Public expectations of UK inflation

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Every quarter, NOP carries out a survey of the inflation expectations of the general public. This article illustrates how expectations vary according to individuals' different circumstances, and tries to explain how these differences might occur.

Introduction

The Bank of England's Monetary Policy Committee (MPC) is currently charged with the task of achieving the government's inflation target for retail prices excluding mortgage interest payments (RPIX) equal to 2.5%. People use their expectations of inflation to help them make economic decisions, and these decisions affect actual future inflation. Therefore, knowledge about the public's expectations for inflation is useful for the MPC in seeking to achieve low and stable inflation. Furthermore, the public's expectations of inflation provide an indication of the performance and credibility of monetary policy. If people believe the MPC will achieve its inflation target, they will expect future inflation to be around 2.5%.

This article examines public expectations of UK inflation using the responses to an opinion survey. The data we use allow us to answer questions such as: are individuals able to form reasonable expectations for inflation? How do these expectations vary across individuals? Does an individual's expectation of inflation depend on his or her experience of inflation?

The inflation attitudes survey

The simplest way to gauge people's expectations for inflation is to ask them what they expect. In 1999, the Bank, in collaboration with the market research agency NOP, devised an inflation attitudes survey. This survey explores public opinion and awareness of monetary policy matters. The survey asks a range of questions that examine public knowledge and understanding of, and attitudes towards, the MPC process, including people's expectations of inflation.

The inflation survey is conducted quarterly, based on a sample of 2,000 individuals. The February survey questions 4,000 individuals.(1) In this article we analyse data from the February 2001, 2002 and 2003 surveys, to enable a more disaggregated analysis of the responses. Different individuals are questioned each year, and so this allows us to analyse the inflation expectations of around 12,000 people. The survey is designed to capture a sample of respondents that is representative of the UK adult population. For each survey respondent we have data for their expectations for economic variables such as inflation and interest rates, and their demographic characteristics, such as age, education level, and region.(2)

The question asked in the survey is '*How much would you expect prices in the shops generally to change over the next 12 months?*' The survey is conducted face-to-face. Each respondent is given a flash card with a number of ranges for their expectation of inflation and asked to select one, therefore each inflation expectation is expressed as an interval.

Different people may interpret the question posed in different ways. The Bank of England is currently charged with maintaining the stability of RPIX. But individual survey respondents may interpret the question as being about goods only, while others may interpret it as referring to the cost of living. And

(1) The February survey samples twice as many people as the surveys in other quarters. It also contains five additional questions about people's beliefs about the transmission mechanism. These questions are not included in the survey each quarter because in trials the responses to these questions varied little from quarter to quarter.
(2) The responses to all the questions in the inflation attitudes survey are discussed annually in the Summer *Quarterly Bulletin*.

different respondents may have different notions in mind when answering the question. We can never know exactly what prices people are thinking of when they report their expectation of inflation.(1)

Question: *How much would you expect prices in the shops generally to change over the next 12 months?*
Go down
Not change
Up by 1% or less
Up by 1% but less than 2%
Up by 2% but less than 3%
Up by 3% but less than 4%
Up by 4% but less than 5%
Up by 5% or more
No idea

What do the responses look like?

Actual inflation differed in each of the three years for which we examined the survey responses. Table A shows the inflation rate in each year, and the average expected inflation rate from the survey taken in February of the same year. We can see that in 2001 and 2002 average inflation expectations were slightly above, but close to, actual inflation. This suggests that on average the general public forms accurate inflation expectations for the coming year. In the most recent survey, taken in February this year, average inflation expectations rose to 2.6%. This may reflect the fact that RPIX inflation has been consistently above the 2.5% target since November 2002.

