# BETTER PREPARED FOR RETIREMENT? USING PANEL DATA TO IMPROVE WEALTH ESTIMATES OF ELSA RESPONDENTS

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WP12/07

# Better prepared for retirement? Using panel data to improve wealth estimates of ELSA respondents[1]

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**August 2007**

## Abstract

We compare the key assumptions underpinning estimates of the pension wealth of ELSA respondents to outcomes over the period from 2002–03 to 2004–05. We find that many of these assumptions have, on average, proved cautious or reasonable. Improving pension wealth calculations using this new evidence makes little difference to the distribution of pension wealth. Previous estimates of retirement resources also considered net financial, physical and housing wealth. Particularly cautious, ex-post, was the assumption that net housing wealth would remain constant in real terms. We find that average housing wealth has risen by almost 40% in nominal terms over just two years, which is in line with growth in the Nationwide House Price Index. This large increase in house prices boosts estimates of total wealth across the entire distribution of wealth. Previous research showed that once half of current net housing wealth was included as a retirement resource 12.6% of employees approaching retirement were estimated to have resources below the Pensions Commission's definition of adequacy. We show that taking into account the high growth in house prices between 2002–03 and 2004–05 reduces this to 10.9%, and that it would fall by a further 1.2 percentage points if house prices were to grow by 2½% a year in real terms in the future.

## 1. Introduction

The 2002–03 English Longitudinal Study of Ageing (ELSA) allowed estimates of the distribution of pension wealth of those currently approaching retirement in England to be produced for the first time.[2] The distribution of pension wealth – and the extent to which it correlates with non-pension wealth – is crucial for policy design concerned with the adequacy, or otherwise, of retirement provision. Estimates of the distribution of retirement resources among those aged between 50 and the State Pension Age (SPA) using ELSA has informed the UK Government's recent Pensions White Paper.[3]

Calculating pension wealth at retirement for individuals who are still in paid work requires various assumptions to be made. These were described in detail in Banks, Emmerson and Tetlow (2005). Furthermore, in order to examine the extent to which future pensioners' resources will be adequate, assumptions also have to be made about individuals' future non-pension wealth (discussed in Banks, Emmerson, Oldfield and Tetlow, 2005). The assumptions were chosen so that, at least on average, they would be expected to be more likely to lead to an underestimate rather than an overestimate of individual's retirement resources. This was done so that the estimates were cautious in the sense of trying to avoid understating the extent to which any lack of preparedness for retirement among this group should be a concern for policymakers.

This paper uses evidence now available on differences between individuals' responses to the 2002–03 and the 2004–05 waves of ELSA to document the extent to which the assumptions made were – with the benefit of hindsight – cautious, reasonable or optimistic in terms of the amount of retirement resources that these individuals had accumulated. The assumptions we focus on relate to future earnings growth, future growth in defined contribution pension funds and future real growth in net housing wealth. In light of this new evidence we present new pension wealth estimates under revised assumptions. Estimates of net housing, financial and physical wealth are also updated using revised assumptions.

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[2] For details of ELSA see, for wave 1, Marmot, *et al*. (2002) and, for wave 2, Banks, *et al*, (2006). The microdata from both waves, and from the pension wealth calculations, are available from the ESRC data archive (Marmot, *et al*, 2005).

[3] Banks, Emmerson, Oldfield and Tetlow (2005) document the distribution of both pension wealth and total wealth and the extent to which it correlates with other observed characteristics. They also present estimates of the number of individuals falling below typically used 'adequacy' benchmarks. Pensions Commission (2004 and 2005) used evidence from ELSA in part to inform their calculations of the extent to which individuals have inadequate retirement resources. The recent Pensions White Paper (2006) draws on both of these analyses and additional calculations published in Emmerson and Tetlow (2006a).

Specifically, rather than provide estimates of wealth of ELSA respondents in 2004–05 (which would be of interest but to the extent that stocks of wealth are relatively stable over time might be expected to be little changed from estimated wealth in 2002–03), this paper sets out estimates of the wealth of ELSA respondents in 2002–03 under improved assumptions and compares these to the estimates produced under the previous assumptions.

Previous work has also shown how sensitive estimates of the number of individuals whose retirement resources appear to be 'inadequate' are to the broadness of the measure of wealth that is used (Banks, Emmerson, Oldfield and Tetlow, 2005). This paper updates these estimates of the numbers at risk for a narrow measure of retirement resources (comprising just pension wealth) and also for a broader measure that, in particular, incorporates half of current net housing wealth.

We show that many of the assumptions made in the computation of pension wealth were either cautious or reasonable, in the sense that they still appear to be accurate reflection of, or at least do not appear to have overstated, individual's preparedness for retirement. In particular the assumption of no real earnings growth was cautious for those aged 50–54, since among this group nominal earnings growth was, on average, nearly 11% over the two year period compared to growth in the Retail Price Index of 6.1%.[4] For those aged between 55 and the SPA the assumption of no real earnings growth appears to have been, at least on average, reasonable. For contributions to defined contribution pensions the evidence suggests that our assumption that contributions would be flat as a share of earnings does not seem unreasonable: over the two year period median nominal earnings growth was 9.1% whereas median growth in nominal contributions to defined contribution pensions was 8.5%. The one assumption underpinning the pension wealth calculations that, ex-post, was optimistic concerns growth in defined contribution pension fund values. It had been assumed that these would grow by 2½% per year in real terms. In fact we find that the median difference in reported underlying fund value was a nominal fall of nearly 3% over the two year period.

For the purposes of estimating total wealth at retirement, assumptions were also required for the growth in net financial, physical and housing wealth. As with pension wealth the intention was that these assumptions would be expected to be cautious so that individuals potential retirement resources more likely to be underestimated than overestimated. We assumed that these would stay constant in real terms – i.e. that there would be no real increase in the underlying value of the assets and no new flows of saving or mortgage repayment. On average, ex-post, these assumptions were indeed cautious – especially so in the case of

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[4] Growth from 2002Q3 to 2004Q3, source: http://www.statistics.gov.uk/rpi

housing wealth, as the vast majority of homeowners are found to have benefited from the growth in house prices over this two year period. This is particularly important as around five-in-six individuals aged between 50 and the SPA in England are homeowners.

Across our whole sample the total stock of net financial and physical wealth grew by 7½%, between 2002 and 2004 although there was considerable variation in this growth across individuals. In any case for the majority of individuals net financial and physical wealth is relatively small: the median increase in net financial and physical wealth was just £100 which, if annuitised at a rate of 5%, would add just 10p per week to retirement incomes. More significant has been the considerable growth in housing wealth between 2002–03 and 2004–05. The median increase in nominal net housing wealth among homeowners was almost 40%. This is a substantial amount of wealth: among those with some housing wealth the median increase over the two year period was £50,000 (which, at an assumed home reversion rate of 2½% would be equivalent to an income of just under £25 per week). We also find that among individuals with some housing wealth there was little variation in the increase occurring over the two years: among this group nearly half experienced an increase in net housing wealth of between 10% and 60% over the two year period, and very few reported that their housing wealth in 2004–05 was less than 10% larger than what they had reported in 2002–03.

The evidence on the accuracy or otherwise of the key assumptions underpinning the pension wealth calculations are presented in section 2. Similar analysis in section 3 looks at the assumptions underpinning growth in housing wealth (section 3.1) and net financial and physical wealth (section 3.2). This evidence is then used to inform improvements to the assumptions. The assumptions which have been revised are set out in Table 1.1, along with the relevant section of this paper that describes the evidence from the ELSA survey behind this judgement.

Two changes have been made which affect the estimates of future individual pension wealth. First, rather than assume no real future earnings growth, we now assume that between ages 50 to 54 individuals receive real earnings growth of 2½% year, while at older ages we leave our assumption of no real earnings growth unchanged. Second we assume that wealth held in defined contribution private pensions will fall by 5% in real terms per year between 2002–03 and 2004–05 before growing at 2½% a year thereafter. This is because, while (ex-post) our previous assumption that these funds would grow at 2½% in real terms each year has proven optimistic over the period from 2002–03 to 2004–05, we do not believe this is sufficient reason to believe that (ex-ante) our assumption was (or, going forwards, is) the wrong one to take. The assumption that future contributions to defined contribution pensions will remain flat as a share of earnings remains unchanged.

One change has been made which affects non-pension wealth, in particular net housing wealth. The previous assumption regarding net housing wealth was that it would remain constant in real terms in the future. Ex-post our assumption has proven particularly cautious over the period from 2002–03 to 2004–05. However, this does not mean that it would necessarily be appropriate to assume higher growth in housing wealth going forwards. Hence we assume that net housing wealth grows by 30% in real terms over the period from 2002–03 to 2004–05 but that it will remain constant in real terms thereafter. For net financial and physical wealth we leave our assumption of no real growth unchanged.

**Table 1.1. Previous and revised key assumptions for the calculation of retirement resources.**

|  | Previous assumption | Revised assumption | Section |
|---|---|---|---|
| **Pension wealth estimates** |  |  |  |
| Future real earnings growth | No real earnings growth | 2½% per year for 50–54 year olds, no real earnings growth for those aged 55–SPA | 2.1 |
| Future DC contributions | Constant share of earnings | Constant share of earnings | 2.2 |
| Real return on DC pension funds | 2½% real growth per year | 5% decline per year from 2002–03 to 2004–05, 2½% growth per year thereafter | 2.3 |
| **Non-pension wealth estimates** |  |  |  |
| Real net housing wealth | No real growth | 30% real increase over 2 year period from 2002–03 and 2004–05, no real growth thereafter | 3.1 |
| Real net financial and physical wealth | No real growth | No real growth | 3.2 |

Using these revised assumptions we then calculate revised estimates for the distribution of both pension wealth and of total wealth. These are described in sections 4.1 and 4.2 respectively. We find that while the distribution of pension wealth is little changed as a result of the improvements to the underlying assumptions, the high growth in house prices boosts estimates of total wealth across the entire distribution of wealth. We then estimate the percentage of individuals whose retirement resources fall below the adequacy benchmark set out in Pensions Commission (2004). As shown in section 4.3 the improved assumptions have little impact on the numbers estimated to have 'inadequate' retirement resources when looking solely at pension wealth. However when a broader measure of retirement resources is considered (which includes half of current net housing wealth) we find that the percentage estimated to have resources below the Pensions Commission's definition of adequacy is reduced from 12.6% to 10.9%. We also document the sensitivity of this estimate to both future growth in house prices and the proportion of housing wealth used for non- housing consumption. Section 5 concludes.

## 2. Components of pension wealth

This section compares some of the key assumptions underpinning estimates of pension wealth for ELSA respondents to what occurred over the period from 2002–03 to 2004–05. As our principle interest in this section is looking at differences in individuals' responses to the 2002–03 and the 2004–05 waves of ELSA, the figures presented in this section cover only those individuals who gave a precise answer to the relevant question. In other words, we exclude those individuals who gave a banded answer to, for example, the question about their gross earnings.

Section 2.1 looks at growth in earnings, section 2.2 looks at growth in contributions to defined contribution pensions and section 2.3 looks at growth in the underlying value of defined contribution pension funds.

### 2.1. Earnings

Across all those in paid work aged between 50 and the SPA (and reporting a precise value for their gross earnings), median earnings were just over £15,000 in 2002–03. Analysis of the differences in reported earnings (or indeed other characteristics) is, of course, only possible for those who did not die or leave the sample for other reasons. Therefore, Figure 2.1 shows how median earnings in 2002–03 (as well as the mean, and $25^{th}$ & $75^{th}$ percentiles) varied between different groups. On average those who died before the $2^{nd}$ wave interview received lower levels of earnings in 2002–03 than those who did not die, while those who survived but attrited from the sample received slightly lower earnings than those who survived and remained in the sample. Among those who remained in the sample it is also the case that those who remained in paid work received, on average, higher earnings in the first wave than those who subsequently left paid work.
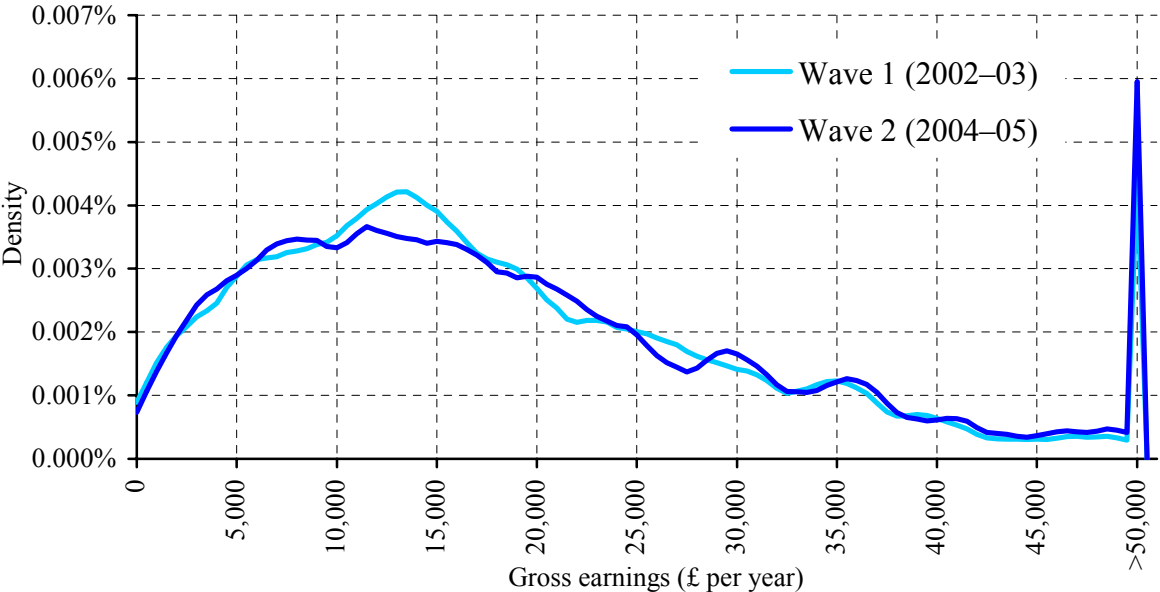
Figure 2.2a shows the distribution, and Figure 2.2b the cumulative distribution, of gross earnings in 2002–03 and 2004–05, among those aged between 50 and the SPA who provided a precise positive value for earnings in both waves. It is clear that the distribution of earnings was in fact very similar in these two years, although (if anything) slightly greater in 2004–05 than in 2002–03.

