

# The Inflation Experience of Older Households

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The Institute for Fiscal Studies

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## **Preface**

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# Executive summary

Recent increases in inflation have been accompanied by concerns over the extent to which official figures match the ‘true’ household experience of inflation. Rapid increases in the prices of household fuel, petrol and diesel and, more recently, of food have brought considerable attention to the fact that inflation will be different for different households according to their expenditure patterns. Any measure of inflation, such as the Retail Prices Index (RPI) or Consumer Prices Index (CPI), is necessarily only an average of the experience of different households and may not be especially representative of what is happening for any household in particular.

Using data from the Expenditure and Food Survey, this Commentary looks at the inflation experience (based on the RPI) for different groups of households, examining how the average inflation rate they face has varied over time and making comparisons across the groups, focusing in particular on pensioner households. Our key findings are as follows:

- Households will have different inflation rates because their expenditure patterns are different from the ‘average’ patterns used to calculate the national RPI figures. There is often considerable variation in household inflation rates within a single year or a single month.
- The average inflation rate for pensioner households is often a better guide to the typical inflation experience of pensioners than the average for all households. However, even looking within pensioner household type, there is still variation in inflation rates.
- Over the whole period between 1977 and 2008, average inflation for pensioners (5.8 per cent) has been virtually the same as that for non-pensioners (5.9 per cent), but the ranking changes frequently from year to year and differences within any one particular year can be large. Non-pensioner inflation has tended to be more volatile – this is driven by mortgage interest payments, which are paid by few pensioners.
- Looking at average inflation on a month-by-month basis in recent years, pensioner inflation was higher than non-pensioner inflation during 2006, lower during 2007 and higher again in 2008. In August 2008, average pensioner inflation reached 7.4 per cent, significantly higher than the 5.4 per cent rate for non-pensioners and the highest rate for pensioners since 1991.
- Importantly, ‘pensioner households’ are not homogeneous. There are sometimes quite substantial differences in the average inflation for different pensioner household groups at any point in time.
- The rapid increase in fuel prices in 2006 affected households aged 75 and over far more than other pensioner groups on average; younger pensioners had average inflation rates that looked very similar to those of non-pensioners at the time. In 2008, inflation in both food and fuel prices meant *all* pensioner age groups had significantly higher average inflation than non-pensioners, though again the oldest pensioners suffered most. By August 2008, pensioner households aged 60–64 had average inflation rates of 6.6 per cent, compared with 8.4 per cent for those aged 80 or over and 5.4 per cent for non-pensioners.

- Over the whole period between 1991 and 2008, pensioners in the poorest fifth of the overall population have had the same average inflation rate (3.2 per cent) as pensioners in the richest two-fifths of all households. The poorest pensioners were most affected by the fuel price inflation in 2006 as the share of their budget they spend on fuel is around twice as large as that of the richest pensioner households. Average inflation for the poorest pensioners reached 8.3 per cent in August 2008, compared with 6.4 per cent for the richest pensioners.
- During 2006, inflation appeared to be more closely related to income than to age. The oldest, poorest pensioners had the highest average inflation rate, peaking at 6.8 per cent in December 2006. Richer pensioners of the same age had inflation rates that looked much more like those faced by rich younger pensioners, reaching 4.8 per cent in the same month. In 2008, inflation for the youngest, richest pensioner households has risen less quickly than that for other pensioners, though all have seen substantial increases relative to 2007. In August 2008, the youngest, richest pensioners had an average inflation rate of 6.1 per cent, compared with 9.0 per cent for the oldest, poorest.
- Housing costs play a very important role in determining inflation. The small number of pensioner households that have mortgages have an inflation rate that looks very similar to that of non-pensioner households with mortgages and less like the inflation rate of mortgage-free pensioners.
- In most years since 1987, the increase in the basic state pension has been broadly similar to pensioner inflation. Overall, the current value of the pension (£90.70 per week) is around £6.60 more than the pension would be worth if the 1987 figure had been uprated in line with pensioner inflation each year. This is largely due to the substantial real-terms increase in the basic state pension in 2001. However, looking over a shorter time period, we get a different result: had the pension been uprated by pensioner inflation since 2002, it would now be worth £92.26 per week, around £1.60 *more* than the current rate. These differences illustrate how there are periods when pensioner inflation is higher than inflation for other groups and periods when it is lower.
- The basic state pension increased by *less* than pensioner inflation in 2006, 2007 and 2008, and even the guarantee element of the pension credit, uprated in line with average earnings, fell relative to pensioner inflation in both 2007 and 2008.

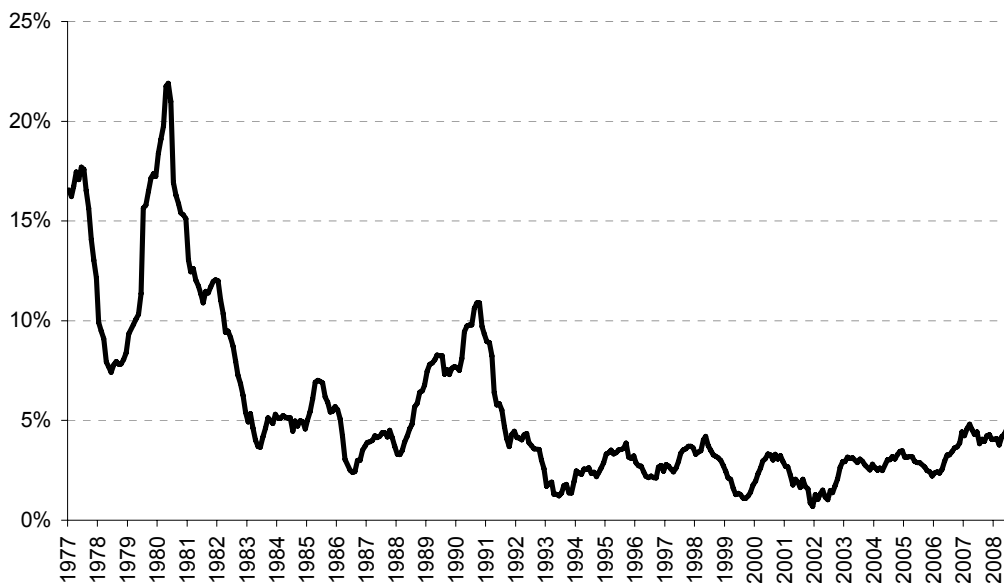
*Part of the explanation for the lack of confidence in the official inflation figures ... is that they represent the expenditure and inflation experiences of an average household and that, not surprisingly, most people's expenditure patterns, and their resulting experience of price changes, will differ from that average.*

O'Donoghue, 2007, p. 33

# 1. Introduction

Over the last thirty years, there has been considerable volatility in UK inflation. Inflation (as measured by the all-items Retail Prices Index, RPI) peaked at almost 22 per cent in 1980 following an oil price shock. It then fell to around 3 per cent in 1986 before rising strongly in the subsequent few years of the 'Lawson Boom' period, to almost 11 per cent in 1990. Since then, inflation has tended to be relatively low and stable. By 1993, it had fallen to less than 2 per cent. Between 1993 and 2006, the inflation rate fluctuated between around 1 per cent and 4 per cent. However, during 2007 and 2008, inflation has risen strongly, peaking at 5 per cent in July 2008 (the highest figure since July 1991) before falling back slightly in August. Figure 1.1 illustrates these trends.

Figure 1.1. All-items RPI inflation rate, January 1977 – August 2008



Source: Office for National Statistics.

However, despite the recent increase in inflation, many commentators have expressed surprise that the headline inflation numbers are still relatively low, given rapid increases in the prices of food, fuel and petrol, for example. There has been a growing sense that 'the' inflation rate as reported by the Office for National Statistics (ONS) does not reflect the reality facing many households. In part, this may reflect the facts that recent inflation has focused on high-



visibility items that people buy frequently, such as food and petrol,<sup>1</sup> and that price increases for these items and for household fuel have had such a high profile. It also reflects the fact that different households have different inflation experiences based on their overall spending patterns, which is the focus of our work here.

This Commentary examines the inflation rate at a household level, in particular looking at the experience of older households – many pensioners spend a much higher-than-average share of their incomes on food and fuel, for example, and so official inflation numbers may well have understated their recent inflation experiences. We examine the extent to which this is true and how pensioner inflation has compared with non-pensioner inflation over a longer time period. We look within pensioner households to assess, for example, whether poor and rich pensioners are similar in terms of their inflation experience, and to examine how inflation varies with age and household tenure. We also look at how far increases in benefits targeted at pensioners have kept pace with pensioner-specific measures of inflation. Whilst there have been other recent studies that have looked at variation in inflation rates across household groups – and the ONS publishes a separate price index for low-income pensioner households – they have typically relied on published estimates of average spending for these groups (or example families within each group) to calculate group-specific inflation rates. By contrast, our Commentary uses microeconomic data on household expenditure patterns to calculate household-level expenditures which can be analysed for various groups and allow us to examine the distribution of inflation across households. Our analysis makes clear the variation in inflation rates even within quite narrowly defined groups of households.

Chapter 2 first outlines what is meant by inflation and how it is calculated by the ONS, explaining the different inflation measures that are commonly used and discussing other recent studies that have looked at the variation in inflation across groups. Chapter 3 describes our method of calculating household-level inflation rates. Chapter 4 discusses our main results, looking at inflation rates across pensioners and non-pensioners and within different types of pensioner household, examining the extent to which inflation varies even within a particular household group. In Chapter 5, we analyse the extent to which benefits aimed at pensioner households have kept pace with pensioner inflation. Chapter 6 concludes.

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<sup>1</sup> See, for example, Pike (2008).

## 2. Measuring inflation

### 2.1 What is inflation?

Inflation is a measure of how quickly prices are increasing. It measures changes in prices rather than price levels – if the rate of inflation falls, it does not mean prices are falling, just that they are rising less quickly (unless inflation falls below zero). Of course, different goods and services increase in price at different rates. When we talk about ‘the’ rate of inflation, it refers to an average of the inflation rates of different items. Each month, the ONS collects more than 100,000 prices from around the country on a wide range of goods and services that make up a ‘shopping basket’ of some 650 typically purchased items.<sup>2</sup> This basket is updated each year to make sure the items it contains reflect what is being bought. The 2008 basket can be found on the ONS website;<sup>3</sup> it saw, for example, the prices of fruit smoothies and of portable memory sticks being collected for the first time, whilst CD singles and camera films were dropped from the basket.

By comparing the prices of the basket items with their level in a reference period, an inflation rate for each item can be calculated. The items are chosen to be representative of price increases for general categories of expenditure. The all-items Retail Prices Index (RPI – see Section 2.2) includes around 80 such categories from ‘bread’ and ‘cereals’ to ‘electricity’, ‘pet care’, ‘domestic services’ and ‘foreign holidays’, for example, which are further aggregated into 14 broad spending groups such as ‘food’ and ‘leisure goods’.<sup>4</sup> A price index and an inflation rate for each of these categories are calculated from the thousands of prices collected. A weighted average of these inflation rates is then taken to give an overall inflation figure. The weight for each category reflects how important a part of the ‘average’ budget it is. In the 2008 RPI, for example, food items have a weight of 11.1 per cent in the total basket, though each individual food category has a relatively small weight (bread 0.5 per cent, bacon 0.2 per cent, fresh milk 0.5 per cent and so on).

Table 2.1 shows the average annual inflation rates over the last twenty years or so for the main RPI expenditure groups – food, catering (food outside the home), alcohol, tobacco, housing, household fuel, household goods, household services, clothing, personal goods and services, motoring, public transport, leisure goods and leisure services. Whilst prices for the various components of the basket tend to move in similar ways over time, it is clear there is considerable variation. Over the first eight months of 2008, for example, the overall RPI rose by an average of 4.4 per cent, but within the subcomponents, clothing prices have fallen by 3.0 per cent and leisure goods by 2.6 per cent, whilst food prices have risen by 8.5 per cent and household fuel prices by 10.1 per cent. In August 2008, the annual inflation rate of oil

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<sup>2</sup> Detailed information on how inflation is measured and data are collected can be found in Office for National Statistics (2007).

<sup>3</sup> See annexes A and B of Wingfield and Gooding (2008).

<sup>4</sup> The full list of categories in the RPI and the Consumer Prices Index (CPI) can be found in appendices 3 and 4 respectively of Office for National Statistics (2007).

Table 2.1. Inflation rates for broad RPI subcategories, 1988–2008

	Food	Catering	Alcohol	Tobacco	Housing	Household fuel	Household goods	Household services	Clothing	Personal goods & services	Motoring	Public transport	Leisure goods	Leisure services	Overall RPI
1988	3.4%	6.7%	5.0%	3.3%	8.8%	2.5%	3.7%	4.8%	3.3%	4.8%	4.5%	5.8%	2.6%	6.4%	4.9%
1989	5.7%	6.3%	5.7%	2.9%	20.4%	5.6%	4.0%	5.3%	5.2%	6.8%	5.5%	7.2%	3.1%	6.5%	7.8%
1990	8.0%	8.4%	9.6%	6.8%	20.9%	8.0%	4.8%	6.3%	4.7%	7.5%	6.1%	7.1%	4.7%	8.2%	9.5%
1991	5.2%	10.0%	12.4%	14.3%	-1.2%	8.0%	6.2%	8.3%	3.0%	8.7%	7.4%	9.8%	4.6%	11.5%	5.9%
1992	2.2%	6.4%	6.5%	11.2%	-0.5%	2.3%	3.3%	5.8%	0.3%	6.6%	6.9%	6.2%	2.7%	8.2%	3.7%
1993	1.8%	5.2%	4.4%	8.4%	-5.4%	-1.3%	1.3%	3.6%	0.8%	4.0%	4.3%	5.2%	1.5%	4.5%	1.6%
1994	1.0%	4.1%	2.4%	7.6%	3.3%	4.4%	0.3%	0.1%	0.5%	3.7%	3.5%	2.6%	-0.6%	3.7%	2.5%
1995	3.8%	4.3%	3.8%	6.7%	6.7%	2.2%	3.7%	-0.3%	0.2%	3.2%	1.8%	2.5%	-0.1%	3.2%	3.4%
1996	3.3%	4.0%	2.9%	6.7%	1.4%	0.3%	3.3%	0.1%	-0.7%	3.8%	3.0%	3.0%	1.6%	3.7%	2.5%
1997	0.1%	3.7%	2.8%	7.4%	6.5%	-3.1%	1.2%	1.8%	0.7%	3.6%	5.3%	3.3%	0.2%	4.9%	3.1%
1998	1.3%	3.9%	3.4%	8.6%	8.9%	-4.3%	1.3%	2.7%	-0.6%	4.7%	3.1%	2.2%	-2.2%	4.4%	3.4%
1999	0.4%	3.8%	2.6%	11.5%	0.8%	-0.4%	0.5%	2.9%	-2.6%	3.2%	2.4%	3.1%	-4.1%	4.1%	1.6%
2000	-0.3%	3.5%	1.6%	8.6%	8.9%	-0.4%	-0.9%	3.1%	-3.8%	1.0%	3.8%	3.3%	-3.5%	5.0%	2.9%
2001	3.3%	4.0%	2.1%	5.5%	3.2%	0.8%	0.9%	1.1%	-4.2%	3.2%	-0.5%	3.2%	-2.0%	5.9%	1.8%
2002	0.7%	3.7%	2.3%	3.0%	2.6%	3.1%	0.6%	4.6%	-4.8%	1.8%	-0.8%	2.8%	-2.9%	8.2%	1.6%
2003	1.3%	3.1%	2.1%	3.5%	7.6%	2.1%	0.5%	4.7%	-1.5%	1.7%	1.3%	7.1%	-3.4%	4.1%	2.9%
2004	0.6%	2.7%	1.9%	3.6%	9.7%	7.0%	0.8%	3.6%	-2.8%	0.7%	1.0%	3.5%	-3.8%	2.0%	3.0%
2005	1.2%	3.0%	2.0%	4.4%	7.4%	13.5%	0.7%	2.3%	-2.4%	1.9%	0.6%	4.1%	-4.7%	3.2%	2.8%
2006	2.1%	2.7%	2.4%	4.4%	5.0%	24.5%	1.3%	3.5%	-1.2%	2.7%	1.5%	1.8%	-2.4%	2.2%	3.2%
2007	4.6%	3.3%	3.0%	5.3%	9.5%	8.1%	2.3%	3.4%	-0.8%	3.0%	1.2%	6.2%	-2.6%	3.3%	4.3%
2008	8.5%	4.1%	3.7%	4.3%	4.8%	10.1%	3.0%	3.8%	-3.0%	3.3%	5.5%	5.1%	-2.6%	3.8%	4.4%
Ave. (88–08)	2.8%	4.6%	3.9%	6.6%	6.2%	4.4%	2.0%	3.4%	-0.5%	3.8%	3.2%	4.5%	-0.7%	5.1%	3.7%
Ave. (97–08)	2.0%	3.4%	2.5%	5.8%	6.2%	5.1%	1.0%	3.1%	-2.3%	2.6%	2.0%	3.8%	-2.8%	4.3%	2.9%

Notes: Figures are annual averages of the monthly inflation rates for each subcategory. Figures for 2008 are based on January–August data.

Source: Authors' calculations from monthly ONS inflation data.

and liquid fuel was 58 per cent, butter 39 per cent and household gas 28 per cent; by contrast, the inflation rate for audio-visual equipment was –17 per cent, women’s clothing –8 per cent and motor vehicles –6 per cent. Over the whole period since 1988, it has tended to be services such as catering, housing, fuel, public transport and leisure services that have risen fastest (as well as tobacco, where price rises have been designed to discourage consumption via the tax system) and goods such as food, household goods, clothing and leisure goods that have risen in price more slowly, though of course there is significant year-on-year variation.

In general, inflation rates may well overstate how important price rises are in terms of how they affect people’s well-being. Inflation rates as measured do not immediately take account of how people might change their behaviour in response to rising prices. The basket of goods and services and the weights on the different items in it are held fixed for a year<sup>5</sup> but people’s spending behaviour, even on average, is not fixed over a year. In the 2008 RPI basket, petrol has a weight of 4.3 per cent and public transport a weight of 2.0 per cent. Given the rapid increase in petrol prices in the first half of 2008, however, we might expect people to have already started switching from petrol to public transport, meaning that these weights do not reflect ‘average’ spending any more. Any changes will not be reflected until the 2009 basket. This ‘substitution bias’ is one of the key problems of measuring inflation in this way. To use economists’ jargon, it is the difference between a ‘cost-of-goods’ index, such as the RPI, and a ‘cost-of-living’ index, which reflects how much more it costs to purchase a basket of goods that gives the same level of *welfare*, rather than the same basket of goods. For more on this, see section 2 of Crawford and Smith (2002).

## 2.2 What are the main measures of inflation in the UK?

There are two major measures of inflation published each month by the ONS: the Retail Prices Index (RPI) and the Consumer Prices Index (CPI). Both follow the same basic procedure to calculate inflation as discussed in Section 2.1. However, their coverage and exact calculation differ slightly, which means they can give different inflation rates for the same point in time. In August 2008, the 12-month rate of inflation was 4.7 per cent as measured by the CPI and 4.8 per cent as measured by the RPI (though typically the differences can be larger).

The RPI has a long historical tradition, going back to attempts to work out inflation in food prices from 1914. A more systematic approach to measuring price changes began in 1947, and this evolved into the RPI from 1956, looking at all wage-earners rather than just working-class households. The scope and definition of the RPI as they stand today have been in place since January 1987. The RPI is used to uprate many tax allowances and thresholds each year

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<sup>5</sup> Although the basket is fixed within a year, inflation rates can still be reported on an annual basis as inflation is measured as an index relative to a fixed reference point, so in effect different years’ baskets can be ‘chained’ together. See section 2.5 of Office for National Statistics (2007) for details.

and is also the default rate of increase for non-income-related benefits such as the basic state pension.<sup>6</sup> It is also often used as a cost-of-living measure in wage bargaining.