Table A
Actual and expected inflation(a)

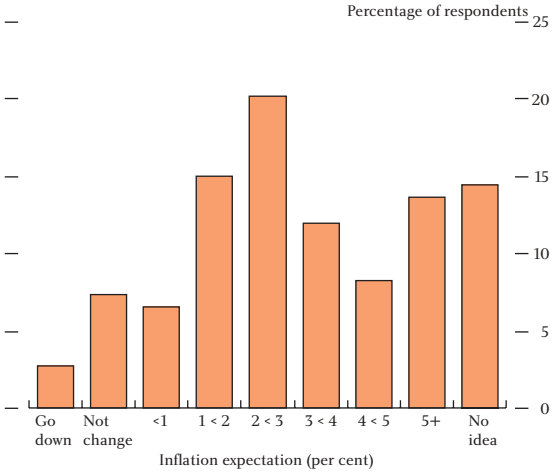
Per cent

	2001	2002	2003
Actual inflation	2.1	2.2	
Average expected inflation	2.2	2.3	2.6

(a) These averages are reported by NOP. The interval mid-point is used to calculate the average response. For respondents who answer 'go down' the mid-point is taken as zero, for the '5% or more' response the mid-point is taken as 5.5%.

Taking an average across all the respondents does not give us a full picture of how expectations for inflation differ across the respondents. Without knowing the distribution of expectations across individuals we cannot know how many people are forming accurate expectations.(2) Chart 1 shows the distribution of responses across different intervals in the February 2003 survey.

Chart 1
Public inflation expectations in February 2003



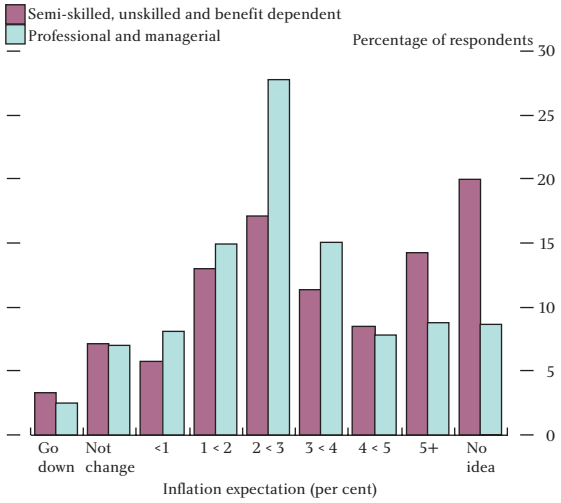
It turns out that the responses have shown a similar pattern each year. The average expected inflation rate from respondents in February 2003 was 2.6%. But within this average there is some interesting variation. Although RPIX inflation has not been outside a range of 1% to 4% for over ten years, only around half of respondents expect inflation to be within this range in the following year. One in ten people expect inflation to be negative or zero and one in seven people expect inflation to be as high as '5% or more'. The same number, one in seven respondents, reported that they have 'no idea' what they expect inflation to be over the next twelve months.

Different people, different expectations?

This section turns to answer the following questions. Are there any systematic patterns to the differences in expected inflation? Are some people better judges of inflation than others? And do particular demographic groups expect prices to rise more quickly or slowly than other groups?(3) If we look at inflation expectations across individuals we can see some systematic differences. Chart 2 shows the inflation expectations for two different types of occupational groups. The mean expectation for both occupational groups shown is the interval 2% to 3%. The expectations of inflation of those people who can be described as professional and managerial workers are more clustered around the mean; and fewer of this group give the response 'no idea'. Different occupational groupings have the same expectations for inflation on average. But the distribution around the average expectation is different.

(1) The difficulty in ascertaining the beliefs underlying survey responses is discussed in detail in Hansen *et al* (1953).
(2) The importance of considering forecasts individually is discussed by Keane and Runkle (1990).
(3) For a discussion of how inflation expectations in the United States vary across demographic groups see Bryan and Venkatu (2001).

Chart 2
Inflation expectations across occupational groupings



When we turn to the expected inflation rates of different age groups we find that on average different age groups expect different inflation. In particular younger respondents—those aged 15–34—have lower inflation expectations. But across age groups the distribution of expectations around the mean is similar (see Chart 3).