**Figure 2.1. Distribution of earnings in wave 1 (2002–03) by what happens later, those aged between 50 and the SPA in 2002–03 only.**
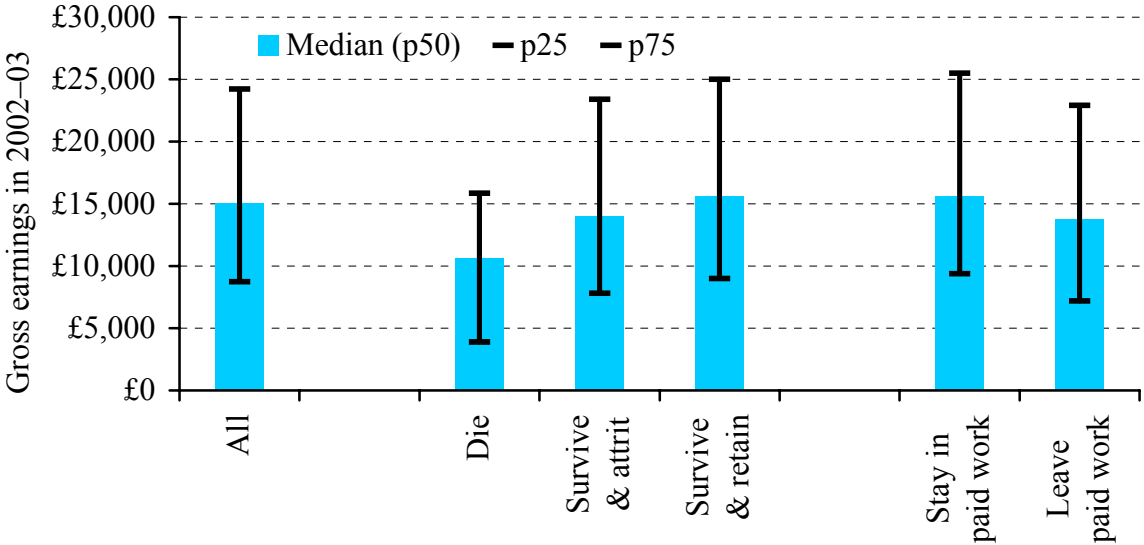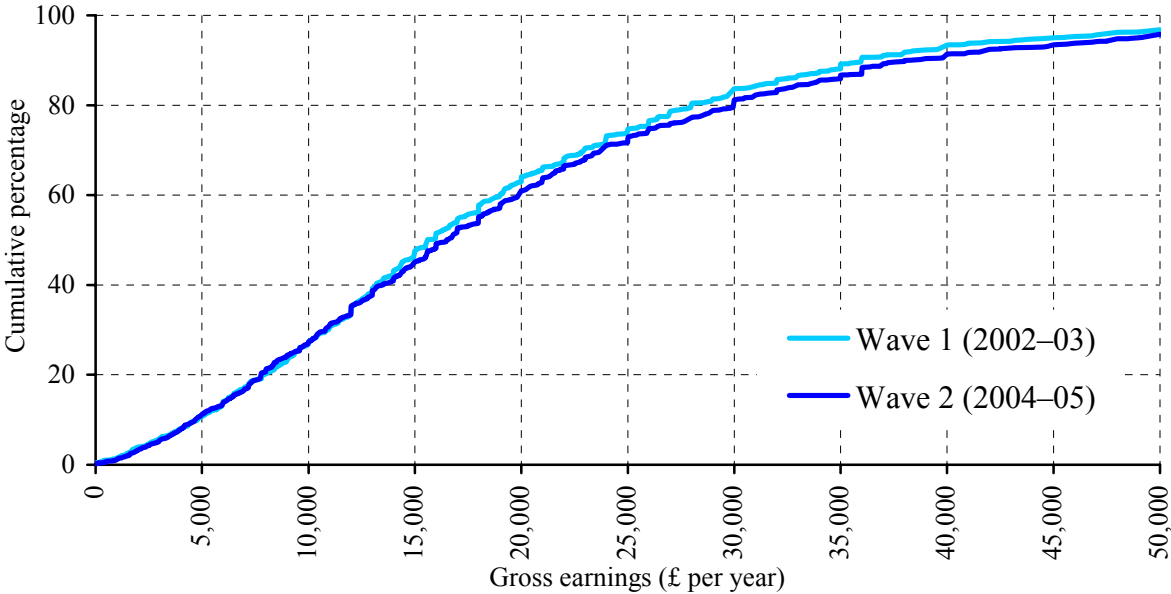


Notes: Those aged between 50 and the SPA who report a precise value for gross earnings in 2002–03 only. Underlying data, and sample sizes, are contained in Table A.1. Unweighted.

**Figure 2.2a. Distribution of earnings in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 1,761 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their gross earnings in both waves. The density functions are estimated using an Epanechnikov kernel with a band width of £1,000, with all values in excess of £50,000 set to £50,000. Unweighted.

**Figure 2.2b. Cumulative distribution of earnings in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 1,761 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their gross earnings in both waves. Unweighted.

This is confirmed by looking at the distribution of the difference in reported earnings between these two years. Figure 2.3 shows that nearly one-quarter (24.1%) of individuals who reported a precise value for their earnings in both waves experienced nominal growth in earnings of between 0% and 10%, with nearly a further one-third (31.1%) experiencing an increase of between 10% and 30%. The average increase varies by age but not by sex. Table 2.1 shows that the median increase in gross earnings was higher for those aged between 50 and 54 (10.6% over the two year period in nominal terms), and lower for older individuals (7.4% among those aged between 55 and 59 and 1.9% among men aged between 60 and 64).

**Figure 2.3. Distribution of nominal change in reported earnings in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
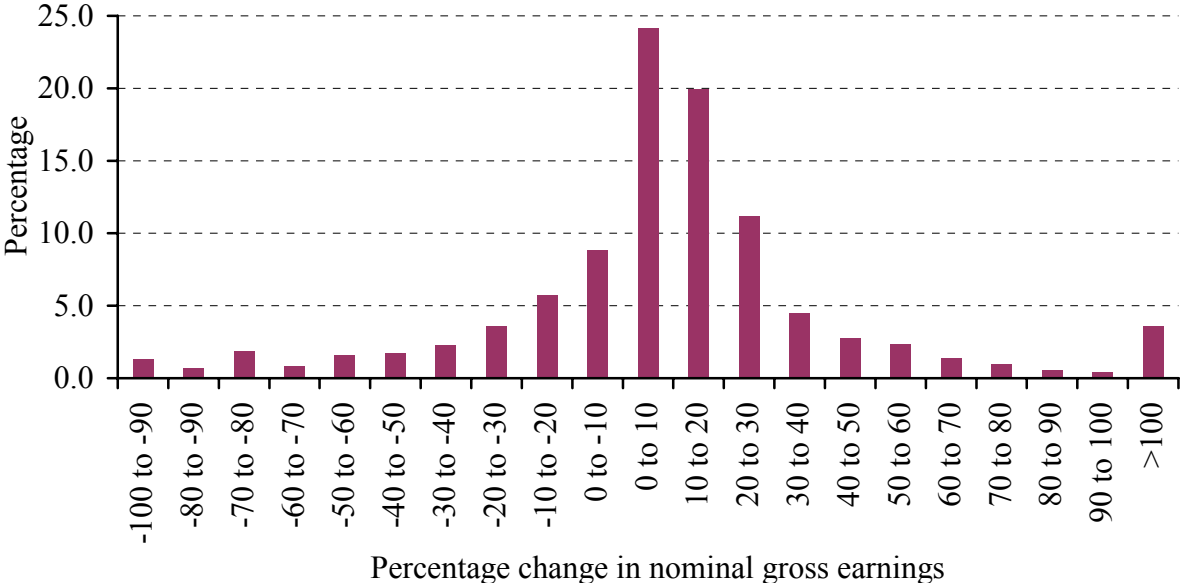


Notes: Sample size = 1,761 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their gross earnings in both waves. Unweighted.

**Table 2.1. Median difference in reported nominal gross earnings by sex and age.**

|             | Men    | Women  | All     |
|-------------|--------|--------|---------|
| 50 to 54    | +10.72 | +10.55 | +10.61  |
| 55 to 59    | +6.15  | +8.50  | +7.40   |
| 60 to 64    | +1.89  | n/a    | +.89    |
| All         | +8.08  | +9.96  | +9.09   |
|             |        |        |         |
| *Sample size* |      |        |         |
| *50 to 54*  | *420*  | *531*  | *951*   |
| *55 to 59*  | *341*  | *344*  | *685*   |
| *60 to 64*  | *125*  | *n/a*  | *125*   |
| *All*       | *886*  | *875*  | *1,761* |

Notes: Individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their gross earnings in both waves. Unweighted.

**The previous pension wealth calculations assumed that there would be no future real earnings growth. In the light of the evidence in Table 2.1 we conclude that a more reasonable assumption would be real growth of 2½% a year for 50 to 54 year olds, but to maintain the assumption of no real earnings growth between the ages of 55 and the SPA.**

## 2.2. DC pension contribution growth

This section looks at how reported contributions to defined contribution private pensions differed between 2002–03 and 2004–05. The previous estimates of pension wealth assumed that contributions to defined contribution pensions would remain constant as a share of earnings in the future. Figure 2.4a shows the distribution, and Figure 2.4b the cumulative distribution, of nominal contributions to defined contribution private pensions in 2002–03 and 2004–05 among those who reported a precise value for their contributions in both waves. As was the case with the distribution of gross earnings there is little difference between the two distributions, though if anything nominal contributions in 2004–05 are higher than those in 2002–03.

**Figure 2.4a. Distribution of contributions to defined contribution pensions in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
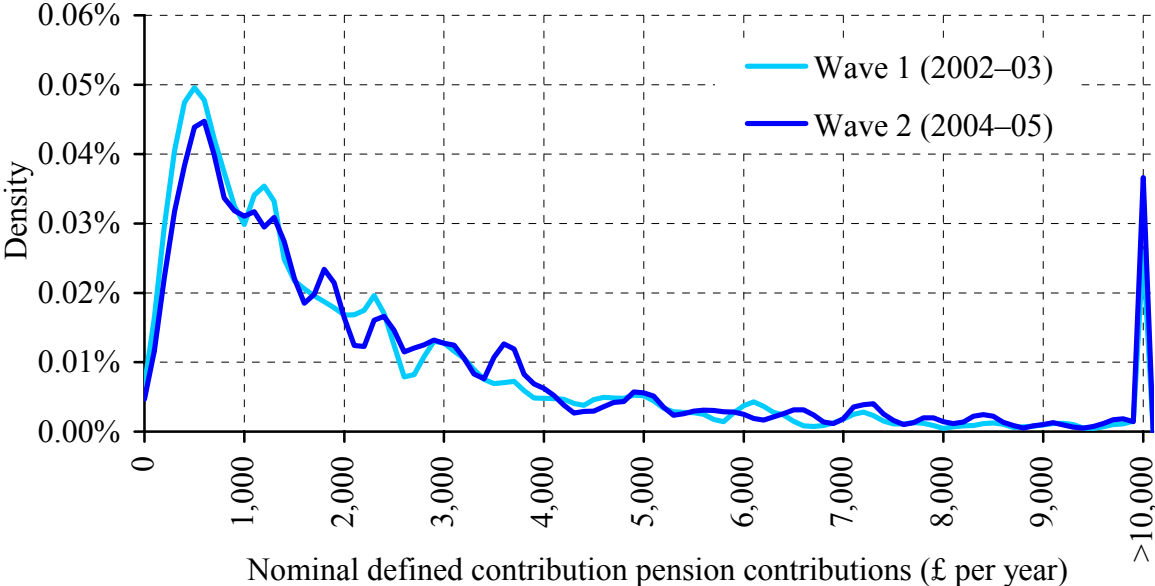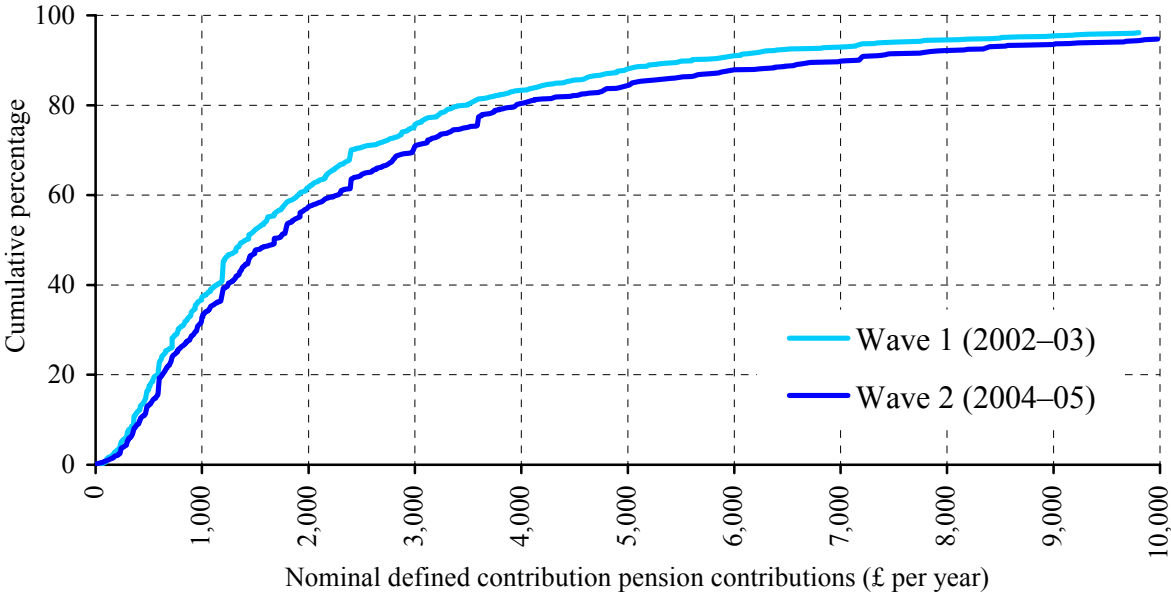


Notes: Sample size = 832 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) in both waves. The density functions are estimated using an Epanechnikov kernel with a band width of £100, with all values in excess of £10,000 set to £10,000. Unweighted.
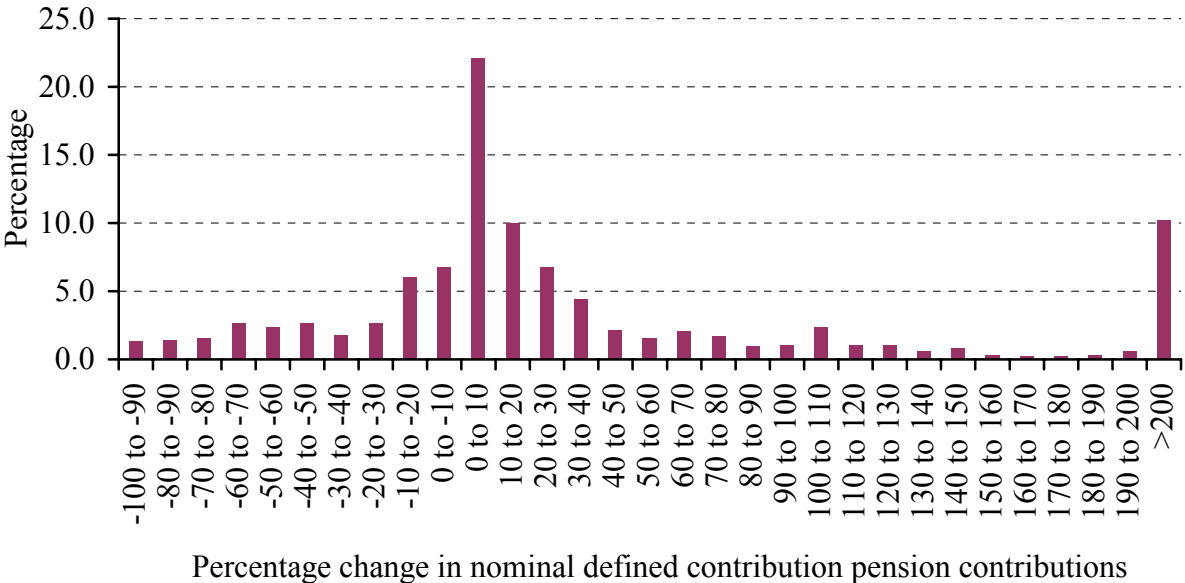
**Figure 2.4b. Cumulative distribution of contributions to defined contribution pensions in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 832 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) in both waves. Unweighted.

