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responded to scary markets?

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How have older workers responded to scary markets?

By Jonathan Gardner and Mike Orszag

Watson Wyatt LLP

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Abstract

Declines in equity markets in the United Kingdom and the United States have had a significant impact on the retirement funds of individuals approaching retirement. This paper reviews results from a Watson Wyatt survey of 4500 individuals in the U.K. aged 50-64 to see how they were affected by changes in the equity market and how it affected their retirement plans as well as asset allocation. We also find that 25 % of older working individuals are now planning to retire later than they had planned 2 years ago; there is a strong positive relationship between those delaying retirement and those most affected by the stock market decline. On the other hand, for those individuals who have already retired, there appears little correlation between the degree of loss and the likelihood of returning to work, providing support for theories in which the retirement decision is modelled as irreversible. We also find that individuals who have more control over their retirement date are no more likely to have been more exposed to the equity market which is contrast to predictions about asset allocation in Bodie, Merton and Samuelson (1992).

1 Introduction

During the equity boom of the 1990s there was much expansion in the role of equity-based individual accounts around the world. The publication of the World Bank's *Averting the Old Age Crisis* (World Bank 1994) in particular was followed by a series of pension reforms in Eastern Europe and South America whose main foundation were individual accounts invested as much as feasible in equity.

During the same period, assets of 401(k) plans grew rapidly in the United States. And by the end of the 1990s, there were increasing calls for a move to privatize part of social security by switching some of state-based provision to equity-based individual accounts. In December 1998 the White House hosted its first ever conference on social security at which the main difference in opinion seemed to be not on whether more retirement money should be put into equity investments but whether it should be done through government investment vehicles or individual accounts.¹

The situation in the United Kingdom was somewhat analogous. At the beginning of the 1990s, personal pensions in the United Kingdom had just recently been established. By the end of the 1990s, the assets in personal pension plans in the United Kingdom amounted to roughly 20% of GDP. While investments of defined contribution plans in Continental Europe were generally more conservative, the bulk of investment of defined contribution funds in the United States and United Kingdom were invested in equity.

At the end of 1999, the FTSE All-Share Index stood at 3242. By the end of 2002, it had declined to 1894, a decline of 42% in the value of the index. On a total returns basis (using indices produced by Global Financial Data, Inc. (Taylor 2003)), the decline was 37% whereas it had increased by 75% from the end of 1996 through to the end of 1999. The United States S&P 500 decreased 38% on a total returns basis where it had risen 108% from the end of 1996 to 1999. The Wiltshire Index in the US declined 37% on a total returns basis after having risen by 100% in the preceding three years. In Europe, a rise of 86% in markets from 1996 to 1999 was followed by a subsequent decline of 40% over the next three years.

¹ See <http://www.ssa.gov/history/whconfer.html> for a list of statements contributed to the 2 day event.

The situation was by no means uniform throughout the world. In Australia for instance, the ASX All-Ordinaries index rose 6.3% on a total returns basis from the end of 1999 to the end of 2002. In New Zealand, markets also increased. In Australia and New Zealand, the late 1990s boom had also been more moderate, with the market increasing only by 17% in New Zealand and 43% in Australia from the end of 1996 to the end of 1999. Asian markets though were far from calm. Hong Kong and Taiwan though both experienced decreases in markets from the end of 1999 to the end of 2002 which were more dramatic than either the US, UK or Europe.

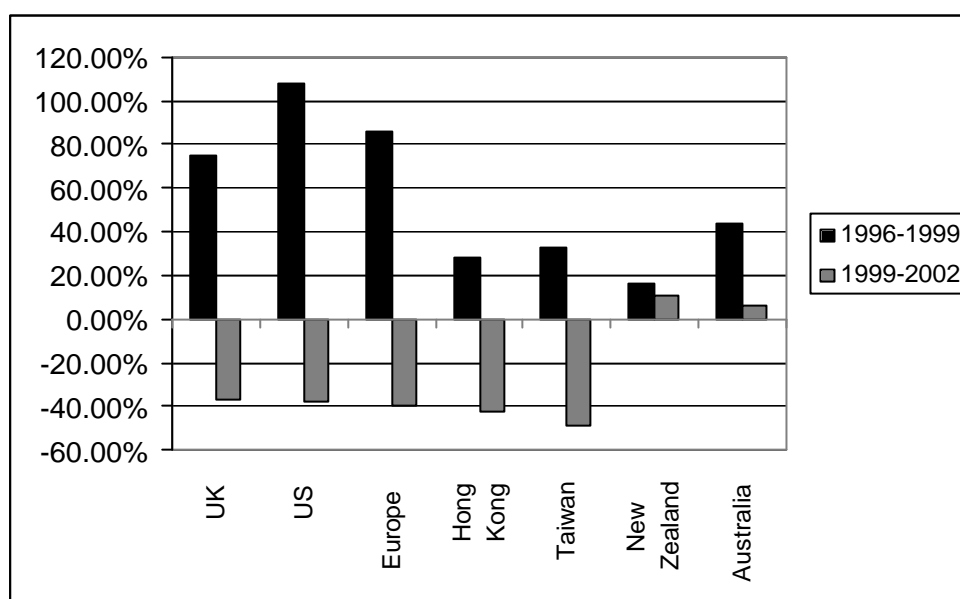


Figure 1.1: Changes in stock market indices over three year periods.²

These declines in stock markets were by no means unprecedented. The period at the beginning of the 1970s for instance exhibited bigger declines. In 1974 for instance the FTSE All-Share declined by 55.34%.³ However, unlike the 1970s and earlier stock market declines, investors in the US and the UK were relying much more than ever before on equity markets to finance their retirement.

The situation with equity markets somewhat understates the problem of markets for retirees as bond yields were also declining at the same time as equity markets were declining. This decline in bond yields coupled with new information about increased longevity led to the fall in annuity rates documented in Figure 1.2. In December 1996, the best available level annuity rate in the UK for a male aged 60

² Calculations based on total returns indices supplied by Global Financial Data.

³ Total returns indices of Global Financial Data, Inc.

yielded about 10% per annum.⁴ By the end of 1999, this had fallen to 7.99% and by 2002 it had fallen yet further to 6.66%. The decline in annuity rates prior to the end of 1999 and hence lower retirement incomes was causing considerable disquiet among those retiring. When the level of retirement income provided by the market is the benchmark, markets got scary for those near retirement well before the decline in the stock market.

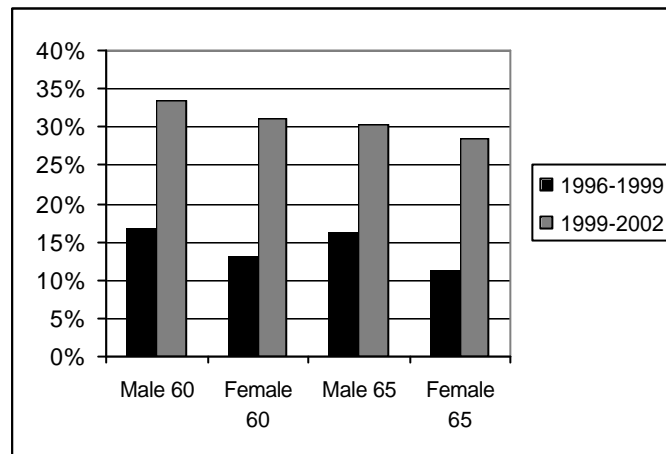


Figure 1.2: Decline in annuity rates in the UK.

The market for annuities in other countries is much smaller than the U.K. (Cardinale, Findlater et al. 2002) and both because of this and to restrict the analysis to movements in markets rather than changes in regulatory regime, competitiveness of the market and capital supply, we annuity rate as equal to a mortality markup plus the 10 year bond yield. If we set this mortality markup at 3.5% and use this approach, we get an estimated annuity rate of 11% in the UK at the end of 1996, 8.65% at the end of 1999 and 7.94% at the end of 2002. These relate to quoted market rates of 10.99% for a 65 year old man at the end of 1996, 9.15% at the end of 1999 and 7.67% at the end of 2002.

⁴ Annuity rates quoted in this paper are from the January 1997, January 2000 and January 2003 issues of *Pensions World*. The January 1997 issue covers rates as of 16 December 1996 which are payable monthly in advance with a £1k purchase price and payable for a guaranteed five years. The January 2000 issue quotes rates on 10 December 1999 which are for a purchase price of £100,000 and payable monthly in arrears without guarantee. The January 2003 issue covers annuity rates in the compulsory purchase market on 6 December 2002 which are monthly in arrears without guarantee and with a purchase price of £100,000.

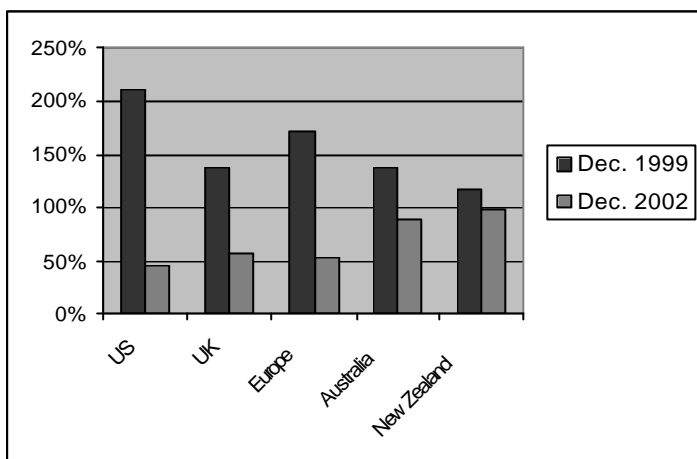


Figure 1.3: Effect on annuity values of portfolio invested entirely in equity.

Figure 1.3 shows the combined impact of changes in equity markets and notional annuity rates on retirement income. In December 1999, an individual in the US who had invested entirely in equity would have retired with about double the retirement income as three years earlier. But, an individual investing in equity from 1999 to 2002 would have ended up 54% worse off in terms of retirement income.

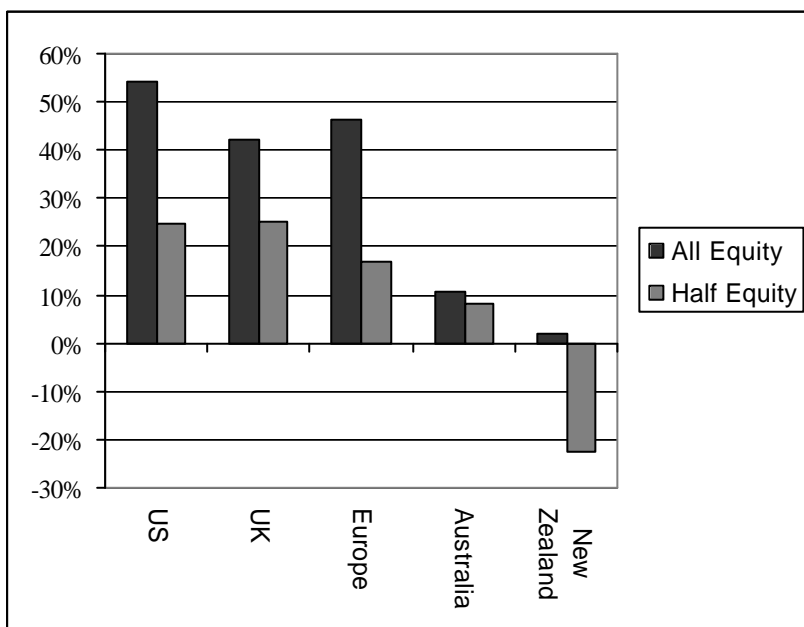


Figure 1.4: Decline in Retirement Income for Individuals from end of 1999 to end of 2002.

This figure, representing the decline in income due to the combined changes in annuity rates and equity markets from 1999 to 2002, is a good indicator of how scary markets have been for retirement investors. Figure 1.4 shows that the decline in purchasing power of retirement funds has been dramatic in the US, UK and Europe

for those invested entirely in equity. For those who moved into bond investments, the decline in retirement income has been much less onerous. Investment of half the portfolio in 10 year government bonds would have for instance cut losses from 42% in the UK to 25%. But the late 1990s were an era where individuals were short on caution and the extent to which individuals did cut their losses through portfolio shifts therefore limited.