The CPI has been published since 1996, although until 2004 it was known as the ‘Harmonised Index of Consumer Prices’ or HICP. It is the measure of inflation targeted by the Bank of England, which has a remit to keep the CPI inflation rate within 1 percentage point of 2 per cent.<sup>7</sup> Its earlier name reflects the fact that it was designed to be internationally comparable across the European Union, largely to assess whether member states had met the criteria for joining the single European currency.

The main differences between the CPI and the RPI are in terms of coverage and use.<sup>8</sup> The CPI is the main ‘macroeconomic’ measure of inflation used as a policy target and for international comparisons. The RPI is a more ‘microeconomic’ or household measure of inflation that is more broadly representative of household expenditures. In particular, given the very different nature of housing markets in different countries, the CPI excludes most housing expenditures (such as mortgage interest costs, council tax and building insurance). It also excludes specific national indirect taxes such as vehicle excise duty and the television licence fee. All of these expenditures are covered by the RPI.

The RPI is specifically intended to be a measure of household inflation and so it excludes people living in institutions such as old people’s homes and university halls of residence. It also excludes very rich households (those among the top 4 per cent by income) and pensioner households that derive at least three-quarters of their income from benefits. The ONS justifies excluding these households on the grounds that their expenditure patterns are so different from those of other households that including them in the RPI average would make it a less representative measure of inflation for the majority of households. In the next section, we discuss a separate measure of inflation for the excluded pensioner households calculated by the ONS. Note that the CPI covers all households including those household types that are excluded from the main RPI and people not living in private households.

## **2.3 ‘Average’ inflation versus ‘household’ inflation**

Both RPI and CPI measures of inflation are averages. They reflect the average price increase for the basket of goods and services (the coverage of which differs across inflation measures) weighted by average household expenditures on each of those goods and services. For the RPI, average household spending is defined largely from an annual survey of household spending, the Expenditure and Food Survey (EFS), which also underlies our analysis in this Commentary. For the CPI, averages are defined from National Accounts measures of consumption, which are based in part on the EFS but also on other consumer and retailer surveys.

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<sup>6</sup> Means-tested benefits such as housing benefit tend to be uprated by the ROSSI index, a measure of the RPI that excludes rent, mortgage interest costs, water charges and local taxes. Benefits are often uprated by more than the statutory levels governed by the inflation rate. We examine benefit uprating in more depth in Chapter 5.

<sup>7</sup> Before 2004, the Bank of England targeted the RPIX, a measure of the RPI that excludes mortgage interest payments.

<sup>8</sup> For more on the differences between the RPI and the CPI, see Office for National Statistics (2003).

It is extremely unlikely that any one household will have the same spending pattern as the average. For 2008, alcohol has a weight of 5.9 per cent in the average basket and tobacco a weight of 2.7 per cent. For households that do not smoke or drink, these weights will be too high, but for households that do, they may well be too low. Similarly, petrol and other vehicle fuels have a weight of 4.3 per cent in the average basket; households without cars may spend almost nothing on this item, but those with several cars may spend a much bigger share of their budget on petrol.

The ONS clearly recognises that inflation measures are only averages. The exclusion of very rich households and benefit-reliant pensioner households from the main RPI index reflects concern that including them would distort the pattern of average expenditures too far away from that which is relevant for most other households, so making the RPI less representative for anyone.<sup>9</sup> The ONS publishes quarterly inflation data for pensioner households excluded from the main RPI (around 5.2 per cent of the households in the 2006 EFS), with separate figures for one-pensioner and two-pensioner households.<sup>10</sup> These pensioner price indices are calculated in much the same way as the regular RPI. The weights given to the various expenditure groups that make up the pensioner shopping basket are calculated from data on the expenditure patterns of these households, though there are some areas of spending that are not included in the pensioner inflation measure. First, all housing expenditures (rent, mortgage interest, local taxes, water costs, insurance, DIY and repair costs) are excluded on the grounds that as the pensioner group covered by the index are relatively low-income pensioners, they will tend to be excluded from housing cost increases through benefits such as housing benefit and council tax benefit – we examine how far this is true shortly. Similarly, ‘canteen meals’ are excluded from the pensioner indices as they largely reflect food purchased at workplaces, which is unlikely to be relevant for this group of households. There are other minor changes that reflect other costs that pensioners are unlikely to face or where prices will be different from those for other households, such as bus fares, TV licences and optical and dental charges. Otherwise, the price data used to calculate the pensioner indices are the same as those used to calculate the general RPI and all that differs is the weights given to the spending components.

Figure 2.1 shows the inflation rates for one- and two-pensioner households from the ONS series compared with inflation using a non-housing RPI (i.e. an RPI with exclusions broadly comparable to the main exclusions made from the pensioner series) between the first quarter of 1997 and the second quarter of 2008.

Before 2005, inflation for benefit-reliant pensioners was, like regular RPI inflation, relatively low and stable. Indeed, prior to 2002, pensioner inflation tended to be below the RPI figure. In 2006, the sudden increase in household fuel prices pushed up inflation for all groups but particularly pensioners: the one-pensioner household rate rose to almost 6 per cent and the two-pensioner rate to over 4 per cent. These rates fell sharply as fuel prices fell in 2007, but in 2008, the growth of food and fuel prices again saw a spike in inflation. This time, the

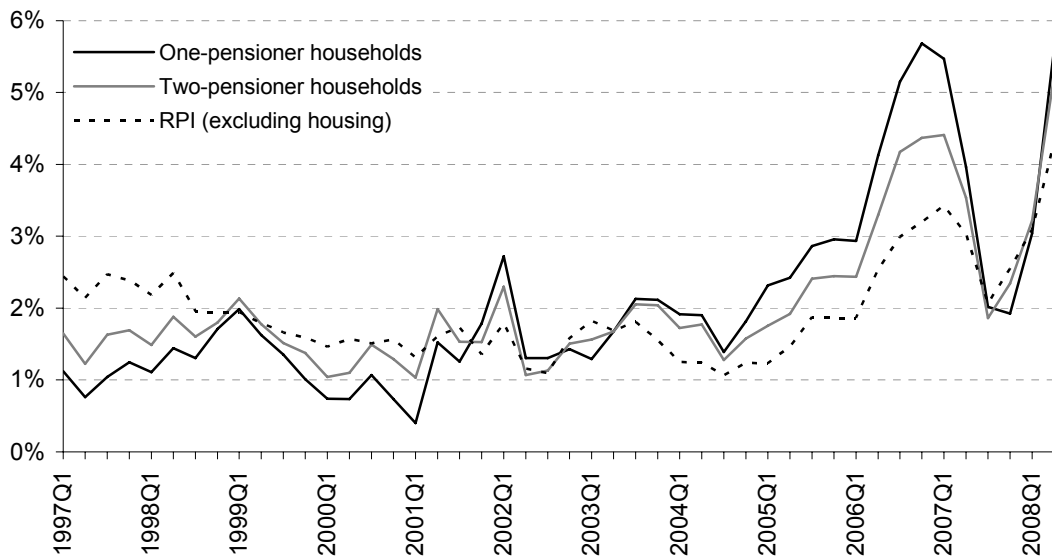
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<sup>9</sup> Since 2007, the ONS has provided a ‘personal inflation calculator’ on its website (<http://www.statistics.gov.uk/pic>), which allows users to determine their own inflation rate based on their expenditure patterns.

<sup>10</sup> The pensioner price indices and inflation rates can be found in section 7 of the ONS *Focus on Consumer Price Indices* publications, a list of which can be found at <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=867>.

difference between one- and two-pensioner households was smaller – both groups saw inflation rates of more than 5 per cent in the second quarter of 2008, still substantially above the non-housing RPI rate. However, the difference between the pensioner inflation rates and the non-housing RPI inflation rate was smaller in 2008 than in 2006, again reflecting the broader increase in inflation than in 2006, when it was largely limited to fuel.

Figure 2.1. ONS pensioner inflation rates, 1997Q1–2008Q2



Note: Figures are for pensioners who receive at least three-quarters of their income in state benefits.  
Source: ONS, *Focus on Consumer Price Indices*, July 2008.

The ONS's own figures are broadly in line with our findings in Chapter 4, where we compare inflation rates for all pensioners and non-pensioners rather than focusing on benefit-reliant pensioner households. It is not clear, however, that the reasoning behind excluding housing expenditures from the calculation of pensioner inflation is borne out by the data. Though many benefit-reliant households receive full rebates for council tax and rent payments, not all do, and other housing costs such as water charges, repairs and DIY payments should not be excluded on this basis. There appear to be a significant number of benefit-reliant pensioners with large housing costs: using the 2006 EFS, we estimate that pensioner households that derive at least three-quarters of their income from benefits spend on average 19.7 per cent of their budget on housing, not much different from the 20.4 per cent spent by all households on average. Around 22 per cent of this benefit-dependent pensioner group report zero expenditure on council tax (suggesting they receive full rebates). This is double the proportion of other households that report zero net council tax, but still less than one-quarter of this group that is supposedly fully shielded from housing costs. For those poorer pensioners who are genuinely protected from large increases in housing costs via the benefits system, the ONS figures may provide a good measure of their typical inflation rate, but this group is not the same as those pensioners who receive most of their income from benefits.

The ONS figures are not the only studies of how inflation differs across different types of households. Crawford and Smith (2002) examined the variation in inflation across household

types, including pensioner households. Using data from the Family Expenditure Survey between 1976 and 1999, they found that over the whole period, pensioners had slightly lower inflation than non-pensioners (averages of 6.8 per cent and 6.9 per cent a year respectively), but the difference between them varied substantially across time. However, their report looked only at pensioners as a whole and did not look within the pensioner population as we have done in this analysis.

A study by Clerical Medical in 2006<sup>11</sup> found that between 1996 and 2006, prices faced by pensioners increased by 34 per cent, though no comparison with other household types was made. Their figures were calculated using the ONS pensioner price indices discussed above, but also attempted to incorporate pensioner housing costs into the figures. They used data from *Family Spending*, the annual report into the EFS, to estimate the correct weight to use for pensioner housing expenditure, which they coupled with RPI housing inflation data to derive their results. However, the ONS pensioner inflation measures are explicitly defined only for those pensioners deriving at least three-quarters of their income from benefits and it is not clear that the measurement of housing costs used in the Clerical Medical study was calculated for this same reference group. Their report also focused on pensioners as a whole and did not calculate inflation rates within subgroups of the pensioner population.

A recent study by the Alliance Trust (2008), a financial services group, looks at CPI inflation rates for different age groups, finding that for August 2008 households aged under 30 had an inflation rate of 4.5 per cent (just less than the headline CPI that month), compared with 7.0 per cent for those aged over 75. Their approach is similar to ours – they use published data from the EFS to reweight the CPI based on household-type-specific expenditures on 68 detailed spending groups. However, as they use published data, they are limited to calculating an average inflation rate for each age group identified in the ONS *Family Spending* report. Because we use the EFS micro-data, we are able to calculate an inflation rate for each individual household and aggregate the data in any way we wish. In addition, because we have household-level inflation rates, we are also able to analyse the variation in inflation rates around the mean in any particular group. As discussed in Chapter 2, the CPI is perhaps a less useful measure of household inflation than the RPI as it excludes most housing expenditures, which are a significant share of the budget for most households, though the patterns the Alliance Trust report across age groups are similar to those we find based on RPI expenditures. They focus only on age and do not look in more detail within the pensioner population. In addition, our figures go back in time to 1977 so that comparisons can be made over a longer period.

In 2006, Capital Economics began to analyse monthly inflation figures and how they varied by household type for the *Daily Telegraph*. Like the other studies discussed here, they effectively reweighted the national inflation basket (here, the CPI) to account for different expenditure patterns of different households.<sup>12</sup> They found, for example, that in late 2006 students had inflation of around 7 per cent, compared with the CPI rate of less than 3 per cent (though since students living in student accommodation are excluded from the EFS, it is not clear how the expenditure patterns of students were estimated). They also calculated

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<sup>11</sup> A press release is available at [http://www.hbosplc.com/media/includes/19\\_08\\_06\\_Pensioner\\_Inflation.doc](http://www.hbosplc.com/media/includes/19_08_06_Pensioner_Inflation.doc).

<sup>12</sup> See Bootle and Loynes (2006) for details of their approach.



‘extreme’ inflation rates for different household groups, using example households. For example, they assumed that their pensioner household spent a total of £440 per month, of which around one-third was on food and just under one-quarter was on household fuel (gas and electricity), though these weights are far higher than the weights on food and fuel we find from the data (see Appendix A). Whilst there may indeed be some pensioner households that spend such a large share of their budget on these items, it is unlikely they are ‘typical’ any more than the ONS figures represent typical pensioner households. For this example pensioner household, inflation was estimated at almost 9 per cent in late 2006, but much of the reporting of the figure did not highlight that this was for a very extreme example pensioner household (one with very low total spending that was dominated by food and fuel) and not therefore representative of all pensioners.<sup>13</sup> Other example families used in the study were equally extreme, such as a ‘middle-class family’ of two adults and two children with a gross combined annual salary of £100,000 (well above average earnings) or a young professional with a salary of £60,000 (again, well above average). Whilst it is not wrong to use example families, it is important not to imply that the results for such extreme cases are more widely applicable to other households, and in particular that they are more representative of ‘average’ inflation than the official figures.

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<sup>13</sup> See, for example, *Daily Telegraph*, 14 December 2006, <http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2006/12/13/cninf113.xml>.

### 3. Methodology

To calculate household-level inflation rates, we use expenditure data from the UK Expenditure and Food Survey (EFS).<sup>14</sup> The EFS is an annual, cross-section survey of around 7,000 households. Participants are required to record a two-week diary of their expenditures and also answer an interview about their household characteristics, incomes and expenditures on some ‘big-ticket’ items such as furniture, cars and holidays over a longer time period since so few households buy these items in any given two-week period. Information on regular payments such as rent, mortgage costs, council tax and fuel bills is also collected as part of the interview. Expenditures are calculated as weekly averages and reported for each household as several hundred expenditure codes. These expenditure codes are aggregated into 71 groups, or ‘sections’, that match those used in calculating the RPI. For each household, we work out the share of their total budget spent on each section and use these expenditure weights to generate a household-specific inflation rate using the RPI data.<sup>15</sup>

For most sections, measuring total expenditures is relatively straightforward: all codes relating to bread purchases are added to give the ‘bread’ section, spending on all shoes and related items adds up to the ‘footwear’ section and so on. One less straightforward case is housing-related expenditures. We define housing expenditures to match the way they are calculated in the RPI as closely as possible. Rent and local taxes are recorded net of any rebates or status discounts (thus households receiving full housing benefit and council tax benefit, for example, will be recorded as having zero expenditure on these items). From the perspective of measuring inflation, this is important – as discussed in relation to the ONS pensioner inflation measure in Chapter 2, households on full council tax benefit will be shielded from any rise in the tax rate and so their personal inflation rate will be unaffected. For those with mortgages, only mortgage interest costs are included as spending, with mortgage principal repayments considered as a form of saving or investment rather than expenditure – this again matches the approach in the RPI.<sup>16</sup>

Defining  $w_{hm}^s$  as the budget share of household  $h$  observed in month  $m$  on RPI section  $s$ , and  $p_m^s$  as the year-on-year RPI inflation rate for section  $s$  in month  $m$ , our household inflation measure is then

$$\pi_m^h = \sum_s w_{hm}^s p_m^s$$

where  $w_{hm}^s = x_h^s / \sum_s x_h^s$  and  $x_h^s$  is weekly expenditure by household  $h$  on section  $s$ .

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<sup>14</sup> The EFS replaced the Family Expenditure Survey (FES) from 2001–02.

<sup>15</sup> Our list of sections differs slightly from those used currently to calculate the RPI as we have in some cases aggregated sections that have changed over time in order to generate a consistent series of inflation measures over a long time period. Table A.1 in Appendix A gives a full list of the sections used in our analysis, together with their average budget shares from the start and end of our data period for comparison across time and across groups.

<sup>16</sup> For more on housing costs in the RPI, see section 7.4.4 of Office for National Statistics (2007).

Note that our approach assumes that households' inflation rates vary only because of differences in their expenditure patterns. We are limited by the nature of the data to assuming that all households face the same inflation rate,  $p$ , for each section (e.g. bread) but devote a different share of their spending,  $w_h$ , to it. In practice, households will also face different inflation rates not only because they have different basket weights but also because the particular inflation rates they face for each expenditure category are different. For example, within bread, some households will buy wholemeal bread and others will buy white bread, and the inflation rate may be different across different bread types. As another example, those pensioner households in receipt of free bus travel or free television licences will not be affected by price increases for these services and so assuming the same inflation rate will be inaccurate. However, the data are limited to variations in spending patterns across groups and do not cover variations in prices faced.<sup>17</sup>

RPI inflation rates for each expenditure group are recorded each month, and we apply the relevant month's inflation rates to each household in our EFS data depending on the month in which they are observed. So, for example, a household observed in the EFS data in March 2005 will have an inflation rate based on RPI inflation between March 2004 and March 2005. However, our expenditure data only cover the period up to the end of 2006. We therefore use all of the households observed in 2006 and assume their expenditure patterns remain unchanged into 2007 and 2008 in order to look at inflation rates for the very recent past – that is, we ignore possible substitution between spending groups based on relative price changes since 2006. Clearly, the further from 2006 we move, the less realistic this assumption becomes, but in the absence of more up-to-date expenditure information it is the best we can do without making other equally arbitrary assumptions about how individual households' expenditure patterns will have changed in the interim. Note, though, that our focus is on differences in inflation rates across groups; this means that the problem of substitution really matters only to the extent that different groups will have responded to relative price changes in different ways.

One other difference in our analysis after 2006 is that we apply each month's inflation data from January 2007 to *all* households observed in the 2006 EFS sample, rather than simply using the January 2006 households and applying January 2007 or 2008 inflation rates to their spending and so on. This is so that when we look at recent month-on-month inflation trends (see, for example, Figure 4.10 below), we have a reasonably large sample size of households, particularly when looking within different population groups. This introduces a second possible bias into our numbers to the extent that we apply inflation data for one month to households whose expenditure is observed in another month (for example, households may have very different spending patterns in December from in July).

Once we have calculated a household-specific inflation rate for each observation in our sample, we can work out averages across all households or across subgroups of households. There are two ways to work out the averages: simply taking the unweighted mean observed inflation rate (the *democratic* average) or weighting each household according to its share of total expenditures in the sample (the *plutocratic* average). The plutocratic approach gives

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<sup>17</sup> As discussed in Chapter 2, the ONS pensioner price series tries to take some account of variation in prices paid by using slightly different price indices for items such as bus fares from those used in calculating the main RPI, but for most expenditure categories the ONS too assumes the same prices.

more weight to richer households. The RPI is a plutocratic average: the average expenditure basket depends on total economy-wide expenditures and so will be more heavily influenced by those who spend the most.<sup>18</sup> However, when we look at household inflation rates, it is not clear that we would want to weight the inflation of the rich more heavily when looking at averages. We thus focus on democratic averages throughout this Commentary.

