prior to 1986. So we do not uprate these entitlements. From 1986 onwards, uprating became mandatory.

average pension fund growth[37] from the year of leaving the scheme to the year the individual reaches the SPA.

3.3.2. Future retirements

The future income from past pensions is not affected by retiring later since the individual will still not be making any additional contributions and the final salary of interest is obviously the same. The inflation of this final salary to the SPA will also be the same (assuming the year in the future is before he reaches the SPA). The pension tenure also remains the same, as does the accrual fraction. Pension income in payment is then indexed to prices, as before. This stream of income (from the SPA to death) plus the income received by the spouse is then discounted back to 2002 to find the net present value. For all future years before the SPA, this wealth will be the same as the value calculated for 2002 above.

To find the wealth from past pensions in years beyond the SPA (i.e. after the individual has begun drawing this pension), we sum the discounted stream of income from the year of interest to death. The level of wealth will, therefore, decrease for each year beyond the SPA as income will be received from these past pensions for one less year.

3.4 Past pensions already in receipt

The wealth from past pensions in receipt is relatively simple to calculate since we know the annual income received in 2002 from each of the three most important past pensions. The fact that we do not have information on more than three schemes should not make much difference to pension wealth since very few people have more than 3 pension schemes during their lifetimes. Of those people who do not yet receive a pension but who have at some time belonged to a pension scheme (59.3% of those aged 50 to the SPA) only 3.8% have more than three schemes in total. Furthermore, people are asked to describe their three most important past pensions, which makes it even less likely that significant wealth will be omitted.

In addition, respondents who have been divorced or widowed are asked if they are receiving a pension from a former spouse. Each respondent is asked about the income received from up to three of these schemes in addition to income from their own past pensions.

Where respondents were not sure of their income from any of these schemes, they were asked to give a range in which the true value lay. For these people, a hotdeck (conditional on gender and education level) was used to impute a value for income.

---

[37] Average pension fund growth between 1982 and 2001 is from Pension Pocket Book (2003, 2002, 1995, 1993). Average pension fund nominal growth from 2002 onwards is assumed to be 5%. Data is not available on average pension fund growth prior to 1982; therefore we assume that annual pension fund growth during this period was the same as the average annual pension fund growth during the period 1982-2002.

3.4.1. Retirement in 2002

The only difficulty in finding gross income from past schemes in 2002 was that respondents in ELSA could give the level of income either before or after tax. For those who gave the value before tax (22.6% of those aged 50 to the SPA describing their income from their first past pension[38]), we obviously know gross income. However, for those that gave the income after tax, we would need to know the value of all other sources of income in order to find their marginal tax rate. Since this is fairly complicated, we assume that everyone pays basic rate tax on this pension income and use this assumption to calculate gross pension income from the net value reported[39].

In future years, we assume that pension income is indexed to inflation (2.5%). We also assume, again, that the spouse inherits 50% of the pension entitlement from past pensions (though not from widow/divorcee pensions) when the scheme member dies. Therefore, the wealth from past pensions in receipt in 2002 is the net present value of the stream of income from 2002 to death, plus the stream of income received by the spouse until her death, using a 5% discount rate.

3.4.2. Future retirements

Clearly retiring later does not affect the level of income received from past pensions in receipt. In fact, calculating wealth at some future date simply involves ignoring the income received between 2002 and the future date and then summing the remaining income stream from then to death plus the income received by the spouse and discounting back to 2002.

3.5 Widow/divorcee pensions yet to be received

The final category of pension wealth is wealth from widow/divorcee pensions that are not currently being received but which the individual expects to receive income from in the future. Each respondent who has been divorced or widowed is asked about the income they expect to receive from one such scheme. Whilst in all other aspects of our calculation of pension wealth we have avoided using individual's expectations of their future pension income, we could not avoid using them here because the value of the pension fund depends on the characteristics of a former partner, whom we know nothing about from the ELSA data.

Individuals can give the expected value of the pension either as a total amount or as an annual income. If the respondent is not exactly sure how much they will receive, they are asked to give boundaries within which the figure for annual income is likely to lie. For

---

[38] Of those describing income from their second past pension, 24.8% gave the figure before tax. Of those describing income from their third past pension, 33.6% gave the figure before tax.

[39] For those people who did not know or refused to say whether the value was before or after tax we assumed that the value was net of tax. These answers accounted for 4.1%, 3.9% and 8.4% of responses to questions about income from first, second and third past schemes, respectively.

these people we hotdeck (unconditionally[40]) the value for annual pension income, from within the range they indicated.

3.5.1 Retirement in 2002

Individuals who expect, at some time in the future, to receive a pension from a former spouse are asked to give a figure (in today's prices) for the amount that this pension will be worth when they receive it. What the income stream from the pension is worth clearly depends on when they expect to start drawing their pension. Since they have not yet started drawing their pension, when in theory they could have (assuming they are over 50), we assume they draw their pension at the SPA. We also assume that they expect to do this and that the figure they give for expected future income from the pension takes into account any accrual between 2002 and when they reach the SPA.

Pension wealth is then calculated in one of two ways, depending on whether the individual indicated that the amount they expected was a total amount or an annual income. For those who indicated it was a total amount (11.1% of those aged 50 to the SPA who expected to receive a pension from a former spouse) we calculated the annuity income that would be received from annuitising this amount at the SPA. The pension wealth, therefore, from this pension is the discounted present value of this stream of annuity income from the SPA to death. If someone indicated that the figure was given as an annual amount[41], we calculated the wealth from this pension simply as the discounted present value of the stream of this annual income from the SPA to death.

3.5.2 Future retirements

For future retirements in years before the SPA, the pension wealth is exactly the same because we continue to assume the individual does not draw the pension until the SPA. For retirement in years after the SPA, we still assume that the individual started drawing the pension at the SPA (as we did with past pension schemes) and so the pension wealth is lower in all years after the SPA than at the SPA because there are fewer remaining years in receipt of the pension.

---

[40] This is an unconditional hotdeck because the value of the pension depends on the characteristics of a former spouse rather than on the characteristics of the individual in the ELSA sample.

[41] 14.2% of people gave the figure as an annual amount and a further 69.2% who did not know the amount were asked to estimate the amount as an annual income figure.

4. Summary statistics on the distribution of pension wealth

This section describes the distribution of total individual pension wealth, individual state pension wealth and individual private pension wealth. Two alternative measures of each are presented. Firstly, figures are given for the distribution of pension wealth assuming all individuals retire immediately in 2002. Secondly, figures are given for the distribution of pension wealth assuming all individuals retire at the SPA. Figures 4.1a-4.3b show the distribution of pension wealth on the basis of retirement in 2002 and retirement at the SPA. Tables 4.1-4.6 show the distribution of pension wealth by gender and five-year age band.

4.1 Retirement in 2002

Table 4.1 shows how total individual pension wealth (on the basis of immediate retirement in 2002) varies by gender and age. Men in all age groups have significantly higher pension wealth than women of the same age. Median pension wealth across all men aged between 50 and the SPA is £138,609 compared to just £75,439 for women (or 84% higher). Most of this difference is accounted for by differences in private pension wealth. Whereas men have private pension wealth of £73,650 at the median, pension wealth amongst women is just £5,613 at the median. In fact, women actually have higher state pension wealth than men at the median (and this is true across all age groups).

Women have higher state pension wealth than men partly because they have longer life expectancies and (amongst this group at least) a lower SPA. As a result, they receive pension income from the state for several more years and consequently have higher wealth from this source.

The illustrative figures given in section 2 can help us interpret the levels of state pension wealth we see in the ELSA sample. Consider the example of men aged between 50 and 54 in 2002 and the pension wealth they have if they retire immediately in 2002. Figure 2.1 showed that the maximum discounted present value of wealth from the current entitlement to the BSP was £29,000 for a 50 year-old man and £36,000 for a 54 year-old man[42]. The maximum SERPS/S2P wealth for these two groups, from figure 2.9, is £49,000 and £56,000 respectively. So the maximum state pension wealth for men aged 50-54, on the basis of retirement in 2002, is between £78,000 and £92,000. Table 4.3 shows that state pension wealth for men in this group (£40,705 at the median and £46,140 at the mean) is, in fact, well below this maximum level. However, state pension wealth (across most of the distribution) is above the level of the maximum BSP wealth. This could indicate that whilst many men in this age group have significant BSP entitlement, many have been contracted out of the state second tier pension so do not have significant additional entitlement to the state second tier pension. Similar comparisons can be made for men in other age groups.

Looking at the state pension wealth of women in table 4.3 and comparing this to the maximum levels of wealth from the BSP from figure 2.2, we see that, unlike men, median

---

[42] A man can have accrued a maximum of 69% entitlement to the BSP by age 50 and 80% by age 54.

and mean pension wealth amongst women aged 55-59 (£65,754 and £59,946, respectively) is lower than the maximum possible from the BSP on its own (£70,522-£78,050). In other words, not only have the majority of women in this age group not accrued significant SERPS/S2P entitlements, they have also not accrued their maximum BSP entitlement (even though we may have overestimated their period in employment). In contrast, women in the 50-54 year-old age group have average state pension wealth (£54,044 at the median) that is about the same as their current maximum BSP wealth (£41,566-59,302). The current maximum level of wealth for this group is significantly lower than for the older age group because the 50-54 year-olds are the ones who are affected by the change in the SPA for women. So, not only do they have fewer years of entitlement, they also have a larger denominator used in the calculation of their current BSP entitlement.

As an indication of what these levels of wealth mean in terms of annual income during retirement, pension wealth of £100,000 for someone at the SPA corresponds to approximately £5,000 a year of pension income. So, from table 4.4 we can see that (at the median) men aged 60-64 in 2002 will have about £8,000 a year of pension income during retirement if they retire at the SPA. At the median women aged 55-59 will have pension income of about £4,000 a year if they retire at the SPA.