The decline in markets is a natural experiment to help us understand how individual adjust their labour supply when markets move in the wrong direction. There is some macroeconomic evidence that the number of individuals retiring early has declined. (Eschtruth and Gemus 2002) report a significant increase in labour market participation of older men in the United States and discuss the decline in the stock market as one reason for this decline. And in the United Kingdom, the economic activity rate of men over 65 in March 2003 was at its highest level since 1992 and roughly 20% higher than at the end of 2000. However, macroeconomic evidence is weak because of its level of aggregation, because there are competing explanations for trends and because of the volatility of macroeconomic time series.

In order to study the response of individuals to bear markets, Watson Wyatt designed and commissioned a special study which went into the field in May 2003 with individuals aged 50-64 in the United Kingdom. We asked individuals how they had been affected by the changes in equity markets and how they responded. We also asked them about their pension arrangements and plans for the future. The study also allows us to perform some evaluation of different models of optimal individual choice which combine decisions about asset allocation with retirement date.

The remainder of the paper is organised as follows. Section 2 presents a review of the literature on asset allocation and choice of retirement date. Section 3 reviews the design of the Watson Wyatt study. Section 4 assesses who was worst hit by scary markets. Section 5 looks at responses in terms of labour market behaviour to declines in asset markets. Section 6 looks at responses in terms of asset allocation to the bear market. A final section concludes.

2 Overview of the Literature

Perhaps the first attempt to look at retirement decisions jointly with asset allocation decisions was in (Bodie, Merton et al. 1992). (Bodie, Merton et al. 1992)

add human capital and choice over leisure to (Merton 1969) (Merton 1971). The key result is that flexibility over labour supply leads to a higher degree of equity investment in the portfolio. The optimal portfolio weight in equity is:

$$q = -\frac{V_A}{AV_{AA}} \left[\frac{m-r}{s^2} \right] - \frac{V_{Aw}}{AV_{AA}} s_w w \quad (1.1)$$

where V is the value function, A is the sum of human capital and financial wealth, m is the rate of return on equity, s^2 is the variance of equity returns, r is the interest rate, w is the wage and s_w is the standard deviation of wage growth.

Individuals may be willing to invest more in equity if they have more labour supply flexibility because of the wealth effect. Indeed, *ceteris paribus* those who have control over their labour supply have more potential wealth and therefore are more willing generally to take risks in equity markets. An increase in the risk of future wage growth (e.g., the standard deviation of wage growth) implies riskier human capital and normally leads to a decrease in the exposure to the risky asset.

The continuous time analysis in (Bodie, Merton et al. 1992) has been expanded in a number of directions. (Basak 1999) extends the analysis to general equilibrium. (Liu and Neis 2002) build a retirement decision into the model. In their model, retirement decisions do depend strongly on asset market performance as expected. An interesting result though is that when wages are positively correlated with stock prices (as for instance in (Cardinale 2003)), an increase in stock prices may cause workers to continue working instead of retiring.

(Kenc 2003; Kenc 2003) uses a martingale duality approach to solve the dynamic optimal control problem for optimal asset allocation and retirement behaviour. His approach in particular enables consideration of more realistic wage profiles as well as is more amenable to numerical solution. (Campbell and Viceira 2002) examine analytic approximations to models in which there is nondiversifiable labour income risk.

One of the key assumptions implicitly underlying much of this literature is that retirement is voluntary. Evidence on this point is mixed. (UK Cabinet Office 2000) finds that at most one-third of early retirees in the age range between 50 and the official state pension retirement age in the UK retire voluntarily. Studies which point to the importance of labour demand factors in determining retirement dates are: (Lee

2003) , (Herbertsson 2001), (Downs 1995) (which reviews some evidence about layoffs of older American workers), and (Gray 2002).

Furthermore, there is quite a bit of evidence that retirement is driven by many non-economic factors such as the retirement date of the spouse, health and the organisation of work. Non-optimising models such as loss aversion (Kahneman and Tversky 1979; Tversky and Kahneman 1991) may also explain work past retirement when stock markets decline. Appendix B summarises briefly these models.

(Williamson and McNamara 2001) reviews some of the empirical evidence about work past retirement. In terms of the likely impact of the decline in the stock market decline on retirement behaviour, (Gustman and Steinmeier 2002) estimate a structural model based on data from the US Health and Retirement Study (HRS). They find that during the late 1990s the effect of the asset market boom was to lower labour market participation those in the HRS study by 3%. The net effect is a change in the average retirement age of 3 months. Similarly, the projected effect of the asset market bust is to increase labour market participation of older workers, with an anticipated short-term rise in the average retirement age of 3 months.

These effects appear small. The asset market boom in the U.S. involved returns of over 20% per annum in the late 1990s. As we have noted above, the asset market bust involved a decline of as much as half or more in realised retirement income from funded pensions over a three year period from early 2000 to the end of 2002. Yet in both the case of the boom and the bust the model projects little effect on the retirement age.

To summarise some of the broad predictions from the literature:

- Asset allocation should be more in equity the greater the level of non-financial capital relative to financial capital
- Individuals with flexible retirement dates should hold more assets in equity.
- A decline in financial wealth should induce more work.
- Spousal decisions should be important in influencing work behaviour.

While these results do not always hold under the most general assumptions, they seem reasonable conclusions to draw from models using common assumptions.

3 Data and survey

This study uses data from an especially commissioned survey that was carried over a week during mid-May 2003.⁵ The fieldwork was conducted via a web-based survey using the YouGov polling agency. This organisation has an active pool of respondents typically numbering around 40,000 at any one time, for whom various demographic and economic status data are known. The active pool currently includes approximately: 23,000 men and 17,000 women; 11,000 individuals aged 18-29, 15,000 individuals aged 30-44, 10,000 individuals aged 44-59, and 4,000 individuals aged 60 or over.

In studying the impact of the large declines in stock market values on retirement decisions we focussed on individuals close to the margin, either nearing retirement or in the early stages of retirement, who were likely to be most effected by changes in asset values. We then restricted attention to individuals aged 50 to 64. A total of 4,051 productive interviews with individuals in this age range were obtained. This provided robust sub-samples for sub-sets of age categories.

Of the survey participants 57 percent were observed to be working, 33 percent were retired or semi-retired (were an individual is retired from their main employment but are now working part-time), and 10 percent reported that they were not retired but were also not working. Some 59 percent had some equity related investments, where this could be in the form of direct share-holdings, or indirectly via savings and pensions vehicles, invested in equities.⁶ With regards pension provisions, 19 percent had no private pension, and were hence relying on the state for their income in retirement, 45 percent reported they had one private pension, 23 percent two private pensions, 9 percent three, and 4 percent four or more. Of those with a private pension, in 64 percent of cases an employer defined benefit (DB) scheme was the main source of retirement income, in 12 percent of cases an employed defined contribution (DC) scheme, and for 24 percent personal pensions provided the major source of pension income. The survey included questions regarding: demographics and economic status (for both the individual respondent and their spouse), private pension provision, how savings had changed since the year 2000, whether equities

⁵ A list of the questions in the survey is found in the appendix.

⁶ This percentage of equity investment is broadly similar to that found for the US HRS in Gustman, A. L. and T. L. Steinmeier (2002). Retirement and the Stock Market Bubble, National Bureau of Economic Research.

investments had recently been revised or retirement plans changed, how (working) respondents employers had endured the turndown, and household income. These data were matched to pre-existing data regarding individual characteristics.

The survey questions are listed in Appendix A. The key questions in this study are those that characterise asset loss. In all cases, we characterise asset loss as a relative effect, i.e. the percentage loss in savings when comparing today to three years prior. We do not know the exact amounts invested, or the absolute decline in savings⁷. Nor do we know the split between pension and non-pension investments or the division in asset allocations between equities and bonds, though we can infer that those with the greatest decline in savings are likely to have had the greatest exposure to equities. Nevertheless, this question format has the advantages that it is relatively easy for people to understand and comprehend, facilitating more accurate responses and less question non-response.

The core question with regards retirement plans is, almost by definition, subjective and individuals may evaluate the question in very different ways. So, for example, one person may only report they are considering postponing retirement if this is a relatively definite decision, whilst another individual may simply report their current perspective. Nevertheless, such issues will only bias estimates if individuals systematically respond in different ways, for unobserved reasons. Moreover, retirement decisions, where voluntary, are subjective. The use of such questions remain probably the best indicator of future behaviour.

There are, however, potential limitations to the survey. First, whilst 45 percent of UK households now has internet access in the home (Office for National Statistics 2003)⁸, we are sampling from a potentially self-selecting sample. Those who use the internet tend to be more educated and more affluent (see (Gardner and Oswald 2001)). This may be especially true for the older age group we analyse, where internet use is less prevalent. Web-based surveys also make stronger assumptions regarding the literacy and technical proficiency of respondents.

(Chang and Krosnick 2003) examine the robustness of internet surveys relative to alternative telephone interviews. The authors conducted comparison tests, using identical questionnaires, for traditional direct dialling and internet methods, and

⁷ Previous experience suggested non-response, and errors, with regards these questions would be high.

⁸ This may well underestimate the number of have access to the internet via other sources (e.g. place of work, etc).

found, despite possible sample bias, the web-based method actually provided more accurate reports than a traditional telephone interview.⁹

To check for any potential sample bias, on our analyses, we examined the regression models by socio-economic group. Coefficient estimates are found to be very similar across occupational class. Moreover, in all cases we control for age, gender, education, and occupational class, the variables most likely to correlate with selection into the sample, and it is thus not clear *a priori* why results should be biased (DuMouchel and Duncan 1983).¹⁰

4 Who lost the most of their savings in the last three years?

Two forms of questions were used to try to quantify the size of losses in savings, as a result of the decline in equity values. The first asked respondents to describe what had happened to the value of their savings in the last three years:

"Thinking of all moneys you had set aside as savings before 2000 (e.g. pensions, bonds, ISA's, stocks and shares) have they increased or decreased in value over the last 3 years?"

Responses were qualitative, with categories: 'increased a lot', 'increased a little', 'remained about the same', 'decreased a little', and 'decreased a lot'. Whilst we do not know the previous exposure to equities, it seems likely that those who have suffered the greatest declines in savings are also those who had greater investments in equity products. This question will reflect both the absolute decline in savings, and subjective factors which will influence how an individual reacts to a given savings loss. This subjectivity has some advantages. Firstly, workers' perceptions are likely to be an important determinant of behaviour, and secondly, the question may capture the *relative* impact of the decline in savings more effectively than attempting to

⁹ The telephone survey was found to manifest more random measurement error, survey satisficing, and social desirability response bias. This is aside from the issues of non-response to telephone surveys, and whether those who do respond can be regarded as a random sub-sample of the population.

¹⁰ In a related discussion, regarding the merits of sample survey weights (DuMouchel and Duncan, 1983) show parameter estimates, in a skewed sample, will be unbiased where the model holds independently of the sample composition, or where we are able to include amongst the explanatory variables the variables upon which selection is based, intuitively we then control for selection.

compare individual's savings declines to their other asset wealth.¹¹ These subjective measures may then allow us to infer, albeit with some error, the relative declines in savings.

The sample responses to this question are found in Figure 4.1 below. Some 48.6 percent of individuals respond their savings have 'declined a lot', and some 20.1 percent that they have 'declined a little'. A majority have then seen their savings decline over the period. In 11.2 percent of cases the value of savings has remained largely flat, whilst for 18.8 percent there has been a small increase in savings. Only 1.3 percent has seen a large increase in savings. For those who have seen their savings increase in value, we may hypothesise they have been largely invested in bonds or other guaranteed-return financial products, they may have upped their savings rate, or may even have received an inheritance. It is important to note this question captures the change in the stock of savings, which is the relevant issue for our analysis, not the decline in moneys invested in the stock market, though these will be quite closely related.