Importantly, there is *no* reason why our average inflation rate should match the ‘average’ RPI inflation rate as calculated by the ONS in any given month or year. First, as just discussed, we look at democratic rather than plutocratic averages. Second, our household sample includes households excluded from the ONS definition of inflation, such as those in the top 4 per cent of incomes and pensioner households that derive at least three-quarters of their income from state benefits. Even if we did plutocratically weight and exclude these households, however, we would still not expect to match the ONS average. Third, the ONS inflation basket has included as part of the housing category a section called ‘depreciation’ since 1995. This is supposed to reflect the expenditure costs needed to maintain the housing stock at a constant quality, which, coupled with mortgage costs, may give a better measure of the consumption of housing for owner-occupiers than mortgage payments alone. However, we have no way of replicating this section, which accounted for 5.5 per cent of the ONS basket in 2008, in our data. Finally, it is known that expenditure surveys such as the EFS tend to underestimate expenditures on items such as alcohol and tobacco; the RPI figures use other data to supplement the EFS figures (such as retailer sales data and Customs and Excise data) when working out the appropriate basket weights for these items.<sup>19</sup> Appendix A shows that, for example, in 2006 the average household reported spending 3.4 per cent of its budget on alcohol and 1.5 per cent on tobacco, whereas alcohol and tobacco have respective weights in the 2006 RPI basket of 7.0 per cent and 3.0 per cent (excluding housing depreciation from the overall basket). The key comparisons to make from our results are *across different groups*, rather than trying to compare averages for a particular group with the RPI itself.<sup>20</sup>

Figure 3.1 shows how our overall measure compares with the RPI since 1977. We take annual averages of our household-level inflation rates and compare them with annual average RPI rates in each year up to 2008. Overall, our measure tends to be slightly higher than the RPI (averaging 5.9 per cent over the whole period, compared with 5.5 per cent for the RPI), though the two tend not to be very different in absolute terms. In 2006, our average household inflation rate was 3.8 per cent, compared with an RPI average of 3.2 per cent.<sup>21</sup>

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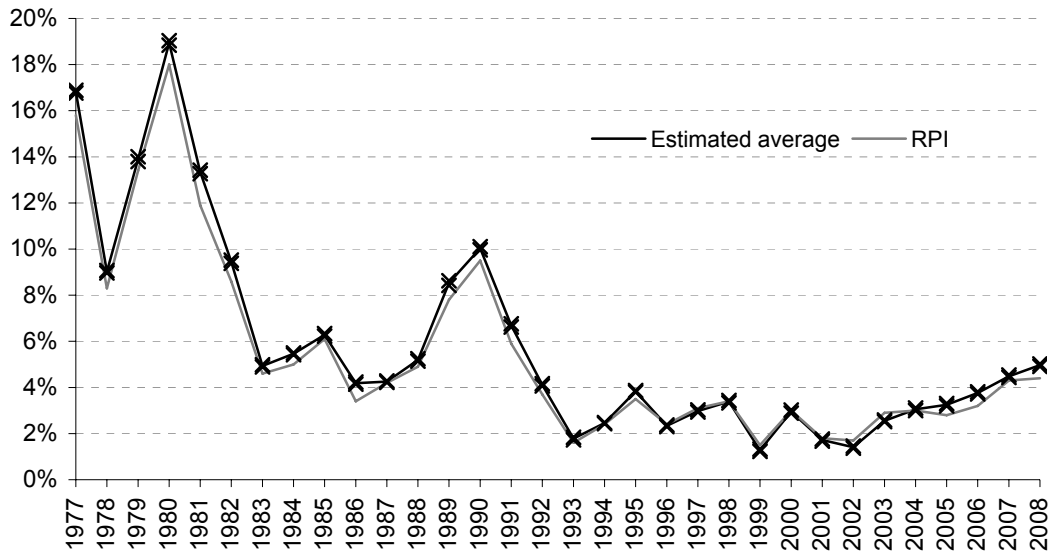
<sup>18</sup> Though, of course, as discussed in Chapter 2, the RPI does exclude the richest 4 per cent of households in calculating its inflation baskets. For more on the use of plutocratic and democratic weights, see section 6.2 of Office for National Statistics (2007) and pages 11–12 of Crawford and Smith (2002), which show that the difference between the plutocratic and democratic averages is typically small, often not significantly different from zero.

<sup>19</sup> A full discussion is contained in section 6.6.1 of Office for National Statistics (2007).

<sup>20</sup> Even comparing across groups, it is still necessary to assume that, say, alcohol and tobacco underreporting or the impact of excluding depreciation is the same for different groups. Although this assumption is unlikely to hold, it is the best we can do, given the constraints of our data.

<sup>21</sup> Our EFS data only extend to 2006. If we look at the recent figures month-by-month, we also find differences between our average and the RPI measure. For August 2008, we estimate an average household inflation rate of 6.1 per cent, compared with an RPI rate of 4.8 per cent. This difference may be partly driven by our use of out-of-date expenditure data.

Figure 3.1. Comparison of average household inflation and RPI inflation, 1977–2008



Notes: Up to and including 2006, figures are annual averages based on applying each month's inflation data to households observed in that month. For 2007, we take the average annual household inflation rate based on applying each month's inflation data in 2007 to each household in the 2006 EFS. The crosses on the graph show 95 per cent confidence intervals around each year's estimate. Figures for 2008 are based on January–August data. Sources: Authors' calculations based on FES/EFS; Office for National Statistics.

The crosses in Figure 3.1 show the 95 per cent confidence intervals around our estimates for average inflation in each year – that is, we can be 95 per cent certain that the ‘true’ average inflation rate lies within the range covered by that interval (for example, in 2006 our central estimate of the average inflation rate faced by households is 3.76 per cent with a 95 per cent confidence interval of 3.72–3.81 per cent).<sup>22</sup> As our spending information comes from a survey of just 7,000 households per year, there is some statistical uncertainty over the average rates calculated from those data, which clearly depend on the particular households sampled.<sup>23</sup> When looking at averages calculated over the full sample, as in Figure 3.1, this uncertainty tends to be quite small. However, when we look at smaller subgroups of the population, such as pensioner households or pensioner households of particular age or income groups, the uncertainty over the average we calculate becomes even greater as the number of households on which our estimates are based is smaller. Given this uncertainty, it may be that we cannot be sure that any differences in average inflation we estimate across groups are not just a result of sampling error (or ‘statistically insignificant’). We calculate the standard errors of our

<sup>22</sup> Our confidence intervals account for sampling variation in the EFS and the inherent uncertainty over the true average expenditure shares in each year of data. There is additional uncertainty in the RPI figures themselves, which are also based on a sample of prices. No information is published on the estimated standard errors around the RPI figures and so we cannot incorporate this additional uncertainty into our confidence intervals.

<sup>23</sup> As already discussed, annual inflation averages from 2007 are calculated based on applying each month's inflation data to the 2006 EFS sample, which effectively inflates the number of households we observe over a year from around 7,000 to around 84,000 by replicating each observation 12 times. To avoid this giving us artificially low standard errors around the annual inflation averages, we cluster our estimates at the household level in 2007 and 2008 to account for this. Obviously, when we look at monthly inflation figures, this problem is avoided.

estimate of the mean and also the standard error of the difference between mean inflation rates of different groups. We do not report these, but throughout we highlight where we can be confident that the results are not driven purely by sampling.

## 4. Main results

### 4.1 The distribution of inflation

The extent to which inflation varies across households is important in determining how representative the ‘average’ inflation rate is for any one household. At one extreme, if there were no variation (everyone had the same inflation rate), the average inflation rate would be a perfect measure of inflation for all households. On the other hand, a very dispersed distribution would mean that the average inflation rate was very different from the actual inflation experience of a large number of households.

The variance in inflation will vary from year to year, as will the shape of the distribution of inflation rates, depending on a combination of the variance in spending patterns across households and the variance in inflation rates across individual RPI sections. If prices for all goods rose by the same amount, or if all households had identical spending patterns, everyone would have the same inflation rate.

Inflation rates for different goods are not, of course, the same. How much a high inflation rate for one particular good affects the dispersion of inflation rates depends on the variability in spending on that good as a part of the total household budget. High food price inflation, for example, will tend to affect most households in a broadly similar way, since food spending is a relatively large share of most household budgets. However, rapid rent increases will create much more dispersion in inflation: many households are non-renters, or receive housing benefit which makes their net rental costs very low, but for households that do pay rent, it is likely to be a large part of their overall budget.

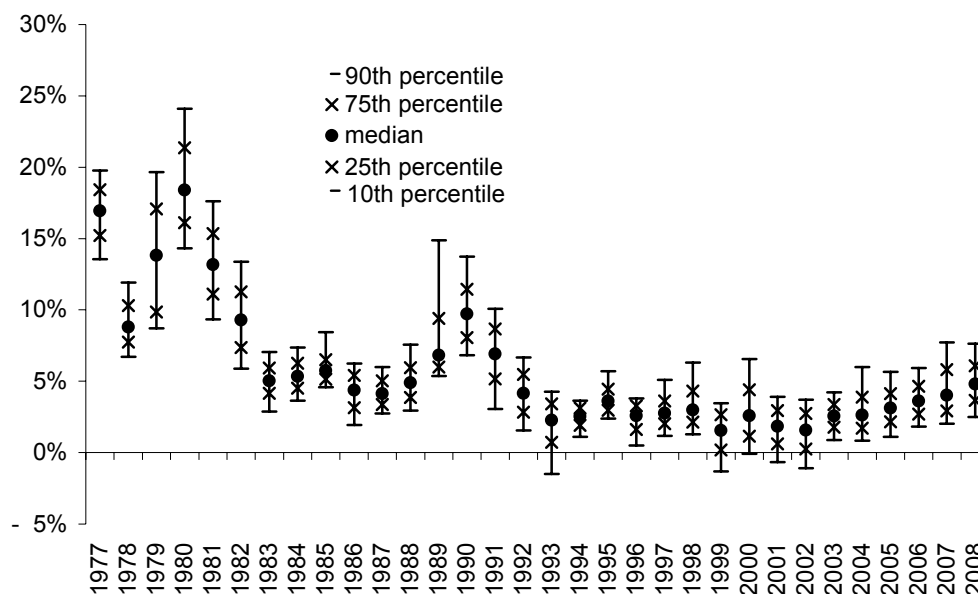
Figure 4.1 summarises the distribution of inflation from 1977 to 2008 for all households. For each year, the median is shown by the black dot, the 25<sup>th</sup> and 75<sup>th</sup> percentile points are shown by crosses and the 10<sup>th</sup> and 90<sup>th</sup> percentile points are shown by lines.<sup>24</sup> The graph shows how the amount of dispersion varies widely from year to year. In some years – for example, 1979 and 1982 – the distribution is fairly dispersed, whereas in other years – such as 1994 – the distribution is much more compact. There are also examples where the distribution is skewed: in 1989, for example, there is a long tail in the upper half of the distribution and in 1993 there is a long tail in the lower half. Figure 4.1 only shows selected percentile points, so it does not show the shape of the distribution. This can vary from year to year but it is generally bell-shaped.<sup>25</sup>

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<sup>24</sup> The 25<sup>th</sup> percentile shows the point below which 25 per cent of households lie. For example, if the 25<sup>th</sup> percentile is at 3 per cent, then 25 per cent of households have inflation rates of less than 3 per cent and 75 per cent of households have inflation rates of greater than 3 per cent. The median is the 50<sup>th</sup> percentile, so half of households have inflation rates below the median and half have inflation rates above the median.

<sup>25</sup> See figure 4.1 of Crawford and Smith (2002) for more detail.

Figure 4.1. The distribution of annual inflation, 1977–2008



Note: Figures for 2008 are based on January–August data.

Source: Authors' calculations from FES/EFS expenditure data and ONS inflation data.

Figure 4.1 illustrated the distribution of inflation across all households. As our analysis is focused on pensioner households, it is interesting to see whether the distribution of inflation for pensioners looks different from that for the whole population. We define a household as a 'pensioner' household if either the head of household (the person who owns the dwelling or who is legally responsible to pay the rent) or their spouse is of pensionable age. This definition typically excludes pensioners living with children or other relatives below pensionable age, largely because the expenditure patterns of such households are typically quite different from those of households headed by a pensioner, particularly in terms of housing costs. However, there are relatively few pensioners living in non-pensioner-headed households: over time, between 96 and 99 per cent of the pensioners in our data live in 'pensioner' households as we define them.<sup>26</sup>

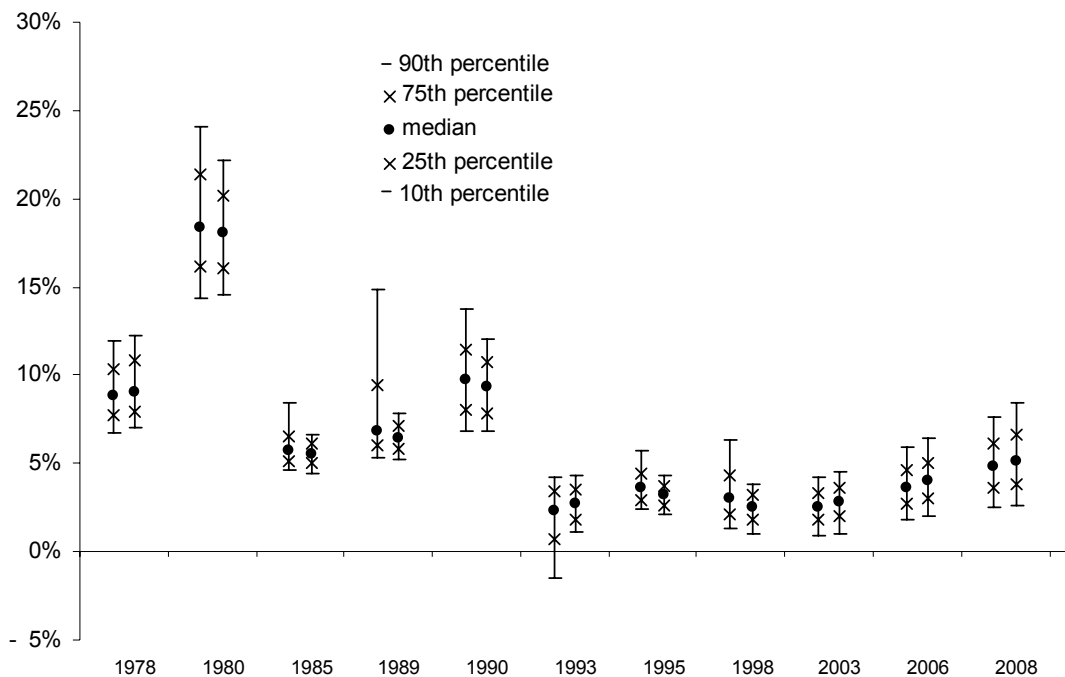
Figure 4.2 compares the percentile points of the distribution for all households (as in Figure 4.1) and the percentile points of the distribution for pensioner households in selected years between 1978 and 2008. The years are selected to illustrate particular similarities and differences between all households and pensioner households; as such, there is not a regular interval between the years. Within each year, the distribution for all households is shown by the line on the left and the distribution for pensioner households is shown by the line on the right. What is clear is that in some years – for example, 1978 and 2003 – there is little difference between the two distributions. However, in other years, the percentile points of the distribution are very different. In 1989, for example, across all households (as we saw above) there is a long tail in the upper half of the distribution and there is a great deal of dispersion. However, the picture is rather different for pensioner households – the distribution is much

<sup>26</sup> Note too that the FES/EFS is a household survey and so does not sample pensioners living in residential homes.



less dispersed and is much more symmetric than that for all households. This is likely to be explained largely by housing inflation: in 1989, overall housing inflation ran at more than 20 per cent, driven in particular by mortgage interest payments, which in that year made up on average just 3 per cent of the budget for pensioners compared with almost 8 per cent for non-pensioners. Those households who spend a large portion of their budget on housing will typically be found in the upper tail of the inflation distribution. In 1993, the reverse situation can be found: there is a long tail at the bottom of the distribution for all households but not for pensioner households. Again, this is likely to be strongly related to what was happening in the housing market at that time. Housing inflation was  $-5.4$  per cent in 1993 and was again driven mostly by mortgage payments. Those with mortgages were therefore more likely to be in the lower tail of the inflation distribution in that year.

Figure 4.2. The distribution of annual inflation for all households and for pensioner households, selected years

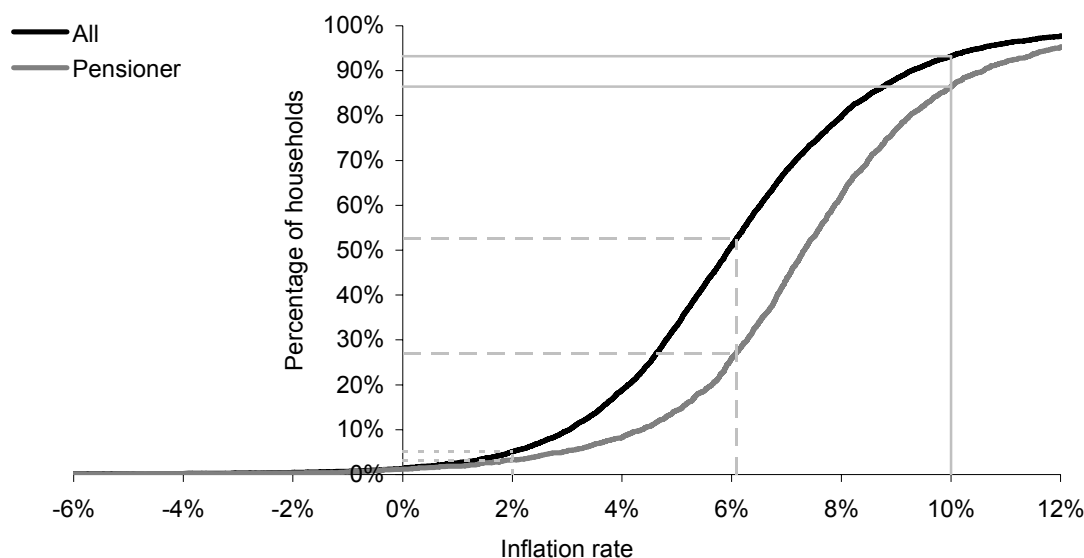


Notes: Within each year, the line on the left is the distribution for all households and the line on the right is the distribution for pensioner households. Figures for 2008 are based on January–August data.  
Source: Authors' calculations from FES/EFS expenditure data and ONS inflation data.

Figures 4.1 and 4.2 showed key points of the distribution in each year. Figure 4.3 shows the entire cumulative distribution of household inflation rates for pensioners and for all households for the latest month, August 2008. The vertical axis shows the percentage of households (or pensioner households) with an inflation rate below each point along the horizontal axis. The fact that the cumulative distribution of inflation for all households lies above that for pensioners reflects the higher inflation experienced by pensioner households in August 2008. For example, around 52 per cent of all households had an inflation rate below

the average household rate for August 2008 of 6.1 per cent,<sup>27</sup> but only 27 per cent of pensioner households had inflation below this figure. Around 6.8 per cent of all households had inflation rates of above 10 per cent, compared with 13.6 per cent of pensioner households. Only 5 per cent of all households and 3.2 per cent of pensioner households had inflation rates below 2 per cent in August 2008.

Figure 4.3. Cumulative distribution of inflation rates, August 2008



Note: The horizontal axis is truncated at -6 per cent and +12 per cent.

Source: Authors' calculations from EFS expenditure data and ONS inflation data.

To gain some insight into how representative 'average' inflation is for any particular household, we can ask how many households have an inflation rate that is 'close' to the average. Of course, 'close' is a subjective concept. We look at two alternative summary measures of 'closeness'. The first asks how many households have an inflation rate that is more than 25 per cent away from the mean inflation rate in each year. Our second measure asks how many households have inflation that is more than 1 percentage point away from the mean.<sup>28</sup> The former will tend to suggest that many households are far from the mean when inflation is very low – a band of  $\pm 25$  per cent around a mean of 1 per cent would count only households with inflation rates between 0.75 per cent and 1.25 per cent as close. The latter will suggest many households are far from the mean when inflation is very high – a band of

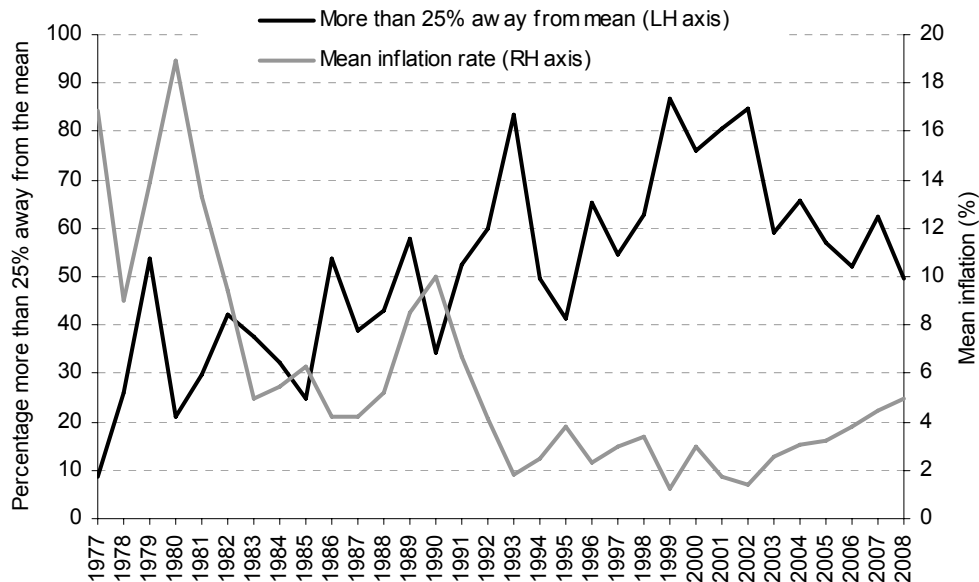
<sup>27</sup> The graph is truncated at inflation rates of -6 per cent and +12 per cent; around 2.5 per cent of all households and 5 per cent of pensioner households had inflation rates of over 12 per cent in August 2008. The fact that just over half of all households had inflation below the mean rate of 6.1 per cent reflects the fact that the median inflation rate (the rate below which exactly half of households fall) was slightly lower than the mean, at 5.9 per cent.