Pension wealth is higher amongst the older age groups than amongst the younger age groups when we assume retirement in 2002. When they reach the SPA we would expect the younger group to be richer than the group currently nearing the SPA are (for reasons that are more fully explained in section 6.1). However, assuming retirement in 2002 means that the 50-54 year-old age group have many fewer years of pension accrual than the 55-59 or 60-64 year-olds have had. This is why we see lower pension wealth amongst younger individuals in tables 4.1-4.3. This pattern is particularly clear when looking at state pension wealth. It is generally true of private pension wealth, though not entirely, as men aged 55-59 have lower average pension wealth than either the 50-54 year-olds or the 60-64 year-olds. This may be partly because, as already mentioned, pension wealth from DB schemes actually declines before the SPA and also there are caps on the accrual of pension rights – these are set at the lower of 40 years or two-thirds of final salary.

Table 4.1 - Distribution of total individual pension wealth by gender and age, assuming retirement in 2002 (all 50 to SPA)

	Mean	p25	Median	p75	N
Men					
50-54	£200,020	£64,062	£119,198	£280,981	896
55-59	£203,797	£75,792	£128,401	£270,445	1,020
60-64	£235,407	£102,757	£166,160	£287,073	808
All	£211,300	£77,824	£138,609	£277,965	2,724
Women					
50-54	£114,649	£49,576	£69,208	£138,610	1,086
55-59	£125,312	£49,289	£81,826	£155,580	1,164
All	£119,757	£49,576	£75,439	£147,205	2,250
All					
50-54	£156,966	£55,070	£85,007	£216,212	1,982
55-59	£164,202	£64,113	£98,519	£217,241	2,184
60-64	£235,407	£102,757	£166,160	£287,073	808
All	£172,651	£62,549	£104,008	£230,430	4,974

Table 4.2 – Distribution of individual private pension wealth by gender and age, assuming retirement in 2002 (all 50 to SPA)

	Mean	p25	Median	p75	N
Men					
50-54	£153,881	£10,965	£75,277	£241,434	896
55-59	£142,272	£7,293	£66,433	£211,882	1,020
60-64	£148,439	£12,823	£76,030	£203,008	808
All	£148,355	£10,278	£73,650	£217,410	2,724
Women					
50-54	£63,788	£0	£5,921	£89,612	1,086
55-59	£65,366	£0	£5,277	£88,145	1,164
All	£64,544	£0	£5,613	£88,189	2,250
All					
50-54	£108,446	£0	£25,748	£166,126	1,982
55-59	£103,474	£0	£25,701	£152,950	2,184
60-64	£148,439	£12,823	£76,030	£203,008	808
All	£112,970	£0	£32,948	£168,170	4,974

Table 4.3 – Distribution of individual state pension wealth by gender and age, assuming retirement in 2002 (all 50 to SPA)

		Mean	p25	Median	p75	N
Men						
	50-54	£46,140	£31,792	£40,705	£57,957	896
	55-59	£61,524	£41,523	£58,101	£76,918	1,020
	60-64	£86,967	£58,465	£85,695	£107,041	808
	All	£62,945	£39,592	£56,598	£80,503	2,724
Women						
	50-54	£50,861	£36,126	£54,044	£65,503	1,086
	55-59	£59,946	£34,987	£65,754	£81,242	1,164
	All	£55,214	£35,356	£56,359	£73,605	2,250
All						
	50-54	£48,521	£31,986	£49,568	£61,890	1,982
	55-59	£60,728	£39,918	£61,097	£78,931	2,184
	60-64	£86,967	£58,465	£85,695	£107,041	808
	All	£59,681	£38,349	£56,488	£76,815	4,974

4.2 Retirement at the SPA

In general, each individual's pension wealth is higher if he retires at the SPA than if he retires immediately because he works and accrues pension entitlements for longer. The only exception to this is private pension wealth from DB schemes. As shown in figure 3.4, an individual's pension wealth can actually decline if he retires later due to the existence of a normal retirement age in the scheme that is before the SPA. This effect can be seen in figure 4.1a: whilst for the majority of the distribution, pension wealth assuming retirement at the SPA is higher than pension wealth assuming immediate retirement, in the extreme right hand tail, pension wealth assuming later retirement is in fact lower than pension wealth assuming immediate retirement. This is particularly clear from comparing the top of the wealth distribution for men from tables 4.2 and 4.5.

Mean private pension wealth amongst men continues to be about twice that of women if we assume they all retire at the SPA. There are a few factors to bear in mind, however. Firstly, as was explained in section 3, the stream of income that the surviving spouse receives is attributed as pension wealth to the original scheme member. In general, it is women who outlive men. Consequently, men are attributed with wealth that will in fact benefit their wife rather than them[43]. Secondly, as men in this age range have a higher SPA than women, assuming they work until the SPA gives them about 5 additional years of accrual compared to women of the same age. Though, of course, this additional accrual of pension rights could be offset by the fact that men will receive their pension income for fewer years[44].

As we saw for retirement in 2002, the majority of men in all age groups have state pension wealth that is higher than the maximum possible from full entitlement to the BSP. Amongst women, more individuals have wealth close to or below the level of wealth from a full BSP, even when we assume they all work until the SPA. This is especially true amongst women aged 55-59. For example, mean state pension wealth amongst 55-59 year-old women is £65,127. The wealth from a full BSP for this group is between £70,522 and £78,050. Amongst men, on the other hand, in all age groups most men have wealth above the wealth from a full entitlement to the BSP.

Comparing the state pension wealth of men of different ages on the basis of retiring at the SPA we see that older men have significantly more state pension wealth than younger men. The median level of state pension wealth for men aged 60-64 is £93,253 compared to just £63,039 for men aged 50-54. Whilst this wealth for younger men is discounted over more years, this cannot account for all of this difference. This difference principally reflects the reduced generosity of the SERPS system for younger individuals. However, when comparing 50-54 year old women to 55-59 year old women, there is virtually no difference in their levels of state pension wealth. This is likely to be because the reduced

---

[43] However, legally this wealth does belong to the original scheme member, since this survivor benefit will pass to their spouse at the time of their death and, if an existing couple were to divorce prior to the death of the scheme member, the current spouse would not necessarily receive all or any of this survivor benefit.

[44] This will reduce pension wealth from state pensions and DB schemes though not from DC schemes, as DC schemes will compensate an individual for drawing the pension later by offering a higher annual income, which will make the individual equally well off if the annuity rates offered are actuarially fair.

generosity of the state second tier pension is offset by higher labour force participation amongst these younger women.

Table 4.4 - Distribution of total individual pension wealth by gender and age, assuming retirement at the SPA (all 50 to SPA)

	Mean	p25	Median	p75	N
Men					
50-54	£199,758	£90,355	£151,425	£260,964	896
55-59	£195,529	£94,589	£147,347	£247,232	1,020
60-64	£221,673	£108,644	£162,624	£263,344	808
All	£204,485	£96,198	£152,584	£257,181	2,724
Women					
50-54	£127,843	£64,485	£87,973	£156,994	1,086
55-59	£126,279	£53,730	£87,558	£152,093	1,164
All	£127,094	£60,722	£87,713	£155,294	2,250
All					
50-54	£163,490	£74,760	£110,644	£216,145	1,982
55-59	£160,593	£73,243	£111,355	£208,465	2,184
60-64	£221,673	£108,644	£162,624	£263,344	808
All	£171,811	£77,636	£119,950	£224,437	4,974

**Table 4.5 - Distribution of individual private pension wealth by gender and age,
assuming retirement at the SPA (all 50 to SPA)**

|	Mean	p25	Median	p75	N
Men					
50-54	£133,573	£17,299	£79,768	£198,638	896
55-59	£118,590	£9,744	£68,116	£175,109	1,020
60-64	£129,107	£10,617	£67,370	£170,535	808
All	£127,162	£12,609	£70,477	£181,198	2,724
Women					
50-54	£62,074	£0	£7,306	£90,087	1,086
55-59	£61,152	£0	£4,599	£79,906	1,164
All	£61,632	£0	£6,621	£86,599	2,250
All					
50-54	£97,515	£0	£31,631	£149,044	1,982
55-59	£89,613	£0	£26,139	£132,058	2,184
60-64	£129,107	£10,617	£67,370	£170,535	808
All	£99,496	£0	£35,074	£147,408	4,974

Table 4.6 - Distribution of individual state pension wealth by gender and age, assuming retirement at the SPA (all 50 to SPA)

	Mean	p25	Median	p75	N
Men					
50-54	£66,185	£44,380	£63,039	£82,254	896
55-59	£76,939	£50,615	£76,015	£94,656	1,020
60-64	£92,567	£58,465	£93,253	£113,585	808
All	£77,323	£50,615	£73,930	£96,750	2,724
Women					
50-54	£65,768	£49,037	£70,100	£82,835	1,086
55-59	£65,127	£40,242	£70,892	£88,233	1,164
All	£65,461	£43,411	£70,487	£85,273	2,250
All					
50-54	£65,975	£44,869	£66,573	£82,680	1,982
55-59	£70,980	£48,233	£72,621	£91,565	2,184
60-64	£92,567	£58,465	£93,253	£113,585	808
All	£72,315	£48,932	£72,173	£91,809	4,974