A second question, more quantitative in tone, was subsequently asked.¹² Those individuals who responded their savings had increased or decreased, were then asked:

"By approximately how much have all the moneys you had set aside as savings before 2000 increased (decreased) in the last 3 years?"

Response categories were: 'less than 5 percent', 'between 5 and 10 percent', 'between 11 and 25 percent', 'between 26 and 50 percent', and 'more than 50 percent'. Sample responses are shown in Figure 4.2. Some 8.2 percent report losses of greater than 50 percent, 24.9 percent a fall in savings of between 26 percent and 50 percent, and 20.7 percent losses of between 11 and 25 percent. Around a quarter (25.7 percent) report their savings have changed by less than 5 percent, only 2.3 percent respond their savings have increased by more than 10 percent.¹³

¹¹ A more rigorous argument in favour of the use of subjective data is found in Kahneman et al (1997). They suggest the evaluation of any event have a basic scale, pleasant, neutral, and unpleasant. Other scales can expand the positive or negative categories to a finer degree but the neutral case is a constant. It is argued the distinctiveness of the neutral value provides a focal point that allows confidence in interpersonal comparisons of subjective experiences.

¹² Both this question and the last are only asked of those with private pensions.

¹³ Due to the small number of responses in the last three categories, increases of savings of more than 10 percent, are grouped for regression analysis where this variable is an explanatory variable.

FIGURE 4.1

The change in the value of savings since 2000

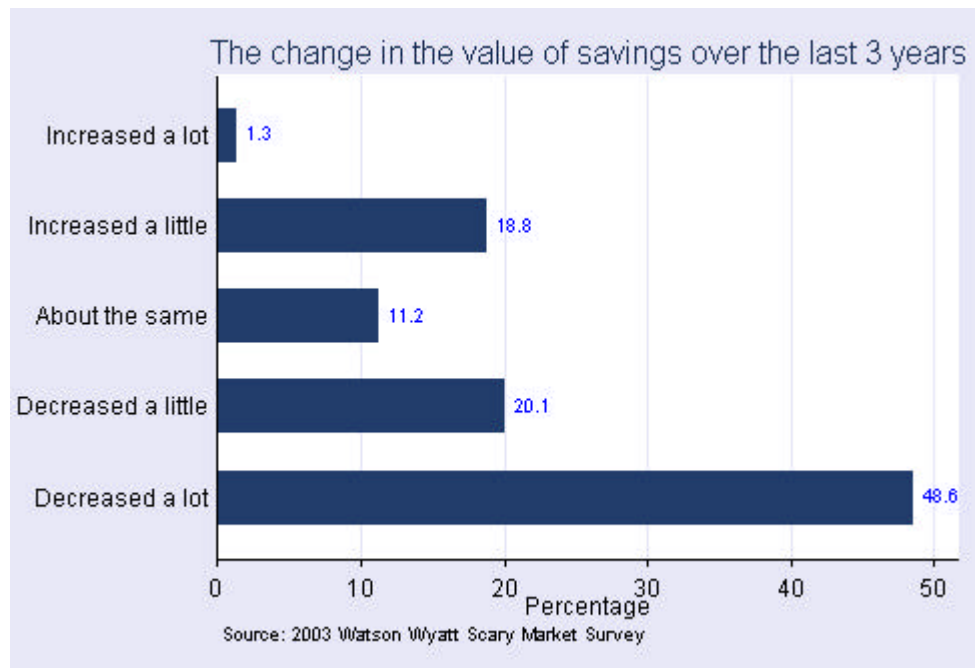
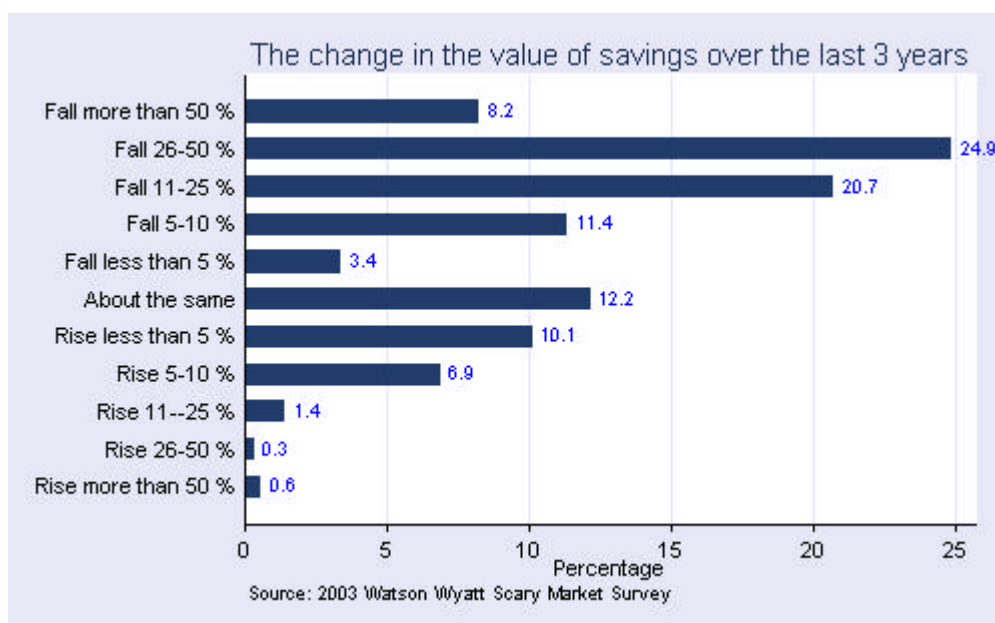


Figure 4.2:

The amount of the decline in savings



Using responses from these banded categories we can estimate the mean decline in savings by characteristics using the grouped order probit (interval regression) technique (see Stewart, 1983). This maps the true change in savings (the latent variable, y^*) into the ordered categorical bands described above (which we here term, y). For individual i , we observe a response in band k (where k runs from 1 to K) if:

$$y_i = k \quad \text{if } \mu_{k-1} < s^* \leq \mu_k \quad \forall k = 1, \dots, K$$

The values of μ are then determining by the lower and upper values associated with the band, where $\mu_0 = -\infty$ and $\mu_K = \infty$. Estimation is then by the maximum likelihood, where we maximise the probability of observing a response within a category, k , given the characteristics of the individual and the band cut-points. Assuming an underlying normal distribution we can estimate the mean and standard deviation in the change in savings for different characteristics.¹⁴

Table 4.1 reports the estimated mean change in the value of savings by characteristics. In all cases the mean change in savings is negative. We estimate the average change in the value of savings, amongst this sample, to be -17.04 percent. This figure is slightly higher for men than for women, but not statistically significantly different.

One of the interesting features of the results is that individuals who have flexibility over their retirement plans appear to have lost no more and were no more likely to hold equity than those without flexibility. In the (Bodie, Merton et al. 1992) analysis, individuals with flexible retirement dates should be willing to risk greater losses in their retirement savings as they have the option to make up losses through working longer. However, in Table 4.1, we see to statistically significant difference in the mean change in savings between those with fixed and flexible retirement dates. In Table 4.4 we report regression results for employed individuals which show flexibility over retirement date has little impact on the savings loss. We achieve similar results for the whole working population when treating the self-employed as having a flexible retirement date.

¹⁴ Given the data are actually skewed to negative returns, we may underestimate the true decline in savings.

TABLE 4.1

Estimated mean and standard deviation in the change in savings by characteristics

<i>Sub-sample</i>	<i>Mean</i>	<i>Standard deviation</i>
All	-17.04	(20.94)
Male	-17.24	(20.91)
Female	-16.47	(20.99)
Low Education	-13.54	(19.69)
Medium Education	-16.12	(21.12)
High Education	-19.10	(21.11)
Main pension: Employer DB	-16.60	(21.22)
Main pension: Employer DC	-15.77	(19.01)
Main pension: Personal DC	-18.52	(20.61)
Private sector	-18.71	(21.63)
Public sector	-14.87	(19.35)
Professional occupation	-18.30	(21.18)
Non-professional	-17.04	(20.94)
Currently Retired	-18.19	(20.65)
Currently Working	-15.79	(20.61)
Self-employed	-19.82	(21.40)
Flexible retirement date	-16.59	(20.56)
Fixed retirement date	-14.52	(20.62)

Notes

1. Education and public vs private effects are statistically significantly different all p-values
2. Fixed vs flexible statistically significantly different only for p-values of 0.073 and above.
3. Note: flexible retirement date 58.4 percent some equity vs 60.9 percent some equity for fixed retirement date, when just focus those with private pensions 62.7 percent vs 62.4 percent (sample used above)
4. this result holds in regression analysis = no more likely to hold equity
5. Uses Interval regression techniques (see Stewart, 1983). Technique assumes normality (potentially invalid).

TABLE 4.2
Correlates of savings loss
Dependent Variable: The percentage change in savings

<i>REGRESSOR</i>	<i>(1)</i>	<i>(2)</i>	<i>MALE</i> <i>(3)</i>	<i>MALE</i> <i>(4)</i>	<i>FEMALE</i> <i>(5)</i>	<i>FEMALE</i> <i>(6)</i>
Employer DC	0.833 (1.282)	1.402 (1.363)	-0.232 (1.429)	0.118 (1.482)	3.674 (2.687)	4.967 (3.155)
Personal Pension	-1.573 (1.109)	-0.692 (1.179)	-2.848 (1.275)*	-1.983 (1.352)	2.826 (2.291)	4.176 (2.419)
Log household income		0.845 (0.870)		0.683 (1.015)		1.453 (1.663)
Age	-0.236 (0.122)	-0.247 (0.128)	-0.279 (0.142)*	-0.288 (0.147)*	-0.058 (0.250)	-0.103 (0.268)
Intermediate qualification	-3.248 (1.266)*	-3.370 (1.345)*	-2.458 (1.491)	-2.163 (1.570)	-4.238 (2.463)	-5.796 (2.637)*
Degree or professional qualification	-5.204 (1.344)*	-5.636 (1.438)*	-4.773 (1.549)*	-5.011 (1.653)*	-5.680 (2.680)*	-7.000 (2.864)*
Female	-0.112 (1.091)	-0.027 (1.164)				
Married	0.286 (1.193)	-0.114 (1.334)	0.253 (1.532)	0.105 (1.668)	0.643 (1.917)	-0.360 (2.270)
Own house with mortgage	0.609 (0.924)	0.389 (0.984)	-0.073 (1.080)	-0.110 (1.140)	2.783 (1.821)	2.213 (2.005)
Renter	3.595 (1.791)*	4.151 (1.833)*	3.853 (2.054)	4.424 (2.098)*	2.066 (3.550)	2.434 (3.537)
Managerial	0.561 (1.147)	0.597 (1.195)	0.227 (1.294)	-0.002 (1.338)	3.024 (2.458)	4.422 (2.609)
Clerical	3.060 (1.518)*	2.227 (1.675)	2.600 (2.026)	1.494 (2.216)	4.245 (2.433)	4.244 (2.733)
Blue-collar	0.634 (1.452)	0.697 (1.548)	1.098 (1.633)	0.959 (1.736)	-1.474 (3.179)	-1.224 (3.371)
Public sector	3.652 (1.007)*	3.796 (1.063)*	2.364 (1.158)*	2.453 (1.207)*	7.851 (2.089)*	8.131 (2.281)*
Retired	-1.762 (1.061)	-0.878 (1.172)	-2.267 (1.246)	-1.379 (1.372)	-0.670 (2.126)	0.228 (2.378)
Out of labour force	-8.227 (2.266)*	-7.688 (2.456)*	-8.878 (2.868)*	-8.569 (3.143)*	-6.995 (3.696)	-6.036 (3.946)
Observations	2418	2158	1820	1647	598	511

1. The coefficients on the pension characteristics are with respect to the omitted category, an employer DB pension. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
2. Equations are estimated by interval regression (Stewart, 1983). Negative coefficients indicate a greater savings loss.
3. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 4.3