<sup>28</sup> There are many measures that we could use to analyse the amount of dispersion in the distribution of inflation rates. We have calculated a number of them. Measures of dispersion that are independent of the location of the distribution (for example, the coefficient of variation or the ratio of the 75<sup>th</sup> percentile point to the 25<sup>th</sup> percentile point) are typically very noisy as they are sensitive to low estimates of mean inflation. This makes comparisons across years harder to interpret. In addition, some measures of dispersion are not defined for values that are negative (for example, the Gini coefficient or the mean log deviation). Since we have negative inflation rates in a number of years, we cannot use these measures.

$\pm 1$  percentage point around a mean of 20 per cent counts households as close if their inflation rate is between 19 and 21 per cent.

Figure 4.4 plots both measures of closeness (on the left-hand axis) along with the mean inflation rate (the light grey line plotted on the right-hand axis). The percentage of households with inflation more than 25 per cent from the mean is shown in Figure 4.4a. The percentage of households with inflation more than 1 percentage point from the mean is shown in Figure 4.4b. The negative relationship between the average inflation rate and the percentage of households who are more than 25 per cent away from the mean is clearly visible:<sup>29</sup> when inflation is low in the 1990s, this measure typically shows around three-quarters of households ‘far’ from the mean, whereas when inflation is high in the 1980s, typically less than half of households are ‘far’ from the mean. However, this negative relationship between the inflation rate and this ‘closeness’ measure is not perfect – over the late 1980s, for example, there was an upward trend in both average inflation and the fraction of households far from the mean. On average, across the whole period, just over half (53 per cent) of households experience inflation that is more than 25 per cent away from the mean. In 1977, when average inflation was 16.8 per cent, only 9 per cent of households were more than 25 per cent away from this, i.e. outside the range 12.6 per cent to 21 per cent. At the other extreme, in 1999, 87 per cent of households experienced inflation that was more than 25 per cent away from the mean. Since inflation was very low in that year (just 1.28 per cent), this means only 13 per cent of households experienced inflation between 0.96 per cent and 1.6 per cent.

Figure 4.4a. Percentage of households with inflation more than 25 per cent away from the mean, 1977–2008

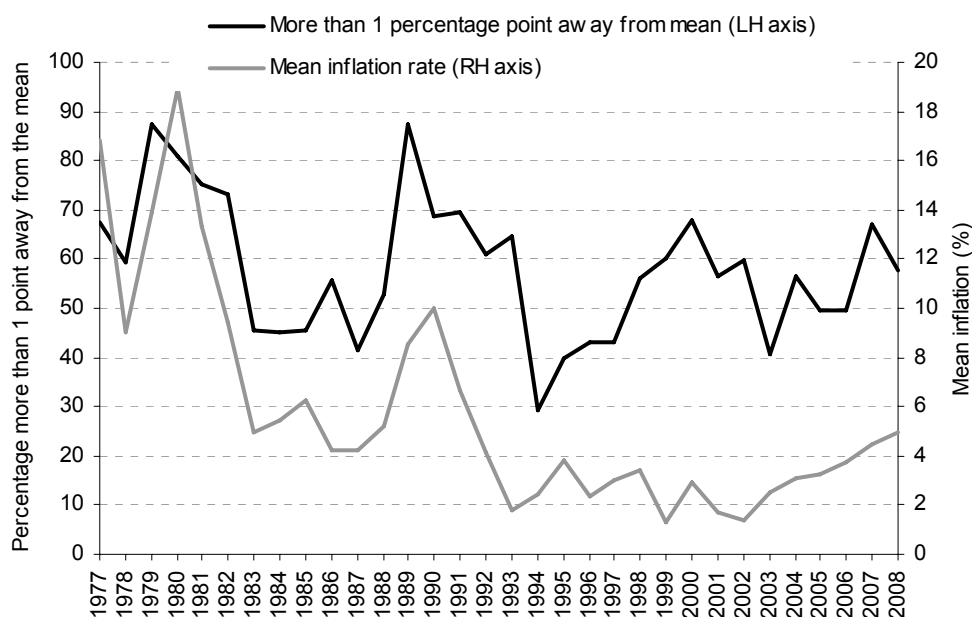


Note: Figures for 2008 are based on January–August data.

Source: Authors' calculations from FES/EFS data and ONS inflation data.

<sup>29</sup> The correlation coefficient between mean inflation and the percentage of households who are more than 25 per cent away from the mean is  $-0.72$ .

Figure 4.4b. Percentage of households with inflation more than 1 percentage point away from the mean, 1977–2008



Note: Figures for 2008 are based on January–August data.

Source: Authors' calculations from FES/EFS data and ONS inflation data.

Our alternative (absolute) measure – the percentage of households with an inflation rate that is more than 1 percentage point away from the mean – is shown in Figure 4.4b. The tendency for this measure to show that households are more likely to be ‘far’ from the mean when inflation is high is clear from the graph.<sup>30</sup> In the late 1970s and early 1980s when inflation was very high, the vast majority of households (around three-quarters of them over the period 1977–82) had inflation outside the band  $\pm 1$  percentage point around the mean. In the late 1990s and early 2000s, when inflation was much lower, around half of households had inflation that was ‘far’ from the mean.<sup>31</sup> Again, this positive relationship is not perfect: in the mid- to late 1990s, mean inflation was generally falling or static but the percentage of households with inflation more than 1 percentage point away from the mean was rising quite rapidly.

Figure 4.5 presents another way to assess the representativeness of average inflation. Here, we use the mean absolute deviation (MAD) of inflation around the average in each year, calculated as

$$MAD = \frac{\sum_h |\pi_h - \bar{\pi}|}{N}$$

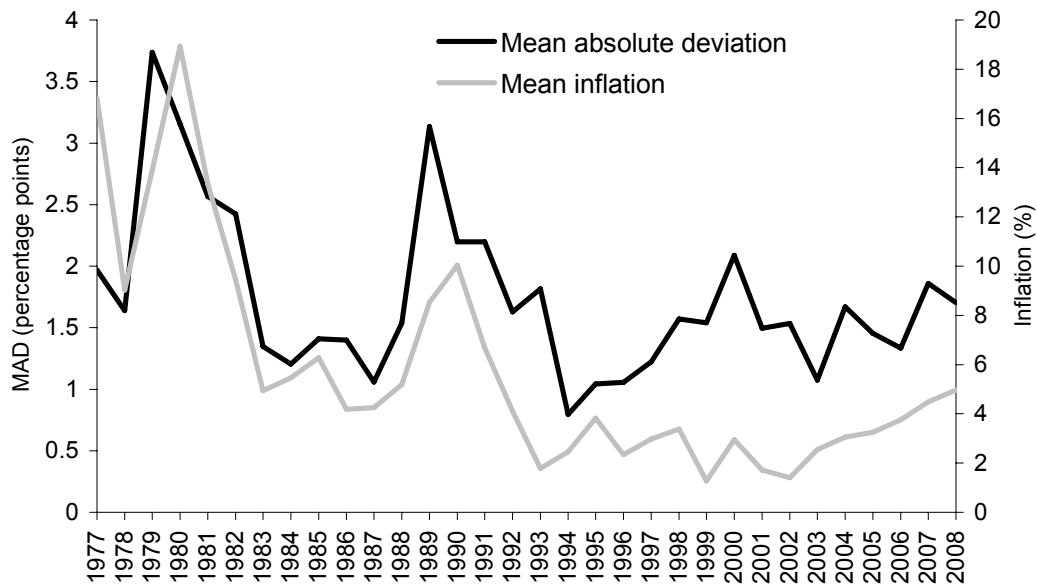
<sup>30</sup> The correlation coefficient between mean inflation and the percentage of households who are more than 1 percentage point away from the mean is 0.64.

<sup>31</sup> Of course, in recent years, when inflation has been hovering around 4 per cent, our two measures of closeness are very similar as the band  $\pm 1$  percentage point and the band  $\pm 25$  per cent around 4 per cent are identical.

where  $\pi_h$  is the inflation rate for household  $h$ ,  $\bar{\pi}$  is mean annual inflation and  $N$  is the number of households.<sup>32</sup> Unlike the 25 per cent figure and the 1 percentage point figure that were used as yardsticks above, the MAD does not draw some arbitrary threshold of closeness against which all households are judged, but instead tries to summarise the whole distribution.

The mean absolute deviation calculates the average absolute difference between each household's inflation rate and the average rate. If the MAD is 2, this means that, on average, households are 2 percentage points away from the mean. The MAD for each year from 1977 to 2008 is plotted on the left-hand axis of Figure 4.5. On the right-hand axis, we show the mean inflation rate. There is a clear positive relationship between the mean inflation rate and the MAD. This is to be expected, for the same reason that there is a positive relationship between the rate of inflation and the percentage of households who are outside  $\pm 1$  percentage point of the mean – when the average inflation rate is high, in absolute terms each household is likely to have a larger difference from the mean. A household 10 per cent away from the mean when inflation is 20 per cent will have an absolute difference of 2 points, whereas a household 10 per cent away from the mean when inflation averages 2 per cent will have an absolute difference of 0.2 points.<sup>33</sup> Again, the relationship is not perfect: in 2000, average inflation was less than 4 per cent but the MAD was over 2, whereas in 1995 inflation was over 4 per cent but the MAD was only just over 1.

Figure 4.5. Mean absolute deviation of inflation, 1977–2008



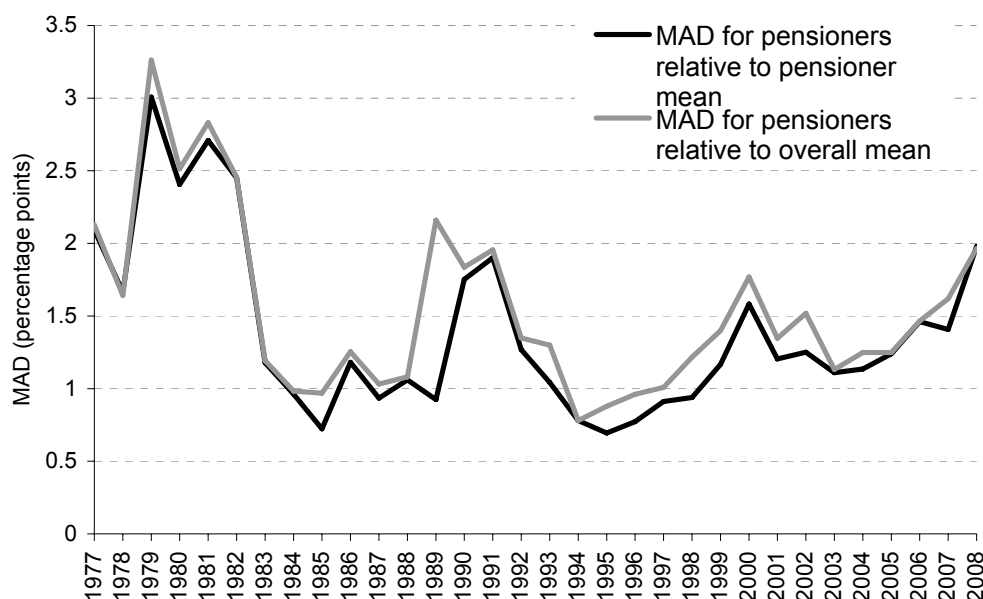
Note: Figures for 2008 are based on January–August data.  
 Source: Authors' calculations from FES/EFS data and ONS inflation data.

<sup>32</sup> The MAD is an absolute measure of dispersion. An alternative to the MAD is the mean relative deviation (MRD), where we average the percentage difference in each household's inflation rate from the mean each year rather than each household's percentage point difference. As with many potential measures of dispersion, the MRD is rather noisy as it is sensitive to values of the mean that are very low.

<sup>33</sup> Using the MRD would give the opposite result: high inflation would be accompanied by a lower relative deviation.

We have shown that average inflation is not a representative measure of inflation for all households. This Commentary focuses on how inflation varies across different groups, with the hope that average inflation within a particular group is more representative of the inflation experience for households in that group than the overall average. To examine the extent to which this is true, Figure 4.6 plots the MAD for pensioner households relative to the overall average inflation rate and relative to the pensioner-specific average household inflation rate in each year. It is generally true that the mean deviation of pensioner households from the average pensioner inflation rate is less than that from the average for all households (the exceptions are 1978 and 2008; in both cases, the differences are negligible). This suggests that the pensioner mean inflation rate does indeed provide a better summary of inflation for pensioners than the overall inflation rate using the MAD as a yardstick. In some years, the differences are very large: in 1989, the MAD for pensioners relative to the overall mean was 2.2 percentage points whereas the MAD relative to the pensioner group mean was just 0.9 percentage points. As we saw in Figure 4.2, 1989 was a year in which the pensioner distribution was very different from the overall distribution, and so it is not surprising that the pensioner mean is more representative (on this measure) of the inflation experience of pensioners than the overall mean.

Figure 4.6. Mean absolute deviation of pensioner inflation relative to the overall mean and relative to the pensioner mean, 1977–2008



Note: Figures for 2008 are based on January–August data.

Source: Authors' calculations from FES/EFS data and ONS inflation data.

Figure 4.6 compared pensioners as a whole; the more finely we divide our population groups (by age, income and so on), the more representative the average for that group is likely to be for the households within it.

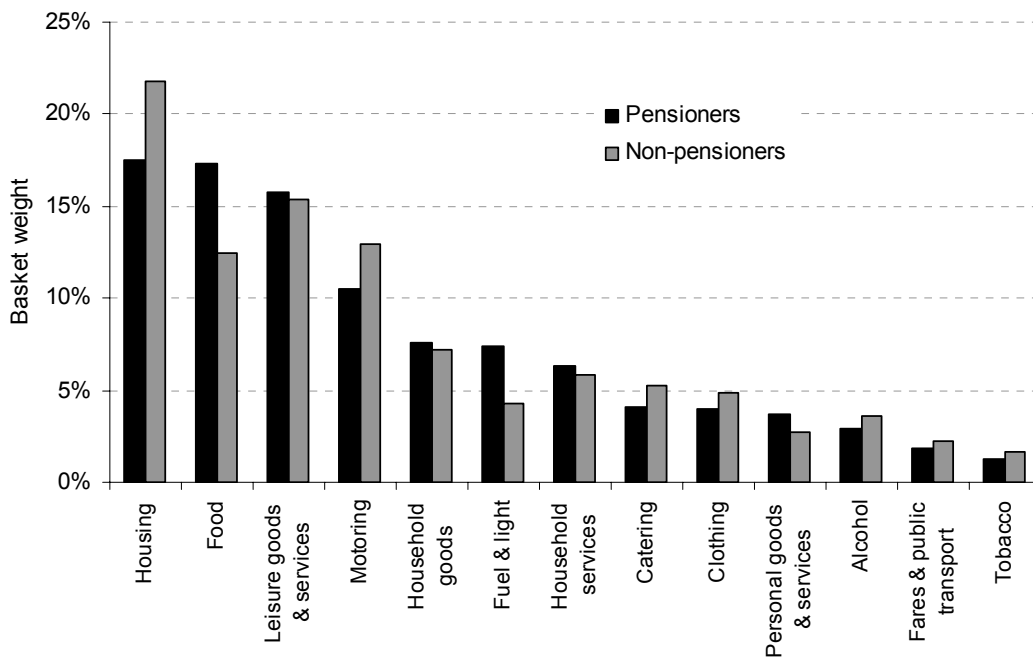
We now turn to an examination of average inflation rates across different population groups over time. It should be borne in mind with all these results that we are still looking at an average rate for the households within each group. Even when looking at group-specific

means, however, there is still variation across households: a household's inflation rate will depend on its own individual spending patterns. As discussed in Chapter 3, the more specific the group on which we focus (for example, pensioners in a particular age and income group), the more uncertain the estimates of mean inflation for that group tend to be.

## 4.2 Inflation rates by household type: pensioner and non-pensioner

In Chapter 3, we described how household inflation rates depend on the pattern of expenditures of each household. Underlying average inflation for different groups, therefore, are the average spending patterns for each group. Figure 4.7 shows the average share of the total budget devoted to each of the broad RPI categories (food, motoring, housing etc.) for pensioner and non-pensioner households from the 2006 EFS data, where (as before) pensioner households are those where either the head of household or their spouse is of pensionable age. Pensioners, on average, spend a greater proportion of their budget on food (17 per cent) than do non-pensioners (12 per cent), and will therefore be affected more strongly by food price inflation – all else unchanged, a 1 per cent rise in the inflation rate of food will increase the pensioner average inflation rate by 0.17 per cent and the non-pensioner average inflation rate by 0.12 per cent. Pensioner households spend significantly more on fuel, on average, than non-pensioners (7 per cent and 4 per cent respectively), but less on total housing costs (18 per cent and 22 per cent). This housing result is largely due to mortgage interest costs, which make up, on average, 8.5 per cent of the non-pensioner basket but only 1.1 per cent of the pensioner basket since so few pensioner households have mortgages. However, within total

Figure 4.7. Comparison of expenditure weights for pensioner and non-pensioner households, 2006

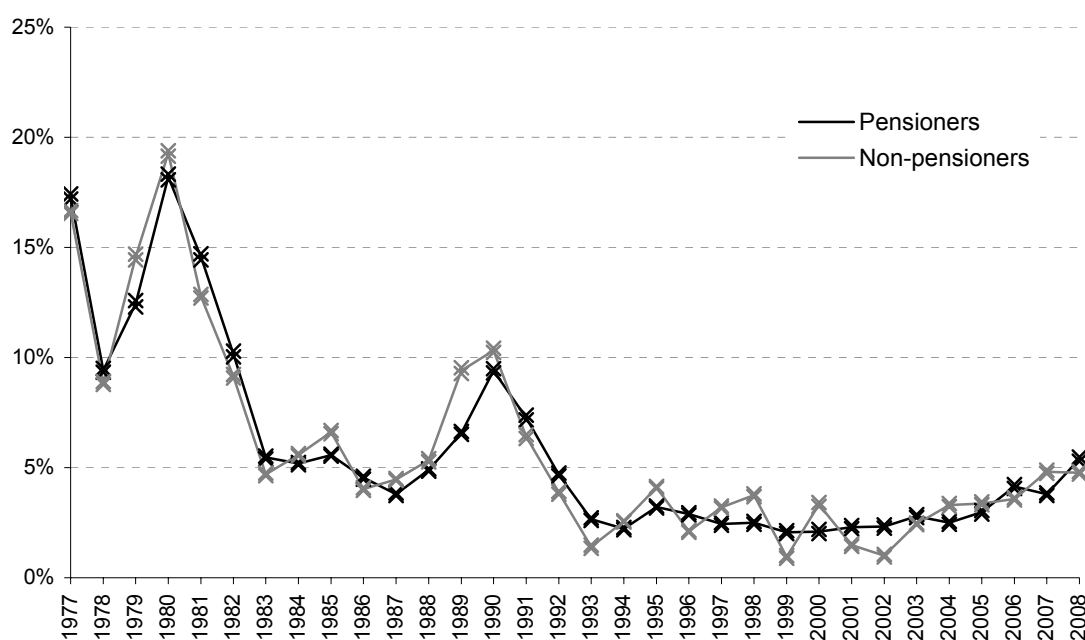


Source: Authors' calculations from EFS data.

housing expenditures, pensioners spend more of their budget on local taxes (7.0 per cent, compared with 4.4 per cent for non-pensioners) and water charges (2.8 per cent compared with 1.8 per cent).