The distribution of reported nominal differences in contributions to defined contribution pensions is shown in Figure 2.5. Just under three-in-ten report contributions in 2004–05 that are lower than they reported in 2002–03, nearly one-quarter of the sample (22.1%) report contributions in 2004–05 that are between 0% and 10% higher than they did in 2002–03, while nearly half report that a contribution that is more than 10% larger in 2004–05 than they did in 2002–03.

**Figure 2.5. Distribution of nominal change in reported contributions to defined contribution pensions between 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Percentage change in nominal defined contribution pension contributions

Notes: Sample size = 832 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) in both waves. Unweighted.

The median difference in reported contributions to defined contribution pensions in 2002–03 and 2004–05 by age and sex is shown in Table 2.2. The average growth in contributions is very similar for those aged 50 to 54 as it is for those aged 55 to 59, with the average increase being slightly higher for men than for women. At the median among men aged 60 to 64 there is no difference in reported contributions in nominal terms, although relatively few men of this age group were found to be contributing to a defined contribution pension in both waves. Those contributing to a defined contribution private pension were given the choice of reporting either an amount in pounds or a share of their earnings. Among those who chose to report an amount in pounds in both waves we find, at the median, there was no difference in the reported amount contributed in both waves. Among those who chose to report their contributions as a share of their earnings in both waves we found, again at the median, that there was no difference in the reported percentage of earnings contributed. This provides, at least on average, little evidence of individuals 'gearing up' their contributions to defined contribution pensions as they approach retirement. Furthermore it might suggest that a sensible assumption might be to assume that contributions stated as an amount should be held constant in nominal terms while contributions stated as a percentage of earnings should be held constant as a share of earnings. However in practice it is not possible to implement this

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without determining how to increase the amount contributed to defined contributions by those for whom contributions were imputed.[5]

**Table 2.2. Median difference in reported nominal contributions to defined contribution schemes by sex and age, split by whether amount or a percentage of earnings stated.**

|  | Men | Women | All |
|---|---|---|---|
| **All** | | | |
| 50 to 54 | +10.64 | +6.97 | +8.70 |
| 55 to 59 | +9.42 | +7.87 | +9.09 |
| 60 to 64 | +0.00 | n/a | +0.00 |
| All | +9.31 | +7.29 | +8.52 |
| | | | |
| *Sample size* | | | |
| *50 to 54* | *271* | *204* | *475* |
| *55 to 59* | *206* | *104* | *310* |
| *60 to 64* | *47* | *n/a* | *47* |
| *All* | *524* | *308* | *832* |

Notes: Individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for their contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) in both waves. Unweighted.

**The previous pension wealth calculations assumed that contributions to defined contribution pensions would remain constant as a share of earnings. Given that the average nominal increase in these contributions between 2002–03 and 2004–05 by age and sex (as shown in Table 2.2) is similar to the average nominal increase in gross earnings seen over this period (as shown in Table 2.1) we have decided to leave this assumption unchanged.**
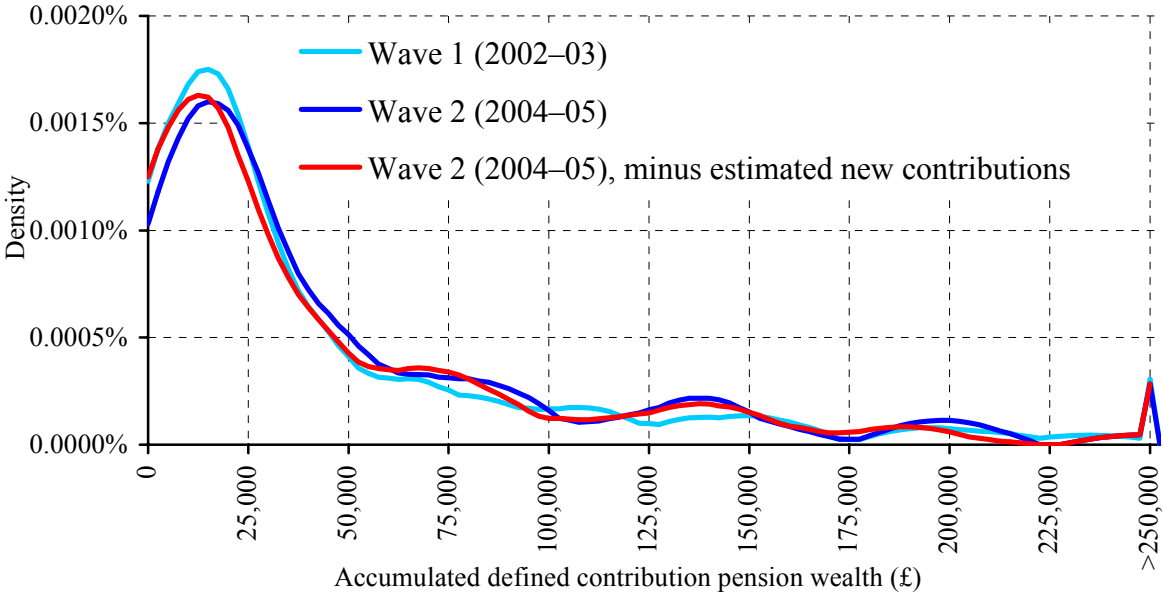
## 2.3. DC pension fund growth

This section looks at differences between the reported value of defined contribution pension funds in 2002–03 and in 2004–05. There are two elements to the growth in these pension funds. First there is growth due to additional contributions (discussed in the previous section) and second there is growth due to returns earned on the fund. This section focuses principally on the latter. The previous pension wealth calculations assumed that real growth in the underlying fund (i.e. excluding growth due to additional contributions) would be 2.5% per year.

Figure 2.6a shows the distribution, and Figure 2.6b the cumulative distribution, of the fund value of defined contribution pensions in 2002–03 and 2004–05. Also shown is the distribution of the fund value in 2004–05 once the estimated impact of new contributions made since 2002–03 are removed. Since this can only be shown on a comparable basis for

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[5] For details of the imputation procedure used see Banks, Emmerson and Tetlow (2005).
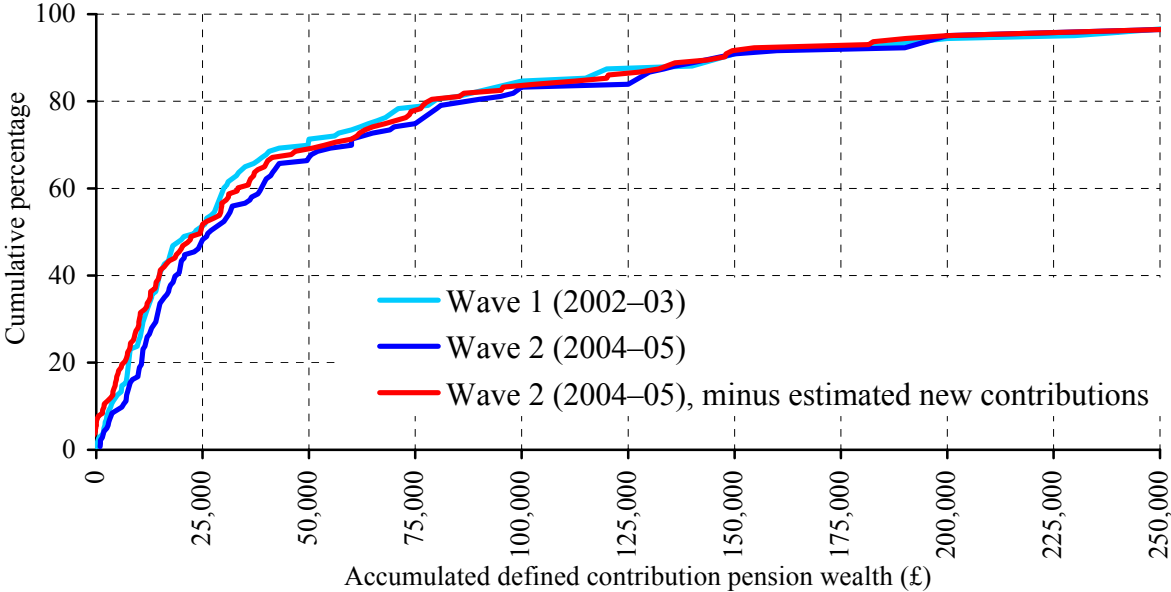
those who report a positive precise value of their fund value and a precise value for their contributions in both waves, the sample size is relatively small compared to the other analysis in this paper (just 143 individuals). While the 2004–05 distribution is to the right of the 2002–03 distribution – i.e. fund values were typically higher in 2004–05 than in 2002–03 – this pattern is less clear once the new contributions that have been made are taken into account.

**Figure 2.6a. Distribution of defined contribution pension fund wealth in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 143 individuals aged between 50 and the SPA who give a precise value (i.e. not a band) for their defined contribution pension contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) and a positive value (again not a band) for their defined contribution pension wealth in both waves. The density functions are estimated using an Epanechnikov kernel with a band width of £10,000, with all values in excess of £250,000 set to £250,000. Unweighted.

**Figure 2.6b. Cumulative distribution of defined contribution pension fund wealth in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
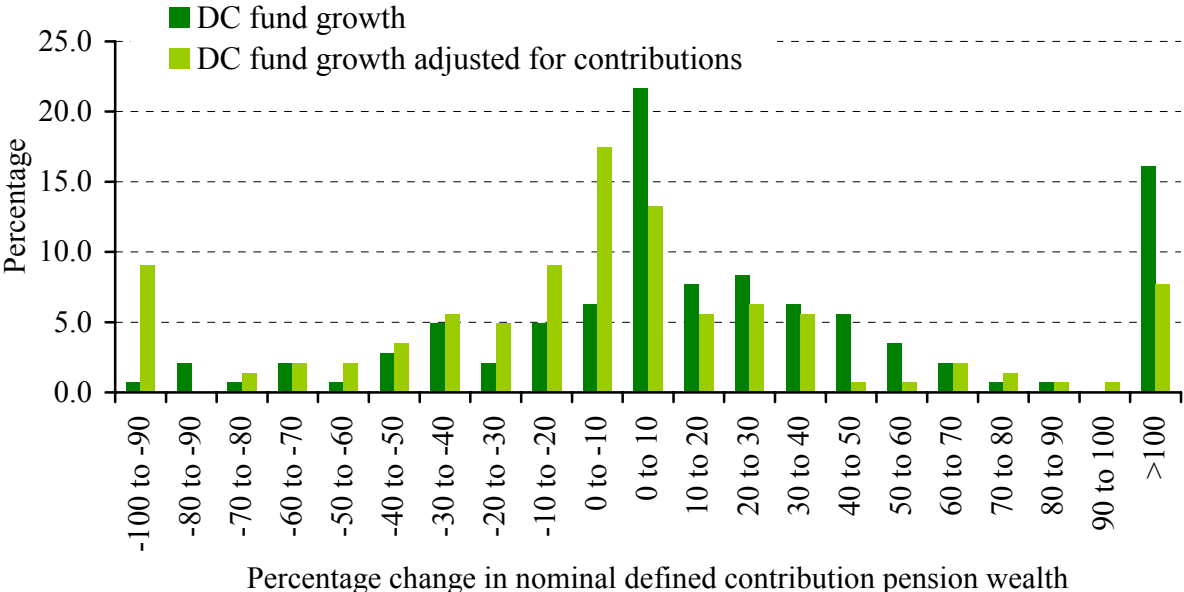


Notes: Sample size = 143 individuals aged between 50 and the SPA who give a precise value (i.e. not a band) for their defined contribution pension contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) and a positive value (again not a band) for their defined contribution pension wealth in both waves. Unweighted.

The distribution of individual changes in the value of defined contribution pensions is shown in Figure 2.7, again both including and excluding the estimated impact of contributions made between the two waves. The most common increase in the overall fund value is between 0 and 10% in nominal terms over the two year period. However once the estimated impact of new contributions is taken into account the most common change in value is a fall of between 0 and 10% over the two years.

The median increase in the overall value of defined contribution pension funds is 11.1%, but once the estimated impact of new contributions is taken into account the median nominal change in value is a fall of almost 3%. For comparison, over the period from April 2002 to March 2005 the FTSE 100 index fell by 6%. Table 2.3 breaks down the median change in defined contribution pension funds by both age and sex (although please note that in many cases the sample sizes are very small). At the median, once the estimated impact of new contributions between the two waves is taken into account, a fall in nominal fund value is seen in all age/sex groups.

**Figure 2.7. Distribution of nominal change in defined contribution pension wealth between 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 143 individuals aged between 50 and the SPA who give a precise value (i.e. not a band) for their defined contribution pension contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) and a positive value (again not a band) for their defined contribution pension wealth in both waves. Unweighted.

**Table 2.3. Median change in defined contribution pension wealth by sex and age.**

|  | Men | Women | All |
|---|---|---|---|
| 50 to 54 | –2.94 | –6.67 | –4.48 |
| 55 to 59 | –1.73 | –3.10 | –1.73 |
| 60 to 64 | –3.42 | n/a | –3.42 |
| All | –2.03 | –6.20 | –2.94 |
|  |  |  |  |
| *Sample size* |  |  |  |
| *50 to 54* | *45* | *21* | *66* |
| *55 to 59* | *43* | *16* | *59* |
| *60 to 64* | *18* | *n/a* | *18* |
| *All* | *106* | *37* | *143* |

Notes: Individuals aged between 50 and the SPA who give a precise value (i.e. not a band) for their defined contribution pension contributions (either an amount or as a percentage of earnings combined with a positive value for their gross earnings) and a positive value (again not a band) for their defined contribution pension wealth in both waves. Unweighted.

**A 3% nominal fall in the average underlying value of funds held in defined contribution pensions over two years (as shown in Table 2.3) approximates to a real cut of 4% per year. As a result our revised assumption is that the underlying value of defined contribution pensions fell by 5% per year between 2002–03 and 2004–05, which on average will be a cautious assumption. For growth beyond 2004–05 we retain the assumption that funds will grow in real terms by 2½% a year.**

## 3. Non-pension wealth

In addition to pension wealth estimates of total wealth used to assess retirement resource adequacy include net financial, physical and housing wealth. In this section we compare the assumed future growth in both net housing wealth (section 3.1) and net financial and physical wealth (section 3.2) with the evidence from ELSA of on the differences in reported levels of non-pension wealth in 2002–03 and in 2004–05. The previous estimates of retirement resource adequacy presented in Banks, Emmerson, Oldfield and Tetlow (2005) assumed that there would be no future real growth in net housing, financial or physical wealth. Section 3.1 shows that this assumption was particularly cautious in the case of net housing wealth.

### 3.1. Housing wealth

The distribution of both gross and net housing wealth in both 2002–03 and 2004–05, among ELSA respondents with some housing wealth in both waves, is shown in Figure 3.1a, while the cumulative distribution is shown in Figure 3.1b. In both years the distribution of net housing wealth is slightly to the left of the distribution of gross housing wealth – this is due to outstanding mortgage debt. It is also noticeable from Figures 3.1a and 3.1b that the distribution of housing wealth in 2004–05 is considerably to the right of the distribution of housing wealth in 2002–03. The fact that this is true of both gross and net housing wealth shows the extent to which this is due to increasing house prices rather than respondents paying of their mortgage debt over the intervening two year period.