Correlates of savings loss

Dependent Variable: The percentage change in savings

<i>REGRESSOR</i>	<i>DB</i> (1)	<i>DB</i> (2)	<i>DC</i> (3)	<i>DC</i> (4)
Log household income		0.589 (1.209)		1.006 (1.215)
Age	-0.182 (0.162)	-0.184 (0.168)	-0.356 (0.185)	-0.381 (0.194)
Intermediate qualification	-4.315 (1.697)*	-5.181 (1.789)*	-2.316 (1.875)	-1.284 (1.998)
Degree or professional qualification	-6.940 (1.815)*	-7.922 (1.919)*	-2.871 (1.899)	-2.574 (2.040)
Female	-1.345 (1.362)	-1.332 (1.440)	2.043 (1.835)	2.241 (1.984)
Married	-0.259 (1.519)	-0.444 (1.677)	0.799 (1.880)	0.024 (2.144)
Own house with mortgage	1.528 (1.177)	1.535 (1.245)	-0.811 (1.492)	-1.264 (1.604)
Renter	1.478 (2.482)	2.011 (2.591)	6.088 (2.480)*	6.323 (2.484)*
Managerial	0.233 (1.458)	0.282 (1.505)	0.681 (1.816)	0.652 (1.922)
Clerical	3.085 (1.949)	1.772 (2.106)	2.822 (2.396)	3.138 (2.720)
Blue-collar	-0.068 (1.912)	-1.448 (2.027)	0.965 (2.149)	2.765 (2.308)
Public sector	3.274 (1.219)*	3.406 (1.276)*	4.671 (1.788)*	4.932 (1.900)*
Retired	-1.473 (1.344)	-0.674 (1.499)	-2.360 (1.715)	-1.133 (1.899)
Out of labour force	-9.830 (3.308)*	-8.068 (3.573)*	-7.442 (3.038)*	-8.146 (3.381)*
Observations	1546	1396	872	762

1. The coefficients on the pension characteristics are with respect to the omitted category, an employer DB pension. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
2. Equations are estimated by interval regression (Stewart, 1983). Negative coefficients indicate a greater savings loss.
3. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 4.4

Flexible retirement and savings loss (the employed only)
 Dependent Variable: The percentage change in savings

<i>REGRESSOR</i>	<i>EMPLOYED</i> (1)	<i>EMPLOYED</i> (2)	<i>EMPLOYED</i> (3)
Flexible retirement date	-0.977 (1.229)	0.487 (1.320)	0.577 (1.369)
Self-employed		-4.303 (1.552)*	-3.954 (1.646)*
Log household income			-0.041 (1.204)
Age	-0.207 (0.161)	-0.175 (0.162)	-0.214 (0.169)
Intermediate qualification	-0.547 (1.658)	-0.405 (1.655)	-0.441 (1.709)
Degree or professional qualification	-4.847 (1.765)*	-4.527 (1.764)*	-5.718 (1.851)*
Female	-0.074 (1.372)	-0.386 (1.370)	-1.019 (1.469)
Married	1.298 (1.603)	1.033 (1.595)	0.843 (1.688)
Own house with mortgage	-0.061 (1.210)	-0.060 (1.208)	-0.583 (1.279)
Renter	5.201 (2.033)*	5.372 (2.014)*	5.971 (1.997)*
Managerial	-0.239 (1.486)	-0.671 (1.495)	-1.340 (1.565)
Clerical	2.697 (2.025)	2.097 (2.034)	0.692 (2.199)
Blue-collar	2.463 (1.842)	2.251 (1.841)	1.624 (1.986)
Public sector	3.714 (1.291)*	3.290 (1.298)*	3.234 (1.345)*
Observations	1376	1376	1230

1. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
2. Equations are estimated by interval regression (Stewart 1983). Negative coefficients indicate a greater savings loss.
3. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

5 How have scary markets affected retirement plans?

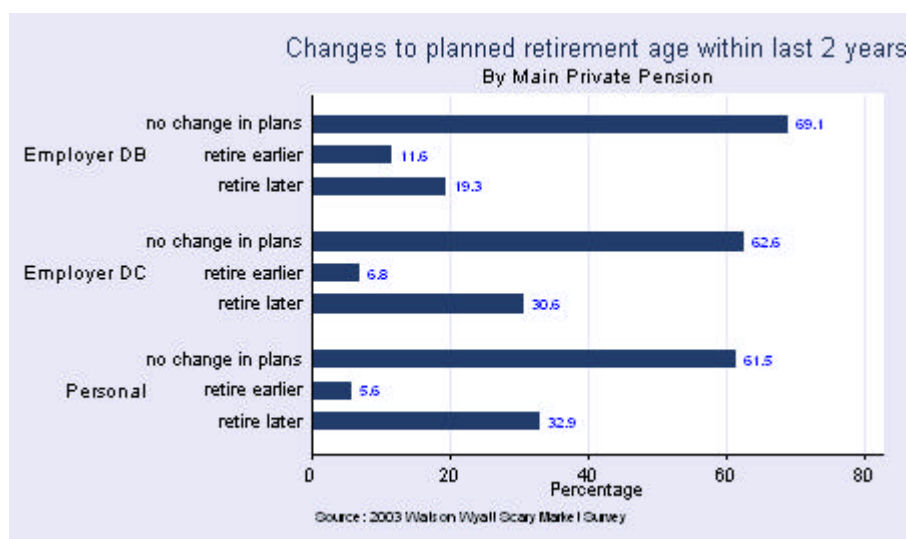
To assess whether individuals have revised their retirement plans in response to declines in equity values we asked employed respondents whether they had changed the age at which they planned to retire, within the last two years. Individuals could state they had not changed their plans, that they now planned to retire earlier, or that they planned to retire later.

The majority, some 66.0 percent, of individuals claim they have not revised their retirement date, with 8.9 percent responding they plan to retire earlier than they though two years before, and some 25 percent now planning to retire later. There is some concern that individuals may be too optimistic at earlier ages, and hence we will see a larger proportion planning to retire later simply from revising expectations as they get older (over the two-year period). Early retirement is also often induced by changes in health (c.f., (Leonesio, Vaughan et al. 2000; Mein, Martikainen et al. 2000; Marshall, Clarke et al. 2001; Baker 2002) or retirement of the spouse (Blau 1997; Baker 2002). We then turn to how retirement expectations are correlated with declines in savings.

Figure 5.1 examines how responses, to the question regarding retirement plans, vary by the main source of pension income. Those for whom employer DB pensions will be the main source of pension income are most likely to be planning to retire earlier, with 11.6 percent of respondents planning to do so. For employer DC pensions and those with personal pensions the figures are 6.8 percent and 5.6 percent respectively. Similarly, those with DB pensions are more likely for their retirement plans to have remained unchanged. By implication, those with DC pensions are more likely to plan to retire later. Of those with a personal pension 32.9 percent suggest they are planning to retire later. For those with an employer DC pension the figure is 30.6 percent, for those with a DB pension only 19.3 percent.

FIGURE 5.1

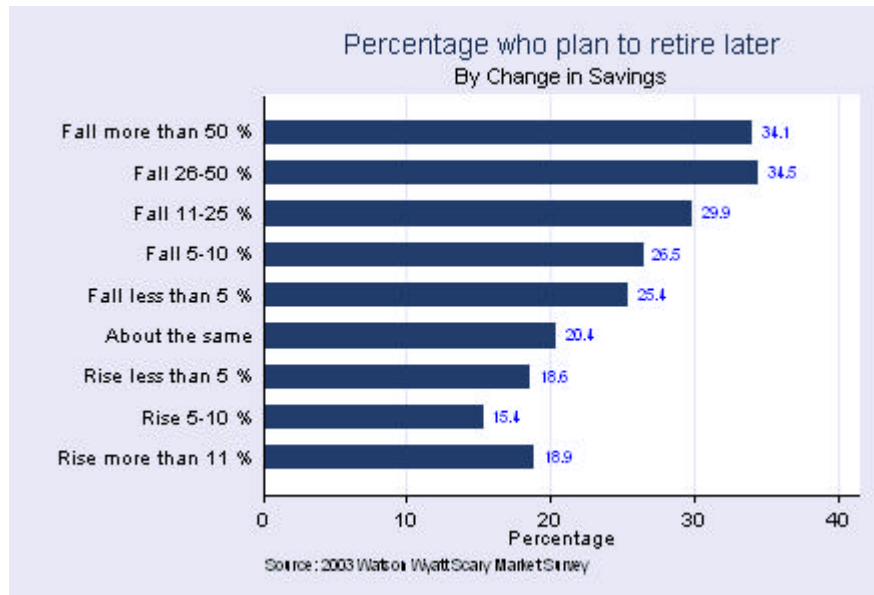
Changes to the expected retirement age by main pension



It is well documented that DB pensions provide strong incentives to retire earlier (see (Clark and Schieber 2002) (Lazear 1983) (Mulvey 2003)) , hence it may not be that we are capturing any effect of reduced lifetime wealth, rather a symptom of the plan design. Figure 5.2 then shows how retirement plans vary by the fall in the savings (for exposition we restrict attention to the proportion planning to retire later). Of those who face reductions of more than 50 percent in their savings 34.1 percent suggest they are planning to retire later. For those with a reduction in savings of between 26 and 50 percent the figure is 34.5 percent, and where savings have fallen by between 11 and 25 percent we observe 29.9 percent plan to retire later. Thereafter, we observe the proportion reporting they are planning to retire later monotonically declines with improved savings performance, with the only exception being the figure for the small group of individuals with gains of more than turning 11 percent.

FIGURE 5.2

Changes to the expected retirement age by change in the value of savings



We now turn to regression analysis. Given there are three unordered and mutually exclusive response categories, which are conceivably non-nested¹⁵, we model the revision in retirement plans by the multinomial logit model. The coefficients from this framework are useful for determining which variables influence retirement decisions. Table 5.1a reports coefficient estimates on the underlying latent response variable, Table 5.1b the marginal effects on the probability of recording a response.

From Table 5.1a we can see that those for whom a DC pension will be their main source of income in retirement are less likely, than those with DB pensions, to respond they are likely to retire earlier, and more likely to say they plan to retire later. In the latter case, both for employer DC pensions and personal pensions, the coefficient estimates are statistically different from zero for conventional p-values.¹⁶ The coefficient estimates correspond to marginal effects, for those with Employer DC pensions, of being 4 percent less likely to respond they are planning to retire earlier, and 14.6 percent more likely to retire later, relative to those with employer DB

¹⁵ In the vast majority of cases the Hausman IIA test supports this (implicit) assumption.

¹⁶ This is a test of whether the coefficients in the 'retire later' column are zero. So we find robust evidence that those with DC pensions are more likely to retire later. We also see those with DC pensions are less likely to 'retire earlier', though this evidence is not statistically robust at the 5-percent level. The test as to whether members of

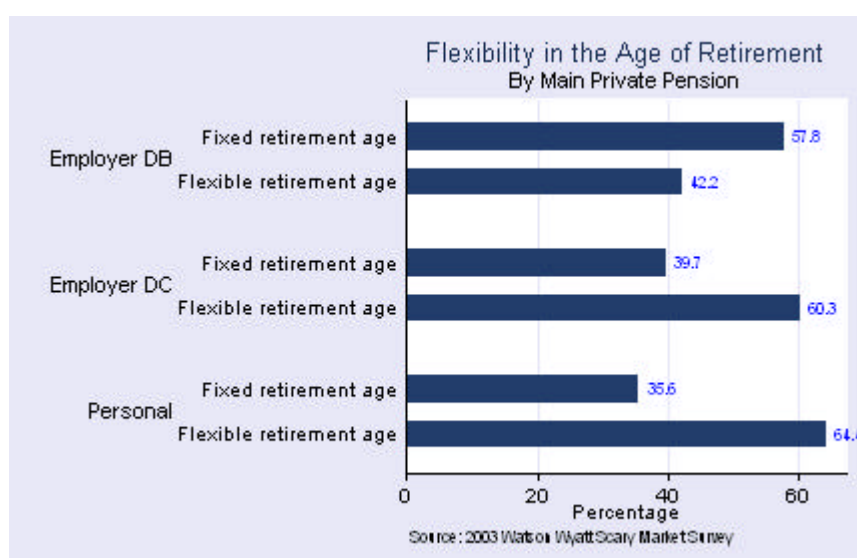
pensions. For those with personal pensions the comparable figures are 3.7 percent and 10.1 percent respectively. To summarise, those with DB pensions are, on average, planning to retire earlier than those with DC pensions.