Figure 4.1a - Distribution of total individual pension wealth by whether retire in 2002 or at the State Pension Age (all 50 to SPA)
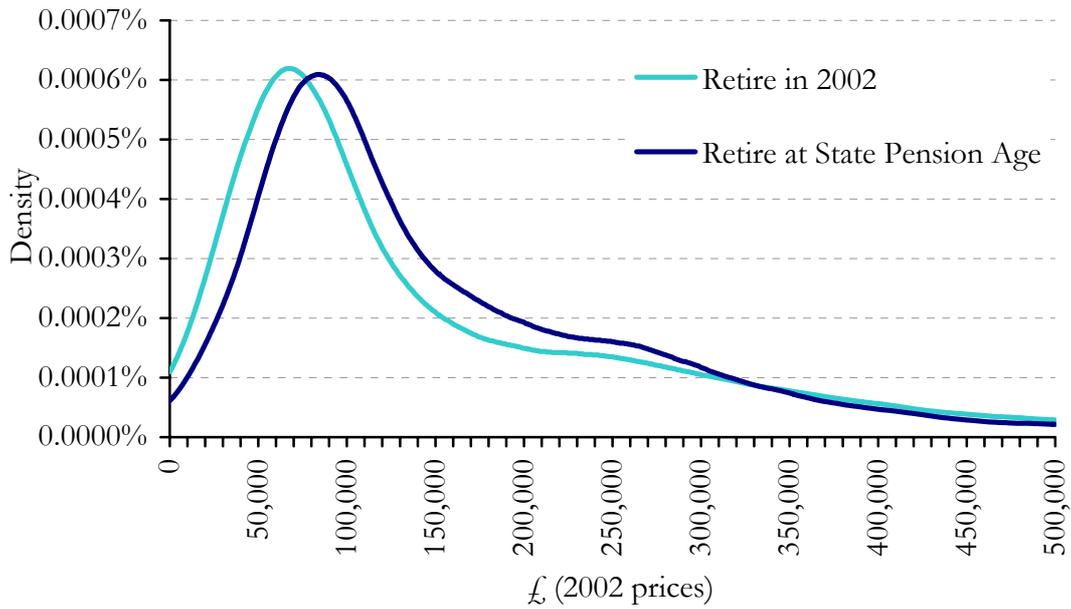
Figure 4.1b – Cumulative distribution of total individual pension wealth by whether retire in 2002 or at the State Pension Age (all 50 to SPA)
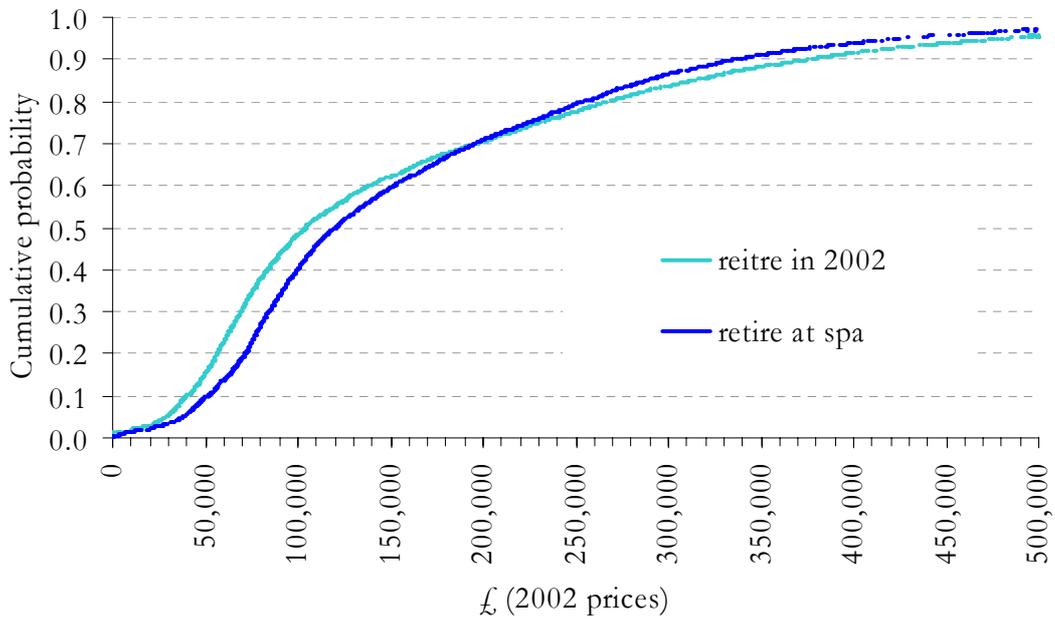
Figure 4.2a - Distribution of total individual private pension wealth by whether retire in 2002 or at the State Pension Age (all 50 to SPA)
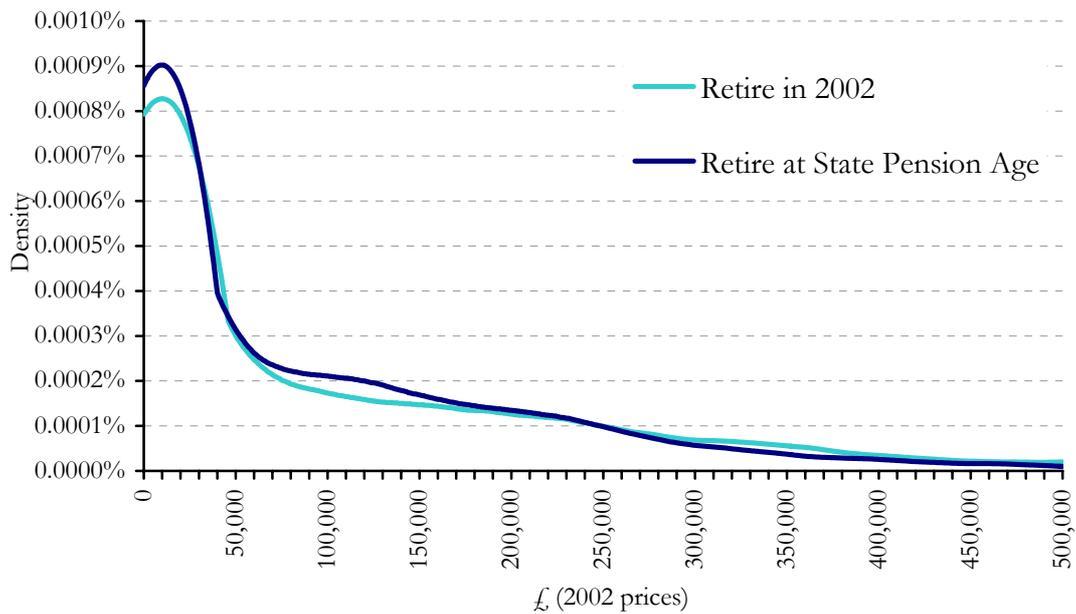
Figure 4.2b – Cumulative distribution of individual private pension wealth by whether retire in 2002 or at the State Pension Age (all 50 to SPA)
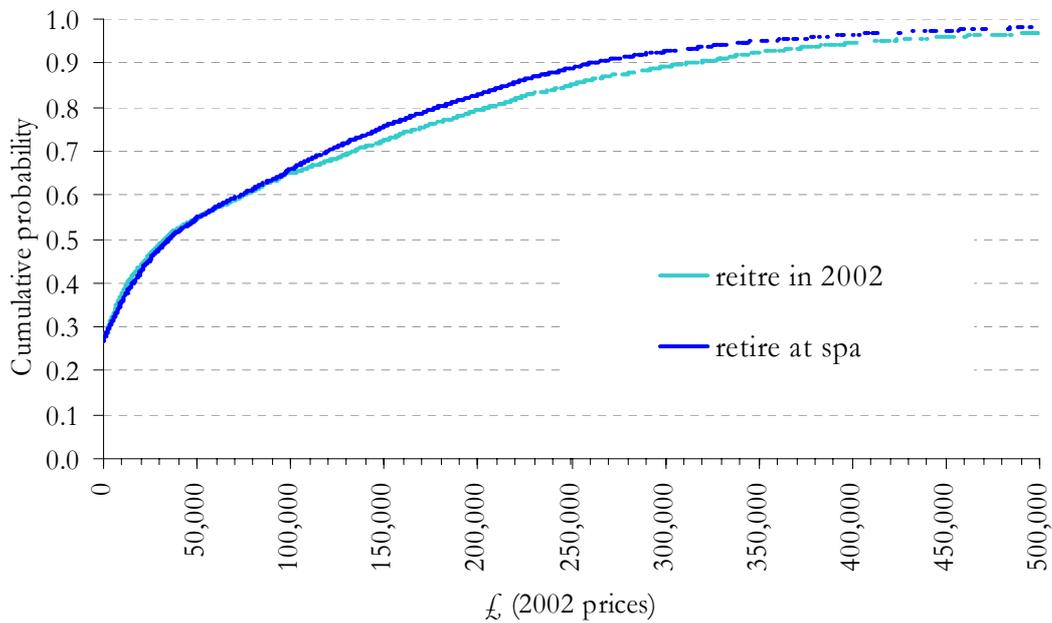
Figure 4.3a - Distribution of total individual state pension wealth by whether retire in 2002 or at the State Pension Age (all 50 to SPA)
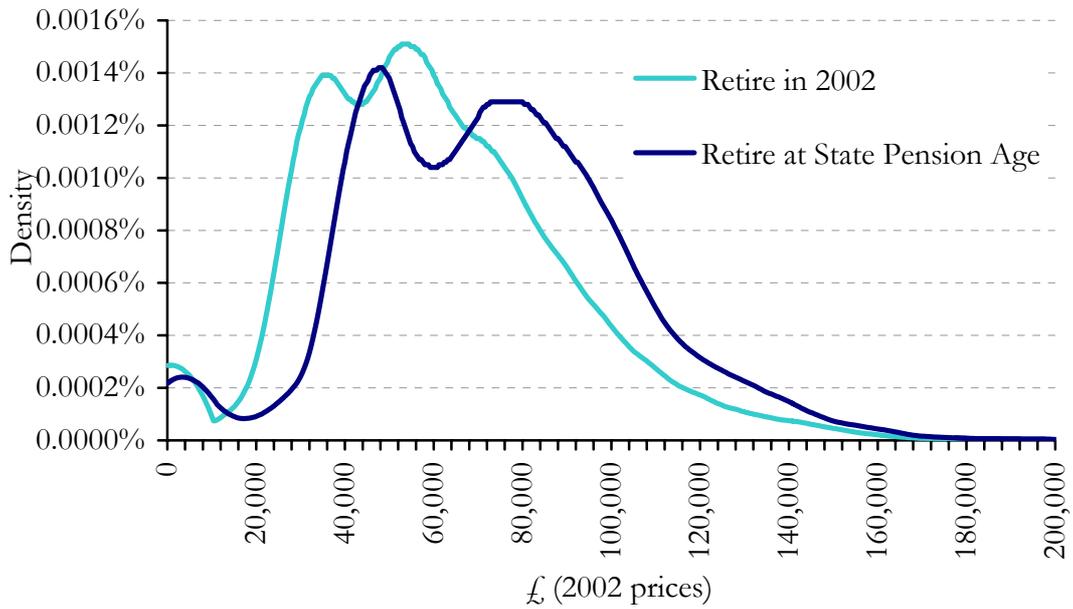