Table A.1 in Appendix A details these budget share figures for each of the 71 RPI expenditure categories for pensioners and non-pensioners. Table A.2 summarises the budget shares of the broader expenditure categories for each of the key population groups we analyse in the remainder of this chapter.

Figure 4.8. Average inflation for pensioners and non-pensioners, 1977–2008



Notes: The crosses show 95 per cent confidence intervals around each point of the series. Figures for 2008 are the averages for the first eight months of the year.

Source: Authors' calculations from FES/EFS data and ONS inflation data.

Figure 4.8 shows how the average inflation rate for pensioner households has compared with that for non-pensioner households since 1977 (the definition of a pensioner household is the same as that used before, i.e. either the head or their spouse is of pensionable age). We also plot 95 per cent confidence intervals around the mean to give some idea of the precision of our estimated means.<sup>34</sup> Over the period 1977–2008, average inflation for non-pensioners has been marginally higher (5.9 per cent) than that for pensioners (5.8 per cent), but the ranking varies frequently from year to year. Note that within any one year, the confidence intervals around each group's inflation rate tend to be fairly small, reflecting the relatively large sample sizes in each group (there are around 2,000 pensioner households in each year and around 4,500–5,000 non-pensioner households; Appendix B gives full details). This leads to the differences between the two groups within each year being statistically significant. The

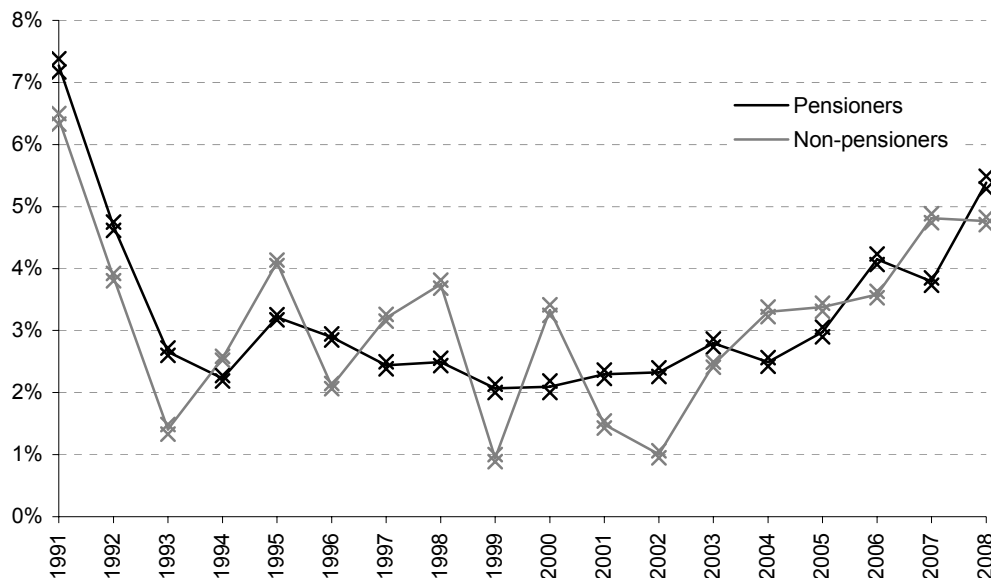
<sup>34</sup> On graphs where we compare the average inflation rate of several different groups at once, we will typically not report confidence intervals, in order to show the averages more clearly. Graphs including them are available on request.



largest difference between the two groups was in 1989, when average pensioner inflation, at 6.6 per cent, was 2.8 percentage points lower than average inflation for non-pensioners (9.4 per cent) – as we saw above, this was a year in which the distribution of inflation was particularly skewed by housing costs. In relative terms, the largest gap was in 1999, when average pensioner inflation, at 2.1 per cent, was more than twice the rate for non-pensioners (0.9 per cent), though this was of course partly driven by the low inflation rates of that period.

One interesting point is that the non-pensioner inflation series, particularly over the last 15 years or so, has been markedly more volatile than the pensioner series. This is largely explained by mortgage interest payments, which have volatile inflation rates that depend on fluctuations in interest rates and which, as already discussed, form a much more substantial part of the non-pensioner expenditure basket.

Figure 4.9. Average inflation for pensioners and non-pensioners, 1991–2008



Notes: The crosses show 95 per cent confidence intervals around each point of the series. Figures for 2008 are the averages for the first eight months of the year.

Source: Authors' calculations from FES/EFS data and ONS inflation data.

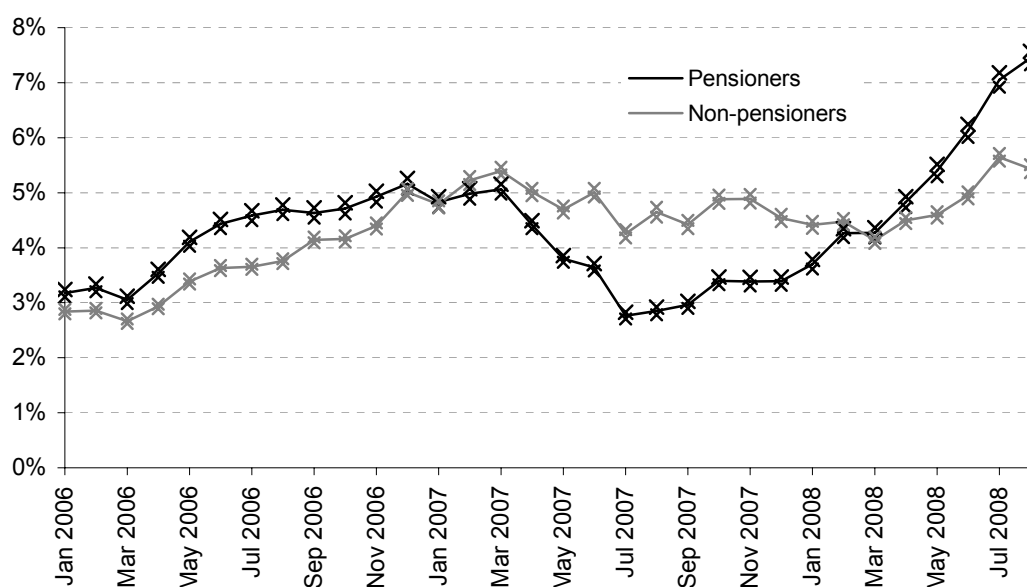
Figure 4.9 presents the comparison between pensioners and non-pensioners over a shorter time horizon in order to show the recent trends more clearly.<sup>35</sup> The greater variability in the non-pensioner series is apparent. For the decade between 1996 and 2005, average inflation for pensioners varied only between 2 and 3 per cent whilst that for non-pensioners fluctuated between 1 and 4 per cent. Average inflation rates for both groups have since risen strongly.

Figures 4.8 and 4.9 both present annual averages of inflation rates but mask variation within any particular year. When inflation is low and stable, this is unlikely to matter too much, but

<sup>35</sup> When looking at annualised inflation rates in the remainder of this chapter, we focus on the period since 1991 as this was the last time inflation was at its current levels. Including the periods of very high inflation in the 1970s and early 1980s makes for a less manageable or less readable scale. Graphs covering the period since 1977 are available on request from the authors.

when inflation is rising or falling quickly, variation within a year matters. Figure 4.10 shows inflation for pensioners and non-pensioners on a month-by-month basis since the beginning of 2006, applying each month's inflation figure from January 2006 onwards to the entire 2006 EFS sample. As Figure 1.1 made clear, it was during 2006 that inflation rates began to rise strongly, driven by higher fuel costs. We now examine how these more recent trends have varied across pensioner and non-pensioner households.

Figure 4.10. Average inflation for pensioners and non-pensioners, January 2006 – August 2008



Notes: The crosses show 95 per cent confidence intervals around each point of the series. Figures for 2008 are the averages for the first eight months of the year.

Source: Authors' calculations from EFS data and ONS inflation data.

The fuel-led increase in inflation during 2006 clearly affected pensioner households more strongly than non-pensioner households, with a gap of almost 1 percentage point opening up by the middle of that year. This is unsurprising as fuel costs make up a much larger share of the pensioner basket – around 7.4 per cent, compared with 4.3 per cent for non-pensioners. During 2007, as the first wave of fuel price increases fell out of the inflation index, pensioner inflation fell rapidly to less than 3 per cent, whereas non-pensioner average inflation remained high, driven largely by mortgage interest inflation. During 2008, as food and fuel price rises began to occur, average pensioner inflation has risen extremely quickly, reaching 7.4 per cent in August 2008 compared with 5.4 per cent for non-pensioners.<sup>36</sup> On a month-by-month basis, the August 2008 figure was the highest for pensioners since the middle of 1991. In July 2008, the non-pensioner figure was at its highest point since the middle of 1991, before falling back slightly in the most recent month of data.

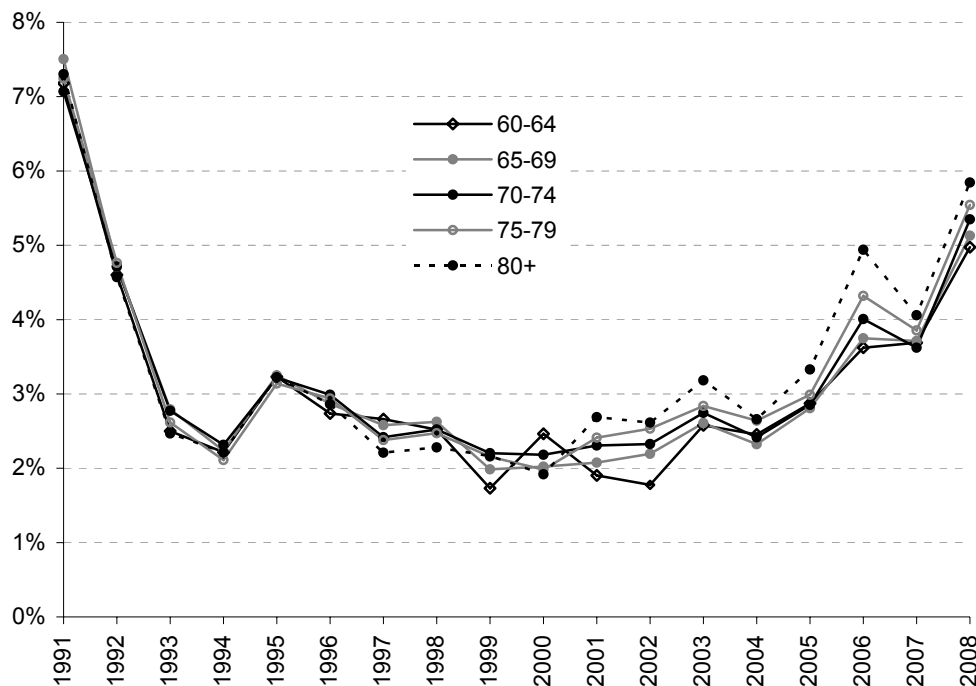
<sup>36</sup> Note that both these measures are above the published RPI for August 2008, which was 4.8 per cent. As outlined in Chapter 3, this is not surprising as our measure is calculated in a different way and is based on slightly out-of-date expenditure patterns.

Our analysis so far has compared ‘pensioner’ and ‘non-pensioner’ households as two distinct groups, but we know from our earlier discussion that there is considerable variation in the inflation experience *within* the population of older households – pensioners are not homogeneous in terms of their expenditure patterns, as the breakdown of expenditures in Appendix A makes clear. We therefore turn now to an examination of the inflation experience of different types of pensioner household.

### 4.3 Inflation by age

Figure 4.11 shows how average inflation has varied for pensioner households of different ages, where age groups are determined based on the age of the elder of the head of household and their spouse. Over the period between 1991 and 2008, average inflation has been slightly higher for the oldest group (aged over 80) at 3.4 per cent than for the youngest pensioners (aged 60 to 64) at 3.1 per cent, though clearly the differences have tended to be fairly small; indeed, between 1991 and 1996, there were few significant differences between the average inflation rates of the different age groups.

Figure 4.11. Average inflation among pensioners by age group, 1991–2008

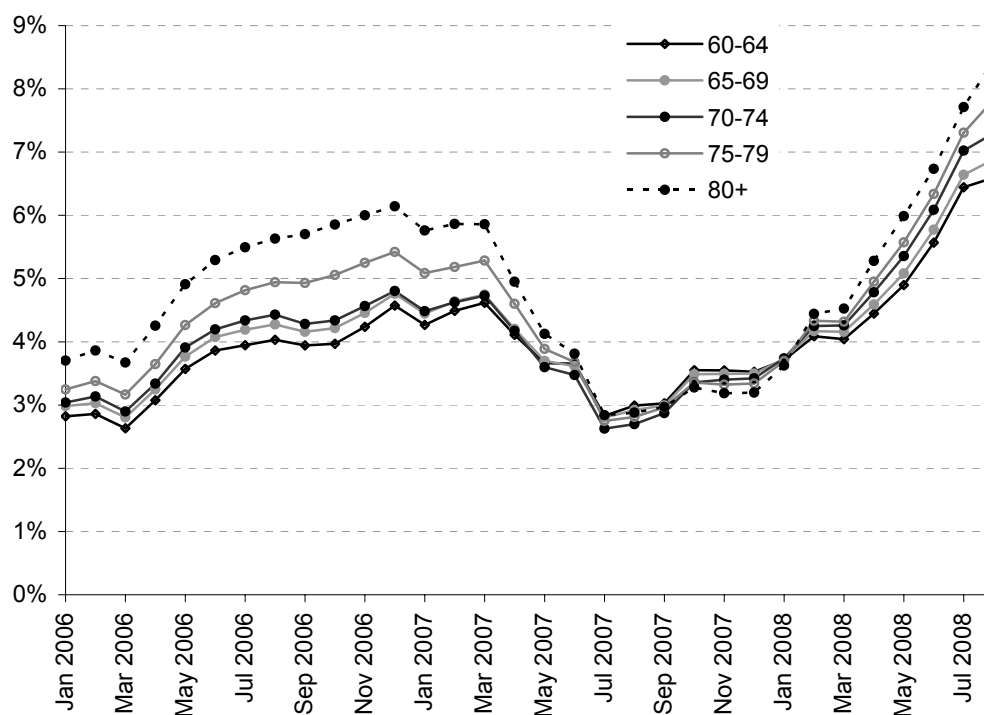


Note: Figures for 2008 are the averages for the first eight months of the year.  
 Source: Authors' calculations from FES/EFS data and ONS inflation data.

More recently, more striking gaps have started to emerge between age groups. The oldest households have tended to have the highest average inflation rates since 2001, often significantly higher than those for any other age group. Figure 4.12 shows inflation broken down by the same age groups month-by-month since January 2006. Whilst the large increase in fuel prices in 2006 affected all age groups, the impact was most pronounced for the oldest

pensioners: their average inflation rate of 6.0 per cent in November 2006 was almost 2 percentage points higher than that of the youngest pensioners (indeed, pensioners under 75, on average, had inflation rates very similar to non-pensioner inflation during this period of price rises). In the first few months of 2008, inflation affected all pensioner groups, on average, in a similar way such that the differences are much smaller and tend to be statistically insignificant between age groups. However, by August 2008, the oldest pensioner average inflation rate of 8.4 per cent was 0.6 percentage points higher than the average inflation rate of the next oldest pensioners and 1.8 percentage points higher than the average inflation rate for the youngest pensioners. Both these differences are statistically significant. Indeed, in August 2008, *all* pensioner household age groups had higher average inflation rates than the non-pensioner average of 5.4 per cent (and all the differences were statistically significant). Across this whole period, the monthly average annual inflation rate for the oldest pensioners has been 4.9 per cent, compared with 4.0 per cent for the youngest.

Figure 4.12. Average inflation among pensioners by age group, January 2006 – August 2008



Source: Authors' calculations from EFS data and ONS inflation data.

## 4.4 Inflation by income

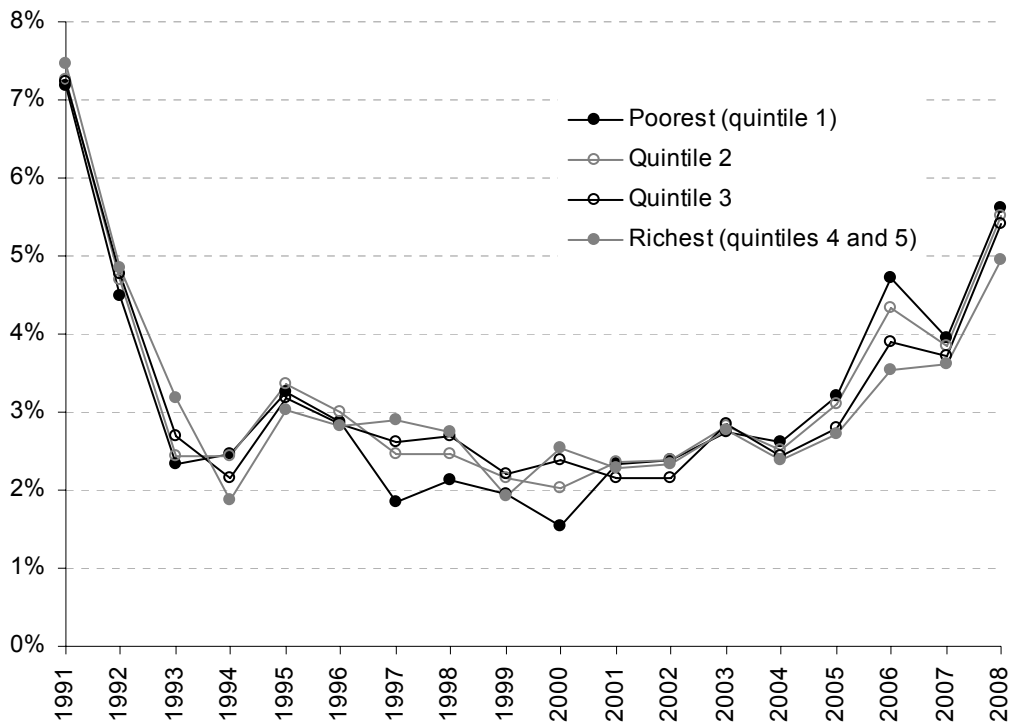
It is likely that inflation rates vary with how well-off particular households are in terms of income. The share of the household budget devoted to items such as food and household fuel tends to fall as households get richer (these are economic 'necessities') and the share of the budget devoted to 'luxury' items such as holidays and leisure goods tends to increase with

income. Thus we would expect inflation rates to be higher for poorer households if the prices of necessities are rising faster than the prices of luxuries.

Using information on post-tax household incomes<sup>37</sup> from the FES/EFS, we divide pensioners into four groups: households in the poorest 20 per cent of the overall population, households in the next poorest 20 per cent (quintile 2), the next poorest 20 per cent after that (quintile 3) and then households among the richest 40 per cent of the population in each year.<sup>38</sup>

Figure 4.13 shows how average inflation has differed for pensioners in these different income groups over the period since 1991. As with the age breakdown, there is little variation between groups, especially in the period before 1996. Even since then, there is no consistent pattern: during the late 1990s, poorer pensioners had statistically significantly lower average inflation than richer pensioners; more recently, this has been reversed. In the period between 1997 and 2008, the average inflation rate for the poorest pensioners has been 2.9 per cent – exactly the same as the average rate for the richest pensioners.