With the exception of age, no other covariates are found to have a statistically significant association with retirement plans. Age itself may reflect a selection effect, for a fixed planned retirement age, those who are observed to be in working at older ages are more likely to have revised upwards their planned retirement age. Nevertheless, omitting age from our regression results does not significantly alter the coefficient estimates on the pension status indicators.

One concern with these results is that DB workers may be more constrained, by plan design, in when they can retire. Figure 5.3 indeed shows that those with DB pensions are less likely to be able to 'choose to work past the age of retirement', with 42.2 percent responding they have retirement flexibility, relative to 60.3 percent for those with employer DC pensions, and 64.4 percent for those with personal pensions. (Note these figures were calculated excluding the currently self-employed.)

FIGURE 5.3

Flexibility in the age of retirement by Pension provision



DC schemes respond systematically differently to DB members (i.e. a joint test of whether they are more likely to retire later *and* less likely to retire earlier) also passes for all reasonable p-values, with $\chi^2(2) = 15.16$.

To control for possible constraints on the retirement decision, in columns three and four of Table 5.1a, we then control for whether the individual can work past the age of retirement. Results are substantially the same, with slightly more pronounced effects.¹⁷ Those who did claim to have the ability to work past the normal age of retirement were 4.1 percent less likely to plan to retire earlier, and 4.1 percent more likely to retire later, relative to those who could not work past the normal retirement age.

In Table 5.2a and 5.2b, we similarly examined the effect of declines in savings on retirement plans. Both with and without controls for retirement flexibility, we find those who report large losses in savings are statistically significantly more likely to plan to retire later, with a marginal effect of around 17 percent. Those with small declines in savings are also more likely to plan to retire later, with a marginal effect of 5.9 percent, but this effect is not statistically robust. Interestingly, those who claim to have made large losses are also more likely to retire earlier. The effects are, however, far from conventional statistical significance, and the magnitude of the effects (Table 5.2b) are relatively small.

A similar analysis is carried out in Tables 5.3a and 5.3b, but instead for the more quantitative amount of savings loss. Consistent with the above, as the relative size of savings decline increases we observe a greater propensity to plan to retire later, than previously, and these effects are generally statistically well determined. An individual whose savings have fallen by more than 50 percent is 23 percent more likely (than a respondent whose savings have not declined) to now plan to retire later. For those with savings losses of between 26 and 50 percent the figure is approximately 18 percent. As above we also observe a positive effect on the likelihood to 'retire earlier' but again these effects are not statistically different from zero, with generally small magnitudes. These results were robust to controls retirement flexibility and within sub-samples of individuals by pension type (DB or DC).

¹⁷ Results were also robust when we examine only those respondents with retirement flexibility.

A supplementary question was later asked, regarding the importance of savings decline on the retirement decision:

"Thinking of all the moneys you had set aside as savings before 2000 how important has the change in the value of these savings been to your decision to change the age at which you plan to retire?"

Responses were ordered: very important, fairly important, fairly unimportant, and, very unimportant, and were subsequently scaled 1 to 4. Equations were then estimated for this variable using the ordered logit technique (see (McKelvey and Zavoina 1975)). Given the variable scaling, positive coefficients indicate cases where the change in savings plays *less* of a role in the retirement decision. Confirming the intuition of previous results, those with DC pensions, and those who have the largest relative declines in savings, are the most likely to claim that the change in savings is an important factor in the retirement decision. In the majority of cases the coefficients are statistically well determined, and for savings decline move monotonically with *a-priori* expectations.

From Table 5.5b we report the marginal effects, on the probability of feeling the change in savings is very important in determining retirement plans. Those respondents whose main pension income is from a personal pension are 13.1 percent more likely, than those with DB pensions, to feel the change in savings is a very important factor in their retirement decision. For those who report a large decline in savings the figure is 18.4 percent, relative to those who savings did not decline. Where the relative decline in savings is 50 percent or more, this figure is 25.7 percent. If we restrict attention to only those individuals who have changed their retirement plans, or only those respondents who now plan to retire later, we observe qualitatively similar, though substantively larger, estimated effects.

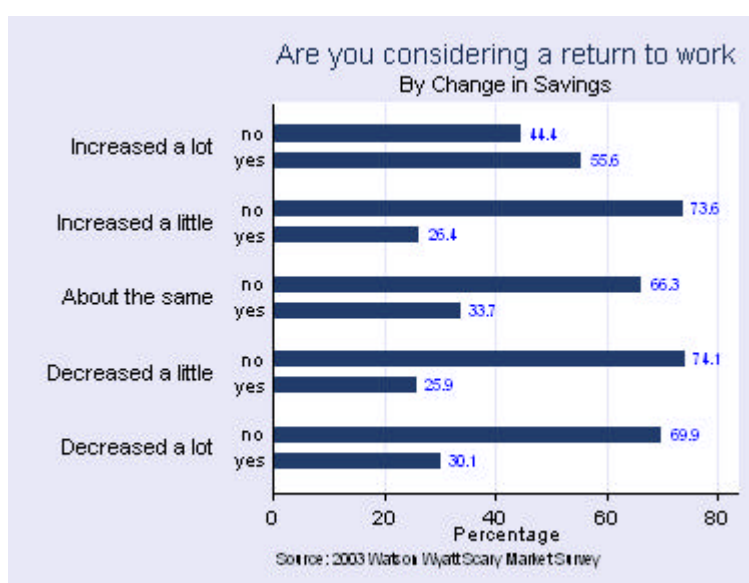
In all the estimates we see that those with larger household incomes are less likely to feel, for a given proportionate decline in savings, that the fall in their savings has contributed to their decision. This may be because those with greater household income also have greater alternative wealth to fall back on. It also may reflect the fact that a certain minimum standard of living is still available to those with large assets, i.e. even though they have suffered large relative declines their absolute wealth levels may still be greater.

We now turn to those who are currently retired, and examine the question whether those who have suffered relatively large savings losses, are more likely to return to work. We ask a question as to whether, the retired, are considering returning to work. If they are considering a return to work we ask them for how long.

Figure 5.4 shows the break down in responses, as to whether the respondent is considering a return to work, by the fall in savings. There does not appear to be a clear discernible pattern in responses by the decline in savings. The same result is found in figure 5.5, where we instead examine the proportion considering a return to work by the size of the (relative) change in savings. In both cases we cannot reject the null, that there is no significant difference in response rates by the change in savings, for all conventional significance levels. These results remain in regression analysis when we control for the same set of variables as used in previous tables (using the bivariate logit model).¹⁸

FIGURE 5.5

The proportion considering a return to work by the change in savings



The lack of correlation between changes in savings and desire to return to work suggests a high degree of irreversibility in the retirement decision. This provides significant support for a real options approach to retirement decisions (Stock

¹⁸ In results not reported, though available upon request, we found those who had been retired longer were less willing to consider returning to work, holding constant their current age.

and Wise 1990) and is also consistent with the empirical work on early retirement in (Gruber and Wise 2003).

TABLE 5.1a
Pension type and the retirement decision (the employed only)
Dependent Variable: Changes to the planned retirement date

<i>Regressor</i>	<i>Retire earlier</i> (1)	<i>Retire later</i> (2)	<i>Retire earlier</i> (3)	<i>Retire later</i> (4)
Employer DC	-0.548 (0.381)	0.665 (0.200)*	-0.572 (0.441)	0.728 (0.217)*
Personal Pension	-0.474 (0.283)	0.482 (0.158)*	-0.226 (0.300)	0.525 (0.169)*
Log household income	0.132 (0.220)	0.018 (0.120)	0.118 (0.235)	-0.007 (0.125)
Flexible retirement date			-0.549 (0.243)*	0.170 (0.165)
Age	0.019 (0.027)	0.119 (0.019)*	0.033 (0.028)	0.107 (0.019)*
Intermediate qualification	-0.038 (0.282)	0.206 (0.193)	-0.161 (0.300)	0.195 (0.204)
Degree or professional qualification	-0.265 (0.317)	0.269 (0.200)	-0.283 (0.333)	0.280 (0.210)
Female	0.095 (0.241)	0.216 (0.157)	0.232 (0.263)	0.233 (0.165)
Married	0.364 (0.336)	0.044 (0.187)	0.523 (0.362)	0.064 (0.196)
Own house with mortgage	-0.224 (0.214)	0.166 (0.143)	-0.254 (0.232)	0.215 (0.152)
Renter	-0.422 (0.473)	0.192 (0.268)	-0.297 (0.469)	0.283 (0.281)
Managerial	-0.260 (0.277)	0.065 (0.167)	-0.209 (0.298)	-0.043 (0.178)
Clerical	-0.555 (0.362)	-0.319 (0.230)	-0.447 (0.386)	-0.279 (0.243)
Blue-collar	-0.270 (0.336)	-0.389 (0.217)	-0.288 (0.369)	-0.380 (0.227)
Public sector	0.051 (0.227)	-0.159 (0.161)	-0.039 (0.245)	-0.107 (0.170)
Self-employed	-0.393 (0.335)	0.309 (0.169)	-0.121 (0.372)	0.250 (0.185)
Observations	1456	1456	1306	1306
Log-L	-1139.24		-1018.91	
Pseudo R2	0.062		0.065	

4. The coefficients on the pension characteristics are with respect to the omitted category, an employer DB pension. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
5. Positive coefficients with respect to retiring early (late) indicate a greater likelihood of retiring early (late) relative to stating no change in retirement plans.

6. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 5.1b
Pension type and the retirement decision (the employed only)
The Marginal effects

<i>Regressor</i>	<i>Retire earlier</i> (1)	<i>Retire later</i> (2)	<i>Retire earlier</i> (3)	<i>Retire later</i> (4)
Employer DC	-0.040	0.146	-0.040	0.162
Personal Pension	-0.037	0.101	-0.023	0.106
Log household income	0.009	0.001	0.008	-0.003
Flexible retirement date			-0.041	0.041
Age	-0.001	0.022	0.000	0.019
Intermediate qualification	-0.006	0.039	-0.013	0.039
Degree or professional qualification	-0.023	0.054	-0.023	0.056
Female	0.003	0.039	0.011	0.040
Married	0.022	0.002	0.029	0.004
Own house with mortgage	-0.018	0.034	-0.021	0.043
Renter	-0.027	0.043	-0.021	0.060
Managerial	-0.018	0.016	-0.012	-0.004
Clerical	-0.028	-0.047	-0.022	-0.043
Blue-collar	-0.011	-0.063	-0.012	-0.062
Public sector	0.006	-0.030	-0.001	-0.019
Self-employed	-0.029	0.066	-0.012	0.050
Observations	1456	1456	1306	1306

See notes Table 5a.