Figure 4.3b - Cumulative distribution of total individual state pension wealth by whether retire in 2002 or at the State Pension Age (all 50 to SPA)
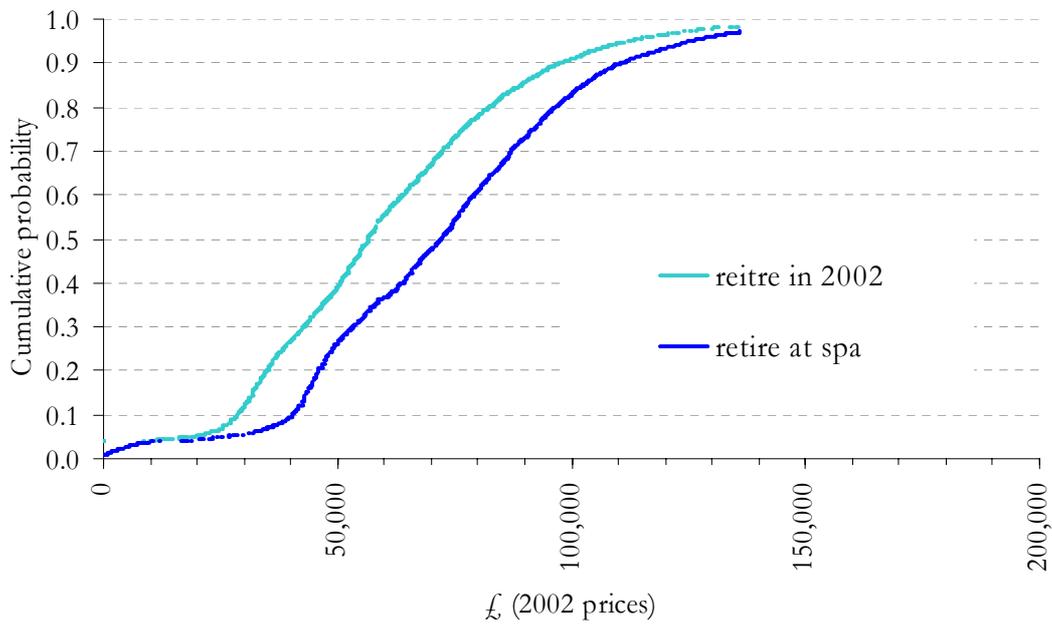
5. Sensitivity analysis

Throughout our calculations we have made various assumptions about both past behaviour and future parameters. One might expect that our results would be sensitive to the assumptions we have made. Therefore, this section shows the effect on the distribution of pension wealth of changing some of these assumptions. As this section will demonstrate, our results are in fact quite insensitive to many of these assumptions. However, some of the assumptions (in particular the assumption about how much individuals discount future income) do have significant effects on the distribution of pension wealth.

Throughout this section, the distribution of pension wealth refers to the distribution assuming retirement at the SPA. This is because many of the assumptions being varied here are forward-looking assumptions which have an effect on pension wealth assuming retirement in the future but have no effect on pension wealth assuming immediate retirement.

## 5.1 Asset return and annuity rates

Two assumptions are made that affect the wealth from DC pension funds. The first of these is that we assume a real risk free return on assets of 2.5%. The second is that we assume annuity rates in 2002 and in all future years are the same as the second best rates quoted by the FSA in January 2005. The first of these assumptions only affects pension wealth if the individual retires in some future year whilst the second affects pension wealth for retirement immediately and retirement in the future.

Changing either of these assumptions will affect the pension wealth of all individuals with current or past DC pension schemes. Figure 5.1 shows how the distribution of pension wealth is affected by increasing the return on assets or decreasing the annuity rates available. The alternative asset return used is a 5% real risk free rate of return, in other words, twice what is assumed in the baseline scenario. The alternative annuity rates used are 90% of those used in the baseline scenario. Table 5.1 gives the mean, median and quartiles of the pension wealth distribution assuming both immediate retirement and future retirement under the baseline assumptions. Tables 5.2 and 5.3 give the same figures assuming the higher rate of return and the lower annuity rates, respectively.

Figure 5.1 shows that changing either the asset return or the annuity rate has very little effect on the distribution of pension wealth. The median in the baseline scenario is £119,950 (assuming retirement at the SPA). Using a lower annuity rate, the median falls to £118,907. Using a higher asset return instead causes the median to increase to £122,365. Neither of these changes is particularly large. This will be partly because these changes only affect individuals who have at some time had a DC pension and even for these individuals the changes only affect their wealth from these pensions. Therefore, the effect on the overall distribution is small. However, in individual cases the effect will be more significant.

Figure 5.1 - Distribution of total individual pension wealth, retiring at the State Pension Age (all 50 to SPA), by rate of nominal rate of return
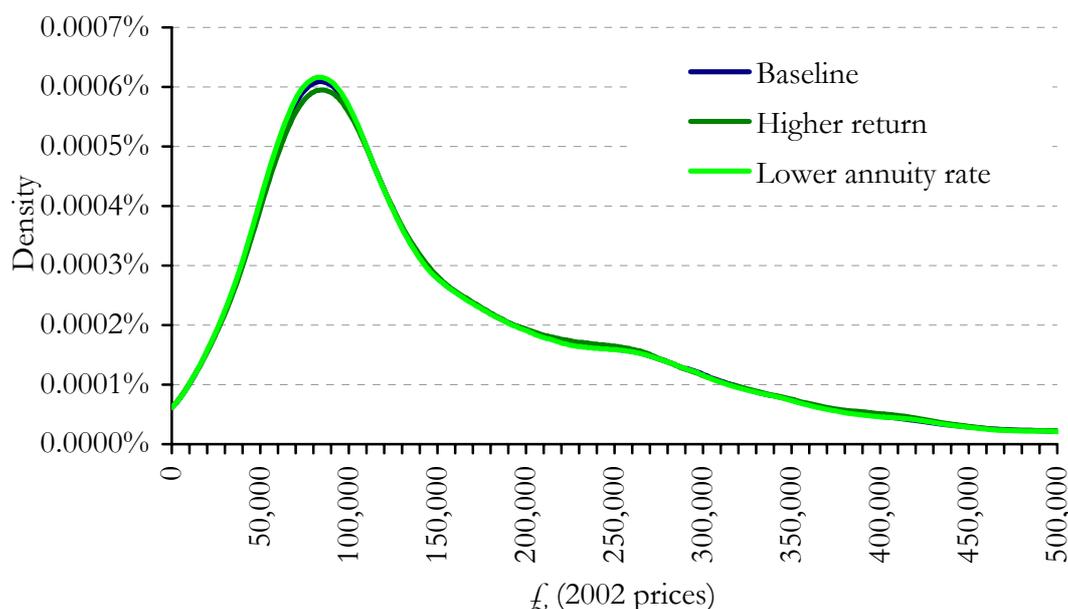
5.2 Future earnings growth

In order to calculate both SERPS/S2P entitlement and DB pension wealth assuming retirement in the future, we had to make an assumption about future earnings growth. As explained in section 2.2.1, we assumed no real earnings growth in future years. However, there may be reasons to suspect that either there is real earnings growth or decline for individuals between age 50 and the SPA. For example, figures 2.5 and 2.6 show that whilst earnings declined over this age range for men reaching the SPA in 2002, earnings for women reaching the SPA in the same year grew over this age range. So we can test the effect of making alternative earnings growth assumptions on the distribution of pension wealth.

The earnings growth assumption only affects the prediction of pension wealth in some future year; the prediction of pension wealth assuming immediate retirement is unaffected. Figure 5.2 shows how the distribution of pension wealth (assuming retirement at the SPA) changes compared to the baseline case when we assume either 1% annual real earnings growth in future years or 1% annual real earnings decline. It is clear that these alternative earnings growth assumptions have very little effect on the distribution of pension wealth.

Median pension wealth increases from £119,950 under the baseline scenario to £120,503 under the assumption of 1% real earnings growth. Under the assumption of 1% real earnings decline in the future, the median falls to £119,626. In other words, the distribution of pension wealth is insensitive to the earnings growth assumption made.

**Figure 5.2 - Distribution of total individual pension wealth, retiring at the State Pension Age (all 50 to SPA), by assumed future earnings growth**
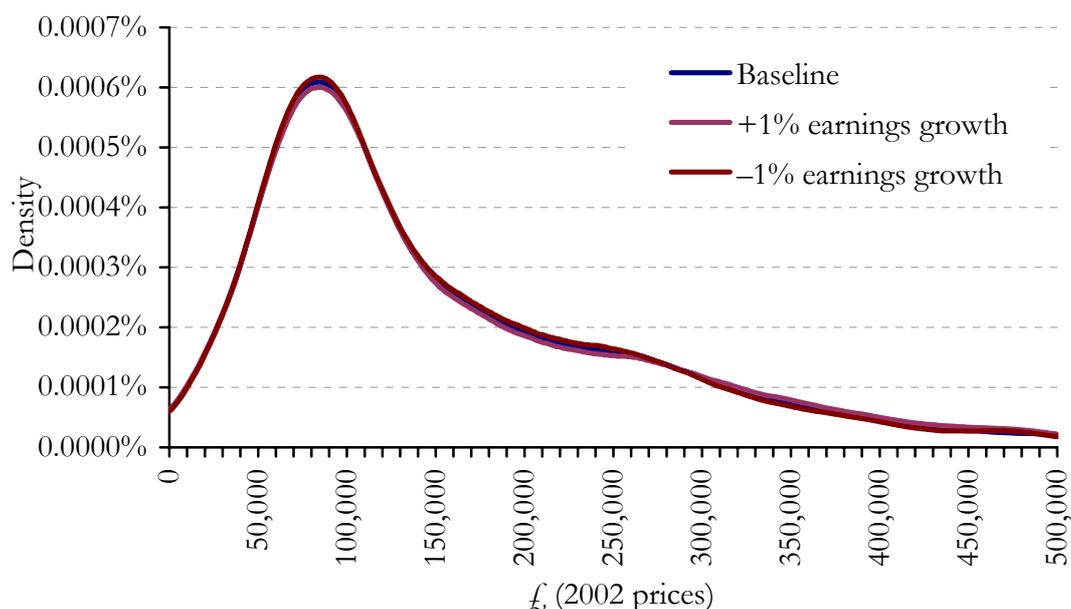

5.3 Discount rate

We assume throughout our calculations that individuals discount real future income at a rate of 2.5% a year. As this is used so frequently in our calculations, changing this assumption has significant effects on the distribution of pension wealth, both assuming retirement in the future and assuming retirement immediately. If we thought that individuals were more long-sighted and so did not discount their future income so heavily, the discounted present value of their pension wealth would be higher. Alternatively, if we thought individuals were more short-sighted (and so discounted their future income more heavily), pension wealth would be lower.