The distribution of individual increases in gross and net housing wealth between 2002–03 and 2004–05 is shown in Figure 3.2. Only one-in-ten of homeowners report a lower value for their net housing wealth in 2004–05 than in 2002–03, while nearly one-third (32.5%) report an increase of between 10% and 40%. Figure 3.2 also shows that the increases in net housing wealth are, on average, larger than the increases in gross housing wealth – which is the effect of individuals paying off part, or all, of their outstanding mortgage. Overall the median increases in gross and net housing wealth are 37.5% and 38.9% respectively. Table 3.1 shows that there is very little variation in the average increase by either age group or sex.

**Figure 3.1a. Distribution of net and gross housing wealth in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
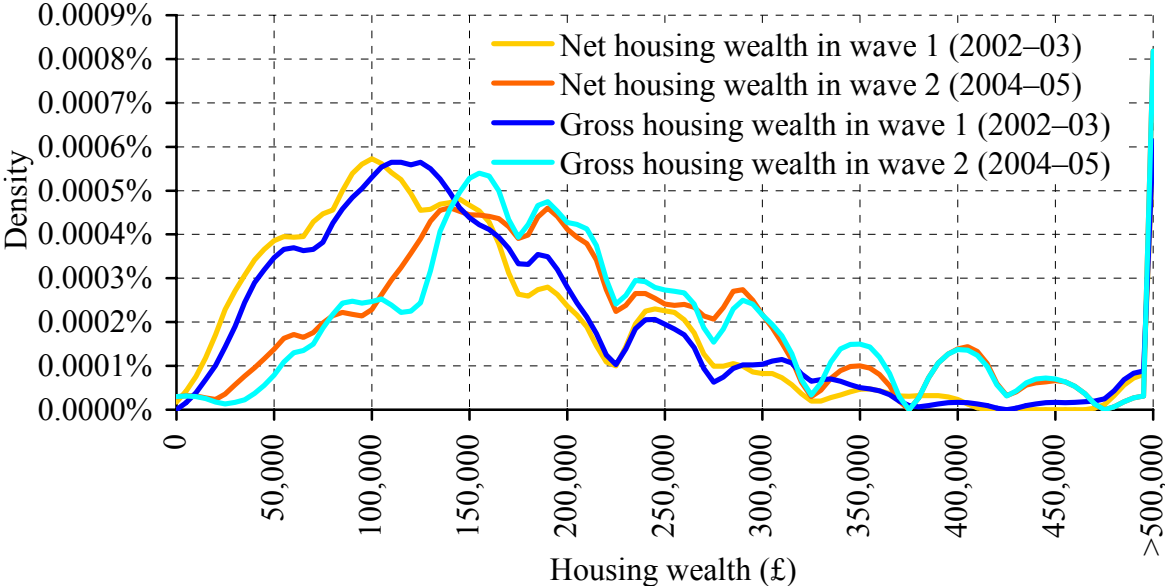


Notes: Sample size = 2,611 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for both their gross and their net housing wealth in both waves. The density functions are estimated using an Epanechnikov kernel with a band width of £10,000, with all values in excess of £500,000 set to £500,000. Unweighted.

**Figure 3.1b. Cumulative distribution of net and gross housing wealth in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
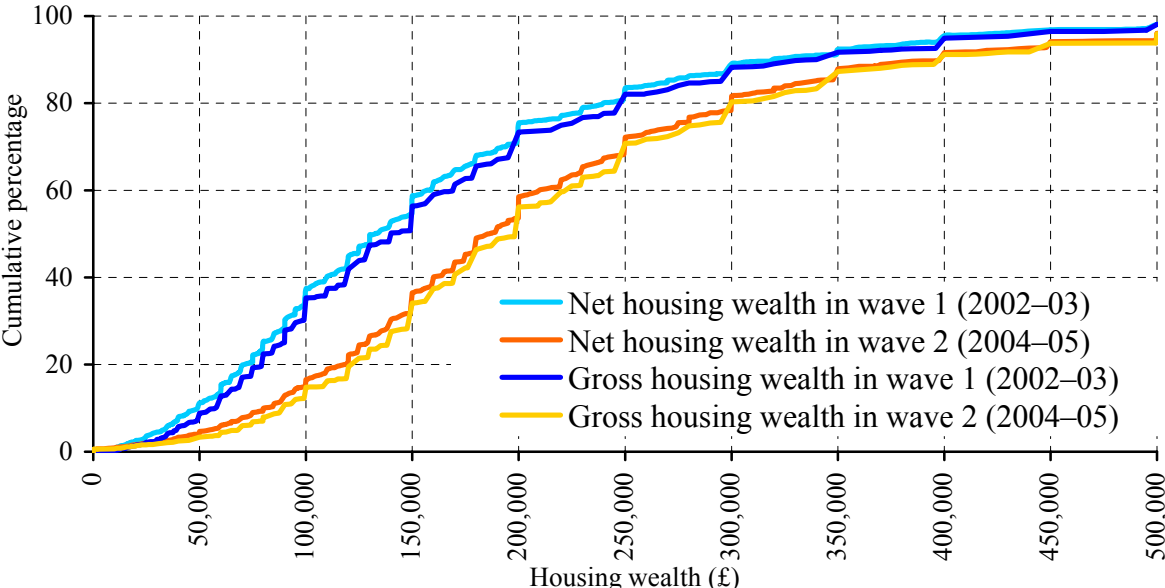


Notes: Sample size = 2,611 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for both their gross and their net housing wealth in both waves. Unweighted.

**Figure 3.2. Distribution of nominal change in defined contribution pension wealth between 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
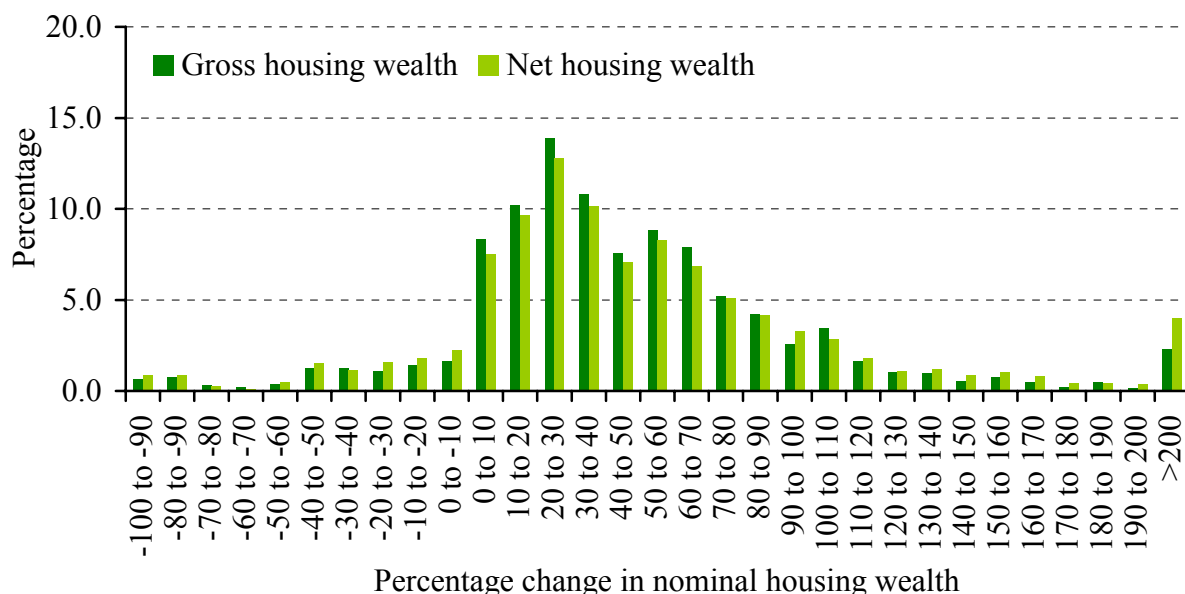


Notes: Sample size = 3,126 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for both their gross and their net housing wealth in both waves. Unweighted.

**Table 3.1. Median change in gross and net housing wealth by sex and age.**

|  | Men | Women | All |
|---|---|---|---|
| **Gross housing wealth** |  |  |  |
| 50 to 54 | +37.93 | +40.00 | +38.89 |
| 55 to 59 | +35.36 | +36.36 | +36.00 |
| 60 to 64 | +36.36 | n/a | +36.36 |
| All | +36.69 | +38.46 | +37.50 |
|  |  |  |  |
| **Net housing wealth** |  |  |  |
| 50 to 54 | +39.14 | +42.78 | +40.00 |
| 55 to 59 | +36.58 | +38.72 | +37.50 |
| 60 to 64 | +37.93 | n/a | +37.93 |
| All | +37.93 | +40.00 | +38.89 |
|  |  |  |  |
| *Sample size* |  |  |  |
| *50 to 54* | *474* | *564* | *1,038* |
| *55 to 59* | *514* | *618* | *1,132* |
| *60 to 64* | *441* | *n/a* | *441* |
| *All* | *1,429* | *1,182* | *2,611* |

Notes: Individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for both their gross and net housing wealth in both waves. Unweighted.

Some light can be shed on the plausibility of the increases in housing wealth presented in Figure 3.2 and Table 3.1 by comparing the average increase in gross housing wealth observed amongst ELSA respondents between 2002–03 and 2004–05 with the growth in the Nationwide House Price Index over the same period. The two line up very well: among ELSA

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sample members the median increase in gross housing wealth is 38.9% whereas across the UK (and across all domestic property, not just that occupied by those aged between 50 and the SPA) the increase in the Nationwide House Price Index was between 27% and 43% (where 43% corresponds to the growth between 2002 Q2 and 2004Q2 while 27% is the growth between 2003Q1 and 2005Q1).

The median growth in housing wealth among ELSA respondents broken down by Government Office Region and the range of growth in the Nationwide House Price Index broken down by standard region is shown in Figure 3.3. As far as is possible comparable regions have been placed next to each other in the figure.[6] In only one case (the North-West) does the median change in gross housing wealth among ELSA respondents lie outside the 'range' covered by the growth in the Nationwide House Price Index across the most similar region. It is certainly the case that lower average growth in housing wealth among ELSA respondents is observed in regions that experienced a smaller increase in house prices over this two year period (London, the East and South-East) than in regions that experienced higher growth (the North). This increases our confidence that housing wealth has in fact increased by as much as implied by the individual responses.

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[6] Unfortunately standard office region was not available in the ELSA data at the time of writing.

**Figure 3.3. Median growth in gross housing wealth between 2002–03 and 2004–05 among ELSA respondents aged 50 to the SPA in 2002–03 compared to growth in the Nationwide House Price Index, by region.**
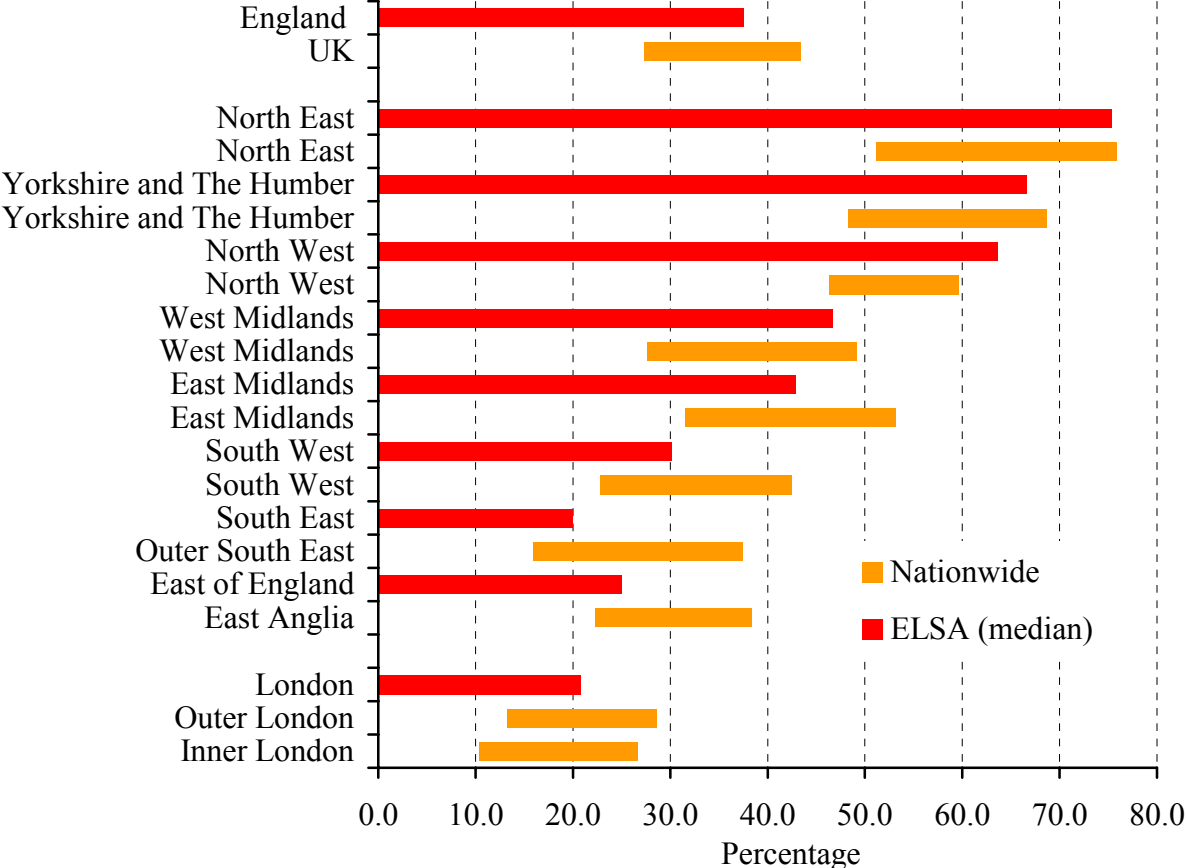


Notes: Sample size = 3,126 individuals aged between 50 and the SPA who give a positive value (i.e. not a band) for both their gross and their net housing wealth in both waves. Unweighted.

Source: Nationwide Building Society series from (http://www.nationwide.co.uk/hpi/), lower end of 'range' relates to the growth over the period from between 2003Q1 and 2005Q1 while the higher end of the 'range' relates growth between 2002 Q2 and 2004Q2.

**A 37.5% average nominal rise in housing wealth over the period from 2002–03 to 2004–05 (as shown in Table 3.1) is, after taking account of growth in the RPI, roughly equivalent to a real increase of 30%. As a result our revised assumption is that the underlying real value of net housing wealth grew by 30% over the period from 2002–03 to 2004–05. For growth beyond 2004–05, we retain the assumption that net housing wealth will remain constant in real terms.**

## 3.2. Financial and physical wealth

The distribution of total net financial and physical wealth in both 2002–03 and 2004–05 among all ELSA respondents aged between 50 and the SPA is shown in Figure 3.4a, with the cumulative distribution shown in Figure 3.4b. These highlight how very skewed the distribution of this component of wealth is: for example, in 2002–03 one quarter report less than £200 while one-quarter have more than £57,600 and one-in-ten have more than £162,650. As a result for the majority of people the amount of retirement resources they are estimated to have will not be sensitive to the growth rate of financial and physical wealth that we assume, but for a relatively small number of people it will be very important. Figures 3.4a and 3.4b also show that there was difference between the distribution of net financial and physical wealth in 2002–03 than in 2004–05.