TABLE 5.2a
Savings decline and the retirement decision (the employed only)
Dependent Variable: Changes to the planned retirement date

<i>Regressor</i>	<i>Retire earlier</i> (1)	<i>Retire later</i> (2)	<i>Retire earlier</i> (3)	<i>Retire later</i> (4)
Small decline in saving	0.384 (0.263)	0.327 (0.190)	0.423 (0.286)	0.339 (0.202)
Large decline in saving	0.174 (0.240)	0.870 (0.153)*	0.361 (0.261)	0.902 (0.165)*
Log household income	0.143 (0.211)	-0.085 (0.113)	0.048 (0.243)	-0.122 (0.122)
Flexible retirement date			-0.673 (0.245)*	0.251 (0.162)
Age	0.027 (0.028)	0.110 (0.019)*	0.041 (0.029)	0.096 (0.020)*
Intermediate qualification	-0.091 (0.296)	0.229 (0.191)	-0.205 (0.316)	0.227 (0.202)
Degree or professional qualification	-0.266 (0.333)	0.180 (0.197)	-0.286 (0.351)	0.200 (0.209)
Female	0.065 (0.251)	0.385 (0.153)*	0.229 (0.278)	0.365 (0.163)*
Married	0.323 (0.344)	0.081 (0.178)	0.567 (0.381)	0.130 (0.192)
Own house with mortgage	-0.298 (0.215)	0.190 (0.141)	-0.334 (0.232)	0.206 (0.152)
Renter	-0.745 (0.551)	0.177 (0.269)	-0.638 (0.548)	0.230 (0.288)
Managerial	-0.328 (0.285)	0.187 (0.164)	-0.265 (0.307)	0.106 (0.176)
Clerical	-0.583 (0.383)	-0.173 (0.223)	-0.476 (0.408)	-0.163 (0.241)
Blue-collar	-0.428 (0.355)	-0.248 (0.209)	-0.419 (0.387)	-0.213 (0.221)
Public sector	0.271 (0.214)	-0.319 (0.154)*	0.155 (0.231)	-0.258 (0.162)
Self-employed	-0.454 (0.348)	0.472 (0.158)*	-0.080 (0.391)	0.389 (0.177)*
Observations	1438	1438	1284	1284
Log-L	-1128.01		-1001.80	
Pseudo R2	0.071		0.075	

1. The coefficients on the decline in savings are with respect to the omitted categories, no decline in savings or a savings increase. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
2. Positive coefficients with respect to retiring early (late) indicate a greater likelihood of retiring early (late) relative to stating no change in retirement plans.

3. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 5.2b
Savings decline and the retirement decision (the employed only)
The Marginal effects

<i>Regressor</i>	<i>Retire earlier</i> (1)	<i>Retire later</i> (2)	<i>Retire earlier</i> (3)	<i>Retire later</i> (4)
Small decline in saving	0.020	0.058	0.022	0.059
Large decline in saving	-0.005	0.168	0.006	0.171
Log household income	0.011	-0.019	0.005	-0.024
Flexible retirement date			-0.050	0.060
Age	0.000	0.021	0.001	0.018
Intermediate qualification	-0.010	0.047	-0.016	0.048
Degree or professional qualification	-0.020	0.040	-0.021	0.044
Female	-0.003	0.076	0.008	0.069
Married	0.018	0.010	0.029	0.016
Own house with mortgage	-0.023	0.042	-0.025	0.045
Renter	-0.038	0.047	-0.034	0.056
Managerial	-0.023	0.043	-0.018	0.025
Clerical	-0.029	-0.024	-0.024	-0.024
Blue-collar	-0.021	-0.040	-0.021	-0.034
Public sector	0.024	-0.065	0.015	-0.052
Self-employed	-0.033	0.105	-0.012	0.080
Observations	1438	1438	1284	1284

See notes Table 5.2a.

TABLE 5.3a

The decline in savings and the retirement decision (the employed only)

Dependent Variable: Changes to the planned retirement date

<i>Regressor</i>	<i>Retire earlier</i> (1)	<i>Retire later</i> (2)	<i>Retire earlier</i> (3)	<i>Retire later</i> (4)
Decline in savings: 50 percent or more	0.253 (0.444)	1.045 (0.256)*	0.314 (0.482)	1.070 (0.271)*
Decline in savings: 26-50 percent	0.041 (0.302)	0.831 (0.184)*	0.175 (0.324)	0.865 (0.196)*
Decline in savings: 11-25 percent	0.559 (0.272)*	0.650 (0.193)*	0.738 (0.293)*	0.687 (0.206)*
Decline in savings: 5-10 percent	-0.074 (0.355)	0.412 (0.231)	0.014 (0.381)	0.306 (0.247)
Decline in savings: Less than 5 percent	0.093 (0.585)	0.652 (0.350)	0.075 (0.682)	0.587 (0.361)
Log household income	0.152 (0.217)	-0.147 (0.122)	0.085 (0.248)	-0.168 (0.129)
Flexible retirement date			-0.677 (0.254)*	0.247 (0.169)
Age	0.022 (0.028)	0.107 (0.019)*	0.038 (0.030)	0.093 (0.020)*
Intermediate qualification	-0.007 (0.299)	0.347 (0.198)	-0.112 (0.320)	0.366 (0.209)
Degree or professional qualification	-0.305 (0.339)	0.248 (0.206)	-0.294 (0.358)	0.275 (0.218)
Female	0.105 (0.257)	0.342 (0.161)*	0.280 (0.288)	0.335 (0.172)
Married	0.299 (0.346)	0.141 (0.188)	0.569 (0.383)	0.188 (0.201)
Own house with mortgage	-0.258 (0.221)	0.178 (0.147)	-0.290 (0.240)	0.220 (0.157)
Renter	-0.620 (0.548)	0.249 (0.276)	-0.565 (0.548)	0.305 (0.294)
Managerial	-0.418 (0.295)	0.154 (0.169)	-0.336 (0.320)	0.075 (0.180)
Clerical	-0.559 (0.384)	-0.261 (0.235)	-0.388 (0.406)	-0.247 (0.252)
Blue-collar	-0.386 (0.360)	-0.292 (0.220)	-0.340 (0.396)	-0.244 (0.232)
Public sector	0.229 (0.221)	-0.334 (0.159)*	0.099 (0.240)	-0.259 (0.168)
Self-employed	-0.468 (0.355)	0.437 (0.162)*	-0.084 (0.399)	0.376 (0.182)*
Observations	1325	1325	1195	1195
Log-L	-1055.939		-940.769	
Pseudo R2	0.070		0.076	

1. The coefficients on the decline in savings are with respect to the omitted categories, no decline in savings or a savings increase. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are

relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.

2. Positive coefficients with respect to retiring early (late) indicate a greater likelihood of retiring early (late) relative to stating no change in retirement plans.
3. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 5.3b
The decline in savings and the retirement decision (the employed only)
The Marginal effects

<i>Regressor</i>	<i>Retire earlier</i> (1)	<i>Retire later</i> (2)	<i>Retire earlier</i> (3)	<i>Retire later</i> (4)
Decline in savings: 50 percent or more	-0.010	0.232	-0.007	0.236
Decline in savings: 26-50 percent	-0.015	0.177	-0.007	0.181
Decline in savings: 11-25 percent	0.025	0.124	0.037	0.127
Decline in savings: 5-10 percent	-0.013	0.088	-0.005	0.063
Decline in savings: Less than 5 percent	-0.009	0.142	-0.008	0.126
Log household income	0.013	-0.032	0.009	-0.035
Flexible retirement date			-0.052	0.061
Age	-0.001	0.021	0.001	0.018
Intermediate qualification	-0.007	0.071	-0.014	0.076
Degree or professional qualification	-0.025	0.055	-0.024	0.059
Female	0.000	0.068	0.012	0.062
Married	0.016	0.022	0.029	0.027
Own house with mortgage	-0.021	0.040	-0.023	0.048
Renter	-0.036	0.062	-0.033	0.073
Managerial	-0.029	0.039	-0.022	0.021
Clerical	-0.028	-0.041	-0.019	-0.041
Blue-collar	-0.019	-0.049	-0.016	-0.041
Public sector	0.023	-0.069	0.011	-0.052
Self-employed	-0.035	0.100	-0.012	0.079
Observations	1325	1325	1195	1195

See notes Table 5.3a.

TABLE 5.4a

Importance of decrease in savings in retirement decision (the employed only)
 Dependent Variable: How important was change in savings in changing planned
 retirement date

<i>Regressor</i>	(1)	(2)	(3)
Employer DC	-0.504 (0.175)*		
Personal Pension	-0.778 (0.132)*		
Small decline in saving		-0.157 (0.129)	
Large decline in saving		-1.124 (0.123)*	
Decline in savings: 50 percent or more			-1.239 (0.226)*
Decline in savings: 26-50 percent			-1.068 (0.154)*
Decline in savings: 11-25 percent			-0.857 (0.143)*
Decline in savings: 5-10 percent			-0.422 (0.156)*
Decline in savings: Less than 5 percent			-0.268 (0.308)
Log household income	0.162 (0.100)	0.254 (0.096)*	0.281 (0.101)*
Age	-0.022 (0.015)	-0.018 (0.015)	-0.022 (0.015)
Intermediate qualification	-0.101 (0.152)	-0.035 (0.152)	-0.109 (0.157)
Degree or professional qualification	0.191 (0.158)	0.330 (0.156)*	0.260 (0.161)
Female	0.024 (0.123)	-0.014 (0.121)	-0.042 (0.125)
Married	-0.050 (0.156)	-0.060 (0.157)	-0.136 (0.165)
Own house with mortgage	0.014 (0.110)	-0.077 (0.109)	-0.105 (0.113)
Renter	0.522 (0.219)*	0.287 (0.226)	0.302 (0.228)
Managerial	-0.128 (0.137)	-0.170 (0.133)	-0.197 (0.140)
Clerical	0.035 (0.180)	-0.032 (0.179)	-0.067 (0.188)
Blue-collar	0.232 (0.183)	0.107 (0.174)	0.070 (0.182)
Public sector	0.378 (0.124)*	0.519 (0.116)*	0.529 (0.123)*
Self-employed	-0.199 (0.142)	-0.352 (0.132)*	-0.371 (0.133)*

<i>Regressor</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>
Observations	1330	1364	1274
Log-L	-1762.03	-1781.93	-1674.95
Pseudo R2	0.034	0.050	0.046

1. The coefficients on the decline in savings are with respect to the omitted categories, no decline in savings or a savings increase. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
2. Negative coefficients indicate that the change in savings is viewed as being more important in determining the retirement decision.
3. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 5.4b

Importance of decrease in savings in retirement decision (the employed only)
The Marginal effects (on the probability of reporting a 'very important response')

<i>Regressor</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>
Employer DC	0.086		
Personal Pension	0.131		
Small decline in saving		0.026	
Large decline in saving		0.184	
Decline in savings: 50 percent or more			0.257
Decline in savings: 26-50 percent			0.201
Decline in savings: 11-25 percent			0.160
Decline in savings: 5-10 percent			0.075
Decline in savings: Less than 5 percent			0.047
Log household income	-0.025	-0.041	-0.046
Flexible retirement date	0.003	0.003	0.004
Age	0.016	0.006	0.018
Intermediate qualification	-0.029	-0.052	-0.042
Degree or professional qualification	-0.004	0.002	0.007
Female	0.008	0.010	0.021
Married	-0.002	0.012	0.017
Own house with mortgage	-0.069	-0.042	-0.045
Renter	0.020	0.028	0.033
Managerial	-0.005	0.005	0.011
Clerical	-0.034	-0.017	-0.011
Blue-collar	-0.044	-0.039	-0.081
Public sector	0.031	0.060	0.064
Self-employed	-0.035	0.100	-0.012
Observations	1330	1364	1274

See notes Table 5.4a.