Figure 5.3 and tables 5.6 and 5.7 show the effect on the distribution of pension wealth of reducing the discount rate. The first alternative tested is a real discount rate of 3.5% (rather than 2.5% which is used in the baseline case). The second alternative tested is a real discount rate of 1.5%.

Median pension wealth on the basis of retirement at the SPA is £119,723 under the baseline assumption of a 2.5% real discount rate. If we increase the discount rate to 3.5%, median pension wealth decreases by about £17,400 to £102,328. If we were to reduce the discount rate to 1.5%, median pension wealth rises to £140,063. It is difficult to know what each individual's discount rate is and it is likely to vary across the population. However, 2.5% is approximately the long run real return on safe assets. If this were very much higher than the individual discount rate, individuals would want to invest a lot of their money to achieve higher future consumption. If it were very much lower than the individuals' discount rate, individuals would not want to invest their money. It seems reasonable to assume that the rate of return on safe assets is such that individuals are indifferent between 1 unit of consumption today or 1+r units of

49

consumption tomorrow. This is why 2.5% was chosen as the discount rate in the baseline scenario.

Figure 5.3 - Distribution of total individual pension wealth, retiring at the State Pension Age (all 50 to SPA), by assumed discount rate
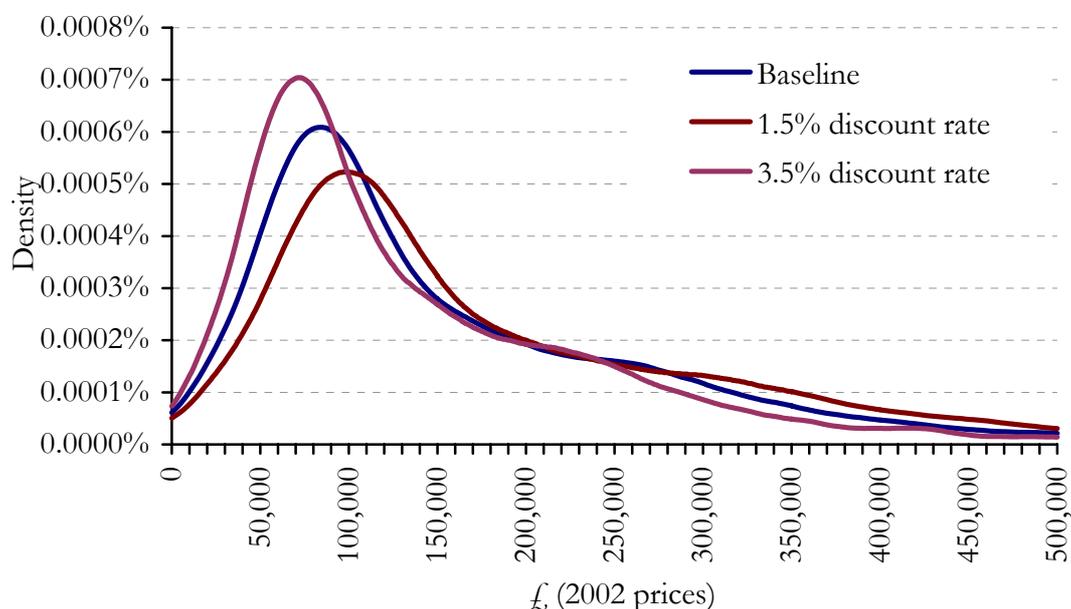
5.4 Contracting out

Our baseline assumption, as described in more detail in section 2.2.2, is that individuals were contracted-out in all years when they were in a past pension scheme but have been contracted-in in all years that they have been in their current pension scheme (except when we know for certain that they were contracted out in 2002). Two interesting alternatives to these assumptions are the extremes of, firstly, assuming that all individuals are contracted out in any period when they were in any pension scheme and, secondly, assuming that all individuals have always been contracted-in[45]. Figure 5.4 and tables 5.8 and 5.9 show how the distribution of pension wealth changes under these alternative assumptions.

Under the assumption that all individuals are always contracted out when they are in a private pension, the median pension wealth (assuming retirement at the SPA) is £112,022, compared to £119,723 under the baseline assumption. Under the assumption that all individuals are contracted in when they are in a private pension scheme, on the other hand, the median level of pension wealth is £122,949 (on the basis of retirement at the SPA).

Whilst changing our assumptions about contracting out does change the distribution of pension wealth (specifically state pension wealth), the two alternative scenarios here are clearly extremes, since we know at least some individuals are contracted in and some are

---

[45] In this scenario, the exception is that individuals in schemes that began before 1988 are assumed to be contracted out in years when they were in these schemes.

contracted out. Therefore, the discrepancy seen between the baseline scenario and the alternatives is the maximum possible from varying the contracting out assumptions. Given that we do not yet have a full contracting out history for each individual our assumption, which produces a distribution of pension wealth between the two extremes, does not seem unreasonable for a baseline case. Though, of course, if one were explicitly trying to find an upper or lower bound for pension wealth, the alternatives presented here would be of interest.

One consideration here is that if certain individuals have had long periods out of the labour market, these people will still be credited with SERPS accrual that they may not have in reality. This is true even under the most extreme assumption of 100% contracting out of individuals in private pensions since, at least in most cases, individuals who were actually out of the labour market will not have had private pension schemes either. So, in this respect, the results shown here for pension wealth assuming all are contracted out is not a lower bound on state pension wealth. However, the assumption that everyone is contracted in is an upper bound on SERPS/S2P pension wealth (assuming our imputed earnings histories are correct).

Figure 5.4 - Distribution of total individual pension wealth, retiring at the State Pension Age (all 50 to SPA), by contracting-out assumptions
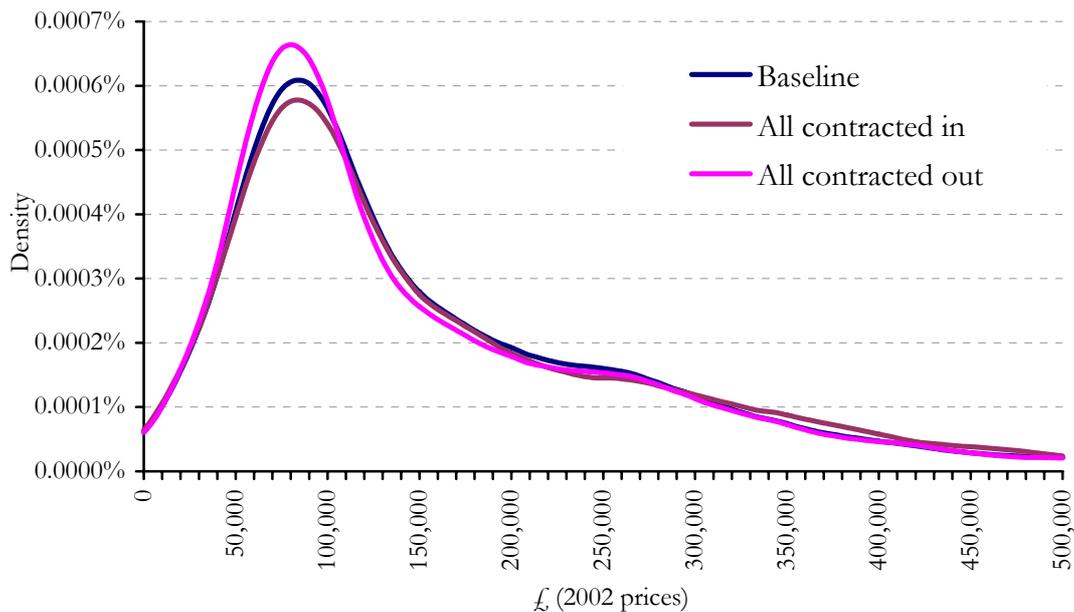
Table 5.1 - Distribution of individual pension wealth by age (all 50 to SPA) baseline assumptions

	Mean	p25	Median	p75	N
Retire today					
50-54	£156,966	£55,070	£85,007	£216,212	1,982
55-59	£164,202	£64,113	£98,519	£217,241	2,184
60-64	£235,407	£102,757	£166,160	£287,073	808
All	£172,651	£62,549	£104,008	£230,430	4,974
Retire at SPA					
50-54	£163,490	£74,760	£110,644	£216,145	1,982
55-59	£160,593	£73,243	£111,355	£208,465	2,184
60-64	£221,673	£108,644	£162,624	£263,344	808
All	£171,811	£77,636	£119,950	£224,437	4,974

Table 5.2 - Distribution of individual pension wealth by age (all 50 to SPA) future nominal rate of return = 7½% a year instead of 5% a year

	Mean	p25	Median	p75	N
Retire today					
50-54	£157,500	£55,116	£85,069	£218,018	1,982
55-59	£164,365	£64,113	£98,519	£217,241	2,184
60-64	£235,467	£102,757	£166,160	£287,073	808
All	£172,959	£62,620	£104,157	£231,054	4,974
Retire at SPA					
50-54	£168,033	£75,855	£113,311	£221,919	1,982
55-59	£162,518	£74,004	£113,068	£211,110	2,184
60-64	£223,873	£108,775	£164,734	£263,858	808
All	£174,922	£78,412	£122,365	£229,173	4,974