Chart 3
Inflation expectations across different age groups

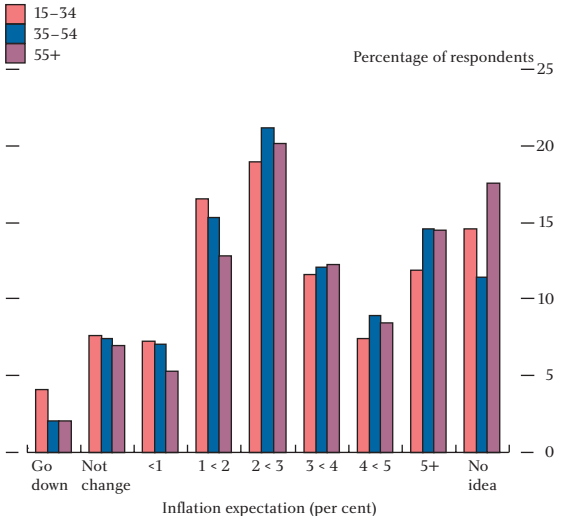
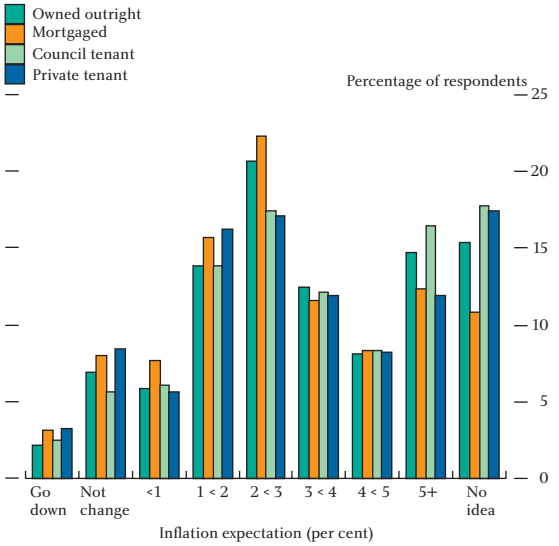


Chart 4 shows inflation expectations across different forms of housing tenure. Interestingly the inflation expectations of those who pay a mortgage appear to differ from the rest of the population. Mortgage payers have lower inflation expectations, with more respondents expecting inflation to be 1% or less in the coming year. Far fewer also report that they have no idea what to expect for inflation.

Chart 4
Inflation expectations across housing tenure



We can examine the differences in responses to the inflation attitudes survey in more detail using regression analysis. This allows us to calculate the effect of particular characteristics on the inflation expectations of an average person. The results of this analysis are shown in Table B. The average inflation rate of the reference group is shown, and the average effects of different characteristics are listed. The reference group is male, 35–44, working in an administrative or non-management executive position, educated to 16, living in the north of England and paying a mortgage.

Table B
Average effect of different characteristics on expected inflation

		2001	2002	2003
Average expected inflation of reference group		1.96%	+0.12(a)	+0.56(a)
Effect of different characteristics on inflation expectation (basis points):				
Age	15–24	15		
	25–34	-8		
	45–54	13	25	28
	55–64	35		
	65+	15		
Left school	Under 16	6		
	17–18	-5		
	19+	-27		
Region	Scotland	-15		34
	Midlands	-2		23
	Wales and west	-17	28	25
	South and east	37	-18	-38
Housing status	Homeowner	10		
	Council tenant	43		
	Private tenant	16		

Note: The reference group is male, 35–44, working in an administrative or non-management executive position, educated to 16, living in the north of England and paying a mortgage.

(a) Percentage points.

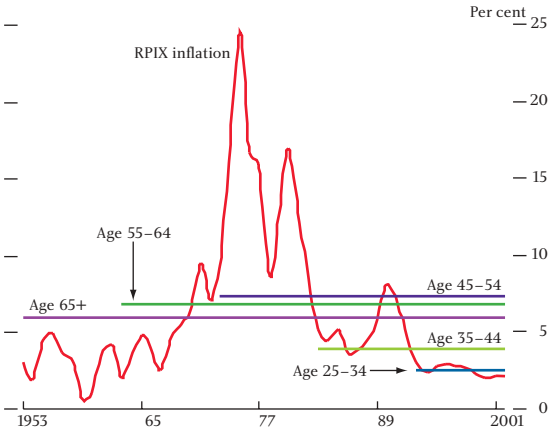
For example, people who live in a council-owned property have inflation expectations that are 43 basis

points higher than the expectations of respondents who pay a mortgage; their inflation expectations are 2.39% compared with 1.96%. Respondents in the age category 45–54 have higher inflation expectations on average than those in the reference age group 35–44. This effect varies in each of the three years. In 2001 their expectation was on average 13 basis points higher, in 2002 it was 38 basis points higher (13 + 25), and in 2003 it was 41 basis points higher (13 + 28). The regression technique used and full results are given in Appendix A.