TABLE 5.5a

Importance of decrease in savings in retirement decision (the employed only)
 Dependent Variable: How important was change in savings in changing planned
 retirement date

<i>Regressor</i>	(1)	(2)	(3)
Employer DC	-0.504 (0.175)*		
Personal Pension	-0.778 (0.132)*		
Small decline in saving		-0.157 (0.129)	
Large decline in saving		-1.124 (0.123)*	
Decline in savings: 50 percent or more			-1.239 (0.226)*
Decline in savings: 26-50 percent			-1.068 (0.154)*
Decline in savings: 11-25 percent			-0.857 (0.143)*
Decline in savings: 5-10 percent			-0.422 (0.156)*
Decline in savings: Less than 5 percent			-0.268 (0.308)
Log household income	0.162 (0.100)	0.254 (0.096)*	0.281 (0.101)*
Age	-0.022 (0.015)	-0.018 (0.015)	-0.022 (0.015)
Intermediate qualification	-0.101 (0.152)	-0.035 (0.152)	-0.109 (0.157)
Degree or professional qualification	0.191 (0.158)	0.330 (0.156)*	0.260 (0.161)
Female	0.024 (0.123)	-0.014 (0.121)	-0.042 (0.125)
Married	-0.050 (0.156)	-0.060 (0.157)	-0.136 (0.165)
Own house with mortgage	0.014 (0.110)	-0.077 (0.109)	-0.105 (0.113)
Renter	0.522 (0.219)*	0.287 (0.226)	0.302 (0.228)
Managerial	-0.128 (0.137)	-0.170 (0.133)	-0.197 (0.140)
Clerical	0.035 (0.180)	-0.032 (0.179)	-0.067 (0.188)
Blue-collar	0.232 (0.183)	0.107 (0.174)	0.070 (0.182)
Public sector	0.378 (0.124)*	0.519 (0.116)*	0.529 (0.123)*
Self-employed	-0.199 (0.142)	-0.352 (0.132)*	-0.371 (0.133)*

<i>Regressor</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>
Observations	1330	1364	1274
Log-L	-1762.03	-1781.93	-1674.95
Pseudo R2	0.034	0.050	0.046

4. The coefficients on the decline in savings are with respect to the omitted categories, no decline in savings or a savings increase. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
5. Negative coefficients indicate that the change in savings is viewed as being more important in determining the retirement decision.
6. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 5.5b

Importance of decrease in savings in retirement decision (the employed only)
The Marginal effects (on the probability of reporting a 'very important response')

<i>Regressor</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>
Employer DC	0.086		
Personal Pension	0.131		
Small decline in saving		0.026	
Large decline in saving		0.184	
Decline in savings: 50 percent or more			0.257
Decline in savings: 26-50 percent			0.201
Decline in savings: 11-25 percent			0.160
Decline in savings: 5-10 percent			0.075
Decline in savings: Less than 5 percent			0.047
Log household income	-0.025	-0.041	-0.046
Flexible retirement date	0.003	0.003	0.004
Age	0.016	0.006	0.018
Intermediate qualification	-0.029	-0.052	-0.042
Degree or professional qualification	-0.004	0.002	0.007
Female	0.008	0.010	0.021
Married	-0.002	0.012	0.017
Own house with mortgage	-0.069	-0.042	-0.045
Renter	0.020	0.028	0.033
Managerial	-0.005	0.005	0.011
Clerical	-0.034	-0.017	-0.011
Blue-collar	-0.044	-0.039	-0.081
Public sector	0.031	0.060	0.064
Self-employed	-0.035	0.100	-0.012
Observations	1330	1364	1274

See notes Table 5.5a.

6 How have people adjusted their investments in equities?

In this section, we examine individuals' adjustment of equity investments in response to what was for many an unanticipated decline in markets. Theory makes no definitive predictions about how individuals respond to a decline in the value of their investments. Even in the absence of labour market risks and where there are no issues such as loss aversion (see Appendix B), the evolution of portfolio shares depends not just on risk aversion and intertemporal elasticities of substitution but also views individuals have about how the equity premium will evolve.

Subsequent to asking people how the value of their savings had changed in the last three years we asked respondents how they had revised their equity investments in the last year.¹⁹ The question took the form:

"Overall, have you increased or decreased the amounts you have invested in equities or equity products over the past 12 months?"

Responses were categorised by whether the investment in equities had increased, decreased or stayed the same. Following this question we asked those who had increased or decreased their investment in equities, how much more (less) they had invested into equities in the last 12 months, compared to the previous 12 months. Responses were either substantially more (less), or slightly more (less).²⁰

We first examine whether individuals equity allocations have been revised according to the change in the value of savings. Figure 1 provides a simple examination, and presents the change in equities for each of the change in the savings categories. A general pattern emerges, as we observe a greater decline in savings we also observe a smaller numbers increasing their equity investments, or leaving their

¹⁹ This question is asked only of those with equity investments, so we may underestimate downward movements in equity holding if investors withdraw from equities.

²⁰ We allowed an additional category where, despite they had stated in the earlier question they had increased (decreased) their equity investments, they could respond that their investment into equities products was about the same. We treat these cases as if their equity allocation has not changed.

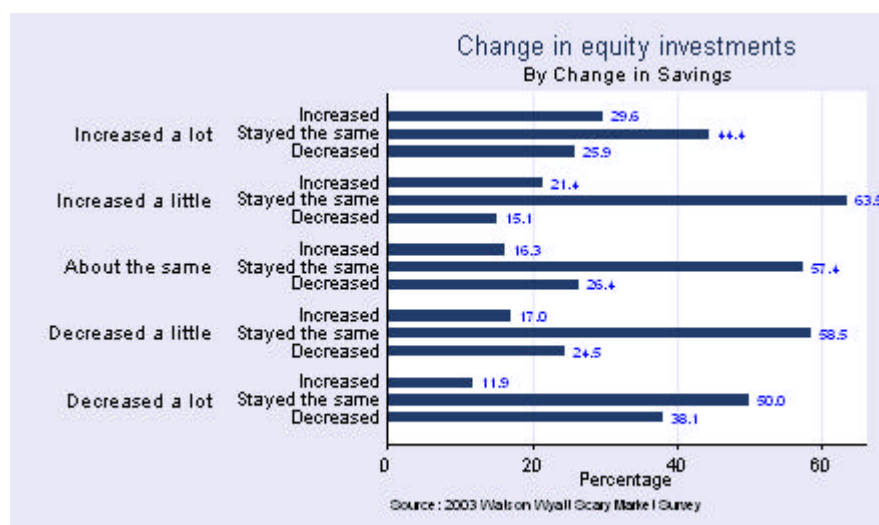
investments unchanged, and more cases where individuals are reducing their equity exposure.²¹

An important issue is how individuals understood the question. One interpretation could have been in terms of the number of shares held. On the other hand, another interpretation is that equity allocation is the percentage of the portfolio. Both interpretations are consistent with the large number of people saying their equity allocation had stayed the same but in the first case equity portfolio shares have fallen whereas in the second case they have not.

²¹ When we examined a similar Figure by pension characteristics we found that those respondents whose main retirement income was a DC pension were simultaneously more likely to have increased *and* decreased their equity investment, and less likely to have left it unaltered. The differences were not, however, statistically robust.

FIGURE 6.1

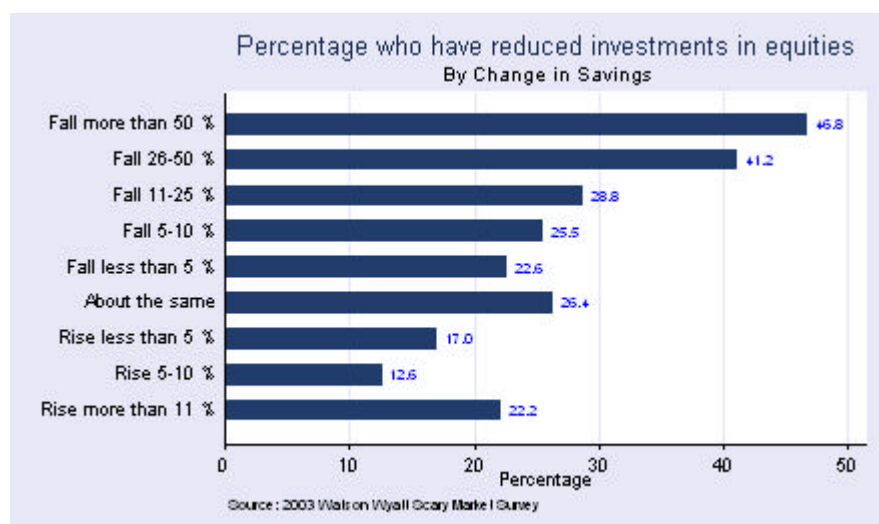
The change in equity investment by the change in the value of savings



An alternative view is presented in Figure 2, where we examine what proportion of individuals are reducing their equity investments for the amount of savings change. Again larger losses are, generally, associated with an increased likelihood of having reduced equity investments.

FIGURE 6.2

The proportion reducing their equity investment by the change in the value of savings



Unfortunately we do not know the reasons for which people are reducing or increasing their equity investments. A decrease in investment may simply be due to the dependence of relative risk aversion on wealth or other portfolio balancing effects

in response to a change in the ratio of financial wealth to human capital wealth. An increase in equity investment could also be a conscious decision to buy when the market is low, or be driven by a desire to top-up ones falling savings. The decision to hold-on may similarly be driven by an expectation of future gains, or by some form of regret or loss aversion (Kahneman and Tversky, 1979) which prevents individuals from revising losses. Those individuals who are reducing their asset allocation may feel there are superior investments elsewhere, or may make a less rational decision that they have simply have 'had-enough'.

Regression models, echoing the basic intuition of Figures 6.1 and 6.2, are reported in Table 6.1a. We examine the second form of question, regarding how much equity investment has changed, where responses are scaled, substantial decrease, slight decrease, stayed the same, slight increase, substantial increase. Responses are scaled 1 to 5 and are estimated by the ordered logit technique. Positive coefficients indicate an increased likelihood of investing in equities, negative coefficients an increased likelihood of reducing equity investment. The associated marginal effects, on reporting a substantial decline in the degree of equity investment, are reported in Table 6.1b.

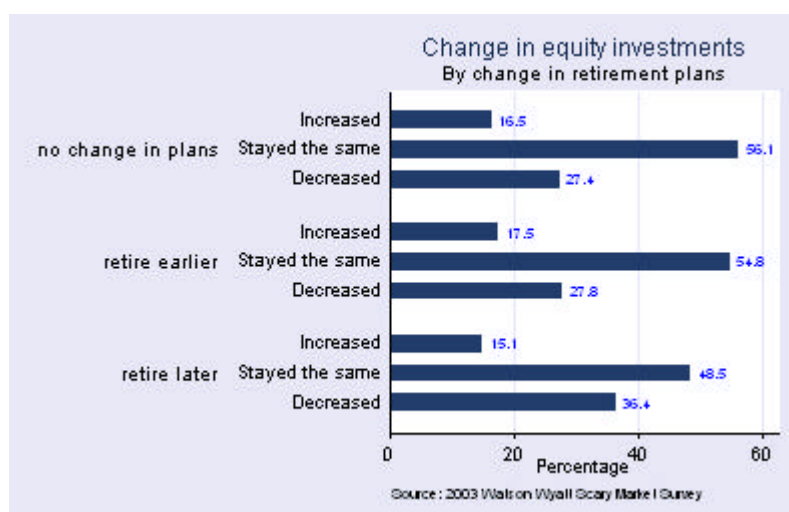
In columns one and two, of Table 6.1a, we can see that those individuals who report declines in the values of their savings are more likely to respond that they are reducing their investments in equities, relative to those whose savings have not declined. In both columns, coefficients are statistically well determined. From Table 6.1b, the estimated increase in the probability of reporting a substantial decrease in investment in equities is 15.2 percent for those who report a large decline in saving, and 6.4 percent for those who report a small decline in savings (compared to those with no decline in saving). Similarly, for those who savings declined by more than 50 percent the Figure is 23.8 percent, and for those whose decline in savings was between 26 and 50 percent the marginal effect is 19.4 percent. Females are also observed to be statistically significantly more likely to reduce their equity investments, other things being equal, with a marginal effect of around 7 percent.

We next turn to the question as to whether those who are now planning to retire later are also revising their equity investments. Given a change in time horizon to retire later, for instance, individuals may in some circumstances be willing to tolerate more exposure to risk and therefore equity. At a first blush Figure 6.3 suggests that those who plan to retire earlier and those who do not plan to change their

retirement date, on average, respond very similarly to the question regarding the change in equity. Indeed, we cannot reject the null that responses are the same for both categories (where we use a Pearson χ^2 test). We do, however, find evidence that those who now plan to retire later are more likely to be decreasing their equity investments.

FIGURE 6.3

The proportion reducing their equity investment by the change in retirement plans



In Column three, of Table 6.1a, we enter controls for retirement plans into the change in equity equation, and now restrict attention to those currently employed. Conforming to the preceding discussion, those who plan to retire later are found not to respond statistically differently from those whose plans have not changed (the omitted base category). For those who now plan to retire later, by contrast, we observe a statistically robust negative effect. That is, from Table 6.1b, those who plan to retire later are 6.4 percent more likely to be reducing their equity investments. Nevertheless, when we also control for the size of losses, this effect is severely attenuated and no longer statistically significantly different from zero. It is not then clear whether the observed correlation between delaying retirement and reducing equity investment is a direct effect, or rather a indirect result of those who face large losses simultaneously working longer and investing less in equities. The limited evidence here suggests the later.