Table 5.3 - Distribution of individual pension wealth by age (all 50 to SPA) annuity rates = 90% of today's level

	Mean	p25	Median	p75	N
Retire today					
50-54	£155,708	£54,914	£84,026	£213,775	1,982
55-59	£163,188	£63,592	£96,892	£215,202	2,184
60-64	£232,923	£102,425	£164,564	£286,497	808
All	£171,291	£62,152	£102,818	£228,829	4,974
Retire at SPA					
50-54	£161,856	£74,300	£108,998	£213,659	1,982
55-59	£159,395	£72,991	£110,346	£206,488	2,184
60-64	£219,120	£107,086	£162,331	£263,031	808
All	£170,202	£77,019	£118,907	£222,207	4,974

Table 5.4 - Distribution of individual pension wealth by age (all 50 to SPA) future real earnings growth = −1% a year instead of 0% a year

	Mean	p25	Median	P75	N
Retire today					
50-54	£157,323	£55,070	£85,007	£217,053	1,982
55-59	£164,348	£64,113	£98,519	£217,241	2,184
60-64	£235,435	£102,757	£166,160	£287,073	808
All	£172,870	£62,549	£104,008	£230,569	4,974
Retire at SPA					
50-54	£157,828	£74,238	£109,655	£208,602	1,982
55-59	£158,362	£73,170	£111,194	£206,009	2,184
60-64	£221,155	£108,620	£162,624	£262,547	808
All	£168,363	£77,380	£119,626	£218,827	4,974

Table 5.5 - Distribution of individual pension wealth by age (all 50 to SPA) future real earnings growth = 1% a year instead of 0% a year

	Mean	p25	Median	p75	N
Retire today					
50-54	£156,645	£55,070	£85,007	£215,474	1,982
55-59	£164,067	£64,113	£98,519	£216,621	2,184
60-64	£235,379	£102,757	£166,160	£287,073	808
All	£172,452	£62,511	£104,008	£230,430	4,974
Retire at SPA					
50-54	£169,743	£74,820	£111,260	£227,426	1,982
55-59	£162,983	£73,412	£111,536	£210,992	2,184
60-64	£222,205	£108,668	£164,163	£263,806	808
All	£175,583	£77,835	£120,503	£230,081	4,974

Table 5.6 - Distribution of individual pension wealth by age (all 50 to SPA) real discount rate = 1.5% a year instead of 2½% a year

	Mean	p25	Median	p75	N
Retire today					
50-54	£183,279	£66,008	£101,790	£251,006	1,982
55-59	£187,123	£74,767	£113,248	£245,745	2,184
60-64	£261,229	£115,020	£181,788	£318,625	808
All	£197,524	£73,796	£119,805	£262,361	4,974
Retire at SPA					
50-54	£198,292	£90,715	£133,939	£262,589	1,982
55-59	£186,625	£84,263	£129,016	£240,781	2,184
60-64	£247,493	£119,746	£182,153	£291,066	808
All	£201,633	£91,704	£140,454	£262,589	4,974

Table 5.7 - Distribution of individual pension wealth by age (all 50 to SPA) real discount rate = 3.5% a year instead of 2½% a year

	Mean	p25	Median	p75	N
Retire today					
50-54	£135,623	£46,259	£71,453	£188,587	1,982
55-59	£145,066	£55,549	£85,870	£191,625	2,184
60-64	£213,210	£93,158	£150,317	£261,337	808
All	£152,053	£53,195	£90,734	£204,574	4,974
Retire at SPA					
50-54	£135,615	£62,177	£91,910	£178,601	1,982
55-59	£138,967	£63,904	£96,678	£179,559	2,184
60-64	£199,416	£96,993	£148,085	£236,771	808
All	£147,357	£66,187	£102,784	£192,347	4,974

Table 5.8 - Distribution of individual pension wealth by age (all 50 to SPA) all individuals contracted out when in a private pension scheme

	Mean	p25	Median	P75	N
Retire today					
50-54	£155,106	£54,086	£80,797	£213,825	1,982
55-59	£161,956	£62,225	£95,184	£214,003	2,184
60-64	£232,458	£100,791	£157,310	£286,497	808
All	£170,458	£60,369	£100,634	£228,895	4,974
Retire at SPA					
50-54	£159,465	£72,906	£101,459	£210,119	1,982
55-59	£156,903	£71,216	£106,002	£203,962	2,184
60-64	£217,897	£104,780	£154,232	£261,727	808
All	£167,961	£75,474	£112,534	£219,231	4,974

Table 5.9 - Distribution of individual pension wealth by age (all 50 to SPA) all individuals contracted in when in a private pension scheme

	Mean	p25	Median	P75	N
Retire today					
50-54	£162,866	£55,373	£86,668	£225,133	1,982
55-59	£169,069	£64,760	£100,869	£221,233	2,184
60-64	£241,420	£106,964	£171,944	£295,961	808
All	£178,155	£63,189	£105,822	£240,028	4,974
Retire at SPA					
50-54	£173,706	£75,725	£112,792	£234,808	1,982
55-59	£167,402	£73,857	£113,564	£217,814	2,184
60-64	£228,310	£109,510	£169,004	£271,845	808
All	£180,077	£78,504	£123,334	£238,293	4,974

6. Validation - comparing actual pension income and predicted pension income

In the absence of a comparable survey on pension wealth in England, one way to validate our findings is to look at how the annual income we predict the next cohort of pensioners will receive compares to the annual income that the current cohort of pensioners receives. This section looks specifically at how the annual income of 65-69 year old men and 60-64 year old women compares to the income we predict 60-64 year old men and 55-59 year old women will have when they reach the SPA. Reassuringly the information on ELSA respondents' incomes does closely match that of similarly aged respondents to the Family Resources Survey which is specifically designed to measure income.

In order to validate our results in this way, we need to know how we would expect the incomes of these two groups to differ. Given the different experiences of these two groups we would not expect their incomes in retirement to be exactly the same. There are several reasons why we would expect the younger group to have higher incomes and some reasons why we would expect them to have lower incomes. Sections 5.1 and 5.2 discuss these. However, it is also necessary to consider whether there are any of our assumptions which will bias the level of income in one particular direction. These are discussed in section 6.3.

Tables 6.1-6.3 show the distribution of actual pension income for the older groups and predicted pension income for the younger groups on the basis of immediate retirement and retirement at the SPA. The distribution of incomes is also summarised in figures 6.1 and 6.2, which show the probability density functions for each measure of pension income.

The expected pension income for the younger group used here is the sum of all pension incomes the individuals will receive from private and state pensions. It is this income stream that has previously been added together to work out pension wealth. However, this section uses the original pension income rather than 'unannuitising' the pension wealth figure. One implication of this is that survivor benefits are not included for any of the younger individuals. The only case where this will be incorrect is for younger individuals who have a spouse who is expected to die by the time the individual reaches the SPA[46]. These people will receive additional pension income at the SPA from any private pensions their spouse may hold that provide survivor benefits and from any SERPS entitlement their spouse has. However, very few of the younger group are likely to be in this position. To the extent that this is a problem, the income of the younger group will be lower than the income of the older group, whose current pension income reflects income from deceased spouses pensions.

---

[46] Pension income from an already deceased spouse's pension will be included, however, because we know about existing entitlement to widows' pensions.

6.1 Reasons why the younger group should have higher income

There are five main reasons why we would expect the younger group to have higher pension income in retirement than the older group. Firstly, productivity growth in the economy means that the younger group will on average have had higher earnings over their lifetimes than the older group. For example, if productivity growth was 2% per year, the younger group (who are on average five years younger than the older group) will have pension income that is approximately 10% higher than the older group. This will tend to increase both their state and private pension incomes.

Secondly, labour market participation amongst older workers has increased since the early 1990s[47]. This means that the younger group are more likely to have been in employment during the years just before the SPA than the older group. Therefore, again we would expect both their state and private pension incomes to be higher.

Thirdly, fewer married women in the younger group paid reduced rate NI contributions during their lifetimes than in the older group. Before 1978 married women could choose to pay NI contributions at a reduced rate. After 1978 no new women could choose to do this, though women who were already doing so could continue to do so. There are significantly more women in the older age group than in the younger age group who chose to do this at some point in their lifetime. 52.9% of women in the older age group have at some point in their lives paid reduced rate NI contributions. This compares to only 38.1% of younger women who had. This should mean that the younger group have higher state pension incomes than the older group, though it will not affect their private pension incomes.

Fourthly, the introduction of personal pensions in 1988 affected these two groups differently for two main reasons. After 1988, fully informed individuals should only have contracted out if they were made better off by doing so. Furthermore, there is evidence that the NI rebate received was (at least initially) on average more generous than the SERPS income forgone. Therefore, the younger group have on average five additional years of receipt of this more generous rebate. Whilst this will increase the younger group's private pension income and also their total pension income, it will do so at the expense of lower state pension income. This is because to get the NI rebate individuals had to contract out of SERPS. The second effect of the introduction of personal pensions is that, to the extent that saving in these schemes represented new saving, the younger group have approximately five years of additional accrual before they reach the SPA. This is true so long as pension fund growth was positive during the period 1998-2002 and remains positive between 2002 and 2007, even if these people ceased contributions at the same time as the older group. This will cause the younger group to have higher private pension income but will not affect their state pension income.

Finally, individuals have the choice when annuitising their DC pension funds of either annuitising the whole fund or taking up to 25% of it as a lump sum and annuitising the balance. We have assumed that the younger group annuitise their entire fund. However, in practice many individuals choose to take a lump sum to invest in other assets such as

[47] Pensions Commission (2004), figure 2.12, p.37

housing. Since many individuals in the older group will have taken a lump sum, their actual private pension income will be lower than the pension income we predict for a younger individual even if they did, in fact, have the same size fund. For this reason we would expect the predicted private pension income of the younger group to be higher than the actual private pension income of the older group.