One of the strongest results from our analysis is that older people expect higher inflation. Inflation expectations are generally increasing with age, with the exception of pensioners, whose expectations are slightly lower than those in the age group below them. Why might this be? One possibility is that older people have higher expectations for inflation because they have experienced periods of higher inflation over their adult lives.(1)

Chart 5 shows actual inflation for the past 50 years, and plots the average inflation rate experienced by people of different age groups. We see that in general older people have on average observed higher inflation. People in the age group 45–54 have experienced the highest level of inflation, an average inflation rate of 7.3% over their adult lives. We test whether inflation expectations are associated with lifetime experiences of inflation formally in Appendix A. And we find that lifetime inflation experience has a significant effect on people's inflation expectations.

Chart 5
Lifetime experiences of inflation



Our regression results also show that inflation expectations held by the public differ across geographical region. In particular people living in the south and the east of the United Kingdom have higher expectations of inflation than those living elsewhere. An article in the Summer 2001 *Quarterly Bulletin* shows that economic activity in the South has been stronger than elsewhere in the United Kingdom.(2) But, perhaps surprisingly, evidence seems to suggest that there are no significant differences in regional inflation. The Croner Reward Group produces cost-of-living indices for different regions in the United Kingdom,(3) and analysis of these data shows that there are no significant differences in regional inflation.

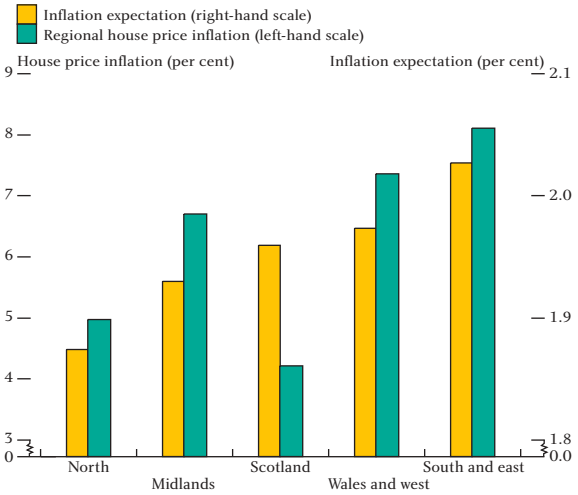
So what can be influencing people in the south and the east of England, and causing them to have higher expectations of inflation than people living elsewhere? The cost-of-living indices produced by the Croner Reward Group use the local prices of goods and services. We cannot use these data to say anything about regional changes in housing costs. But remember the exact wording of the survey question, '*How much would you expect prices in the shops generally to change…?*' This suggests that people's answers should not be influenced by their housing costs.

But perhaps the interpretation is not so simple. People may subconsciously include housing costs when answering such a question. Or perhaps they will be aware of the media attention on property prices in the past few years. Given that housing takes up around 18% of households' expenditure, it is possible that housing costs affect perceptions of price changes even if people do not consciously think of them when answering a survey question about their expectations for inflation.

So what happens if we consider regional housing costs? Over certain periods, differences in regional house prices(4) are correlated with differences in inflation expectations; where property prices have risen most quickly, expectations of inflation are higher, and in areas of the United Kingdom where property prices have been more subdued, the general public has lower expectations of inflation. This can be seen in Chart 6, and is supported by the regressions reported in Appendix A.

(1) Here adult life is taken as over the age of 20.
(2) See Morris (2001).
(3) The data used are taken from *Cost of living regional comparisons* published by the Croner Reward Group. Further information is available from www.reward-group.co.uk.
(4) The data used are from The Nationwide House Price Index. We use average annual house price inflation rates over the past ten years compared with the inflation expectations from the 2001, 2002 and 2003 surveys.