Figure 4.13. Average inflation among pensioners by position in overall income distribution, 1991–2008

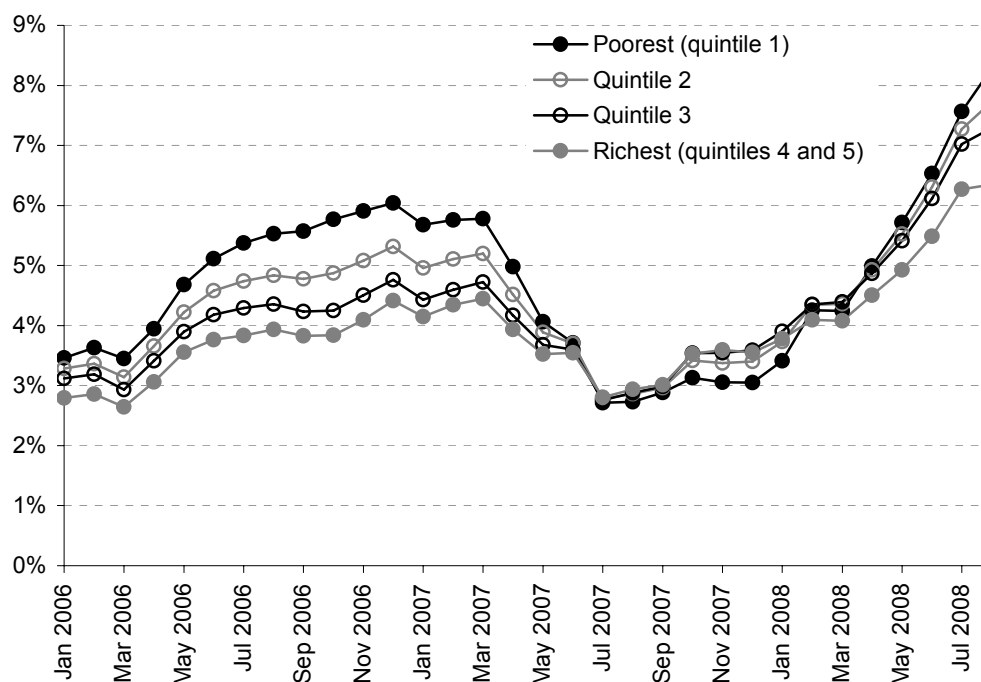


Note: Figures for 2008 are the averages for the first eight months of the year.  
Source: Authors' calculations from FES/EFS data and ONS inflation data.

<sup>37</sup> Incomes are defined after taxes and benefits at the household level. We equalise income using the modified OECD equivalence scale to take account of household composition, since households with fewer people will require a lower income to meet a certain living standard than households with more people. For more on equalisation and the scale used, see pages 82–83 of Brewer et al. (2008).

<sup>38</sup> We look at pensioners relative to the overall income distribution rather than the pensioner income distribution. This is consistent with, for example, pensioner poverty measures, which are calculated relative to overall median income rather than the pensioner median. As there are relatively fewer pensioners in the top two income quintiles, we put them together as the richest 40 per cent to ensure an adequate sample size in each year. Appendix B gives the sample sizes for each income group.

Figure 4.14. Average inflation among pensioners by position in overall income distribution, January 2006 – August 2008



Source: Authors' calculations from EFS data and ONS inflation data.

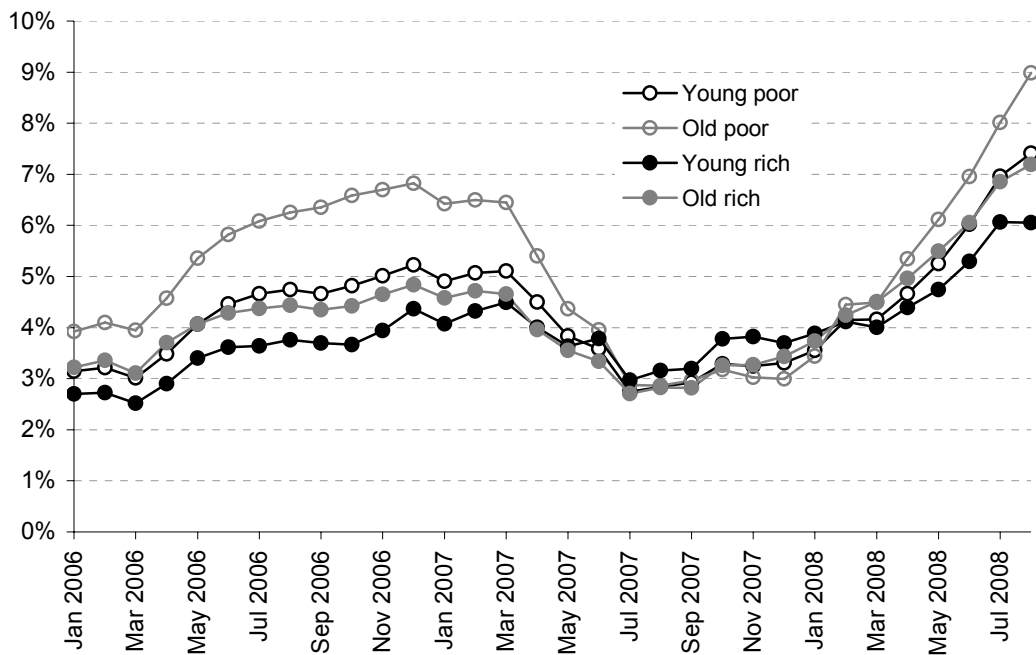
Figure 4.14 shows how inflation has evolved for these groups since the beginning of 2006. Again, as we saw looking at inflation by age, there is a negative relationship between income and inflation during 2006: richer pensioners experienced lower inflation rates. This is unsurprising given that inflation was driven by fuel costs, which make up a much larger share of the budget of poorer households. In 2006, pensioner households in the poorest fifth of the population spent 10.1 per cent of their budget on fuel, compared with around half as much (5.2 per cent) for pensioners in the richest two-fifths. Conversely, it was the poorer households that saw the lowest average inflation during 2007, as these fuel price increases dropped out, though clearly the differences across income groups were smaller (but nevertheless statistically significant by the end of the year). At the beginning of 2008, differences in average inflation rates across income groups were relatively small, although the differences have got larger since the middle of the year.<sup>39</sup> Average inflation for the poorest pensioners in August 2008 was 8.3 per cent, significantly higher than the average rate faced by the richest pensioners, at 6.4 per cent. Average annual inflation over this period has been 4.7 per cent for the poorest pensioners and 3.9 per cent for the richest.

One interesting question is whether income or age is more closely related to inflation rates. We have seen that average inflation rates over the last two or three years have tended to be higher for both older and poorer pensioners. Figure 4.15 shows the data since 2006 for four groups based on both age (age groups 60–69, labelled ‘young’, and 80+, labelled ‘old’) and

<sup>39</sup> All the differences in August 2008 are statistically significantly different from each other.

income (households in the poorest and richest third of the income distribution). Within age group, it is poorer households that have been most affected by recent inflation: both the young poor and the old poor have had higher inflation rates than their rich counterparts.<sup>40</sup> During 2006, the older, poorer households had average inflation rates of around 6–7 per cent, whereas the older, richer households faced significantly lower average inflation of around 4–5 per cent. Indeed, in most months in 2006, the older, richer households had inflation rates that were not statistically different from those of the younger, richer households. In the most recent months, it is again poorer, older households that are most affected, with an average inflation rate for August 2008 of 9.0 per cent. The inflation rate of the oldest households in the richest income group is very similar to that of the youngest pensioner households in the poorest group (indeed, the two are not statistically significantly different from each other in any month of 2008), whilst the youngest, richest households have the lowest average inflation of the four groups.<sup>41</sup>

Figure 4.15. Average inflation among pensioners by income and age, January 2006 – August 2008



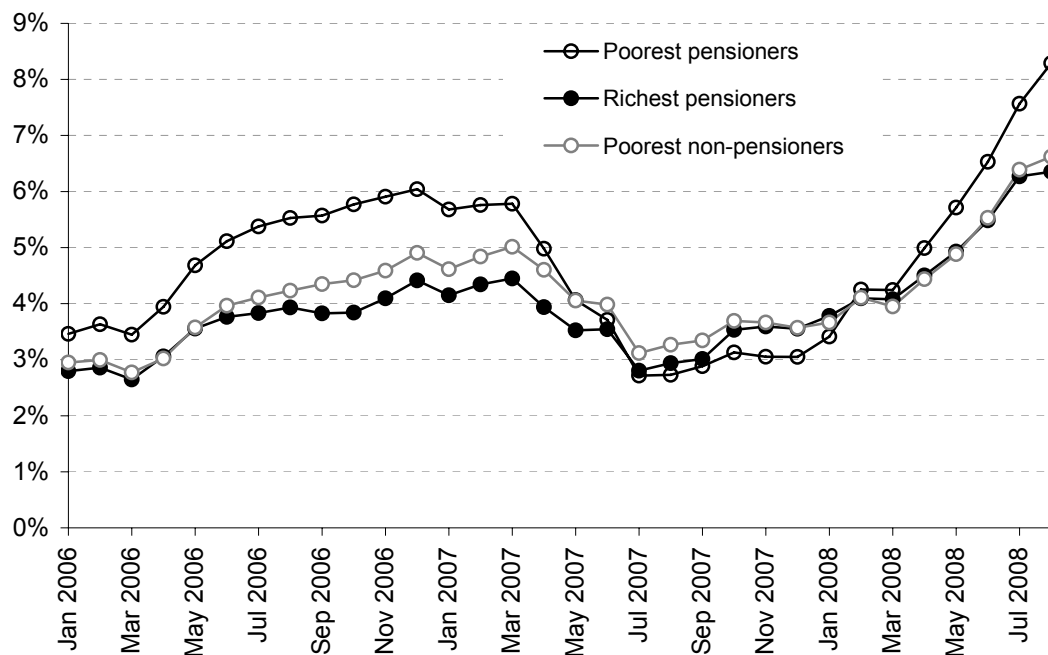
Notes: The 'young' group covers ages 60–69 and the 'old' group ages 80+. The 'poor' group is taken from the poorest third of the income distribution and the 'rich' group from the richest third.

Source: Authors' calculations from EFS data and ONS inflation data.

<sup>40</sup> These differences are statistically significant for June, July and August 2008.

<sup>41</sup> It is worth noting that in recent months, the average inflation rate of the youngest, richest group is significantly lower than those of the youngest, poorest group and of the oldest, poorest group. However, it is *not* statistically different from the average inflation of the oldest, richest group; as there are fewer households in the oldest, richest group, the confidence intervals around our mean estimate for this group are larger.

Figure 4.16. Average inflation for pensioners and non-pensioners, by income, January 2006 – August 2008



Notes: The 'poorest' pensioners and non-pensioners are those in the poorest 20 per cent of the population. The 'richest' pensioners are those in the richest 40 per cent of the population.  
Source: Authors' calculations from EFS data and ONS inflation data.

A similar story emerges if we compare across pensioners and non-pensioners within income groups. Figure 4.16 shows for the recent period the inflation rate of pensioner households in the poorest 20 per cent of the population, comparing them with the rates for pensioner households in the richest 40 per cent and for *non-pensioner* households in the poorest 20 per cent.<sup>42</sup> The richest pensioner households have inflation rates over this period that are very similar to (indeed, during 2006, slightly lower than) those of the poorest non-pensioner households; the poorest pensioners have much higher inflation rates during 2006 and 2008.

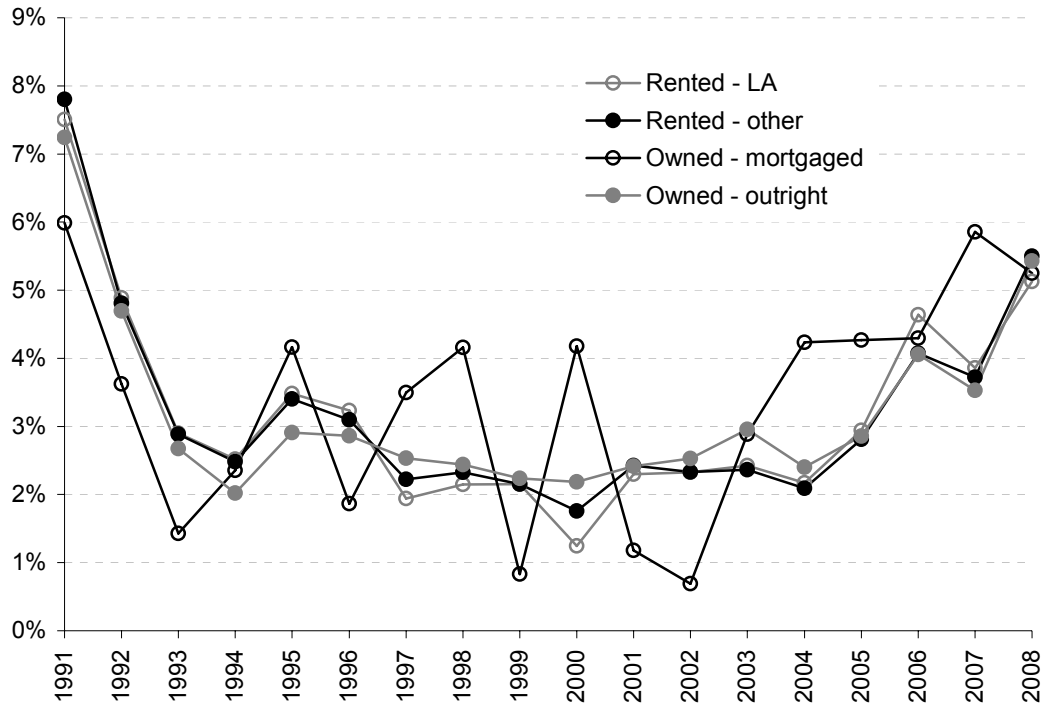
## 4.5 Inflation by housing tenure

Figure 4.9 showed that the inflation rate for non-pensioners has tended to be more volatile than that for pensioners, and we suggested this was largely driven by mortgage interest payments. This is confirmed when we examine inflation rates for pensioner households according to their housing tenure in Figure 4.17. Those pensioners who are still paying mortgages have much more volatile inflation rates than the other groups. (Approximately 8 per cent of pensioners in 2006 had mortgages, compared with 54 per cent of non-pensioners; pensioners with mortgages spent on average 12.4 per cent of their budget on mortgage interest payments.)

<sup>42</sup> We do not show the rate for the richest non-pensioner households, which tend to contain a large number of mortgagors who have very volatile inflation rates depending on the path of interest rates. The figures are available on request.

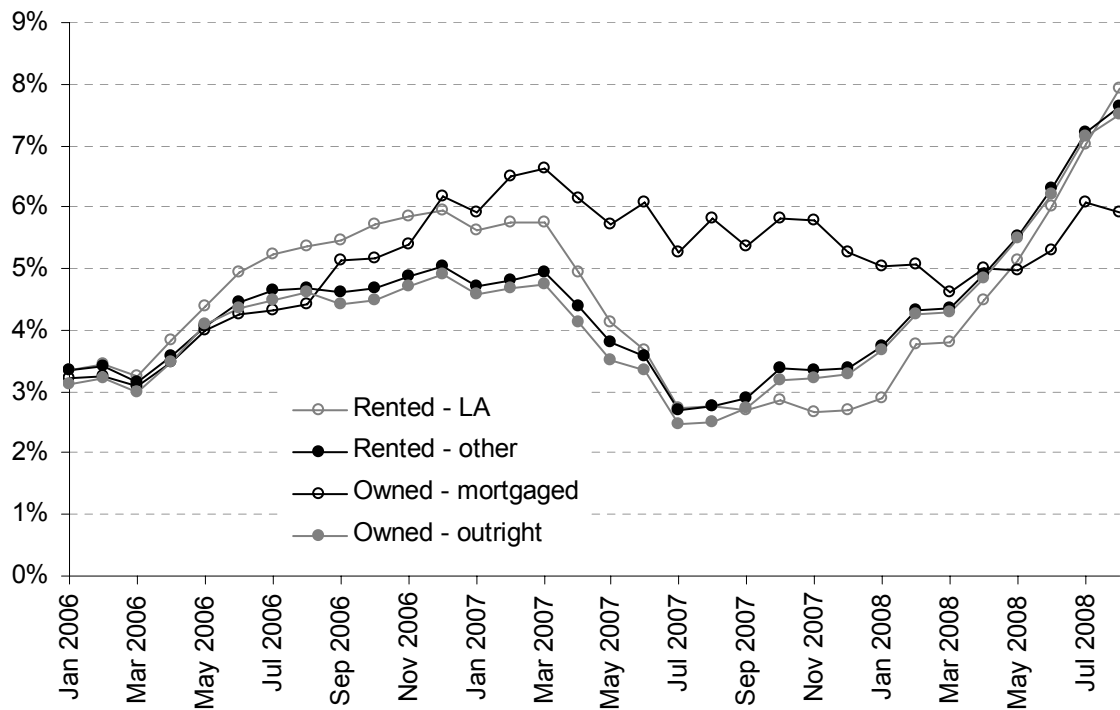


Figure 4.17. Average inflation among pensioners by housing tenure, 1991–2008



Note: Figures for 2008 are the averages for the first eight months of the year.  
Source: Authors' calculations from FES/EFS data and ONS inflation data.

Figure 4.18. Average inflation among pensioners by housing tenure, January 2006 – August 2008

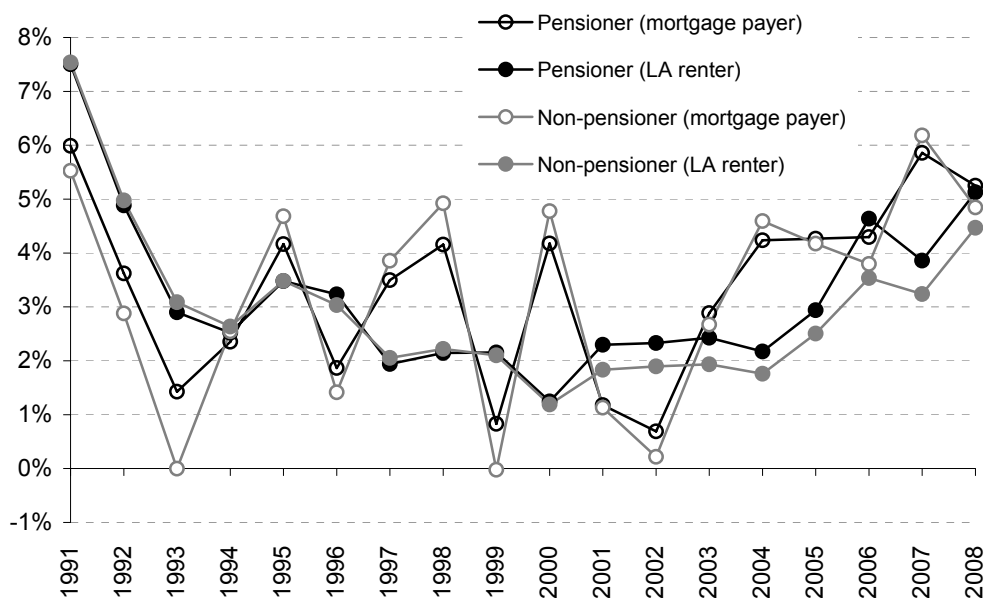


Source: Authors' calculations from EFS data and ONS inflation data.

Interestingly, from the monthly inflation rates since 2006 shown in Figure 4.18, we see that rising interest rates during 2007 had a substantial upward effect on the inflation rate for pensioners with mortgages, which offset the reductions enjoyed by other groups as fuel prices fell. In the three most recent months for which we have data, the inflation rate for pensioners with mortgages has been significantly less than that for other pensioner groups. This is partly because mortgage interest rates fell during mid-2007 and partly because this group tends to be typically younger and richer than other pensioners. The importance of income is again clear from the fact that pensioners in local authority housing, who are typically poorer, had the highest inflation rates in 2006 as fuel prices rose, though interestingly they had suffered less from inflation in 2008 until the most recent months.