6.2 Reasons why the younger group should have lower income

There are two main reasons why we may expect the younger group to have lower pension income than the older group. Firstly, changes in the rules for calculating SERPS mean that it is less generous to younger cohorts and hence should mean that the younger group have lower state pension incomes. However, as section 2.2.2 explains in more detail, these changes partially affect both the older and the younger group but will not be fully implemented for either group. One of the differences in the rules the groups face is that the younger group have slightly lower accrual rates than the older group, which will give them lower state pension income than the older group. A further difference between these two groups is that the SERPS entitlement is calculated by averaging eligible earnings over the whole period between 1978 and when the individuals reach the SPA. For the oldest of the people considered here, this period is 20 years. For the youngest this period is 30 years. In other words, the youngest men have their entitlement calculated from the average of eligible earnings between ages 35 and 65, whereas the oldest men have entitlement calculated as the average of eligible earning between the ages of 45 and 65[48]. Therefore, whether the older group will do better or worse than the younger group from this change depends on whether earnings in the period between ages 35 and 45 (once uprated by average earnings growth) are higher or lower on average than the average of earnings between ages 45 and the SPA. So, whilst the younger group might be slightly worse off than if their entitlement had been calculated in the same way as for the older group, it is not clear that the differences will be very large. Furthermore, the higher average incomes amongst the younger group may offset the reduced generosity of the entitlement formula.

Secondly, the closure of many employer DB schemes in recent years will mean that younger individuals have lower private pension incomes than older individuals. However, most schemes only closed to new members. This would have significant effects if we were looking at individuals in their twenties or thirties (to the extent that the move from DB to DC has been associated with lower contribution rates). However, it is unlikely that many individuals in their late fifties and early sixties will be new scheme members. Therefore, there is not likely to be a very large difference between the incomes of these two groups. The only reason why the younger group would be particularly affected is if any individuals were in schemes that failed and hence lost their private pension entitlement. Whilst this would have significant effects on income for any individual affected, given the numbers of people affected nationwide, it is unlikely that many (if any) of them will be included in the ELSA sample.

---

[48] For women the corresponding ages are five years younger in each case.

Overall the factors causing the younger group to have higher incomes probably dominate the factors causing them to have lower incomes. Therefore, the different experiences of the two groups are likely to mean that the younger group will have higher incomes in retirement than the older group currently have.

6.3 Assumptions that may bias predicted pension income

Most of the assumptions we have made will not systematically bias predicted pension income in one direction or the other. However, four of the assumptions we have made may cause us to under- or overestimate pension income.

Firstly, we have assumed that all individuals have been in employment between leaving fulltime education and leaving their last job. This is the maximum length of time that each individual could, in fact, have been in employment. Therefore, this assumption is likely to lead us to overestimate income from state pensions.

Secondly, our assumptions about contracting out could lead us to over- or underestimate state pension income from SERPS, though it is not clear which bias will dominate. For current pensions, unless we know the individual is contracted out, we assume the individual is contracted in. This will cause us to overestimate SERPS entitlement and hence state pension income. However, in the case of past pensions, we assume that each individual was always contracted out when he was in a past scheme. This will lead us to underestimate pension income from SERPS. The overall bias will depend on how tenure in past schemes compares to tenure in current schemes and how earnings in previous years compare to earnings in recent years. This will only affect state pension incomes, private pension incomes will be unaffected by this bias.

Thirdly, we have assumed a relatively low real return on assets. We have assumed a real risk free rate of return of 2.5% (the effect of varying this assumption is discussed in section 5). In practice, many individuals may have their pension funds invested in riskier assets which have a higher expected return. This will cause our predictions on pension income assuming retirement at some future date to be biased downwards. This does not, of course, affect our estimates of pension income if individuals retire immediately in 2002, since to calculate pension income in this case we do not need to make any assumptions about future pension fund accrual. The assumptions about pension fund accrual only affect people who have current DC pension schemes. This is less that a third of the sample and, as figure 5.1 shows, raising the return on assets does not shift the distribution of pension wealth (and hence private pension income) significantly.

Finally, if private pension schemes are integrated, private pension income when individuals are over the SPA will actually be lower than we predict. Individuals in ELSA were not asked about whether or not their pensions were integrated because the pilots of ELSA revealed the very few people knew this information. Therefore, we have assumed that all schemes are not integrated. This will cause us to overestimate private pension income.

Considering all these factors together, our assumptions about employment histories probably dominate any possible underestimate of state pension income due to our assumptions about contracting out. Therefore, we may have an upward bias in our

estimates of state pension income. The low real return on assets (which biases predicted private pension income downwards) may be offset by the assumption that all schemes are not integrated (which biases predicted private pension income upwards). So it is not clear that there is any particular bias in the estimates of private pension income.

6.4 How predicted pension income compares to actual pension income

Tables 5.1-5.3 show how predicted pension income of the younger group in fact compares to actual pension income of the older group. Table 6.1 shows how predicted and actual total pension incomes compare. Table 6.2 shows the comparison of private pension income and table 6.3 shows the comparison of state pension income.

For the older group the measure of pension income presented in the first column of tables 5.1-5.3 is the reported annual income from state and private pensions already being received in 2002. For the younger group, two alternative measures of pension income are presented. The first is the predicted pension income if each individual retires at the SPA. The second is the predicted pension income if each individual retires in 2002. The predicted pension income for retirement at the SPA exceeds that for retirement in 2002, since retirement at the SPA assumes up to five additional years of work and contributions to pension schemes. Section 4 shows that the discounted present value of pension wealth is sometimes lower for retirement at the SPA than for retirement in 2002. However, pension income will always be higher – it may produce lower wealth because it is received for fewer years, potentially offsetting the effect of receiving a higher income. The difference between the pension income if the individuals retire in 2002 and pension income if they retire at the SPA is not particularly large in tables 5.1-5.3. For example, the mean total predicted pension income for men is 4.8% higher for retirement at the SPA compared to retirement in 2002. This is not surprising since this group has at most five more years of work before reaching the SPA. The difference is particularly small for men, who are more likely to have been in work for longer and consequently for whom five additional years is very small in comparison to the total number of years they have worked. Since on average people retire before the SPA, the true figure for pension income when they retire is likely to lie somewhere between these two estimates[49]. All these figures are given in 2002 prices.

One consideration when looking at the pension income reported by the older group from state pensions is that individuals may have included means tested income from the Minimum Income Guarantee (MIG) in their total state pension income. The question asked was not intended to cover means tested income, however, some individuals may not have realised the difference between state pension income and means-tested income. This could potentially bias state pension income upwards for the older group.

From table 6.1, we see that, as we would expect, predicted pension income of the younger group is higher than the pension income that the older group currently have. Furthermore, the distribution of predicted incomes is similar to the distribution of actual

---

[49] The average age of exit from the labour market is 63.8 for men who were economically active at age 50 – Pensions Commission (2004)

incomes. For example, younger men are predicted to have higher income than younger women, just as older men actually have higher income than older women.

Tables 6.2 and 6.3 demonstrate that both private and state pension incomes are predicted to be higher for the younger group than the older group, which is what we expect based on the explanations given in sections 6.1 and 6.2. There is a greater difference in private pension income than there is in state pension income. From section 6.2, this is what we expect since the reduced generosity of SERPS is likely to mean that the younger group do not receive significantly more state pension income even though they have higher earnings over their lifetimes[50]. Sections 6.1 and 6.2, however, suggest that whilst there have been changes relating to private pensions that will make the younger group better off, there have not been any changes that are likely to lead this particular cohort of younger individuals to have lower private pension income than the older group.

The figures in table 6.3 show that, whilst both younger men and younger women are better off than their older counterparts, women still have lower state pension income than men. Furthermore, just as on average older men receive more state pension income than the value of a full BSP (at the median older men receive £4,680 a year of state pension income), younger men also on average receive more than a full BSP[51] (at the median younger men are predicted to receive £6,174 of state pension income, assuming retirement in 2002). Similarly, younger women are predicted to receive less than a full BSP on average (£3,805 at the median), just as older women currently do (£2,548 at the median). Assuming immediate retirement, at the median younger men are predicted to have state pension income that is 32% higher than the older group currently have whilst younger women are predicted to have pension income that is 49% higher than the older group.

---

[50] Furthermore, the BSP is assumed to be indexed to prices so the younger group only receive more income from the BSP to the extent that they have higher entitlement to it than the older group do.

[51] A full BSP in 2002 prices is worth £3,926 a year.

Figure 6.1 – Distribution of actual annual pension income for older men and predicted annual pension income for younger men

- 60-64 year-olds (retire in 2002)
- 60-64 year-olds (retire at SPA)
- 65-69 year-olds

Density

£ (2002 prices)
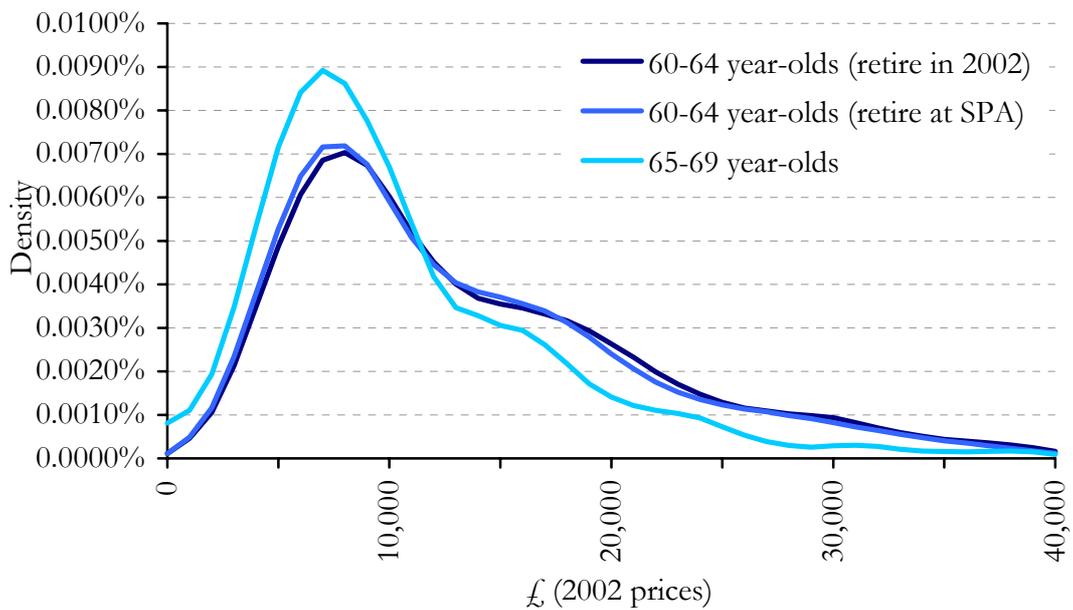
Figure 6.2 – Distribution of actual annual pension income for older women and predicted annual pension income for younger women