The median increase in gross financial and physical wealth over the period from 2002–03 to 2004–05 was 10.1%. However the distribution of the growth in gross financial and physical wealth over this period was extremely dispersed. As shown in Figure 3.5, over one-quarter of the sample reported that their gross financial and physical wealth more than doubled (i.e. an increase of over 100%) over the two year period, while four-in-nine individuals reported a lower nominal value for their gross financial and physical wealth in 2004–05 than they did in 2002–03. Such dispersion in the change in wealth measured at the individual level is a common feature of panel studies of wealth dynamics and is not particularly surprising given that wealth is measured with error in each of the two waves.

**Figure 3.4a. Distribution of net financial and physical wealth in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Net financial and physical wealth (£)
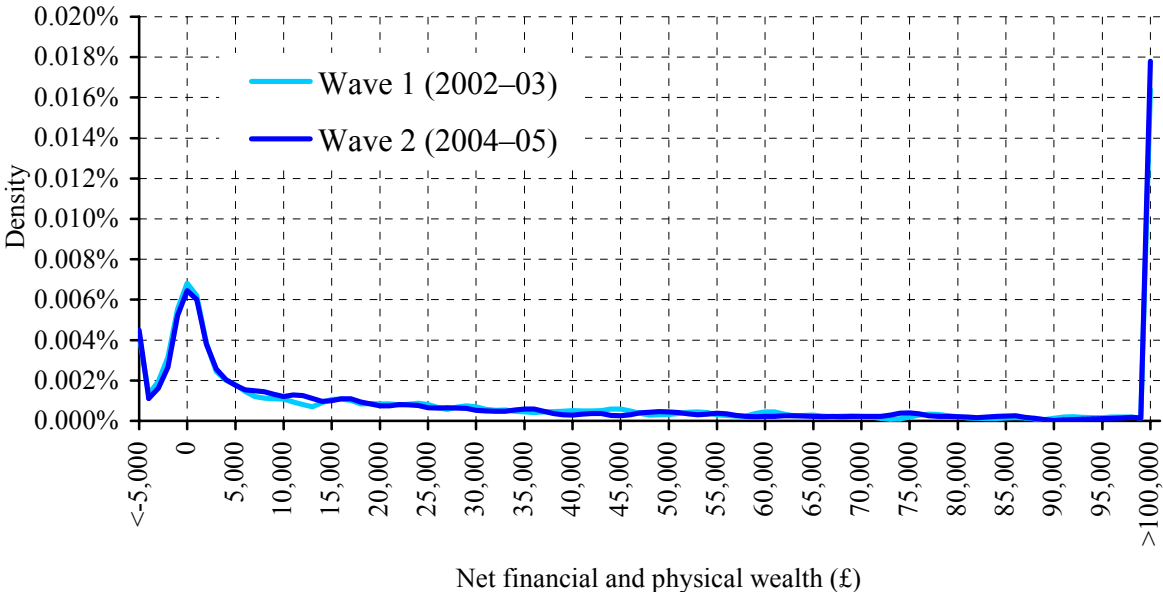
Notes: Sample size = 1,805 individuals aged between 50 and the SPA who give a value (i.e. not a band) for both their gross and net financial and physical wealth in both waves. The density functions

are estimated using an Epanechnikov kernel with a band width of £1,000, with all values in excess of £100,000 set to £100,000. Unweighted.
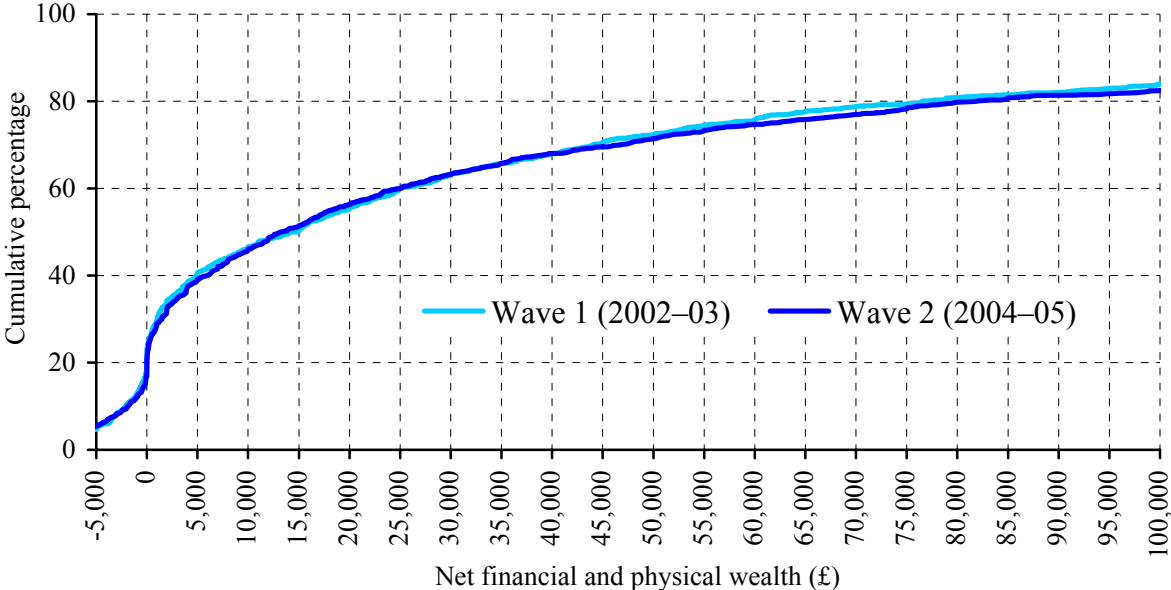
**Figure 3.4b. Cumulative distribution of net financial and physical wealth in 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 1,805 individuals aged between 50 and the SPA who give a value (i.e. not a band) for both their gross and net financial and physical wealth in both waves. Unweighted.

**Figure 3.5. Distribution of nominal change in gross financial and physical wealth between 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**
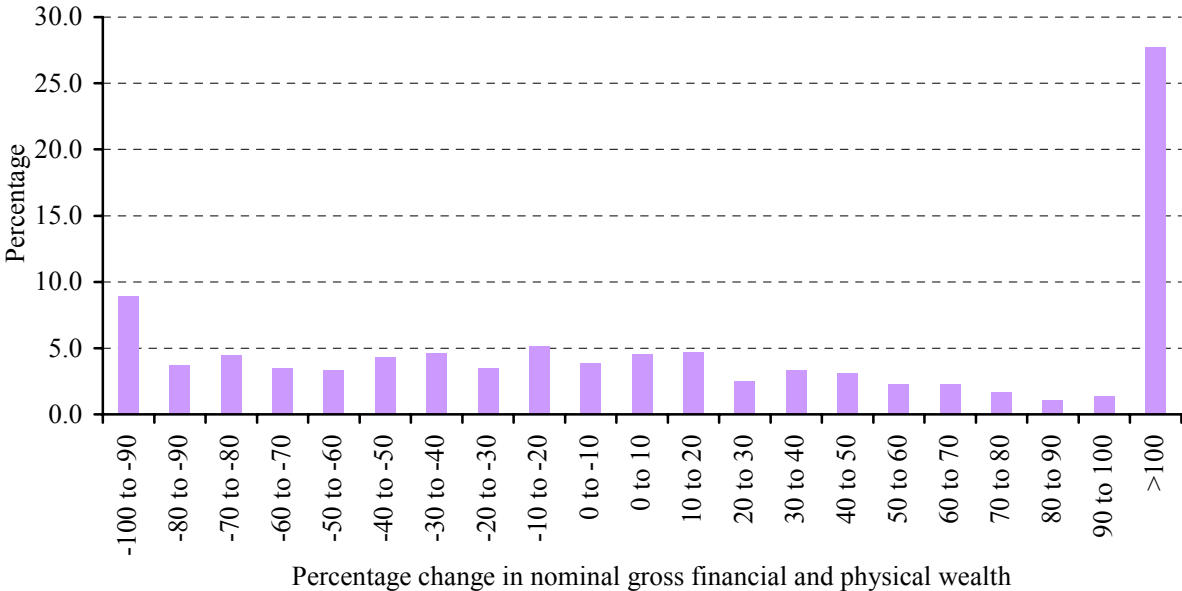


Notes: Sample size = 1,654 individuals aged between 50 and the SPA who give a value (i.e. not a band) for both their gross and their net financial and physical wealth in both waves, and have positive gross financial and physical wealth in the first wave. Unweighted.

Evidence on variation in average growth in the value of financial and physical wealth by age and sex is shown in Table 3.2. The top panel shows the median change in gross financial and

physical wealth. At the median there was higher growth in the value of gross financial and physical wealth among 50 to 54 year old women than among men in the same age bracket, while the reverse was true of those aged between 55 and 59. The bottom panel of Table 3.2 presents the change in mean net financial and physical wealth across each sex and age group between 2002–03 and 2004–05. Since this component of wealth can take negative as well as positive values the change in the mean across the whole group arguably represents a more appropriate measure of the change than the median, or mean, individual change. This shows that across the whole sample net financial and physical wealth grew by 7.5%, with higher growth across the younger age groups and little evidence of differences in the growth of this measure of wealth by sex.

**Table 3.2. Median individual change in gross financial and physical wealth, and mean group change in net financial and physical wealth by sex and age.**

|  | Men | Women | All |
|---|---|---|---|
| **Gross financial and physical wealth** |  |  |  |
| *Median change* |  |  |  |
| 50 to 54 | +5.34 | +12.01 | +9.09 |
| 55 to 59 | +12.28 | +4.90 | +8.06 |
| 60 to 64 | +12.08 | n/a | +12.08 |
| All | +10.26 | +9.12 | +10.11 |
|  |  |  |  |
| *Sample size* |  |  |  |
| *50 to 54* | *340* | *364* | *704* |
| *55 to 59* | *318* | *355* | *673* |
| *60 to 64* | *277* | *n/a* | *277* |
| *All* | *935* | *719* | *1,654* |
|  |  |  |  |
| **Net financial and physical wealth** |  |  |  |
| *Mean group change* |  |  |  |
| 50 to 54 | +13.38 | +9.15 | +11.03 |
| 55 to 59 | +3.29 | +3.17 | +3.23 |
| 60 to 64 | +8.75 | n/a | +8.75 |
| All | +7.89 | +5.91 | +7.48 |
|  |  |  |  |
| *Sample size* |  |  |  |
| *50 to 54* | *357* | *412* | *769* |
| *55 to 59* | *342* | *391* | *733* |
| *60 to 64* | *303* | *n/a* | *303* |
| *All* | *1,002* | *803* | *1,805* |

Notes: Individuals aged between 50 and the SPA who give a value (i.e. not a band) for both their gross and their net financial and physical wealth in both waves. Median change only calculated for those who have positive gross financial and physical wealth in the first wave, and is calculated using the individual level percentage change. Mean group change is the change in total net financial and physical wealth within each group, with reported wealth capped at £500,000 (which affects around 2½% of the sample in each wave). Unweighted.

For the majority of individuals high percentage growth in net financial and physical wealth would not correspond to a large increase in their overall wealth. The distribution of cash increases in net financial and physical wealth is shown in Figure 3.6 – the median cash change was an increase of just £100. However there was fairly wide dispersion around this with one-quarter seeing their financial and physical wealth fall by more than £6,550 and one quarter seeing an increase of more than £11,075.

**Figure 3.6. Distribution of cash change in net financial and physical wealth between 2002–03 and 2004–05, those aged between 50 and the SPA in 2002–03 only.**



Cash change in net financial wealth (£)
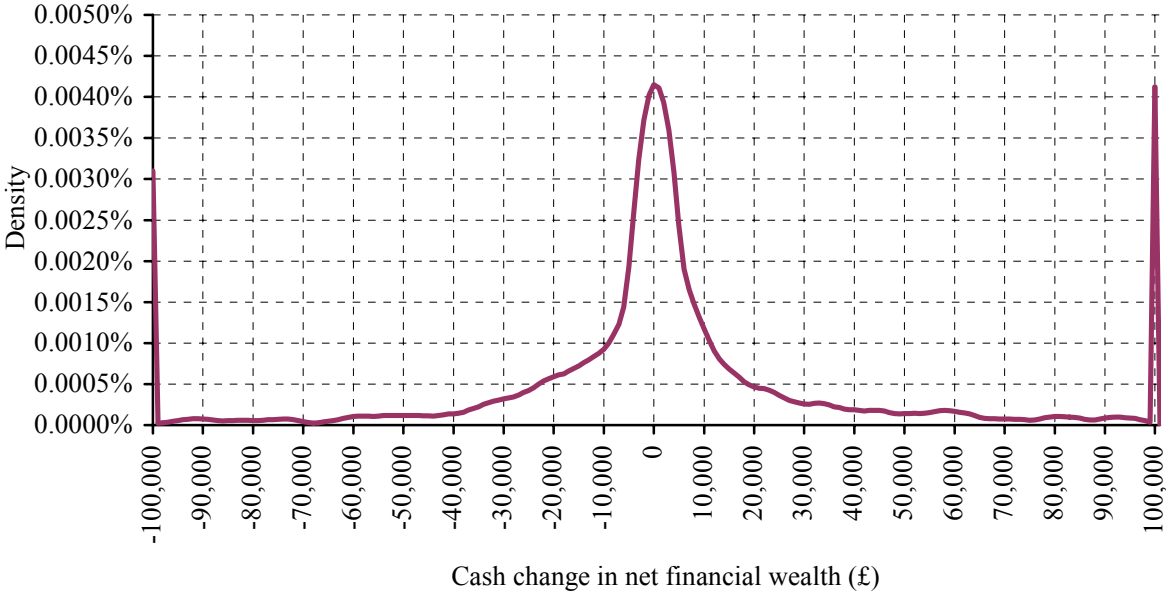
Notes: Sample size = 1,805 individuals aged between 50 and the SPA who give a value (i.e. not a band) for both their gross and net financial and physical wealth in both waves. The density functions are estimated using an Epanechnikov kernel with a band width of £2,500, with all values in excess of £100,000 set to £100,000 and all values below minus £100,000 set to minus £100,000. Unweighted.

**A 7.5% average nominal rise net financial and physical wealth over the period from 2002–03 to 2004–05 (as shown in Table 3.2) is, after taking account of growth in the RPI, roughly equivalent to no real change. As a result we retain the assumption that net financial and physical wealth will remain constant in real terms.**

## 4. Sensitivity of previous analysis to revised assumptions

In Section 4.1 we describe the impact of revising the assumptions underpinning estimates of pension wealth in the light of the evidence that was presented in Section 2. We then incorporate the revised assumptions for growth in non-pension wealth (net housing, financial and physical wealth), which were described in Section 3, and obtain a revised estimate of total wealth. The distribution of this new measure of total wealth is compared to the previous estimated distribution in Section 4.2. Section 4.3 then presents new evidence on the percentage of individuals aged between 50 and the SPA who appear to have retirement resources that fall below the adequacy benchmark used by the Pensions Commission.