Figure 4.19 compares inflation rates by tenure across pensioners and non-pensioners. It is clear that mortgage costs drive inflation rates for households with mortgages irrespective of whether they are pensioner households or not. However, there tends to be a little more volatility from year to year in average inflation rates for non-pensioner mortgage payers than for pensioner mortgage payers. This is not surprising as non-pensioners with mortgages have a greater basket weight on interest payments than do pensioners with mortgages (15.6 per cent compared with 12.4 per cent). For those in local authority accommodation, the trends in inflation rates for non-pensioners and pensioners are again similar, though since 2001 pensioners in local authority housing have had a higher inflation rate than non-pensioners.<sup>43</sup>

Figure 4.19. Average inflation for pensioners and non-pensioners, by housing tenure, January 2006 – August 2008



Note: Figures for 2008 are the averages for the first eight months of the year.

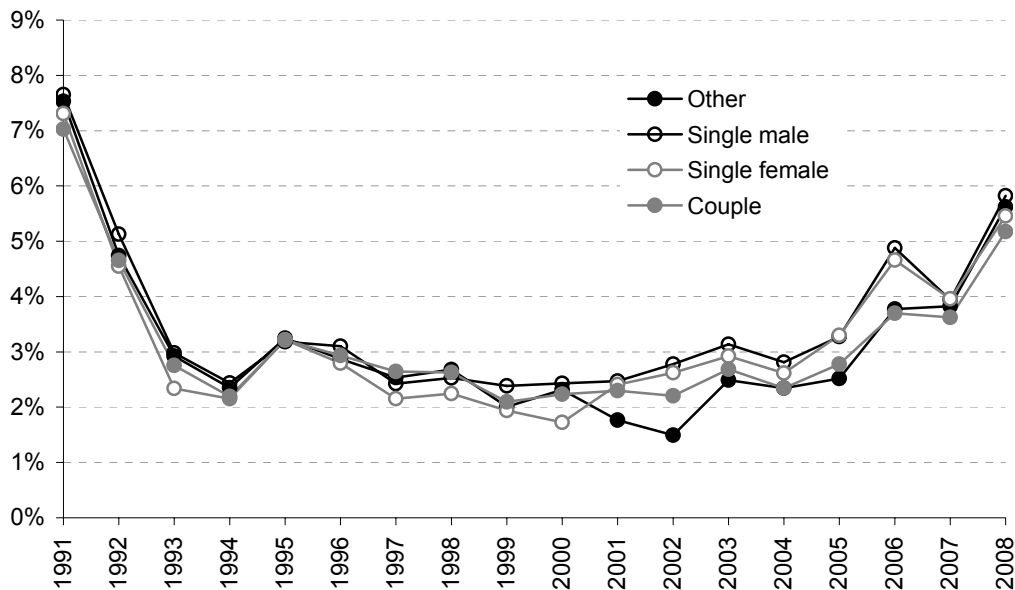
Source: Authors' calculations from FES/EFS data and ONS inflation data.

<sup>43</sup> This result is statistically significant for each year between 2001 and 2008 inclusive.

## 4.6 Inflation by family structure

Figures 4.20 and 4.21 show how average pensioner inflation varies according to household type: single males, single females, pensioner couples, and other pensioner households (essentially any household headed by a pensioner containing dependent children or any additional benefit units). We see somewhat less variation here than in our earlier comparisons across ages, incomes and tenures. Between 1991 and 2000, there was little variation between the household-type groups. Between 2001 and 2006 inclusive, single pensioners had higher average inflation rates than pensioner couples or other household types, but there was little variation again in 2007 and 2008. The monthly breakdown since 2006 in Figure 4.21 shows that single pensioners suffered most from higher fuel costs (this is unsurprising given that fuel is a higher proportion of spending for single households) and that there were no substantial differences between single men and single women. As we have seen when making other comparisons, the most recent price increases have, by contrast to those in 2006, affected all household types somewhat similarly.

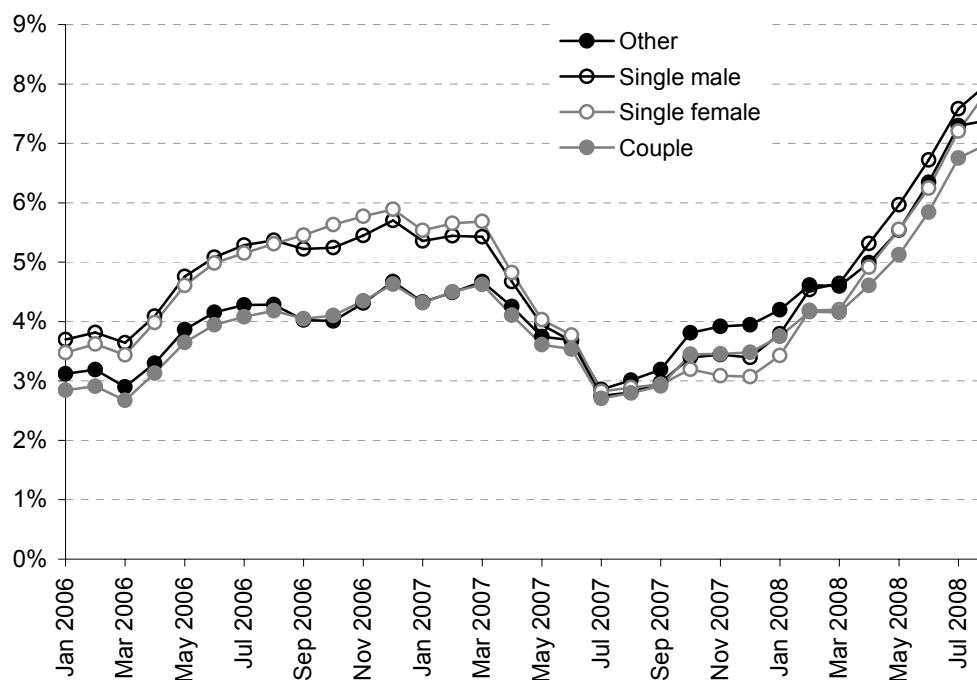
Figure 4.20. Average inflation among pensioners by family structure, 1991–2008



Note: Figures for 2008 are the averages for the first eight months of the year.

Source: Authors' calculations from FES/EFS data and ONS inflation data.

Figure 4.21. Average inflation among pensioners by family structure, January 2006 – August 2008



Source: Authors' calculations from EFS data and ONS inflation data.

## 4.7 Summary of results

Table 4.1 summarises the average inflation rates for different periods for the main groups considered in our analysis. It makes clear some of the key messages from our results so far. Over a long time period, average inflation for pensioners and non-pensioners has been similar, although within any one month or year differences may emerge. Crucially, there have been quite strong differences *across pensioner households*. It is misleading to talk about a single inflation rate for pensioners, just as it is misleading to talk of one across the whole population. Finally, whilst the inflation driven by high fuel prices during 2006 impacted most on poorer, older, single pensioners, more recent inflation into 2008 driven by food and fuel costs has been having a similar effect across different types of pensioner households.

Table 4.1. Average inflation rates by group, various periods

	<i>Annual data</i>		<i>Monthly data</i>	
	<b>1977 to 2008</b>	<b>1991 to 2008</b>	<b>Jan 2006 to Aug 2008</b>	<b>August 2008</b>
All households	5.9%	3.2%	4.3%	6.1%
Pensioners	5.8%	3.2%	4.3%	7.4%
Non-pensioners	5.9%	3.1%	4.4%	5.4%
<b>Age (pensioner households)</b>				
60–64	5.7%	3.1%	4.0%	6.6%
65–69	5.7%	3.2%	4.1%	6.9%
70–74	5.8%	3.2%	4.2%	7.3%
75–79	5.9%	3.3%	4.5%	7.8%
80+	5.9%	3.4%	4.9%	8.4%
<b>Income (pensioner households)</b>				
Poorest 20%	5.8%	3.2%	4.7%	8.3%
Quintile 2	5.9%	3.3%	4.4%	7.7%
Quintile 3	5.8%	3.2%	4.2%	7.3%
Richest 40%	5.8%	3.2%	3.9%	6.4%
<b>Tenure (pensioner households)</b>				
Renter (LA)	5.9%	3.2%	4.5%	7.9%
Renter (private)	5.8%	3.2%	4.3%	7.6%
Owner-occupier (paying mortgage)	6.0%	3.4%	5.1%	5.9%
Owner-occupier (owning outright)	5.7%	3.2%	4.2%	7.5%
<b>Structure (pensioner households)</b>				
Single male	6.1%	3.5%	4.7%	8.0%
Single female	5.8%	3.2%	4.6%	7.9%
Couple	5.7%	3.2%	4.0%	7.0%
Other	5.7%	3.2%	4.3%	7.4%
<b>Age/Income (pensioner households)</b>				
Young poor	5.8%	3.2%	4.3%	7.4%
Young rich	5.7%	3.2%	3.9%	6.1%
Old poor	5.9%	3.4%	5.2%	9.0%
Old rich	5.9%	3.5%	4.2%	7.2%

Notes: Figures since 1977 and since 1991 are averages of annual inflation rates; figures since January 2006 are averages of monthly figures. In the results presented by age and income, 'young' refers to pensioners in their 60s, 'old' to those in their 80s or above, 'poor' to pensioners in the poorest third of the overall population and 'rich' to pensioners in the richest third of the overall population. Results for non-pensioner households across the same demographic dimensions are available on request.

## 5. Pensioner benefits and pensioner inflation

There are two major benefits that are specifically targeted at pensioners in the UK: the basic state pension (BSP) and pension credit (PC). The BSP is paid to all pensioners (conditional on accumulation of sufficient National Insurance contributions over a working life), whereas the PC is an income-contingent payment designed to give all pensioners a minimum weekly income.<sup>44</sup>

The benefits are both uprated annually, but the bases against which they are uprated are different. The BSP is uprated each April in line with the all-items RPI from the previous September (thus, in April 2008, the BSP rose by 3.9 per cent, the same as the RPI inflation rate in September 2007).<sup>45</sup> The PC is uprated in line with increases in average earnings (specifically, the rise in whole-economy earnings including bonus payments, seasonally adjusted and taken as a three-month average from May to July). Broadly speaking, the inflation adjustment made to the BSP can be seen as an attempt to adjust for increases in the cost of living, whereas the earnings-uprating applied to the PC should see the value of the PC rise in the longer term relative to living costs, as earnings typically rise faster than inflation.

One key question, however, is whether using the RPI as measured for the whole economy is an appropriate ‘cost-of-living’ adjustment for the pensioner households in receipt of the BSP. As we saw in the previous chapter, from one year to another pensioners may have higher or lower inflation than non-pensioners, so that relative to a pensioner inflation rate, the ‘real’ value of the BSP can rise or fall. Figure 5.1 shows the real-terms increase in the BSP between 1988 and 2008, subtracting average pensioner household inflation from the actual rise that occurred in each year.<sup>46</sup> As before, pensioner households are defined as those where either the head of household or their spouse is of pensionable age.

In many years, real changes in the BSP have been small, even accounting for the differences between pensioner and non-pensioner inflation, and this accords with periods in Figure 4.8 above in which pensioner and non-pensioner inflation rates have been, on average, quite similar. However, there have clearly been cases where this has not held: a relatively large real cut in the BSP in 1990 was then countered by a large real increase in 1991 (in April 1990, the pensioner inflation rate for the previous year was 10.2 per cent but the BSP was increased by 7.6 per cent; in April 1991, the pensioner inflation rate for the previous year was 6.5 per cent but the BSP was uprated by 10.9 per cent). This volatility was probably driven by high and

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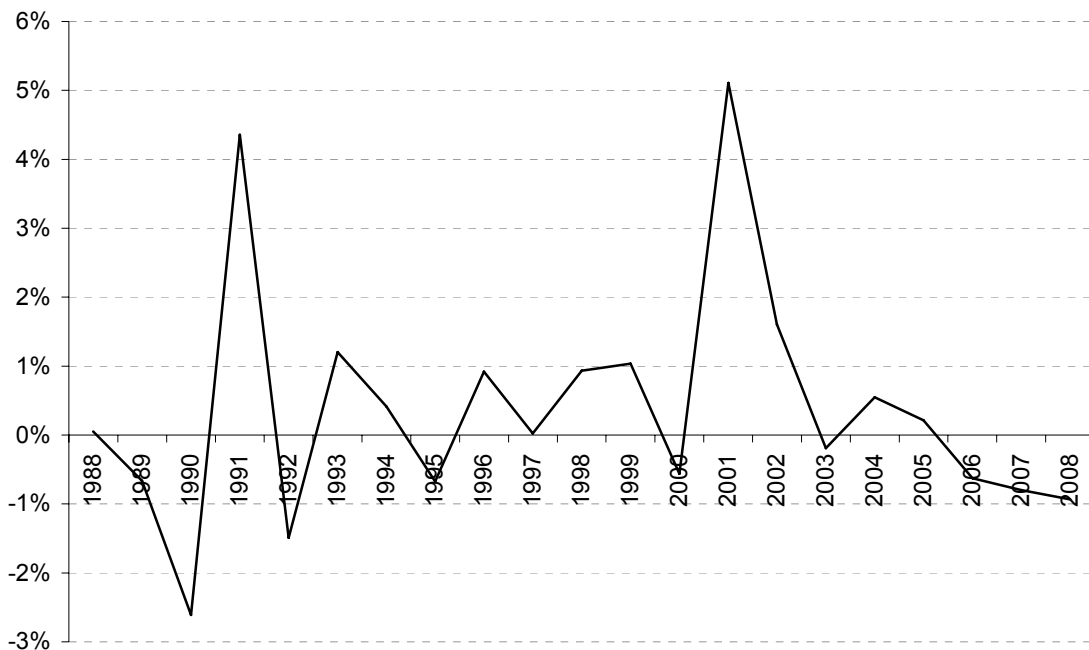
<sup>44</sup> Details of the background to and operation of these benefits, plus other minor benefits for pensioners, can be found in section 3.4 of O’Dea, Phillips and Vink (2007).

<sup>45</sup> Since 2003, there has been a floor in place such that the minimum amount by which the BSP can rise is 2.5 per cent. From 2012, the BSP may rise in line with earnings. The BSP can also be increased ad hoc from year to year.

<sup>46</sup> In particular, we take a sample of households observed in the fiscal year prior to each uprating and apply the April inflation rates for each spending group in each year to their expenditure patterns. Thus to calculate the average pensioner inflation rate for April 2006, for example, we take pensioner households between April 2005 and March 2006 and calculate their inflation based on April 2006 inflation figures. For years going forwards from 2006, where we do not have data on household spending, we take the whole of the sample of pensioner households observed in 2006 and use their spending patterns to calculate inflation based on the April 2007 and April 2008 inflation figures.

variable inflation over that period: the increases each April were simply based on the previous September's inflation rates – in 1989 to 1990, inflation was rising rapidly, so that by April 1990, inflation was high relative to September 1989; conversely, over later 1990 and 1991, inflation fell, so that by April 1991, inflation was low relative to September 1990. Up to 2000, the real increase or decrease in the BSP was typically no more than 1 per cent. Interestingly, it was in 2000 that the BSP increased by 75p per week, which caused significant outcry, though we estimate that this 1.1 per cent increase was not much less than pensioner inflation over the previous year of 1.7 per cent, and had that pensioner inflation rate been used instead of RPI inflation, the additional increase in 2000 would have been around 40p per week. In 2001, clearly responding to the criticism of the previous year, the government increased the BSP by 7.4 per cent, substantially more than pensioner inflation in the previous year of just 2.3 per cent. Since then, changes in the BSP have again typically been small in real terms, though in each of the last three years we estimate the BSP has been uprated by around 0.5–1 per cent less than pensioner inflation.

Figure 5.1. Annual increase in basic state pension above average pensioner inflation, 1988–2008



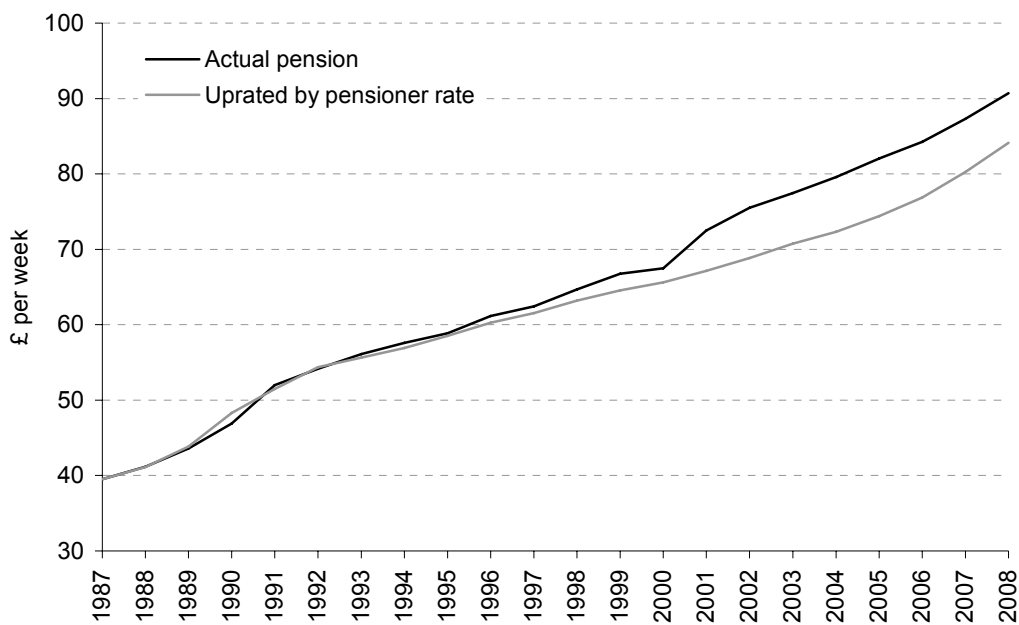
Note: The graph shows the nominal increase in the rate of the BSP in April each year, less the calculated average pensioner inflation rate for the previous fiscal year.

Sources: Authors' calculations from FES/EFS data; pension rates from IFS *Fiscal Facts* (<http://www.ifs.org.uk/fiscalfacts.php>).

Figure 5.2 shows the actual BSP in each year since 1987 and compares it with a series where the 1987 pension has been increased each year since in line with pensioner inflation. Over the whole period since 1987, we estimate that a BSP that had been uprated purely in line with pensioner inflation would now be worth around £84.13 per week, compared with an actual pension of £90.70 in April 2008. This 'extra' £6.57 per week is largely accounted for by the large real increase that occurred in 2001 (and a smaller real increase in 2002); in April 2000, a

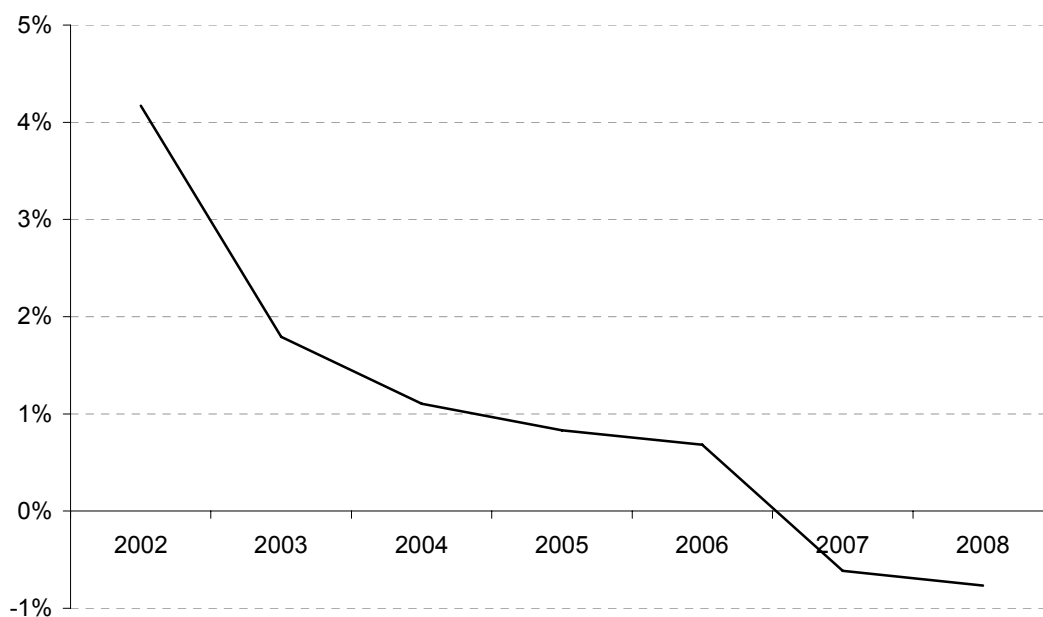
state pension uprated by pensioner inflation since 1987 would have been only £1.86 per week less than the actual pension at the time. Had the pension been uprated by pensioner inflation since 2002, it would now be worth £92.26 per week, around £1.56 *more* than the current rate. These differences illustrate again how there are periods when pensioner inflation is higher than inflation for other groups and periods when it is lower.