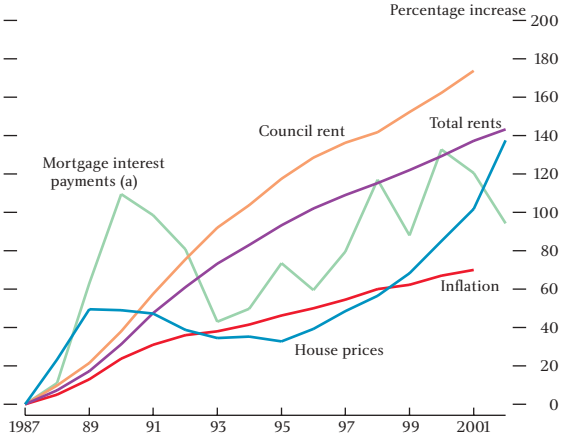
Chart 6
Regional house price inflation



Despite the focus in the question on 'prices in the shops', housing costs may be associated with people's expectations for inflation. Further evidence for this hypothesis is that inflation expectations vary according to what type of housing tenure people hold. People renting their home hold higher expectations for inflation than those who own their home outright or are paying a mortgage on it. This is true for both tenants who are renting privately or are living in council accommodation. But surely owner-occupiers will be more aware of recent attention on house price inflation? Property prices have risen sharply over the past few years, so it seems reasonable to expect homeowners to have experienced higher rates of inflation in their housing costs.

When we examine the data, this turns out not to be true. Chart 7 shows the changes in the costs of different forms of housing over the past 15 years. It turns out that people living in rented accommodation have experienced high levels of inflation in their cost of housing. Over certain periods these rises have been even higher than house price inflation. So perhaps this goes some way to explaining why people living in rented accommodation have higher expectations for inflation.

Chart 7
Changes in housing costs over the past 15 years



(a) Mortgage interest payments are calculated using a model of the payments for mortgages by an average household. See the ONS publication *Retail Prices Index Technical Manual* for further details.

Individual expectations, individual inflation

One reason why different people may hold different expectations for inflation is that they consume different combinations of goods and services. This means that each individual has their own personal basket of goods and services and so they have their own unique inflation rate.(1) The inflation attitudes survey asks for people's expectations for inflation across the whole economy. This section considers whether respondents' expectations of inflation are related to their personal consumption patterns. Using information about the goods and services individuals buy and the inflation attitudes survey we can examine how, if at all, people's expectations for inflation are influenced by changes in the prices of the goods and services they consume.

The Family Expenditure Survey (FES)(2) gives a breakdown of the individual goods and services consumed by each household, as well as the household's characteristics. From this, the actual inflation rate experienced by each household over the previous year can be calculated. We can compare this with inflation expectations for the next twelve months to examine the relationship between expected inflation and actual inflation. To do this we match the characteristics across the two surveys; for example, we take an estimate of the inflation rate experienced by individuals who live in the north of England, are educated to 19 and so on, and compare this with the inflation expectations of individuals with the same characteristics.

When we analyse these two surveys in this way we find that, when responding to the survey question about expected inflation, people do abstract from their individual inflation rate. The details of this analysis are presented in Appendix B. We find that people do not use the inflation rate they experienced in the previous year to form their expectations. There are a number of reasons why this may be the case.

(1) See Bank of England (2002), pages 34–35 and Crawford and Smith (2002) for details.
(2) The UK Family Expenditure Survey is a random cross-sectional survey that collects information on the characteristics and detailed expenditure of around 7,000 households. In April 2001 it was replaced by the Expenditure and Food Survey.

In the previous section we found that individuals' inflation expectations were related to their lifetime experience of inflation. That suggests that individuals base their expectations of future inflation on what has happened over a number of years rather than just the previous year.

It may be the case that people are unable to judge their own inflation rate. An individual's inflation rate is a weighted average of all the price changes that he or she experiences over a year. To calculate this, a lot of information about price changes and computations is required and it is unlikely that most people would spend the time and effort making this calculation for themselves. Alternatively they may get the majority of their information about economic variables from the media, even if they do augment this information with their own experience.