### 4.1. Sensitivity of pension wealth

The revised assumptions over future growth in earnings, and growth in the underlying value of funds held in defined contribution pensions between 2002–03 and 2004–05, make little difference to the estimated distribution of pension wealth, as shown in Table 4.1 and Figures 4.1a and 4.1b. These show the distribution of pension wealth at the SPA if all individuals remain in paid work from 2002–03 until they reach the SPA, under both the previous and the revised assumptions. Since the revised assumptions only affect the future accrual of pension wealth – i.e. not the amount of pension wealth held if individuals chose to retire in 2002–03 – this should be the measure of estimated wealth that differs most from the estimate produced under the previous assumptions. Despite this there is little difference as a result of the changes to the underlying assumptions. In part this is because pension wealth already accumulated is a relatively large component of pension wealth at the SPA for those aged between 50 and the SPA. In addition among families aged 55 or over who have no defined contribution pension wealth there is no change in the assumptions used for estimating pension wealth. For example under the revised assumptions median pension wealth is £209,406 which is just 0.5% below the median estimate under the previous assumptions (£208,300). At the mean moving to the revised assumptions reduces pension wealth by 0.2%

**Table 4.1. Measures of the estimated distribution of pension wealth, assuming retirement at the SPA, old and revised assumptions, all those aged between 50 and the SPA, £.**

|  | p10 | p25 | Median | p75 | p90 | Mean |
|---|---|---|---|---|---|---|
| **Pension wealth estimates** |  |  |  |  |  |  |
| Under previous assumptions | 74,432 | 118,012 | 209,406 | 340,122 | 511,507 | 264,481 |
| Under revised assumptions | 74,401 | 117,832 | 208,300 | 342,687 | 514,251 | 263,922 |
| *% difference* | *−0.0%* | *−0.2%* | *−0.5%* | *+0.8%* | *+1.5%* | *−0.2%* |

Notes: Sample size = 5,090 individuals aged between 50 and the SPA. Unweighted.

**Figure 4.1a. Estimated distribution of pension wealth, assuming retirement at the SPA, under old and revised assumptions, all those aged between 50 and the SPA.**
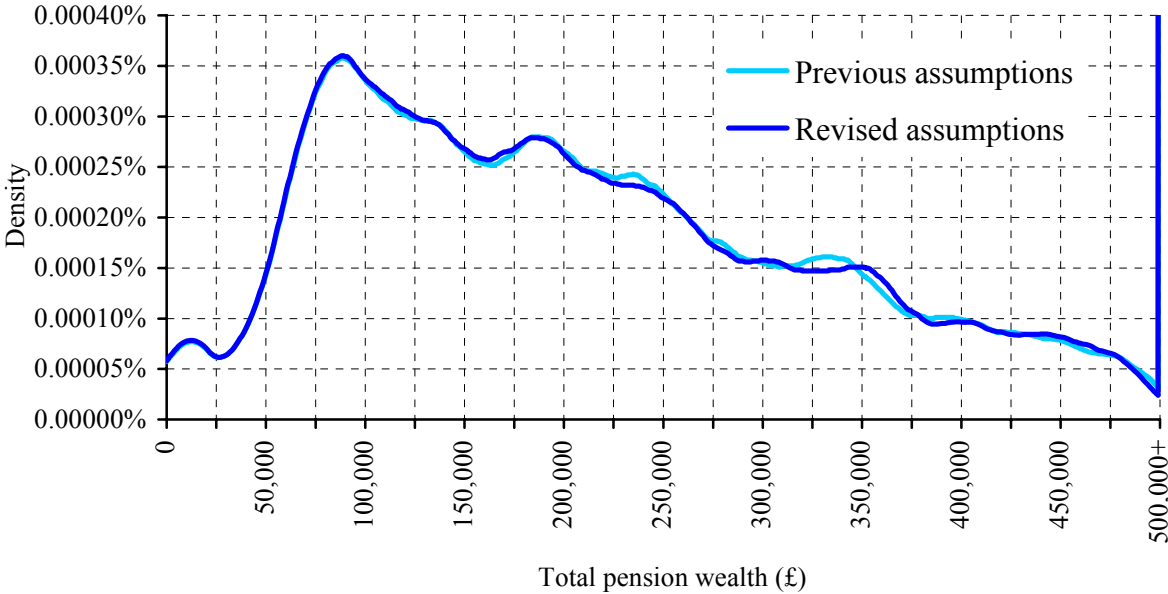


Notes: Sample size = 5,090 individuals aged between 50 and the SPA. The density functions are estimated using an Epanechnikov kernel with a band width of £10,000. Unweighted.

**Figure 4.1b. Estimated distribution of pension wealth, assuming retirement at the SPA, under old and revised assumptions, all those aged between 50 and the SPA.**
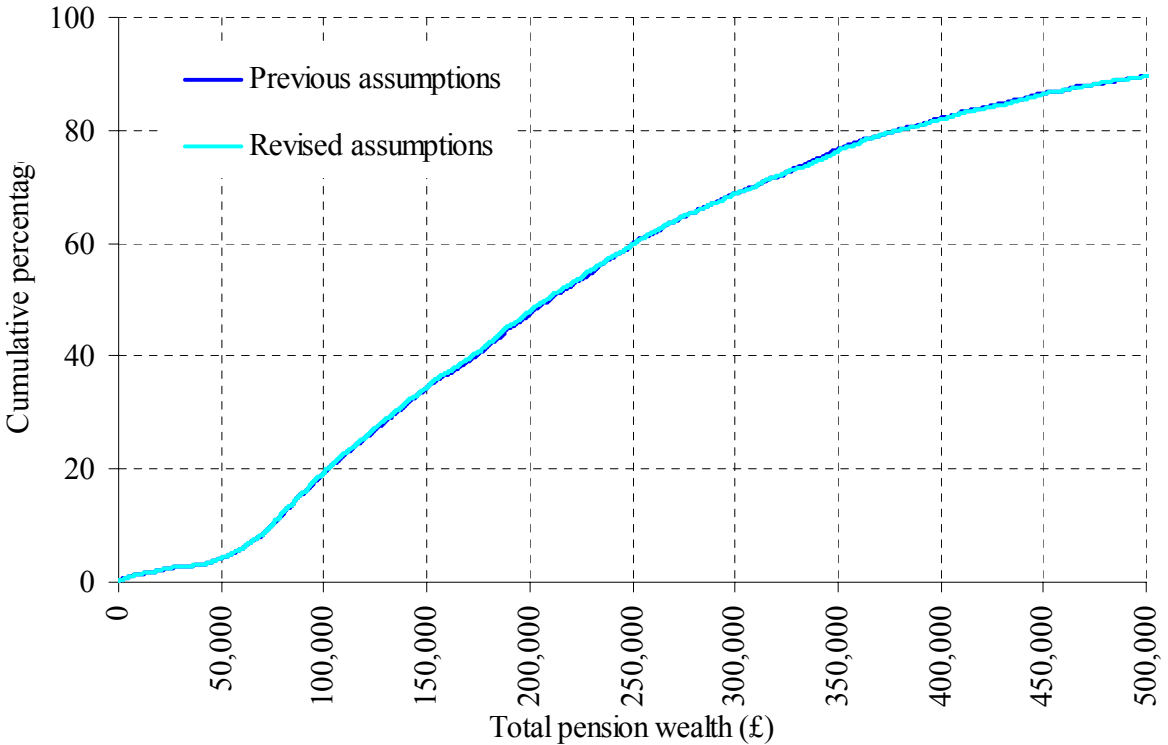


Notes: Sample size = 1,805 individuals aged between 50 and the SPA who give a value (i.e. not a band) for both their gross and net financial and physical wealth in both waves. Unweighted.

The distribution of individual level differences between the two estimates of pension wealth, again assuming retirement at the SPA, is shown in Figure 4.2. In just over two-thirds of cases (68.1%) the new estimate of pension wealth lies within 1% of the previous estimate, and for just over four-in-ten individuals (42.5%) is completely unaffected by the change in assumptions. The median change in the estimate of pension wealth from changing assumptions is zero (again due to large numbers of our sample not being affected by the change in assumptions because they are in families aged 55 or over and are not a member of a defined contribution pension). As shown in Table 4.2 this is true by both age and sex (with, at the median, the only difference being a very slight increase among men aged between 50 and 54 showing that for this group the increase in assumed earnings growth on wealth in defined benefit pensions (including the State Second Pension) outweighs the lower assumed growth in funds held in defined contribution pensions between 2002–03 and 2004–05). For those aged 55 and over this is because the median individual is not a member of a defined contribution pension and therefore does not experience the fall in average fund values over the period from 2002–03 to 2004–05 that are incorporated into the revised estimates.

**Figure 4.2. Distribution of percentage change in estimated pension wealth as a result of moving from previous estimates to revised estimates, those aged between 50 and the SPA in 2002–03 only.**
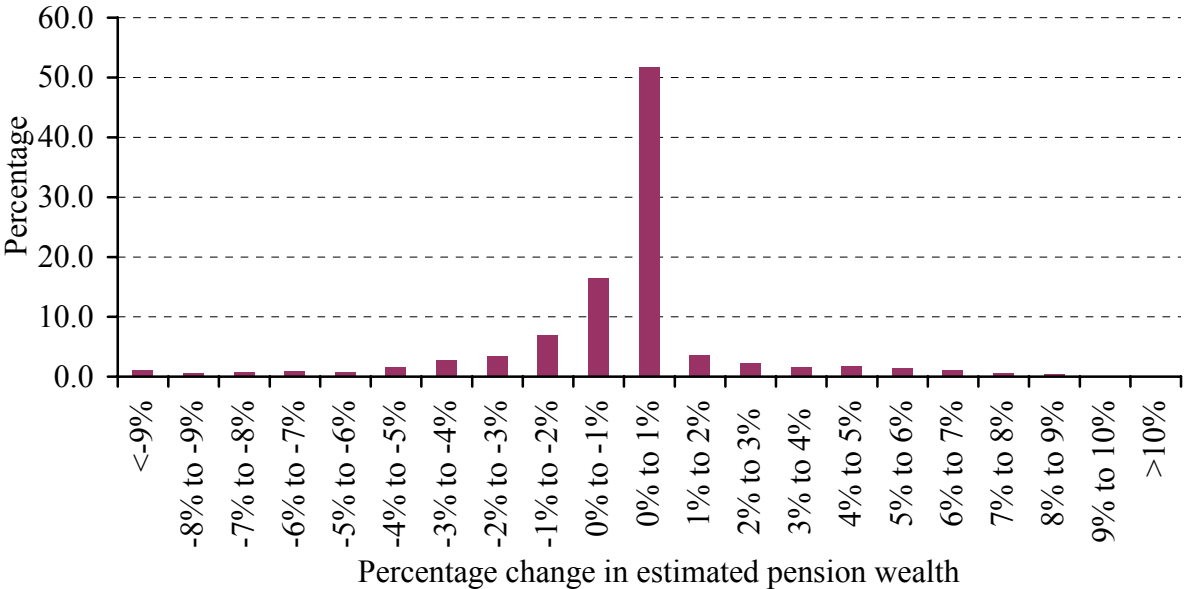


Notes: Sample size = 5,081 individuals aged between 50 and the SPA. 9 individuals dropped due to not having positive estimated pension wealth under the previous estimates. Unweighted.

**Table 4.2. Median change in estimated pension wealth by sex and age.**

|  | Men | Women | All |
|---|---|---|---|
| 50 to 54 | +0.08 | +0.00 | +0.00 |
| 55 to 59 | +0.00 | +0.00 | +0.00 |
| 60 to 64 | +0.00 | n/a | +0.00 |
| All | +0.00 | +0.00 | +0.00 |
| | | | |
| *Sample size* | | | |
| *50 to 54* | *920* | *1,154* | *2,074* |
| *55 to 59* | *1,030* | *1,164* | *2,194* |
| *60 to 64* | *813* | *n/a* | *813* |
| *All* | *2,763* | *2,318* | *5,081* |

Note: 9 individuals dropped due to not having positive estimated pension wealth under the previous estimates. Unweighted.

## 4.2. Sensitivity of total wealth

Taking the revised estimates of pension wealth presented in the previous section and adding them to the revised estimates of non-pension wealth discussed in section 3 (i.e. net housing, financial and physical wealth) gives an updated estimate of total wealth at the SPA. For net housing wealth we now assume that wealth grew by 30% in real terms over the period from 2002–03 to 2004–05 and will remain constant in real terms thereafter, whereas previously we had assumed that it would simply remain constant in real terms. For growth in net financial and physical wealth we retain the assumption that it will remain constant in real terms.
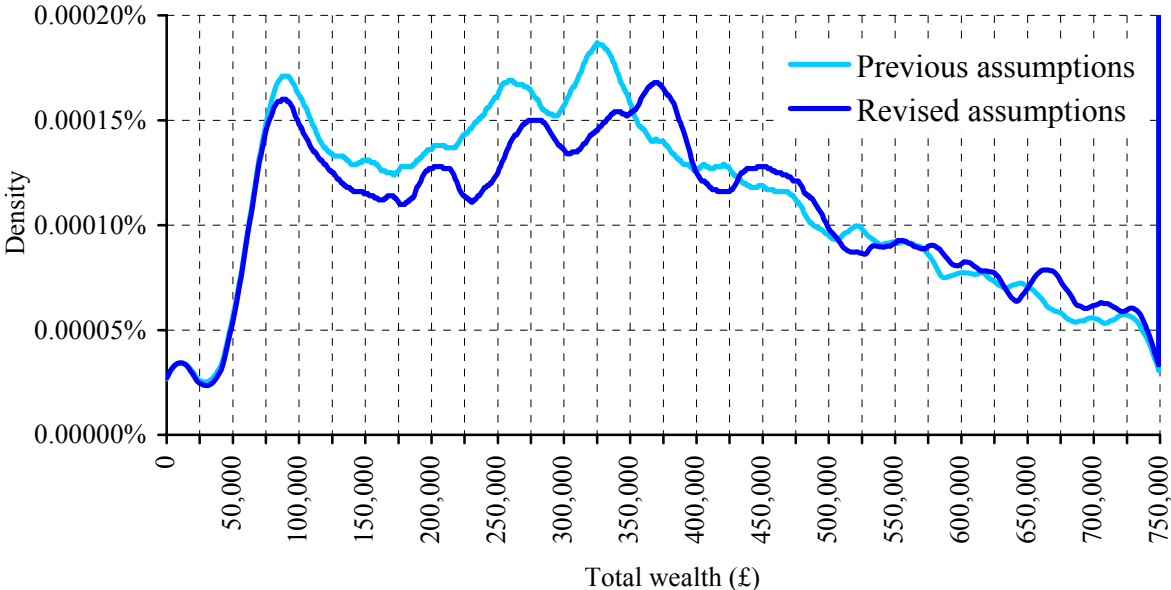
The distribution of estimated total wealth under both the previous and revised assumptions is shown in Table 4.3 and Figures 4.3a and 4.3b. These show that the revised assumptions make a considerable difference to the distribution of estimated total wealth with, on average, higher levels of estimated wealth being observed under the revised assumptions. For example under the revised assumptions median total wealth is £411,390 which is 9.0% above the median estimate under the previous assumptions (£377,452). At the mean moving to the revised assumptions increases total wealth by 7.9%, whereas even the 10th percentile is increased by 3.5%. As set out in Section 3.1 for most individuals this increase in estimated total wealth will be due to the large real increases in housing wealth that occurred between 2002–03 and 2004–05.

**Table 4.3. Estimated measures of the distribution of total wealth, assuming retirement at the SPA, old and revised assumptions, £.**

|  | p10 | p25 | Median | p75 | p90 | Mean |
|---|---|---|---|---|---|---|
| **Total wealth estimates** | | | | | | |
| Under previous assumptions | 107,843 | 221,960 | 377,452 | 617,057 | 939,171 | 501,681 |
| Under revised assumptions | 111,662 | 239,740 | 411,390 | 671,833 | 1,016,703 | 541,212 |
| *% difference* | *+3.5* | *+8.0* | *+9.0* | *+8.9* | *+8.3* | *+7.9* |

Notes: Sample size = 5,090 individuals aged between 50 and the SPA. Unweighted.