Figure 5.2. Basic state pension, 1987–2008



Sources: IFS *Fiscal Facts* (<http://www.ifs.org.uk/fiscalfacts.php>); authors' calculations from FES/EFS data.

Figure 5.3. Annual increase in guarantee component of pension credit above average inflation for households in receipt of MIG/PC, 2002–2008



Sources: Authors' calculations from FES/EFS data; pension credit rates from IFS *Fiscal Facts* (<http://www.ifs.org.uk/fiscalfacts.php>).



Figure 5.3 shows the real growth in the guarantee component of the PC each year since 2002 (the figure for 2002 is based on the increase in the minimum income guarantee (MIG), the precursor to PC), subtracting the average inflation rate for households in receipt of MIG/PC from the actual increase that happened each year.<sup>47</sup> These households tend to be poorer than the average pensioner and so, as we saw in Chapter 4, may well have a quite different average inflation rate even from the overall pensioner average. Prior to 2007, there were substantial real-terms increases, reflecting the fact that the benefit rose in line with average earnings, which rose faster than both overall inflation and average inflation for MIG/PC recipients. In 2007 and 2008, however, even earnings-uprating was not sufficient to compensate for inflation amongst these households. In 2008, the PC of £124.05 per week was £8.33 per week higher than the April 2001 rate uprated for the inflation rate of recipients since then. However, it was around £1.57 per week *less* than if the April 2006 rate had been increased in line with recipient inflation.

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<sup>47</sup> Either the head of household or their spouse must report receipt of MIG/PC. Note that we use explicitly households that *receive* the benefit, not those that are eligible for it.

## 6. Conclusions

This Commentary has examined how average inflation for various groups has changed since 1977, with a focus on the differences between pensioners and non-pensioners and the differences *within* pensioner households. Over time, the differences between average inflation faced by pensioners and non-pensioners tend to be quite small, though within any particular year or month the differences can be quite substantial and the ranking across groups changes frequently. In the very recent past, pensioner households have often faced significantly higher inflation than non-pensioners, driven by rapid increases in the price of fuel during 2006 and 2008, and more recently higher food price inflation. Both these items are a more important part of the pensioner shopping basket than of the non-pensioner basket. However, during 2007, inflation rates were higher for non-pensioners, driven partly by falling fuel prices and partly by higher mortgage interest payments, which impact more severely on non-pensioners and are a significant source of volatility in inflation rates.

Crucially, our results have shown that there is significant variation in household inflation rates, even within the pensioner population. As such, ‘average’ inflation is only that – an average across households – and it is not always representative of the experience of any one individual household. However, the pensioner average inflation rate does tend to be more representative of the pensioner inflation experience than the overall average, particularly in years when the overall figure is skewed by rapidly rising or falling housing costs, which are not such an important part of the pensioner budget.

We have seen that there can be quite substantial differences in average inflation rates across different pensioner groups, though again these differences are not constant over time. The two recent episodes of high inflation in 2006 and 2008 have also had quite different effects across pensioner groups. In 2006, it was mainly the older, poorer and single-person pensioner households that were affected, as rapid inflation was largely confined to household fuel bills. Richer and younger pensioners in that period had inflation rates that did not differ significantly from those of non-pensioners. During 2008, however, the growth of food and fuel prices has seen higher inflation rates emerge for all groups. Pensioners of all age groups, for example, now have significantly higher average inflation than non-pensioners. However, it is still the oldest and poorest pensioners that are most affected.

While it is rare for pensioners as a whole to have a run of years in which their average inflation rate is higher or lower than that for non-pensioners, when looking across pensioner household types more persistent trends can emerge. Older and poorer pensioners have tended to have higher inflation than younger and richer pensioners for most of the past five or six years, for example, and single pensioner households have had higher inflation rates than pensioner couples since 2002.

We used our estimates of pensioner inflation to examine what has happened to the purchasing power of the basic state pension since 1987 and the purchasing power of pension credit since 2002. The basic state pension in 2008 was around £6.50 per week higher than it would have been had it simply been uprated by pensioner inflation each year since 1987. However, this was largely due to a one-off increase in the real value of the pension in 2001, and since 2006 the real value of the state pension has been falling. The pension credit, uprated by earnings rather than prices, rose rapidly in real terms up to and including 2006, but over 2007 and 2008 even earnings-uprating has not been sufficient to compensate pensioners for their inflation.

## Appendix A. Expenditure patterns

Table A.1 shows the 71 sections that make up the all-items Retail Prices Index used in our analysis. We show for each section the average proportion of total spending (in parts per 1,000) across the whole population in 1977 and 2006 from FES/EFS data to demonstrate how spending patterns have changed over time. We then show the average proportion of spending in 2006 for pensioner and non-pensioner households (as defined in our main results, where pensioner households have a household head or their spouse of pensionable age). For comparison, we show the basket weights used in the calculation of the RPI by the ONS for the same sections in 2006. Clearly, there are substantial differences between the pensioner and non-pensioner baskets: food and fuel make up much bigger shares of the average pensioner spending bundle, whilst housing and motoring in particular make up bigger shares of spending for non-pensioners. Relative to the 2006 ONS basket used for the RPI, our figures for 2006 show higher weights for food, fuel and leisure and lower weights for alcohol, tobacco and motoring. Some of these differences, in particular for alcohol and tobacco, may well be due to underreporting in the EFS data (see Chapter 3).

Table A.1. Detailed expenditure shares for RPI sections (parts per thousand)

Section	EFS budget share (1977)	EFS budget share (2006)	Non- pensioner share (2006)	Pensioner share (2006)	ONS basket weight (2006)
Bread	15	7	7	9	4
Cereals	6	7	7	7	3
Biscuits and cakes	15	9	7	13	6
Beef	18	5	4	7	4
Lamb	9	2	1	3	2
Pork	6	2	1	3	1
Bacon	9	3	2	4	2
Poultry and other meat	27	20	18	24	12
Fish	7	6	5	10	4
Butter	7	1	1	2	1
Oils and fats	6	2	2	3	1
Cheese	6	4	4	5	3
Eggs	7	1	1	2	1
Fresh milk	23	7	6	10	5
Milk products	3	5	5	6	4
Tea	7	2	1	2	1
Coffee and other hot drinks	5	2	1	3	1
Soft drinks	6	8	9	7	10
Sugars and preserves	7	2	1	3	1
Sweets and chocolates	7	5	5	7	10
Potatoes	11	6	6	7	4
Other vegetables	17	13	12	15	8
Fruit	13	11	9	15	7
Other foods	16	9	9	9	12
<b>Food</b>	<b>253</b>	<b>140</b>	<b>124</b>	<b>173</b>	<b>110</b>

Section	EFS budget share (1977)	EFS budget share (2006)	Non- pensioner share (2006)	Pensioner share (2006)	ONS basket weight (2006)
Canteen meals	7	4	6	1	4
Restaurants and takeaways	29	45	47	40	48
<b>Catering</b>	<b>37</b>	<b>49</b>	<b>52</b>	<b>40</b>	<b>52</b>
Beer	32	17	19	12	38
Wines and spirits	14	17	17	17	32
<b>Alcohol</b>	<b>47</b>	<b>34</b>	<b>36</b>	<b>29</b>	<b>70</b>
Cigarettes	37	13	15	11	27
Other tobacco	4	2	2	2	3
<b>Tobacco</b>	<b>41</b>	<b>15</b>	<b>17</b>	<b>13</b>	<b>30</b>
Rent	34	41	48	27	47
Mortgage interest payments	26	61	85	11	52
Local taxes and rates	57	53	44	70	41
Water and other charges	5	21	18	28	13
Housing repairs	5	12	9	18	13
DIY costs	10	6	7	6	14
Insurance and ground rent	3	10	7	16	7
<b>Housing</b>	<b>139</b>	<b>204</b>	<b>218</b>	<b>175</b>	<b>186</b>
Coal and solid fuels	16	1	1	1	1
Electricity	39	25	21	34	16
Gas	21	22	17	32	15
Oil and other fuels	5	5	4	7	3
<b>Fuel &amp; light</b>	<b>81</b>	<b>53</b>	<b>43</b>	<b>74</b>	<b>35</b>
Furniture	9	21	22	19	27
Furnishings	11	12	12	11	12
Electrical appliances	9	6	6	7	8
Other household equipment	12	8	8	10	5
Household consumables	15	16	15	19	15
Pet care	8	8	8	9	7
<b>Household goods</b>	<b>65</b>	<b>73</b>	<b>72</b>	<b>76</b>	<b>74</b>
Postage	3	1	1	2	1
Telephone payments	13	30	30	30	25
Domestic services	8	10	9	14	13
Fees and subscriptions	10	18	19	17	30
<b>Household services</b>	<b>34</b>	<b>60</b>	<b>59</b>	<b>63</b>	<b>69</b>
Men's outerwear	10	8	9	7	10
Women's outerwear	20	17	17	17	18
Children's outerwear	8	5	6	1	6
Other clothing	18	7	6	7	7
Footwear	14	9	10	7	9
<b>Clothing</b>	<b>70</b>	<b>45</b>	<b>48</b>	<b>39</b>	<b>51</b>

Section	EFS budget share (1977)	EFS budget share (2006)	Non- pensioner share (2006)	Pensioner share (2006)	ONS basket weight (2006)
Chemist's goods	13	18	18	18	17
Personal services	9	12	9	19	14
<b>Personal goods &amp; services</b>	<b>22</b>	<b>31</b>	<b>27</b>	<b>37</b>	<b>30</b>
Purchase of motor vehicles	29	35	39	27	59
Motor vehicle maintenance	16	21	22	20	21
Petrol and oil	30	41	44	34	42
Tax and insurance	14	25	26	24	25
<b>Motoring</b>	<b>90</b>	<b>122</b>	<b>129</b>	<b>105</b>	<b>146</b>
Rail fares	6	5	6	2	5
Bus fares	13	4	5	2	4
Other travel costs	7	12	11	14	10
<b>Fares &amp; public transport</b>	<b>25</b>	<b>21</b>	<b>22</b>	<b>18</b>	<b>20</b>
Audio-visual equipment	7	8	10	5	9
CDs, toys, personal articles	19	22	24	16	29
Books and newspapers	19	13	10	20	10
Gardening products	5	6	4	8	6
TV licences	17	17	18	15	13
Entertainment, holidays	31	89	88	92	58
<b>Leisure goods &amp; services</b>	<b>97</b>	<b>155</b>	<b>153</b>	<b>158</b>	<b>126</b>

Notes: We exclude 'housing depreciation' from the ONS series as we have no data on this spending item in the EFS. Other series are reweighted to account for this exclusion. Figures may not sum precisely because of rounding. Sources: Authors' calculations from FES 1977 and EFS 2006; Office for National Statistics.

Table A.2 shows the average 2006 expenditure shares of the broad expenditure categories (food, motoring, household goods, etc.) for the household types that we examine in Chapter 4 – by age, income, housing tenure and family structure – along with some of the key detailed expenditure categories in fuel and housing. This table again makes clear that there are substantial differences *within* pensioner households that should not be overlooked. The richest and youngest pensioners spend, as a share of their total budget, around half the amount on fuel that their poorest and oldest counterparts spend, and substantially less on food. Housing costs are also a larger part of the budget for older and poorer pensioners. Whilst poorer pensioner households are to some extent shielded from local taxes by benefit receipts (spending, on average, no larger a share of their budget on local taxes than richer pensioners), older (and single-person) households spend considerably more. Water costs also make up a larger part of the budget of older, poorer and single-person households. By contrast, motoring costs make up a much larger share of spending for younger and richer households, suggesting they are more vulnerable to rapid increases in petrol and diesel prices.

Table A.2. Broad expenditure shares for pensioner household types, 2006 (parts per thousand)

	Non-pensioners	Pensioners	Age 60–64	Age 65–69	Age 70–74	Age 75–79	Age 80+	Poorest 20% (quintile 1)	Quintile 2	Quintile 3	Richest 40%	LA renter	Private renter	Mortgager	Outright owner	Other	One male	One female	Couple
Food	124	173	150	158	172	191	189	214	185	163	123	213	200	145	165	179	164	182	167
Catering	52	40	44	42	41	41	35	32	40	45	46	36	37	40	42	53	39	33	43
Alcohol	36	29	32	35	30	25	23	24	28	31	33	28	26	30	29	39	45	15	32
Tobacco	17	13	13	15	15	10	9	14	16	12	7	29	22	15	8	20	18	12	10
Housing	218	175	151	167	159	182	212	194	182	168	155	179	248	237	155	144	211	203	154
<i>Rent</i>	48	27	17	25	25	26	40	50	31	20	6	85	143	0	0	24	45	36	17
<i>Mortgage interest payments</i>	85	11	22	16	8	6	4	6	8	9	20	0	0	124	0	19	7	7	12
<i>Local taxes and rates</i>	44	70	57	65	66	76	85	65	77	72	66	40	55	56	80	50	83	75	69
<i>Water and other charges</i>	18	28	22	25	25	30	36	40	30	24	16	45	36	20	24	22	36	37	21
Fuel & light	43	74	55	60	67	80	103	101	76	63	52	95	74	53	72	59	93	94	58
<i>Electricity</i>	21	34	26	28	31	38	45	47	36	29	23	47	41	26	31	28	45	44	26
<i>Gas</i>	17	32	24	26	27	34	45	44	33	26	22	44	26	24	31	24	37	42	25
<i>Other fuels</i>	5	8	5	5	8	8	12	10	7	8	7	4	7	3	10	7	11	9	7
Household goods	72	76	83	78	74	72	73	76	77	76	74	68	71	75	78	66	54	84	78
Household services	59	63	52	60	50	66	84	70	65	57	57	77	65	54	61	55	70	82	49
Clothing	48	39	45	43	43	38	29	35	39	40	45	40	31	35	41	44	20	39	43
Personal goods & services	27	37	34	34	37	39	40	35	33	41	40	31	36	29	39	34	18	44	37
Motoring	129	105	137	125	119	89	63	67	100	114	143	44	67	133	119	125	117	54	134
<i>Vehicle fuels</i>	44	34	45	44	37	28	19	21	34	39	43	16	26	47	37	54	34	16	42
Fares & public transport	22	18	25	22	16	12	17	11	20	23	18	29	23	18	15	27	12	17	18
Leisure goods & services	153	158	178	161	177	153	124	125	138	168	207	130	99	136	175	155	139	141	175

## Appendix B. Data sample sizes

Our data come from the UK Expenditure and Food Survey (EFS) between 1978 and 2006.<sup>48</sup> The survey covers around 7,000 households in any particular year. When looking at the average inflation rate for a particular type of household, our results are based on smaller sample sizes, which means a greater level of uncertainty over the ‘true’ inflation rate for each group. Table B.1 shows the sample sizes in our data for each of the key types of pensioner household (based on income, age, housing tenure and household composition).

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<sup>48</sup> The EFS replaced the Family Expenditure Survey (FES) from 2001–02.

Table B.1. Sample sizes for different types of pensioner households, 1977–2006

	All households	Pensioner households	Non-pensioner households	Age 60–64	Age 65–69	Age 70–74	Age 75–79	Age 80+	Poorest 20% (quintile 1)	Quintile 2	Quintile 3	Richest 40%	LA renter	Private renter	Mortgager	Outright owner	Other	One male	One female	Couple
1977	7,197	2,235	4,962	397	652	523	390	273	900	592	336	407	857	404	69	905	434	186	741	874
1978	7,000	2,126	4,874	326	658	493	363	286	857	576	299	394	828	325	72	901	353	182	725	866
1979	6,777	2,112	4,665	284	613	555	380	280	916	568	300	328	812	335	84	881	356	197	749	810
1980	6,944	2,156	4,788	301	660	546	343	306	903	615	269	369	865	295	80	916	340	197	779	840
1981	7,525	2,365	5,160	399	658	600	407	301	873	686	367	439	962	304	91	1,008	409	214	802	940
1982	7,428	2,241	5,187	345	597	578	398	323	759	709	357	416	906	276	106	953	367	215	765	894
1983	6,973	2,192	4,781	384	575	554	401	278	705	643	360	484	824	268	94	1,006	339	187	758	908
1984	7,080	2,222	4,858	409	561	529	378	345	746	671	360	445	839	273	117	993	341	208	788	885
1985	7,012	2,218	4,794	370	542	561	443	302	728	697	360	433	891	251	115	961	355	199	783	881
1986	7,176	2,246	4,930	341	606	531	399	369	738	701	393	414	849	292	120	985	320	223	791	912
1987	7,395	2,336	5,059	347	683	535	411	360	753	721	426	436	811	270	141	1,114	337	233	841	925
1988	7,265	2,272	4,993	289	625	493	469	396	777	696	368	431	765	260	118	1,129	323	274	767	908
1989	7,410	2,297	5,113	306	678	504	422	387	788	718	363	428	736	230	129	1,202	325	236	790	946
1990	7,046	2,214	4,832	279	606	495	422	412	745	682	369	418	699	244	140	1,131	298	264	789	863
1991	7,056	2,255	4,801	313	575	499	456	412	726	666	420	443	678	240	192	1,145	308	253	856	838
1992	7,418	2,278	5,140	289	623	541	420	405	642	707	441	488	635	258	166	1,219	297	260	789	932
1993	6,979	2,095	4,884	250	532	540	365	408	617	546	349	583	567	218	165	1,145	268	232	720	875
1994	6,887	2,104	4,783	283	519	566	330	406	612	550	333	609	608	169	179	1,148	258	271	749	826
1995	6,759	2,040	4,719	264	497	497	363	419	566	640	395	439	534	248	156	1,102	254	246	714	826
1996	6,502	1,908	4,594	225	436	488	365	394	474	630	398	406	475	228	167	1,038	232	221	685	770
1997	6,441	1,888	4,553	239	462	406	395	386	455	614	409	410	456	215	164	1,053	221	241	638	788
1998	6,536	1,890	4,646	243	459	449	404	335	453	614	413	410	421	216	145	1,108	214	256	632	788
1999	7,092	2,101	4,991	287	502	452	476	384	502	686	453	460	491	251	206	1,153	231	270	712	888
2000	6,653	2,036	4,617	282	495	481	409	369	509	646	409	472	411	229	151	1,245	199	255	691	891
2001	7,314	2,088	5,226	268	512	472	412	424	560	695	419	414	351	247	171	1,319	232	245	694	917
2002	7,041	2,157	4,884	267	511	507	416	456	576	680	462	439	387	261	166	1,343	242	236	724	955
2003	7,018	2,147	4,871	271	547	490	395	444	567	660	439	481	324	272	167	1,384	240	260	711	936
2004	6,855	2,111	4,744	294	473	507	367	470	571	608	455	477	287	285	189	1,350	231	271	701	908
2005	6,696	2,107	4,589	297	492	436	423	459	545	645	438	479	265	284	173	1,385	243	248	685	931
2006	6,745	2,172	4,573	318	498	480	416	460	531	667	452	522	264	255	184	1,469	238	241	704	989



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