The two surveys are for different people. Perhaps the match between the surveys is not that close. The people who live in the north of England, are educated to 19, etc captured in the FES may be a very different group from that with the same characteristics in the inflation attitudes survey. We may be picking up sampling error.(1)

We can use the inflation attitudes survey to examine to what extent people accurately report their own inflation rate. One of the questions in the survey asks people what they think inflation has been over the past year. If we match this to the actual inflation rate they have experienced over the same time horizon, again using the Family Expenditure Survey, we find that people's beliefs about inflation over the past twelve months are not related to the price changes they have experienced in the past year. This may be because they are not trying to report their individual experience of inflation, or because they are unable to.

Conclusions

Around half of the UK general public surveyed expects inflation to be between 1% and 4%. However, inflation expectations vary systematically across the population. In particular, age, geographical location, education, and housing status are all associated with different inflation expectations. We provide evidence that the variation in inflation expectations is not being driven by variation in individual consumption patterns. Rather, expectations are related to factors such as the lifetime experiences of inflation, and housing costs.

(1) Technical factors in the construction of the FES inflation data may also play a role. The FES data are for RPI inflation. To construct the individual inflation rates Crawford and Smith (2002) make certain assumptions about housing costs. For example, they assume council tenants have zero housing costs. So a council tenant who uses high rent increments to inform his view on high future inflation would be at odds with the low measure of actual inflation.

Appendix A
Estimating a model of inflation expectations

The dependent variable, inflation expectation, is an interval variable. This means that for each individual, *j*, in the survey, we know their expectation for inflation lies in the interval $[y_{1j}, y_{2j}]$. Individuals are coded as missing where they gave the expectation 'no idea'. The model is consistently estimated by a maximum likelihood procedure. The model assumes that the responses in each interval are distributed normally, and so it is the mid-point in the interval that is used to represent the inflation expectation. For the censored interval no mid-point is assumed and the likelihood function consists of probabilities for the left/right-censored observations.

In Model 1 we estimate an interval regression model of inflation expectations over the demographic characteristics. These are given by a series of dummy variables, for example the variable 'age' is represented by six dummy variables, one for each age range. These take the value of one if the person's age is in the range, zero otherwise. The model is estimated relative to a reference group. This is male, aged 35–44, working in an administrative or non-management executive job, educated to 16, living in the north of England and paying a mortgage. Therefore the regression results give the marginal effect of being in each group relative to the reference group.

We find that a number of demographic characteristics have an insignificant effect on inflation expectations. Differences in gender, social class and working status are not associated with differences in inflation expectations. These are not reported in our models. To some extent we expect the education dummies to be picking up some of the effects of social class.

We pool the data across years, but also include interaction dummies for each characteristic in the different years where they are significant. The numbers in the fourth and fifth columns indicate the years when the particular characteristic has a significantly different effect on expected inflation. The effects for 2002 and 2003 are given in the fourth and fifth columns respectively. For example, if we look at the pattern of inflation expectations across different age groups we see that the effect of being in the age group 45 to 54 is greater in 2002 and 2003 than in 2001. The significance of the positive dummy (the constant term) for 2003 captures the effect of the average expected inflation being much higher in this year.

In Model 2 we substitute the average adult-life inflation rate for the age dummies. The results show that

Model 1
Inflation expectations across demographics

		Coefficient standard error	Variation in 2002	Variation in 2003
Constant		***1.962	0.118	***0.559
		0.088	0.072	0.093
Age	15–24	*0.153		
		0.083		
	25–34	-0.075		
		0.063		
	45–54	0.129	**0.251	***0.284
		0.100	0.128	0.130
	55–64	***0.35		
		0.078		
	65+	*0.149		
		0.085		
Left school	Under 16	0.062		
		0.057		
	17–18	-0.049		
		0.610		
	19+	***-0.266		
		0.061		
Region	Scotland	-0.149		**0.337
		0.950		0.168
	Midlands	-0.019		*0.232
		0.077		0.134
	Wales and west	-0.166	**0.277	*0.249
		0.106	0.141	0.154
	South and east	***0.366	*-0.184	***-0.375
		0.084	0.107	0.124
Housing status	Homeowner	0.095		
		0.060		
	Council	***0.429		
		0.064		
	Other	**0.161		
		0.067		

*, **, *** indicates significance at 10%, 5% and 1% level respectively.