TABLE 6.1a

The change in equity investment and the decline in savings
 Dependent Variable: The change in the amount invested in equities

<i>Regressor</i>	<i>EMPLOYED EMPLOYED</i>			
	(1)	(2)	(3)	(4)
Small decline in saving	-0.346 (0.151)*			
Large decline in saving	-0.910 (0.127)*			
Decline in savings: 50 percent or more		-1.113 (0.210)*		-1.135 (0.278)*
Decline in savings: 26-50 percent		-1.006 (0.144)*		-0.918 (0.187)*
Decline in savings: 11-25 percent		-0.512 (0.150)*		-0.509 (0.200)*
Decline in savings: 5-10 percent		-0.545 (0.178)*		-0.740 (0.232)*
Decline in savings: Less than 5 percent		-0.386 (0.291)		-0.427 (0.437)
Now plan to retire earlier			0.011 (0.197)	0.120 (0.216)
Now plan to retire later			-0.356 (0.145)*	-0.109 (0.155)
Log household income	0.040 (0.090)	0.070 (0.093)	-0.003 (0.103)	0.004 (0.117)
Age	-0.008 (0.015)	-0.005 (0.015)	-0.001 (0.018)	0.000 (0.020)
Intermediate qualification	-0.277 (0.161)	-0.236 (0.163)	-0.435 (0.198)*	-0.535 (0.217)*
Degree or professional qualification	-0.299 (0.165)	-0.281 (0.167)	-0.531 (0.200)*	-0.556 (0.221)*
Female	-0.408 (0.120)*	-0.414 (0.123)*	-0.350 (0.143)*	-0.375 (0.155)*
Married	-0.113 (0.142)	-0.171 (0.145)	0.080 (0.167)	-0.077 (0.188)
Own house with mortgage	-0.039 (0.106)	-0.018 (0.107)	-0.029 (0.126)	0.023 (0.137)
Renter	0.225 (0.289)	0.171 (0.295)	0.139 (0.281)	0.090 (0.330)
Managerial	-0.133 (0.125)	-0.114 (0.129)	-0.340 (0.156)*	-0.371 (0.168)*
Clerical	0.348 (0.176)*	0.341 (0.179)	0.379 (0.197)	0.486 (0.221)*
Blue-collar	-0.045 (0.160)	-0.016 (0.163)	-0.167 (0.191)	-0.317 (0.209)
Public sector	0.139 (0.109)	0.115 (0.112)	0.095 (0.136)	0.059 (0.149)
Retired	0.071 (0.131)	0.062 (0.133)		

<i>Regressor</i>	<i>EMPLOYED EMPLOYED</i>			
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
Observations	1669	1598	1133	942
Log-L	-1804.43	-1740.16	-1233.76	-1023.79
Pseudo R2	0.029	0.030	0.020	0.038

7. The coefficients on the decline in savings are with respect to the omitted categories, no decline in savings or a savings increase. The coefficients with respect to education are with respect to the omitted base of a lower qualification. Housing tenure dummies are relative to owning house outright. The default occupational category (current or last job) is that of a professional worker, who is currently employed. All regressions also include controls for region.
8. Standard errors are in parentheses and are robust to arbitrary heteroscedasticity. A star (*) denotes coefficients that are statistically significantly different from zero at the 5 percent confidence level.

TABLE 6.1b

The change in equity investment and the decline in savings
The Marginal effects (on the probability of reporting a 'substantial decline' in investment)

<i>Regressor</i>	(1)	(2)	(3)	(4)
Small decline in saving	0.064			
Large decline in saving	0.152			
Decline in savings: 50 percent or more		0.238		0.242
Decline in savings: 26-50 percent		0.194		0.177
Decline in savings: 11-25 percent		0.096		0.096
Decline in savings: 5-10 percent		0.106		0.148
Decline in savings: Less than 5 percent		0.074		0.083
Now plan to retire earlier			-0.002	-0.020
Now plan to retire later			0.064	0.019
Log household income	-0.007	-0.012	0.001	-0.001
Age	0.001	0.001	0.000	0.000
Intermediate qualification	0.050	0.043	0.078	0.099
Degree or professional qualification	0.052	0.049	0.091	0.096
Female	0.075	0.077	0.063	0.069
Married	0.019	0.029	-0.014	0.013
Own house with mortgage	0.007	0.003	0.005	-0.004
Renter	-0.037	-0.029	-0.023	-0.015
Managerial	0.024	0.020	0.061	0.068
Clerical	-0.056	-0.055	-0.060	-0.076
Blue-collar	0.008	0.003	0.029	0.058
Public sector	-0.024	-0.020	-0.016	-0.010
Retired	-0.012	-0.011		
Observations	1669	1598	1133	942

See notes Table 6.1a.

7 Conclusions

In this paper, we have examined the response of older workers in the U.K. to declines in equity markets. The bear market from the end of 1999 to the end of 2002 is the first time in which significant volumes of retirement savings were at risk in equity markets. The euphoria of the late 1990s was such that this decline or at least its scale was probably not anticipated by most investors. The experience of the past few years is hence a natural experiment to examine the response of older workers to changes in their private retirement wealth.

We reviewed results from Watson Wyatt commissioned survey of 4500 individuals in the U.K. aged 50-64. We first looked at who lost the most in the stock market. Some 48.6 percent of individuals said their savings have 'declined a lot', and some 20.1 percent that they have 'declined a little'. The effects were very broad-based, with only a few correlates predicting the scale of loss. Indeed, We also find that individuals who have more control over their retirement date are no more likely to have been more exposed to the equity market which is contrast to predictions about asset allocation in Bodie, Merton and Samuelson (1992).

We then examined retirement plans. We found that 25 % of older working individuals are now planning to retire later than they had planned 2 years ago and that there is a strong positive relationship between those delaying retirement and those most affected by the stock market decline. On the other hand, for those individuals who have already retired, there appears little correlation between the degree of loss and the likelihood of returning to work, providing support for theories in which the retirement decision is modelled as irreversible.

We find also that individuals who report declines in the values of their savings are more likely to reduce equity exposure. Females are also observed to be statistically significantly more likely to reduce their equity investments. Those who have decided to delay retirement are also more likely to reduce their equity investments, though this effect basically disappears if the size of losses is taken into account.

Overall, our analysis provides some surprisingly support for continued research attention to the issues raised in Bodie, Merton and Samuelson (1992). Roughly 25% of the older population is delaying retirement in response to changes in the stock market – and this is in Britain where defined contribution is not the dominant form of private provision and even these funds have largely only built up since 1988. On the other hand, the degree to which individuals do not have choice in practice over their retirement age means the model is not fully applicable to a large section of the population. The fact that individuals without flexible retirement ages seem to have been more exposed to the stock market is also a result which seems at odds with the predictions in Bodie, Merton and Samuelson (1992). The results also provide support for the idea that retirement is a largely irreversible decision as in models such as (Stock and Wise 1990).

8 Appendix A: The Questionnaire

The following is a list of questions in the survey:

Background information

1. Age
2. Gender
3. Marital status
4. What is your current employment status?
5. Are you currently self-employed?
6. What year did you retire from your main job?
7. How old is your spouse/partner?
8. What is the current employment status of your spouse/partner?
9. Approximately, how long has your spouse/partner been retired from their main job?

Pensions information

1. Is your spouse/partner receiving income from an annuity?
2. Are you currently receiving income from an annuity?
3. How many PRIVATE pensions, if any, are you currently a member of?
4. Which types of PRIVATE pension are you currently a member of?
5. Which describes the PRIVATE pension you expect to provide, or if already retired does provide, you with MOST income during your retirement?
6. Were you affected by pension mis-selling in the 1990s?

Savings questions

1. Thinking of all moneys you had set aside as savings before 2000 (e.g. pensions, bonds, ISA's, stocks and shares) have they increased or decreased in value over the last 3 years?
2. By approximately how much have all the moneys you had set aside as savings before 2000 increased or decreased in the last 3 years?
3. Do you have any investments in equities or equity products (e.g. stock, shares, Maxi-ISAs, fund investments)?
4. Overall, have you increased or decreased the amounts you have invested in equities or equity products (stocks, shares, Maxi-ISAs, fund investments) over the past 12 months?
5. How much MORE/LESS have you invested into equities and/or equity products in the last 12 months than in the 12 months prior to this?

Retirement questions

1. Decision to retire, forced or voluntary?
2. Considering returning to work?
3. If you return to work, for approximately what length of time would you anticipate working?
4. How important has the decrease in the value of your savings been to your decision to return to work?
5. Have you been offered redundancy or early retirement since January 2000?
6. Have you accepted any redundancy or early retirement since January 2000?

7. In your current job, can you choose to work past the age of retirement?
8. Have you changed the age at which plan to retire within the past 2 years?
9. Thinking of all the moneys you had set aside as savings before 2000, how important has the change in the value of these savings been to your decision to change the age at which you plan to retire?

Economic conditions and income

1. Do you think your company or organisation has weathered the economic downturn well or badly?
2. Thinking of your company or organisation as a whole, has it downsized its workforce in the last 12 months?
3. Thinking about your place of work, and how things will develop over the next 12 months, do you expect the number of people employed there to go up, down or stay about the same?
4. Has your income from work (pay and bonuses) increased, decreased or stayed about the same over the past 12 months?
5. For which reasons do you think your income has decreased in the past 12 months?
6. By how much has your income from work (pay and bonuses) decreased/increased in the last 12 months?
7. If you add up the income from all sources, do you know what is your household's total gross income per year?

Other demographic and background data

1. Housing tenure
2. Region
3. Economic class (current or last main job)
4. Spouse's economic class (current or last main job)
5. Household size
6. Number of children in household less than 18
7. Religion
8. Race
9. Sector of employment (current or last main job)
10. Highest educational qualification

9 Appendix B: Loss aversion and regret theory

The model of loss aversion first developed by (Kahneman and Tversky 1979) suggests the disutility of giving up an object is greater than the utility associated with acquiring it. Simply put, changes that make things worse (losses) loom larger in the mind than do gains.

(Kahneman, Knetsch et al. 1986) show an implication of the model is that people treat opportunity costs differently than out-of-pocket expenses, foregone gains are less painful than perceived losses, and this perception is manifested in people's judgements about fairness. (Perceptions of fairness strongly depended on whether the question was framed as a reduction in a gain or an actual loss.) Whilst (Kahneman, Knetsch et al. 1991) discuss the endowment effect, where the value of a good increases when it becomes a part of a persons endowment, i.e. the person demands more to give up an object than they would be willing to pay to acquire it.

Human beings seem to have a powerful instinct against sustaining losses, and this also seems to apply to losses in the stock market. It may explain why many investors hold onto stocks that have fallen, waiting for an appreciation, victims of what has been called "get-evenitis."

The fact that people hate losses has been proved widely in a variety of settings. In 1998, Terrence Odean studied 163,000 customer accounts at Charles Schwab (Odean 1998). He found that investors are 68 percent more likely to sell a stock that has gone up rather than a stock that has gone down. These investors demonstrate a strong preference for realising winners rather than losers. Their behaviour does not appear to be motivated by a desire to rebalance portfolios, or to avoid the higher trading costs of low price stocks. Nor is it justified by subsequent portfolio performance. For taxable investments it is non-optimal and leads to lower after-tax returns.

Regret theory, independently proposed by (Bell 1982) and (Loomes and Sugden 1982), is another psychological model that assumes agents do not only care about

payoffs. The theory suggests some people have regrets when they see that their decisions turn out to be wrong, even if they appeared correct with the information available *ex-ante*.

In contrast to loss aversion, which assumes a person compares her wellbeing relative to the past, in regret theory the comparison point is not fixed *ex-ante* but rather depends on the future state of the world. So, the main assumption of regret theory is that people after making their decisions under uncertainty may have regrets if their decisions turn out to be wrong.

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