- 55-59 year-olds (retire in 2002)
- 55-59 year-olds (retire at SPA)
- 60-64 year-olds

Density

£ (2002 prices)
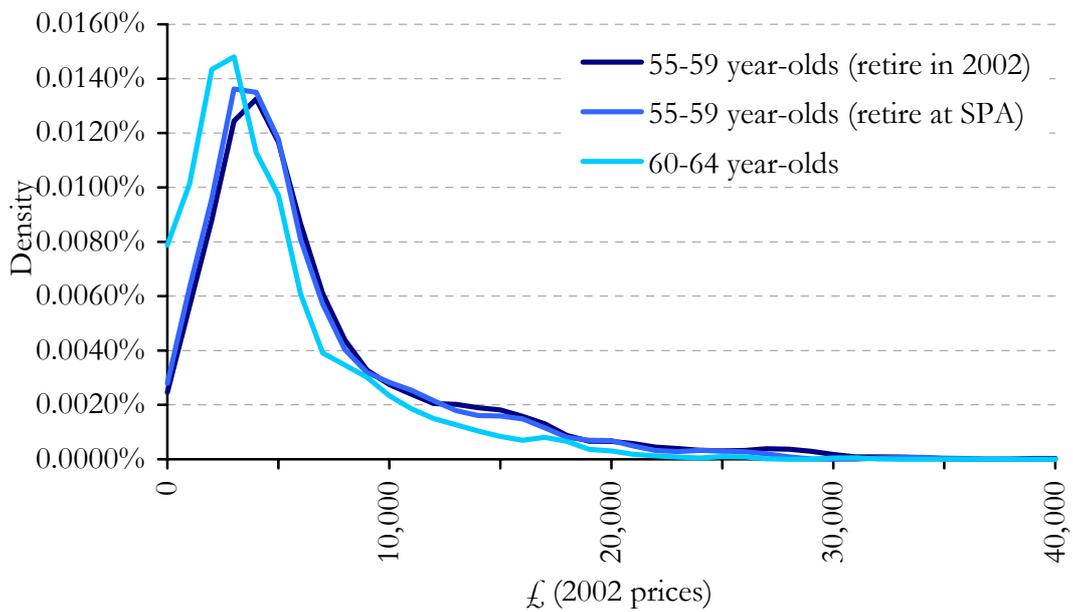
Table 6.1 - Total annual individual pension income for men aged 60-64 and women aged 55-59, compared to men aged 65-69 and women aged 60-64

		Actual income (men 65-69, women 60-64)	Predicted income at the SPA if retire at the SPA (men 60-64, women 55-59)	Predicted income at the SPA if retire in 2002 (men 60-64, women 55-59)
Men				
	Mean	£11,202	£15,683	£14,970
	p25	£5,980	£7,399	£7,204
	Median	£8,883	£11,197	£10,925
	p75	£13,954	£18,341	£17,656
	N	801	808	808
Women				
	Mean	£4,587	£6,867	£6,288
	p25	£2,080	£3,008	£2,716
	Median	£3,491	£4,910	£4,543
	p75	£5,873	£8,356	£7,759
	N	873	1,164	1,164
All				
	Mean	£7,655	£10,801	£10,162
	p25	£2,808	£4,283	£4,028
	Median	£5,670	£7,339	£7,025
	p75	£9,862	£13,781	£12,887
	N	1,674	1,972	1,972

Table 6.2 – Annual individual private pension income for men aged 60-64 and women aged 55-59, compared to men aged 65-69 and women aged 60-64

		Actual income (men 65-69, women 60-64)	Predicted income at the SPA if retire at the SPA (men 60-64, women 55-59)	Predicted income at the SPA if retire in 2002 (men 60-64, women 55-59)
Men				
	Mean	£6,236	£9,424	£8,870
	p25	£372	£920	£812
	Median	£3,895	£4,998	£4,850
	p75	£8,622	£12,231	£11,609
	N	801	808	808
Women				
	Mean	£1,788	£3,244	£2,863
	p25	£0	£0	£0
	Median	£0	£389	£290
	p75	£2,063	£4,460	£3,944
	N	873	1,164	1,164
All				
	Mean	£3,851	£6,002	£5,543
	p25	£0	£0	£0
	Median	£939	£1,921	£1,709
	p75	£5,200	£8,260	£7,698
	N	1,674	1,972	1,972

Table 6.3 - Annual individual state pension income for men aged 60-64 and women aged 55-59, compared to men aged 65-69 and women aged 60-64

		Actual income (men 65-69, women 60-64)	Predicted income at the SPA if retire at the SPA (men 60-64, women 55-59)	Predicted income at the SPA if retire in 2002 (men 60-64, women 55-59)
Men				
	Mean	£4,967	£6,259	£6,100
	p25	£4,160	£4,054	£3,926
	Median	£4,680	£6,368	£6,174
	p75	£5,837	£7,515	£7,368
	N	801	808	808
Women				
	Mean	£2,799	£3,623	£3,425
	p25	£1,417	£2,364	£2,356
	Median	£2,548	£3,940	£3,805
	p75	£4,160	£4,906	£4,596
	N	873	1,164	1,164
All				
	Mean	£3,804	£4,799	£4,619
	p25	£2,340	£3,365	£3,205
	Median	£4,108	£4,544	£4,249
	p75	£4,992	£6,416	£6,237
	N	1,674	1,972	1,972

7. Conclusions

This paper has explained how pension wealth was calculated for each individual in the ELSA sample and also for his or her partner. We have calculated both private and state pension wealth and combined these to find total individual pension wealth. These figures have been calculated both on the basis of immediate retirement in 2002 and on the basis of retirement at the SPA. Various assumptions have been made about both past and future behaviour in the course of these calculations. Sensitivity analysis was carried out on several of these assumptions. In particular it was found that the distribution of pension wealth is insensitive to the assumptions we have made about future earnings growth, future annuity rates and future asset returns. However, the results are sensitive to the discount rate assumed and, to a lesser extent, the assumptions about past contracting out behaviour.

We find that men of all ages have significantly higher pension wealth than women of the same age. This is particularly true for private pension wealth. In fact, the level of state pension wealth amongst individuals of the same age is quite similar, which partly reflect the fact that women receive state pension income for longer (particularly in the period before the state pension age equalises at 65). These general patterns are evident under all the alternative assumptions we have tested.

Comparing our predictions of pension income for the next cohort of pensioners to the pension income currently received by those individuals aged just over the SPA, we find validation of our calculations. As we would expect, the younger cohort are predicted to have higher pension income in retirement. This is more noticeable for private pensions than for state pensions. We expect to see less difference between state pension incomes as higher earnings amongst the younger cohort during their lifetimes are likely to be offset somewhat by the reduced generosity of the SERPS/S2P system for this group. However, for private pensions, whilst there are various reasons we would expect them to have higher pension income, there are no major factors acting in the opposite direction.

Our estimates of pension wealth are likely to be more accurate for some groups than for others. Our assumption that all individuals have always been in work between leaving fulltime education and leaving their last job will be closer to the truth for individuals with fairly complete working and NI contribution histories. For individuals with incomplete contribution histories, we are likely to overestimate their state pension wealth. Since women are more likely than men to have patchy work histories, we are likely to make less accurate estimates of women's pension wealth than men's pension wealth.

References

Banks, J., Emmerson, C. and Oldfield, Z. (2004), *Preparing for retirement: The pension arrangements and retirement expectations of older workers in England*, IFS (unpublished mimeo).

Blundell, Meghir and Smith (2002), 'Pension incentives and the pattern of early retirement', in Gruber and Wise, (eds), *Social Security Programs and Retirement around the World: Micro-Estimation*, The University of Chicago Press.

Budd, A. and Campbell, N. (1998), 'The roles of the Public and Private Sectors in the UK Pension System', in Feldstein, M. (ed), *Privatizing Social Security*, National Bureau of Economic Research, Chicago: Chicago University Press.

Clark, T. and Emmerson, C. (2003), 'Privatising provision and attacking poverty? The direction of UK pension policy under new Labour', *Journal of Pension Economics and Finance*, Vol. 2, No. 1, pp. 67–89 March 2003.

Disney and Emmerson (2004), 'UK pension reform and the wellbeing of current and future pensioners', paper presented at British Association Festival of Science session on pensions, Exeter.

Emmerson, C. and Johnson, P. (2001) 'Pension provision in the United Kingdom', in Disney, R. and Johnson, P. (2001) (eds.) *Pension systems and retirement incomes across OECD countries*, Aldershot: Edward Elgar.

Finkelstein, A. and J. Poterba (2002) "Selection effects in the market for individuals annuities: New evidence from the United Kingdom", *Economic Journal*, vol.112, pp.28-50

Government Actuary's Department (2003), *Occupational Pension Schemes 2000: Eleventh Survey by the Government Actuary*, London: The Stationery Office.

Marmot, M., J. Banks, R. Blundell, C. Lessof and J. Nazroo (eds), *Health, Wealth and Lifestyles of the older population in England: The 2002 English Longitudinal Study of Ageing*, London: IFS.

Pensions Commission (2004), *Pensions: Challenges and Choices*, Norwich: HM Stationery Office

Pension Service (2004), *A Guide to State Pensions*, UK: DWP.