**Figure 4.3a. Distribution of total wealth, assuming retirement at the SPA, under old and revised assumptions, all those aged between 50 and the SPA.**



Notes: Sample size = 5,090 individuals aged between 50 and the SPA. The density functions are estimated using an Epanechnikov kernel with a band width of £10,000. Unweighted.

**Figure 4.3b. Cumulative distribution of total wealth, assuming retirement at the SPA, under old and revised assumptions, all those aged between 50 and the SPA.**
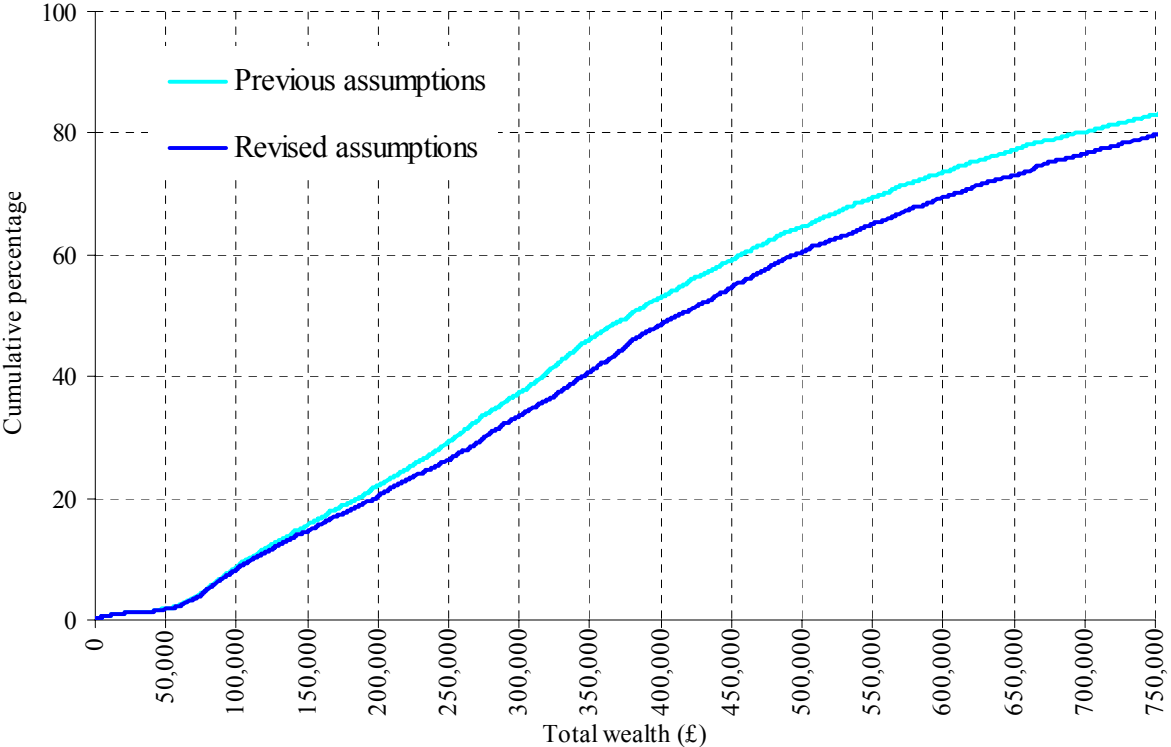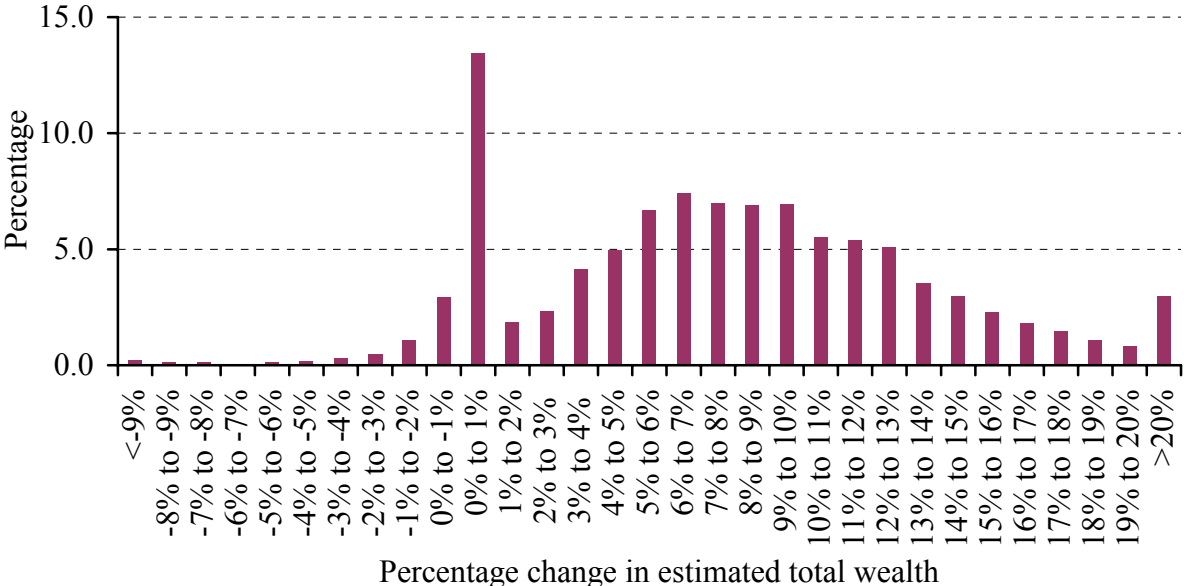


Notes: Sample size = 5,090 individuals aged between 50 and the SPA. Unweighted.

The distribution of the estimates of total wealth under the revised and the previous assumptions is shown in Figure 4.4. Under the new assumptions nearly 95% of individuals (94.5%) are estimated to have the same or larger total wealth. In one-in-six (16.4%) cases the revised estimate lies within 1% of the original estimate, and in one-in-ten (10.2%) cases it is actually unchanged. Again there are some groups who are unaffected by the revisions to the assumptions, for example individuals aged 55 or over who have no wealth in either housing or defined contribution pensions. One-third of the sample (34.9%) have estimated total wealth that is between 5% and 10% higher as a result of the revised assumptions – with a further one-third (32.9%) having estimated total wealth that is more than 10% higher. This shows the extent to which higher estimates of housing wealth have boosted total wealth.

**Figure 4.4. Distribution of percentage change in estimated total wealth assuming retirement at the SPA as a result of moving from previous estimates to revised estimates, those aged between 50 and the SPA in 2002–03 only.**



Notes: Sample size = 5,081 individuals aged between 50 and the SPA. 9 individuals dropped due to not having positive estimated total wealth under the previous estimates. Unweighted.

At the median estimated total wealth is 7.5% higher as a result of the improvements to the underlying assumptions. As shown in Table 4.2, there is very little variation by sex but some evidence of a slightly larger increase in wealth among both men and women aged between 50 and 54 than there is among older men and women.

**Table 4.4. Median change in estimated total wealth by sex and age.**

|  | Men | Women | All |
|---|---|---|---|
| 50 to 54 | +8.66 | +7.71 | +8.15 |
| 55 to 59 | +6.89 | +7.36 | +7.09 |
| 60 to 64 | +7.36 | n/a | +7.36 |
| All | +7.53 | +7.48 | +7.51 |
| | | | |
| *Sample size* | | | |
| *50 to 54* | *919* | *1,153* | *2,072* |
| *55 to 59* | *1,029* | *1,167* | *2,196* |
| *60 to 64* | *813* | *n/a* | *813* |
| *All* | *2,761* | *2,320* | *5,081* |

Notes: 9 individuals dropped due to not having positive estimated total wealth under the previous estimates. Unweighted.

## 4.3. Sensitivity of numbers at risk of inadequate retirement resources

Assessing the adequacy of individual's retirement plans is extremely difficult not least because it requires an assessment of both expected retirement resources and also expected spending needs throughout retirement. The interim report of the Pensions Commission (2004) set out a benchmark for adequacy based on current gross earnings (and therefore is a definition that is only relevant for those who are currently receiving employment income). Table 4.3 sets out the replacement rates that the Pensions Commission chose for each earnings band. Middle earners (those on between £17,500 and £24,999) were assumed to require at least a 67 per cent gross replacement rate (which roughly equates to an 80 per cent net replacement rate). Lower earners were deemed to require a greater replacement rate to have an adequate retirement income, while higher earners were assumed to require a lower gross replacement rate to provide an adequate income. For example, those earning £40,000 a year or more were assumed to require a gross replacement rate of 50 per cent (which roughly equates to a 67 per cent net replacement rate).

**Table 4.5 Replacement rates assumed in Pensions Commission analysis**

| Gross income | Assumed gross replacement rate |
|---|---|
| Less than £9,500 | 80% |
| £9,500 to £17,499 | 70% |
| £17,500 to £24,999 | 67% |
| £25,000 to £39,999 | 60% |
| £40,000 and over | 50% |

Source: Table G.1, page 169, appendix G of Pensions Commission (2004).

Estimates of the percentage of individuals aged between 50 and the SPA with earnings whose retirement resources are estimated to fall below the Pensions Commission's adequacy benchmark are set out in Chapter 6 of Banks, Emmerson, Oldfield and Tetlow (2005). This analysis was done under various scenarios for retirement ages from, at one extreme, a scenario where all individuals retired immediately to, at what might be considered the other

extreme, a scenario where all individuals retired when they reached the SPA. One scenario that was also considered, which lies between these two, is that individuals' likelihood of remaining in paid-work depends on their self-reported probability of being in paid-work at older ages that they gave in response to the 2002–03 survey.[7] In this section we take the previous estimates of the percentage of individuals with employment income facing inadequate retirement resources, as defined by the Pensions Commission, under this retirement scenario and update them in the light of the new pension and non-pension wealth assumptions. The retirement likelihoods are not updated – which ensures that any differences in the estimates of the numbers at risk of having inadequate resources will be due to differences in the assumptions underpinning the evolution of pension wealth and non-pension wealth, rather than due to individuals revising their expectations of being in paid-work. In the Appendix we show how the revised assumptions affect estimates of the percentage of individuals falling below an absolute adequacy threshold (the Pension Credit Guarantee in Table A.2) and two alternative relative adequacy thresholds (67% net and 80% net replacement rates in Table A.3).

A comparison of the percentage of individuals in families with employment income estimated to be at risk under the previous and revised underlying assumptions is presented in Table 4.4. The first ('previous') column presents the figures published in Table 6.4 of Banks, Emmerson, Oldfield and Tetlow (2005). These show that on the basis of pension wealth alone (row 1) 38.8% of those with employment income aged between 50 and the SPA were estimated to have inadequate retirement resources on the basis that the pension income that they could expect at the SPA under the Pensions Commission definition of inadequacy. This equates to 30.2% of all individuals aged between 50 and the SPA. Broader measures of retirement resources lead to fewer individuals falling below this benchmark. So, for example, when we assumed that all non-owner occupied housing wealth (that is pension wealth plus net financial and physical wealth) would be annuitised at a rate of 5% (row 2), then 29.1% of individuals with employment income were estimated to be at risk of inadequate retirement resources. It is also the case that individuals might choose to use part of their owner-occupied housing wealth to finance non-housing consumption. The measure of 'total wealth' in Table 4.4 assumes that individuals annuitise half of their current net housing wealth (which is equivalent to purchasing a home reversion product at a rate of 2½%) and leads to 18.3% of individuals with employment income (row 3) being estimated to have retirement resources

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[7] Emmerson and Tetlow (2006b) show that these expectations correlated with subsequent changes in labour market activity. For example men aged 50 to 54 in 2002–03 who were still in paid work in 2004–05 reported on average a 63.0% chance of being in work at age 60 when asked in 2002–03, while men of the same age who had left paid work by 2004–05 had reported on average a 41.4% chance of being in paid work at age 60 when asked in 2002–03.

falling below the Pensions Commission's adequacy benchmark. Broader measures of wealth in Table 4.4 include expected inheritances (row 4) and entitlement to the Pension Credit (row 5), with the latter (broadest) measure of retirement resources leading to 12.6% of individuals with employment income being estimated to have retirement resources that fall short of the Pensions Commission's adequacy benchmark. This equates to 9.8% of all individuals aged between 50 and the SPA.

**Table 4.6. Percentage of those with employment income aged between 50 and the SPA whose retirement resources fall below the Pensions Commissions definition of adequacy, by different measures of retirement resources and previous and revised assumptions.**

|      |                                                                  | Previous | Revised |
| ---- | ---------------------------------------------------------------- | -------- | ------- |
| (1)  | Pension wealth only                                              | 38.8%    | 39.0%   |
| (2)  | Non-housing wealth only                                          | 29.1%    | 29.2%   |
| (3)  | Total wealth                                                     | 18.3%    | 15.6%   |
| (4)  | Total wealth plus expected inheritances                          | 16.2%    | 14.4%   |
| (5)  | Total wealth plus expected inheritances and pension credit       | 12.6%    | 11.0%   |

Notes: All estimates are weighted, sample size = 3,605 individuals in families with employment income.
Source: Previous estimates from Table 6.4 of Banks, Emmerson, Oldfield and Tetlow, 2005.

The second ('revised') column of Table 4.4 shows the percentage of individuals in families with employment income estimated to be at risk using estimates of wealth calculated under the new underlying assumptions. Counting pension wealth as the only retirement resource results in little difference between the two estimates: 39.0% of these individuals are estimated to have inadequate retirement resources compared to the original estimate of 38.8%. The fact that these numbers are very similar is unsurprising given that the distribution of estimated pension wealth under the revised assumptions is very similar to the estimated distribution of pension wealth under the previous assumptions (as shown in Figures 4.1a and 4.1b). A larger difference is found once 50% of net housing wealth is included as a retirement resource. This leads to 15.6% of these individuals (row 3) being estimated to have retirement resources below the Pensions Commission's adequacy benchmark compared to the original estimate of 18.3%. Taking the broadest measure of retirement resources – which in addition to current pension and non-pension wealth includes both expected inheritances and expected receipt of the Pension Credit – we find that the percentage estimated to have resources below the Pensions Commission's definition of adequacy is reduced from 12.6% to 11.0%.

The decline in this estimated number of individuals in families with employment income facing inadequate retirement resources is due to the large growth in house prices observed between 2002–03 and 2004–05. While the revised assumption takes into account the average growth in net housing wealth observed among homeowners aged 50 and over during this period, it still assumes that there will be no real growth in net housing wealth going forwards. Figure 4.5 gives an indication of how sensitive the estimated percentage of these individuals

facing inadequate resources is to both future growth in net housing wealth and also to the percentage of net housing wealth that is used as a retirement resource. The alternative assumptions about future house price growth shown in Figure 4.5 (i.e. ranging from 5% a year real decline in housing wealth to 5% a year real growth in housing wealth) reflect the range of experience of house price growth in the UK over the last forty years. Between 1969 and 2000, average annual real house price growth in the UK was 2.5% a year. The weakest performance of the housing market during any consecutive five-year period was between 1973 and 1978 when house prices fell on average by 5.9% a year in real terms. The strongest performance of the housing market was between 1984 and 1989 when house prices grew on average by 8.7% a year in real terms.[8]

If we assume that individuals use half of their net housing wealth, and that net housing wealth remains constant in real terms then 11.0% of these individuals would be estimated to have retirement resources below the Pensions Commission adequacy benchmark (as shown in the final row of Table 4.6). Figure 4.5 shows that were net housing wealth to grow instead by 2½% a year in real terms (in line with the Treasury's cautious estimate of expected medium-term growth in the UK economy) then the proportion estimated to face inadequate retirement resources would fall by 0.9 percentage points to 10.1%, whereas were net housing wealth to decline by 2½% a year then it would rise by 0.8 percentage points to 11.8% of these individuals.