Model 2
Lifetime inflation experience

		Coefficient standard error	Variation in 2002	Variation in 2003
Constant		***1.687	***0.180	***0.636
		0.099	0.068	0.091
Lifetime inflation experience		***0.069		
		0.012		
Left school	Under 16	0.065		
		0.055		
	17–18	-0.035		
		0.061		
	19+	***-0.265		
		0.062		
Region	Scotland	*-0.259		**0.358
		0.095		0.168
	Midlands	-0.026		*0.236
		0.077		0.134
	Wales and west	*-0.174	*0.282	*0.263
		0.106	0.141	0.154
	South and east	***0.360	*-0.191	***-0.363
		0.084	0.107	0.124
Housing status	Homeowner	**0.120		
		0.060		
	Council	***0.449		
		0.064		
	Other	***0.190		
		0.099		

*, **, *** indicates significance at 10%, 5% and 1% level respectively.

inflation expectations vary positively with inflation experience. This effect is significant at the 1% level. Model 3 substitutes regional house price inflation for the regional dummies. We find that inflation expectations vary positively with regional house price inflation, again this effect is significant at the 1% level.

Model 3
Regional house price inflation

		Coefficient standard error	Variation in 2002	Variation in 2003
Constant		***1.717	*0.099	***0.538
		0.120	0.053	0.054
Age	15–24	*0.148		
		0.083		
	25–34	-0.082		
		0.063		
	45–54	0.126	*0.249	**0.285
		0.100	0.128	0.130
	55–64	***0.348		
		0.078		
	65+	*0.146		
		0.085		
Left school	Under 16	0.064		
		0.058		
	17–18	-0.044		
		0.062		
	19+	***-0.264		
		0.062		
Regional house price inflation		***0.050		
		0.014		
Housing status	Homeowner	0.089		
		0.060		
	Council	***0.418		
		0.064		
	Other	**0.15		
		0.067		

*, **, *** indicates significance at 10%, 5% and 1% level respectively.

Appendix B
Testing the effects of individual inflation rates

We compare survey respondents' inflation expectations with the actual inflation in the goods and services purchased by someone with the same demographic characteristics. The Family Expenditure Survey (FES) tells us how the prices of goods and services consumed by different people have changed.(1) We use the inflation attitudes survey taken in February 2001, and compare this with the FES in the previous year, that is April 1999 to March 2000.

To test if people use their previous experience of inflation to form their expectations of inflation, we run the regression:

$$\pi^e_{tj} = \alpha + \beta\hat{\pi}_{t-1j} + \varepsilon_t$$

where π^e_{tj} is the inflation expectation at time t of person j taken from the inflation attitudes survey and $\hat{\pi}_j$ is an estimate of the actual inflation rate experienced by someone with the same demographic characteristics. $\hat{\pi}_j$ is constructed from the FES. ε_t is assumed to be independently and identically distributed $N(0,\sigma^2)$. If the hypothesis that people use their personal inflation rates to inform their expectations for inflation the following year is correct, then β would be positive. But we find β is negative (β = -0.1, significant at the 1% level), showing that differences in inflation expectations are not driven by differences experienced by individuals in their consumption baskets.

To test if people accurately report changes in the prices they experience we use the inflation attitudes survey responses to the question *'Which of these options best describes how prices have changed over the last 12 months?'* We then run the regression:

$$\pi^p_{tj} = \alpha + \beta\hat{\pi}_{tj} + \varepsilon_t$$

where π^p_{tj} is the perceived inflation reported by individual j in response to the survey. If people answer the question by accurately reporting the inflation rate for the goods and services that they consume, this would imply β equal to one. Again we reject the hypothesis, finding β is significantly negative.

(1) We are very grateful to Ian Crawford and Zoe Smith for providing us with the data on inflation rates for each household and the ESRC data archive for providing us with the FES data.

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