Figure 4.5 also shows how sensitive our findings are to the proportion of housing wealth used to finance non-housing retirement consumption. If no housing wealth is used for non-housing consumption needs then the estimated proportion of these individuals with employment income facing inadequate retirement resources would be 21.1% (this figure is, obviously, invariant to real growth in house prices). Assuming no real growth in house prices, this proportion falls to 11.0% under our baseline assumption that 50% of net housing wealth is used to finance retirement consumption. This proportion falls by a further 1.6 percentage points to 9.4% if two-thirds of housing wealth were used, and rises by 2.2 percentage points (after rounding) to 13.3% if only one-third were used. Appendix Figures A.1 and A.2 shows how sensitive estimates for alternative relative adequacy benchmarks are to both future house price growth and the percentage of net housing wealth used for non-housing consumption.

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[8] Source: http://www.communities.gov.uk/housingstatistics, deflated by growth in Retail Price Index.

**Figure 4.5. Estimated proportion of individuals with employment income at risk of falling short of the Pensions Commission definition of adequate retirement resources, by growth in net housing wealth and proportion of net housing wealth used for non housing consumption.**
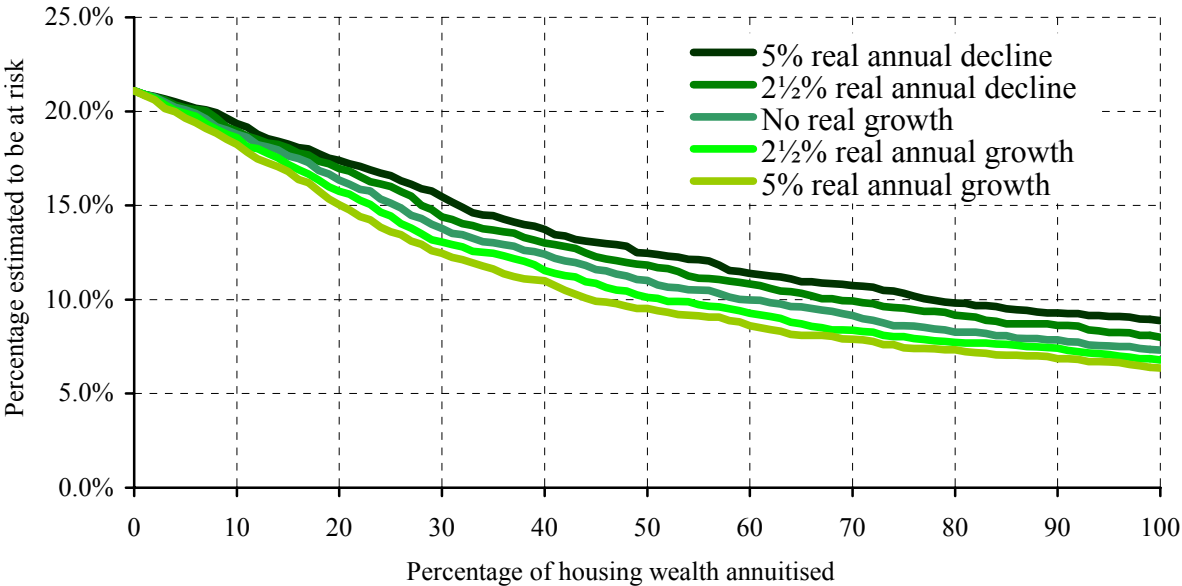


Notes: Sample size = 3,605 individuals in families with employment income. Weighted.

## 5. Conclusions

A key policy issue, particularly in an environment of rising life expectancy, is the extent to which individuals can reasonably expect to have adequate resources to finance their spending needs throughout their retirement. This issue is made even more important in the UK by the declining generosity of state pensions relative to average earnings which, while reducing the burden on taxpayers relative to maintaining their generosity, increases the importance of individuals making appropriate plans for both their private retirement saving and their retirement age. In the context of this background, estimates of the distribution of retirement resources are particularly important when determining the need, or otherwise, for further reforms to the pensions and retirement saving environment.

This paper has taken some of the key assumptions underpinning previous estimates of the distribution of both pension and non-pension wealth at retirement based on data from 2002–03 and compared them to what individuals actually experienced over the subsequent two year period. In many cases the assumptions have proven reasonable or cautious, as initially intended. Improvements over the assumed growth in earnings among those aged between 50 and 54, and incorporating the average decline in the underlying value of funds held in defined contribution private pensions seen over the two year period from 2002–03 to 2004–05, are shown to have relatively little impact on the final estimates of the distribution of pension wealth at retirement. Consequently the percentage of individuals in families with employment income who are estimated to have pension income below the Pensions Commission's benchmark of adequacy is unaffected by the revisions to the assumptions underpinning the pension wealth calculations.

Of far more significance over the period between 2002–03 and 2004–05 has been the far greater than assumed growth in housing wealth. On average net housing wealth is found to have increased in real terms by around 30% which is in line with the growth in the Nationwide House Price Index over this two year period. In contrast the previous estimates of non-pension wealth assumed that net housing wealth would remain constant in real terms. Improving this assumption – by increasing net housing wealth by 30% over the period from 2002–03 to 2004–05 and then assuming that it remains constant in real terms – boosts the estimates of total wealth across most of the wealth distribution. Previous research showed that, once half of current net housing wealth was included as a retirement resource, 12.6% of employees approaching retirement were estimated to have resources below the Pensions Commission's definition of adequacy. Taking into account the high growth in house prices between 2002–03 and 2004–05 reduces this to 10.9%. This assumes that house prices remain constant in real terms. Were they to grow by 2½% a year in real terms (in line with the Treasury's cautious estimate of expected growth in the UK economy) then the proportion

estimated to face inadequate retirement resources would fall by 1.2 percentage points to 9.7%, whereas were net housing wealth to decline by 2½% a year then the proportion would rise by 1.6 percentage points to 12.5% of these individuals.

One issue is whether individuals will be able to use formal equity release – or unlock their housing wealth in an informal way – to the extent required in the broadest measure of retirement resources set out above. It is difficult to get information on the UK equity release market, but recent analysis of the US market suggests that at current real interest rates and life expectancies a 65 year old male is indeed able to unlock half of his housing wealth (Eschtruth, *et al*, 2006). This strengthens the argument that the broadest measure of retirement resources might be the most appropriate to take. However, it also suggests that Government policies aimed at improving the operation of the equity release market, and reducing any unwarranted disincentives to engage in equity release from, for example, the tax, tax credit and benefit system, could also be helpful.

Finally our discussion of changes in housing wealth, and changes in wealth more generally, has led to a consideration of wealth dynamics and their role in scenarios for the distribution of retirement savings adequacy. Confronted with data on changes in wealth between waves, the implications of asset price risks (and consequent changes in asset values) become apparent. Analysis of retirement saving inadequacy might usefully look at the degree of potential inadequacy of retirement resources given assumptions on asset price volatility as opposed to just average asset price growth. Whilst, as with our analysis of scenarios for housing price growth rates, it may be the case that those who are holding risky assets and facing the most volatility in returns are not those who are closest to the thresholds for inadequate resources, such a correlation remains to be established. In order to investigate such issues, analysis would need to look at the particular forms in which financial assets are held and consider asset-specific scenarios for the distribution of asset price shocks and returns. Such analysis would seem an interesting topic for further research.

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## Appendix

**Table A.1 Distribution of earnings in first wave by what happens later**

|  | p25 | p50 (median) | p75 | N |
|---|---|---|---|---|
| All | 8,736 | 15,036 | 24,232 | 2,691 |
| Die | 3,900 | 10,666 | 15,860 | 22 |
| Survive & attrit | 7,800 | 14,000 | 23,400 | 473 |
| Survive & retain | 9,000 | 15,600 | 25,000 | 2,196 |
| *Of which* |  |  |  |  |
| Stay in paid work | 9,375 | 15,600 | 25,500 | 1,761 |
| Leave paid work | 7,200 | 13,752 | 22,908 | 435 |

Note: Those aged between 50 and the SPA who report a precise value for gross earnings in 2002–03 only. Unweighted.

**Table A.2. Percentage of those aged between 50 and the SPA whose retirement resources fall below the PCG when they reach the SPA, by different measures of retirement resources and previous and revised assumptions.**

|  | Previous | Revised |
|---|---|---|
| (1) Pension wealth only | 17.7% | 17.7% |
| (2) Non-housing wealth only | 12.9% | 12.8% |
| (3) Total wealth (including 100% of housing wealth) | 8.2% | 7.8% |
| (4) Total wealth plus expected inheritances | 7.7% | 7.3% |
| (5) Total wealth plus expected inheritances and pension credit | ≈0 | ≈0 |

Notes: All estimates are weighted, sample size = 4,667.
Source: Previous estimates from Table 6.1 of Banks, Emmerson, Oldfield and Tetlow, 2005.

**Table A.3. Percentage of those aged between 50 and the SPA predicted to have a net replacement rate below 67% and below 80% when the reach the SPA, by different measures of retirement resources and previous and revised assumptions.**

|  | Previous | Revised |
|---|---|---|
| **Below 67% net replacement rate** |  |  |
| (1) Pension wealth only | 37.3% | 37.1% |
| (2) Non-housing wealth only | 26.9% | 27.0% |
| (3) Total wealth (including 50% of housing wealth) | 18.3% | 16.7% |
| (4) Total wealth plus expected inheritances | 17.0% | 15.3% |
| (5) Total wealth plus expected inheritances and pension credit | 11.3% | 10.3% |
| **Below 80% net replacement rate** |  |  |
| (1) Pension wealth only | 51.6% | 51.6% |
| (2) Non-housing wealth only | 40.9% | 41.1% |
| (3) Total wealth (including 50% of housing wealth) | 30.4% | 27.5% |
| (4) Total wealth plus expected inheritances | 29.1% | 26.2% |
| (5) Total wealth plus expected inheritances and pension credit | 23.1% | 20.9% |

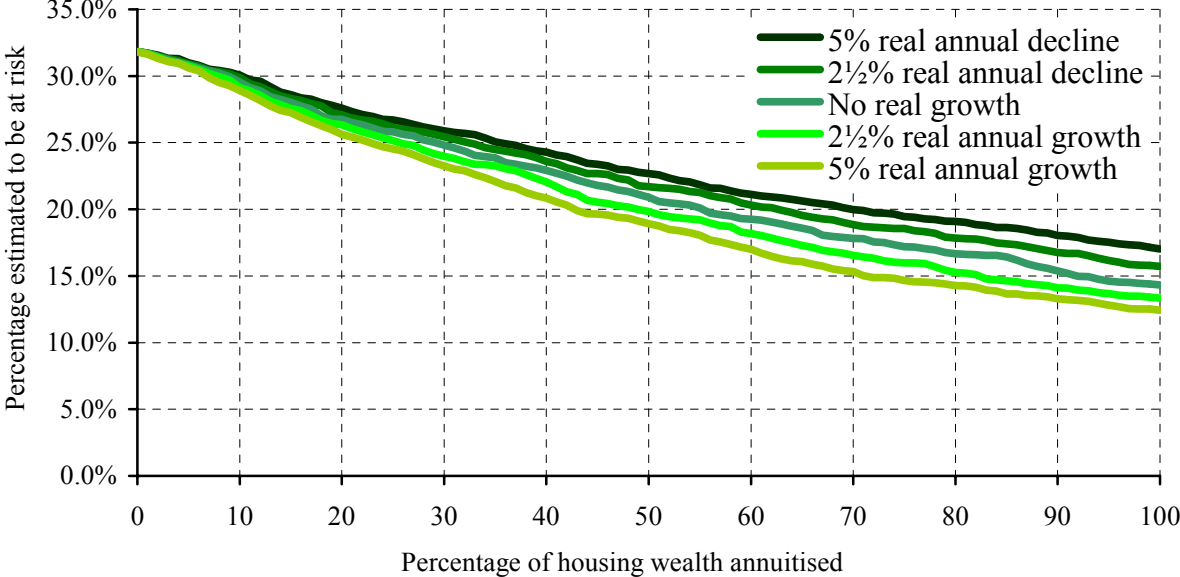Notes: All estimates are weighted, sample size = 4,667.
Source: Previous estimates from Table 6.2 of Banks, Emmerson, Oldfield and Tetlow, 2005.

**Figure A.1. Proportion of individuals aged between 50 and the SPA predicted to fall short of a 67% net replacement rate at the SPA, by growth in net housing wealth and proportion of net housing wealth used for non housing consumption.**
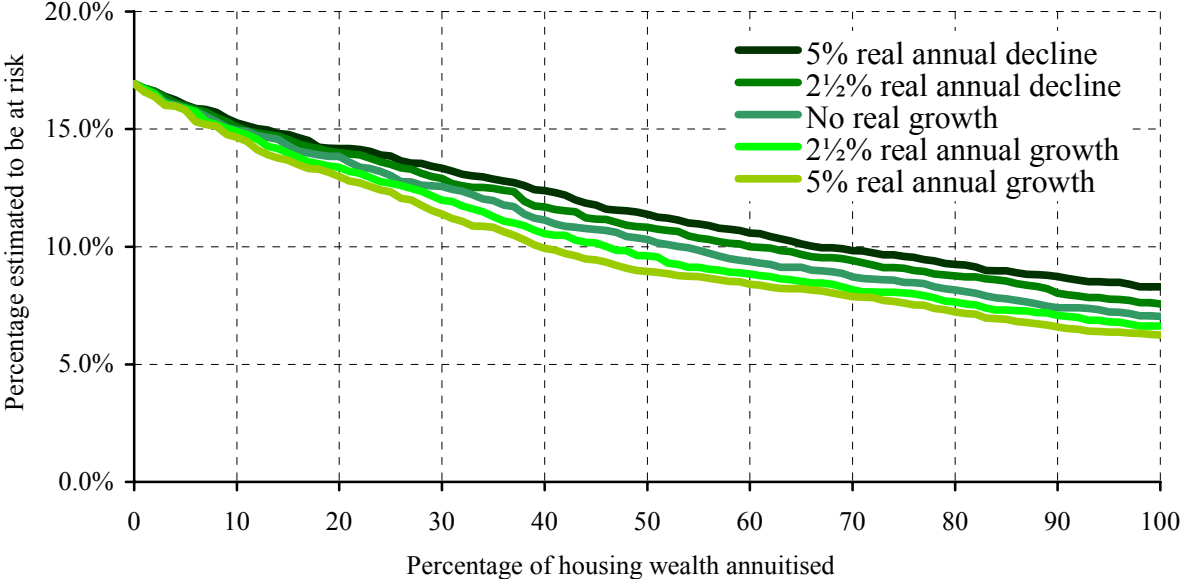


Notes: Sample size = 4,667. Weighted.

**Figure A.2. Proportion of individuals aged between 50 and the SPA predicted to fall short of a 80% net replacement rate at the SPA, by growth in net housing wealth and proportion of net housing wealth used for non housing consumption.**



Notes: Sample size = 4,667. Weighted.